

Principles of Measurement and Assessment

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Revolutionizing Learning, Transforming Health

Overview of today's topics

- Review the purpose of assessments
- Reconsider the importance of learning outcomes
- Think about curriculum sequencing and structure
- Discuss tactics/techniques for designing assessments
- Consider the variety of assessment tools available
- Introduction to standard setting

Purpose of Assessment

Assessment should drive learning and be based on the intended outcomes of the curriculum

- **FOR** learning
 - Is the learner progressing? Are they ready to progress to next level?
 - Sets educational goals, can drive discovery and improvement
- **OF** learning
 - Did the learner make progress against targeted outcomes and criterion-referenced standards?
 - Does the curriculum meet the targets for accreditation, graduation etc.

Purpose of Assessment

- **Formative (typically norm-based)**
 - Gather information during course to give feedback of learners' strengths/weaknesses with respect to learning objectives
 - Consequences are typically low- “Low stakes”
- **Summative (typically criteria-based)**
 - Measure learner's achievement at end of learning cycle, and compare to standard/benchmark
 - “Moderate” to “high stakes”
- **Administrative / Compliance / Process Improvement**
 - Gather data to evaluate gap / needs assessment (not associated with education)

Challenges with assessments

- If you are the learner??
 - Vulnerability
 - Study for the test, not for a broader understanding
 - “Fairness” of the grade
 - ??
- If you are the faculty??
 - Time consuming
 - Am I really assessing the right thing?
 - Can I measure what I am trying to “see”?
 - Inter-rater reliability
 - Bias
 - ??

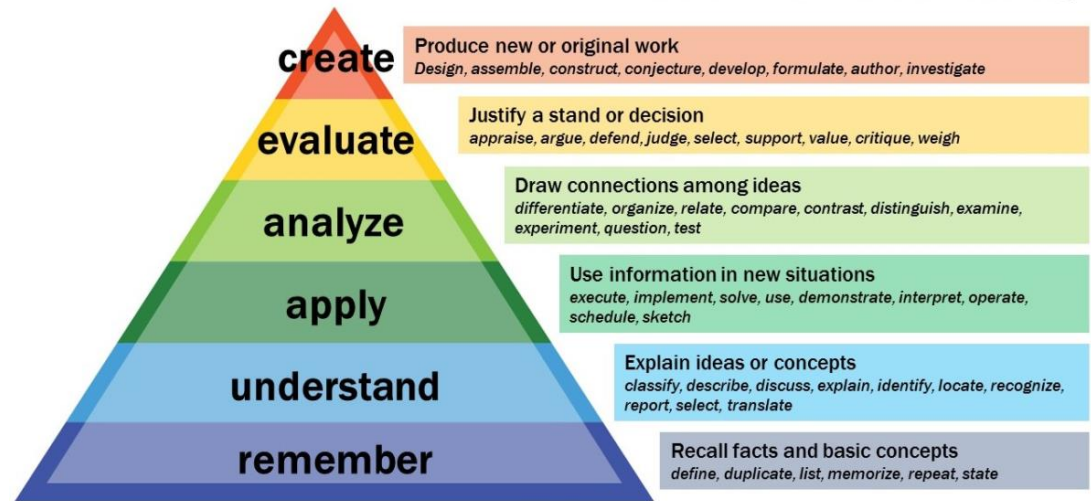
Quick reminder about ILOs

Cognitive = *Knowledge (K)*

Psychomotor = *Skills (S)*

Affective = *Attitude (A)*

Bloom's Taxonomy



Anderson, L. W., & Krathwohl, D. R. (2001). *A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives: Complete Edition*. New York: Longman.

