Establishing Learning Goals for Formative Assessment

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Comprehensive assessment systems

- Inherent limitations of large-scale assessment systems
- Focus on learning and teaching

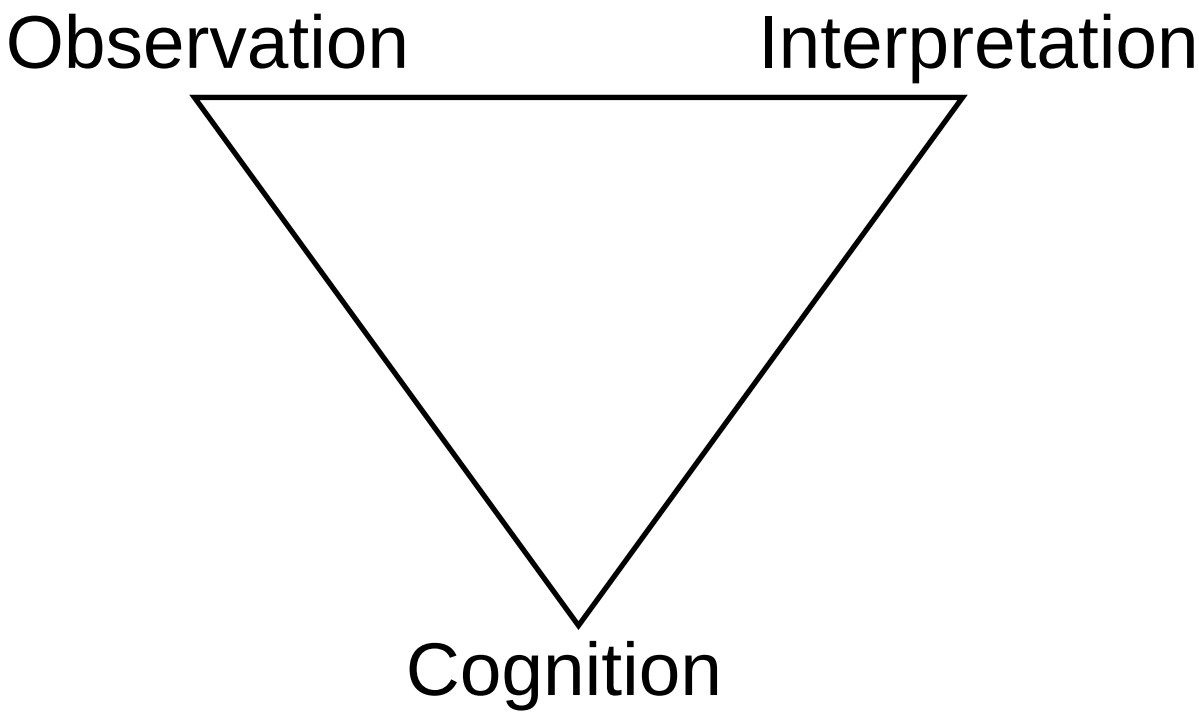
Foundations

- Instructionally sensitive assessment – purposes and uses
- Validity – reliability trade-offs
- What else is known to inform action in addition to immediate assessment

A look at learning/teaching

- Learning goal-oriented, action context
- Essential elements
  - View of the domain
  - View of student's understanding
  - Plan for helping student learn in relation to domain goals

A look at assessment



The assessment triangle
-- *Knowing What Students Know*, p. 44

View of the domain

- Constructed through many views
  - Domain experts
  - Developmental psychologists
  - Curriculum (what to teach)
  - Instruction (how to teach)

Intended Sequence and Scope

- Not your traditional “scope and sequence”
  - Not about task decomposition to smallest tasks
  - Not about pacing, practice, or reinforcement
- What is intended to develop
- Why these things (i.e., key for learning progression)

What is intended to develop

- Content
- Other dimension
  - Skills; Complexity – Proficiency

Content standards not enough

- Good examples of state grade-level content standards showing some development of knowledge, skills, or complexity over time
  - NECAP: Math
  - NRC Science:

Complexity continua

- Rote recall to strategic thinking (Webb)
- (Porter & Smithson)
- Concrete to abstract (Dienes)
- Global to analytic to deductive (van Hiele)
- Pre-operational to operational (Piaget & Beth)
- Concepts to rules to problem-solving (Gagne)
- Enactive to symbolic (Bruner)
- External to internal (Vygotsky)
- Situated to decontextualized (Cole & Griffen; Greeno)
- Facts/skills to applications to analysis/synthesis/evaluation (Bloom)
- Naïve interpretations (based on superficial characteristics) to scientific models (focused on key attributes and underlying regularities) (Steen)
- Application, learning potential, metacognition, beliefs and values, whole (Ginsburg et al.)

Proficiency

- Content, complexity, independence together
- Usually not specified completely
- Centered mostly on the complexity dimension!

Why this scope and sequence

- Domain
- Psychology of learning
- Teacher preference
- Student preference

Learning goals

- More than state content standards
- Learning progressions articulate what is to be learned
  - Makes clear the cognitive complexity
  - Provides a sequence and ideally a rationale
  - Identifies choice points that branch to other learning progressions
  - May also catalogue key states of *how* may be learned in terms of student knowledge representations (not instructional methods)

View of the student

- Cognitive representations
- How content representations develop
  - Example 1: Multiplication
  - Example 2: Forces and Motion
  - Example 3: Biological change
  - Example 5: Historical reasoning

Example: Multiplication

- Acquisition – movement from addition to multiplication
  - Multiplication: problem of finding the total quantity of objects contained in a given number of groups with the same number of elements
  - Cognitive challenges:
    - Learner has to know and operate with two different grouping systems (number of groups and number of items in a group) – not like addition or subtraction
    - Operational number systems different than place value system (e.g., 12 is one ten and two ones)
    - Generalization of learned representations (e.g., quantity per set model; area model; number line model)

Assessment

- Example (Ginsburg)

Example: Forces and motion

Assessment

- Example (Wilson)

Example: Biological change

Assessment

- Example (Gong et al.)

Example: Historical reasoning

Assessment

- Example (Baker)

Prior knowledge

- Incorporation into “more expert” analyses
- Planning future instruction

Other examples

- What are key attributes and distinguishing characteristics?
  - Forrester – reading literature
  - Computer-managed instruction
  - Intelligent tutoring systems
  - Curriculum frameworks
  - Textbooks, instructional programs

View of the Plan

- A hierarchy of values and goals
- Creating and executing a plan for formative assessment to achieve goals
- Formative self-assessment vs. formative instruction

Formative assessment

- Planning and selection
- Observing
- Eliciting
- Student self-evaluation
- Class/groups of students self-evaluation

What to do next? – big goals

- Purpose and values
  - Academic discipline
  - Student self-actualization
  - (from Vallance & Eisner)
- Deciding between individuals and groups of students
- What can I do?

What to do next? – learning goals

- Mastery
- Next in “core sequence”
- Extension
- More independent, less structured
- Transfer, application
- Motivation and other values

For more information:

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