Representing Targets of Measurement within ECD

Maureen Ewing
Sheryl Packman
Cynthia Hamen
Allison Clark

The College Board

NCME 2009
San Diego
Purpose

Domain Analysis
- Content
- Skills

Domain Model
- Claims
- Evidence
- ALDs

Assessment Framework
- Task models
- Form assembly specifications

Maureen

Increasing specificity
Domain Analysis

• First step was to convene panel of content experts

• Identify the content that represented best practices in teaching and learning
  
  • Deep conceptual understanding is promoted when learning is organized around “big picture” ideas
  
  • Content for domain organized and prioritized in increasing specificity starting with the big ideas of the discipline

• Identify the skills to be developed in the course
  
  • Key goal was to move away from a domain that emphasized content facts
Domain Analysis

Inputs to Domain analysis

- Current AP course descriptions
- National and state standards
- Latest research on student learning and assessment
- College Curriculum Study
  - Importance ratings for content and skill
  - Data on their teaching practices and course format
  - Uploaded documents (e.g., syllabus, assessments)
- Expert judgment of panelists to make final decisions
Domain Model

• Claims: statements about students’ knowledge and skill proficiencies
  • Summative claims represent all of the content and skills that should be acquired after learning a particular domain
  • Formative claims represent a subset of the content and skills intended to guide teaching and assess progress

• Evidence: actual student work that is required to support the claims; must be observable.

• Articulation of claims and evidence useful because it goes beyond a simple listing content and skill
Writing claims: Guidelines

- Claims start with “The student can…”
  - To reinforce that fact that claims are made about what students should know or be able to do
- Each claim required a verb or verb phrase that represented the skill involved in the claim
  - For science, these verbs came directly from the list of skills that were considered important in the domain
- Each claim required a piece of content from the domain analysis
Writing claims: Content and Skill Pairing

• What content and skill pairings are most appropriate or ideal?
  • All possible pairings of content and skills were not appropriate or feasible given the learning goals and constraints of the summative exam
  • Determine and reach consensus on the most ideal content and skill pairings
  • Examples of Ideal pairings: promote conceptual understanding, required the student to go beyond simple rules, or promoted depth of understanding
Writing claims: Grain Size

• At what level of specificity or grain size should the claim and evidence pairs be written?

• General guideline was that grain size of the claim should be such that it can be supported by a manageable amount of observable evidence
  • Does claim provoke the question: “What does this mean?” Too general, difficult to articulate evidence
  • Is claim too specific? Only evidence that can be articulated is a restatement of the claim
Writing claims: Proficiency level

• What is the target proficiency level of the claim and evidence pair?
  • Claims should represent summative expectations about what students should know and be able to do at the end of AP course
  • Further defined as any claim one would want to make about an AP student at the end of the course who deserves college credit
• 84 to 119 claims written depending on subject
Defining Evidence

- Evidence started with the phrase “The work is characterized by…” to reinforce the fact that evidence includes characteristics of work that is produced by students.
- Evidence should include only nouns and adjectives to emphasize that evidence must be concrete and observable.
- Evidence cannot include reference to the student or the task.
Defining evidence: Skill definitions

- Key component of the process was defining skills in terms of observable evidence
- **Apply mathematical routines** to quantities that describe natural phenomena
  - Correctness of equation and formulas
  - Correctness of application of mathematical routine
  - Reasonableness of solution given context
- Definitions are helpful because offers a way to represent the observable characteristics of important skills
- Ensures consistency between the evidence associated with claims that evoke the same skill but address different content
Claim and Evidence example

• Claim: The student can apply mathematics in which they evaluate the reasonableness of quantities found in stoichiometric calculations.

• Evidence:
  • Correctness of chemical equation
  • Correctness of chemical formulas
  • Correctness of application of mathematical routine
  • Correctness of coefficients interpreted as mole ratios
  • Reasonableness of solution as it related to mole ratio and differing molar masses
Challenges & Future Research

• Iterative nature of work
  (1) Skill definitions initially created were preliminary
  (2) Process of writing claims and evidence was itself iterative
  (3) Strained project timeline

• Steep learning curve – difficult to think in terms of observable evidence

• Defining appropriate grain size at which to write claims and evidence
Advantages of ECD

• Knowledge about how deep conceptual understanding and complex reasoning skills are acquired and evidenced in specific subject areas is still evolving
  • Articulating claims and evidence for these disciplines helped further understanding within the disciplines themselves

• Having evidence of the skill integrated with the content provides teachers with more guidance for designing instruction that develops content and skill in the context of each other.

• No guesswork on the part of the item writer about what is valued in the domain or what characteristics of student works are required for evidence.
Thank You!

• Researchers are encouraged to freely express their professional judgment. Therefore, points of view or opinions stated in College Board presentations do not necessarily represent official College Board position or policy.

• Access this presentation online at http://professionals.collegeboard.com/data-reports-research/cb/presentations

• Please forward any questions, comments, and suggestions to:
  Maureen Ewing at: mewing@collegeboard.org