Matching Teaching Methods to ILOs

Table 5.2 Matching Educational Methods to Objectives*

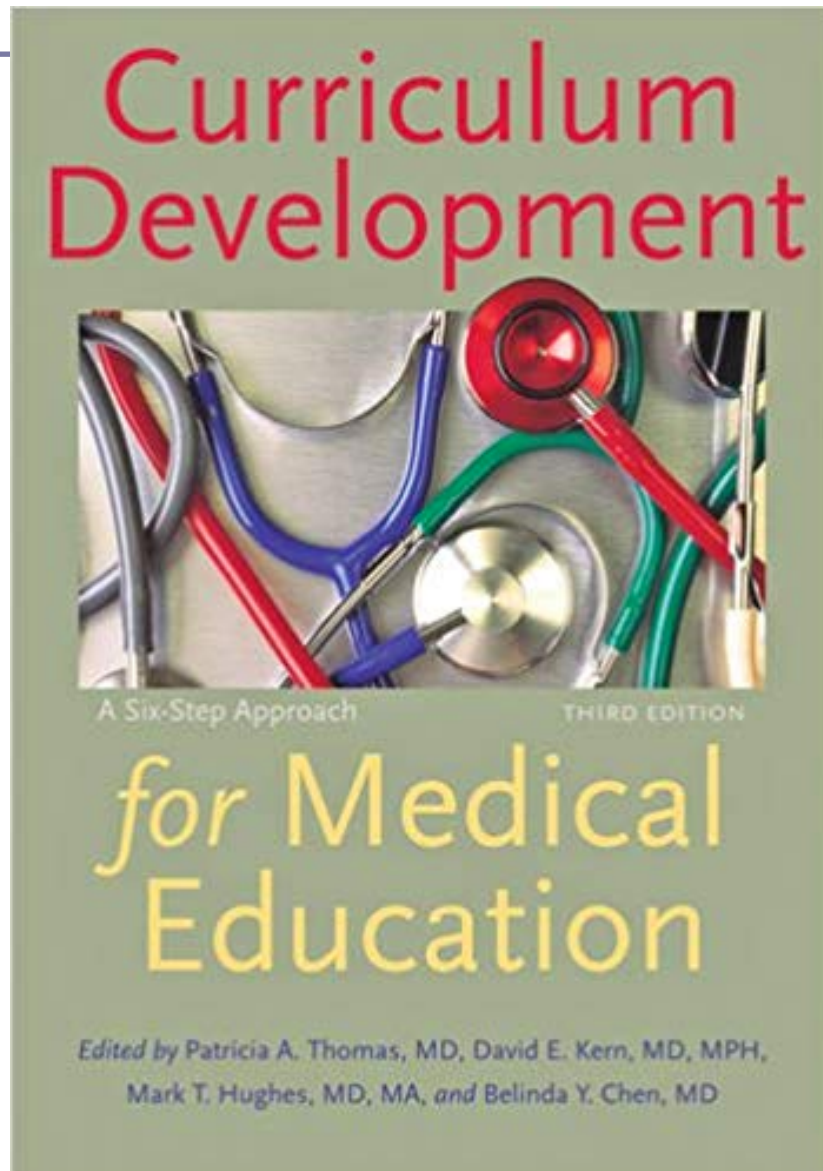
Educational Method	Type of Objective				
	Cognitive: Knowledge	Cognitive: Problem-Solving	Affective: Attitudinal	Psychomotor: Skills or Competence	Psychomotor: Behavioral or Performance
Lectures	+++	+	+	+	
Programmed learning	+++	++		+	
Discussion	++	++	+++	+	+
Reflection on experience			+++	+++	+++
Feedback on performance	+	++	++	+++	+++
Small-group learning	++	++	++	+	+
Problem-based learning	++	+++	+		+
Team-based learning	+++	+++	++	+	+
Learning projects	+++	+++	+	+	+
Role models		+	++	+	++
Demonstration	+	+	+	++	++
Role plays	+	+	++	+++	+
Artificial models and simulation	+	++	++	+++	+
Standardized patients	+	++	++	+++	+
Real life experiences	+	++	++	+++	+++
Audio or video review of learner	+			+++	+
Behavioral / environmental interventions**			+	+	+++



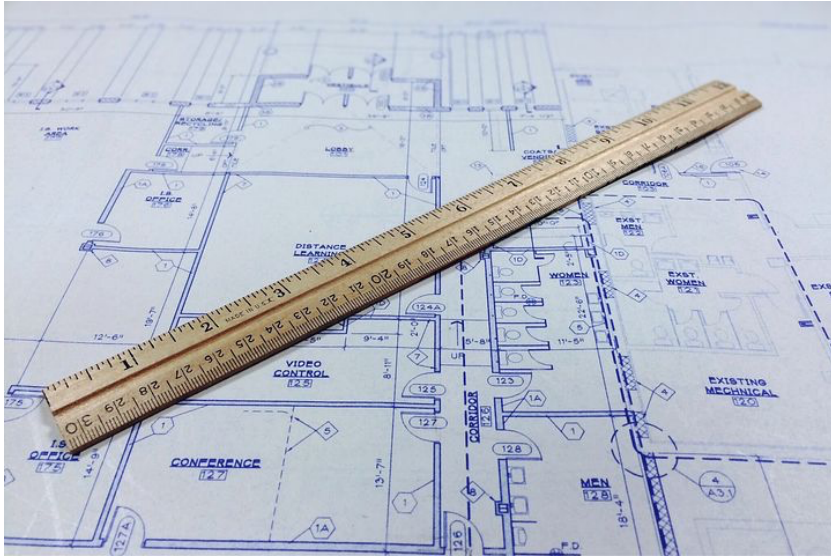
Best Resource

6 Steps:

1. Problem Identification
2. Needs Assessment
3. Goals and Objectives
4. Educational Strategy
5. Implementation
6. Evaluation and Feedback



How to design assessments



- Review the curriculum learning outcomes
- Decide on domains of skills to be tested
 - Map the domains against the learning objectives
 - Sampling: decide on the proportion of questions in each section
 - Calculate your total testing time; ensure appropriate time is allowed for the task

Assessment Tools—

KNOWLEDGE TESTS: Multiple choice questions

SKILL CONFIRMATION: Simple checklists during a procedure, OSCEs

ATTITUDE/ATTRIBUTES: Self-reflection essays, near peer evaluations of team-work

”Blueprinting”

Many things can be “blueprinted”: Multiple choice question exam, how a course is organized, confirming that the local curriculum is matching comprehensive standards

Columns== Institutional objectives, Course objectives, Session objectives

Rows == Curricular elements, Instructional Sessions, Pedagogy/Andragogy

Boxes == Courses/Clinicals, Simple check mark, Numbers of questions on in this area for the MCQ

Standard setting

- Norm-referenced (relative)
 - Fixed proportion of examinees are required to pass
 - If the whole cohort is exceptional, some competent learners may fail
- Criterion-referenced (absolute)
 - Focused on the desirable competency level that each student should achieve
 - Possible for all students to pass (or fail)

Challenges of Standard Setting

- Faculty and/or organizational decision, meaning there is a 'judgment'
- Subjective nature of the standard setting
- Defining a 'minimally competent' student
 - How to remediate 'borderline' performers
- Variability of cut scores....where's the line?
- Training the judges
- Validity and reliability