Assessing Student Learning of the Next Generation Science Standards: Reflections from RILS 2017

Chris Domaleski
Center for Assessment

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WHAT IF I TOLD YOU

STUDENTS CAN LEARN IN 3 DIMENSIONS
3 Dimensional Learning and Assessment

• Students engage deeply with phenomena
  – Develop questions
  – Use practices, concepts, and core ideas to build and test models and theories

• This is a substantial shift from learning discrete knowledge and skills

• Requires that we break out of the summative accountability mindset
Domain specification

TELL ME AGAIN

HOW YOU'LL ASSESS THE FULL BREADTH AND DEPTH OF THE NGSS
Domain specification

- SEP x DCI x CCC = an astonishing number of assessment targets!
- Prioritization important
  - Document approach and rationale
  - Must have a ‘bridge’ between standards and specifications
- Matrix sampling as a promising solution
YOU GET A CLAIM, YOU GET A CLAIM

EVERYONE GETS A CLAIM!
• Many challenges with reporting to include
  – Providing adequate information to support each claim
  – Avoiding narrowing the curriculum
  – Staying true to the intent of the NGSS
ITEMS

YOU'RE THE REAL MVP
Item walk

• The quality of any assessment is only as good as its items
• Items and tasks signal what is valued and influence instruction
• In the best case
  – Items and tasks incorporate multiple dimensions of the NGSS
  – Task models, which address how design supports intended cognition, guides development
  – Attention to rubrics and scoring in design
ONE DOES NOT SIMPLY APPLY TRADITIONAL ALIGNMENT APPROACHES WITH NGSS ASSESSMENTS
Alignment

• The multidimensional nature of the NGSS suggests traditional approaches to alignment must be adapted or expanded to honor the intent of the NGSS

• Notwithstanding, we have a strong base from which to draw to apply alignment strategies
Measurement

TRYING TO SOLVE NGSS MEASUREMENT ISSUES
PSYCHOMETRIC ISSUES?

THAT'S NONE OF MY BUSINESS
Measurement

• Don’t let the tail wag the dog: ensure decisions are guided by
  – priorities for interpretations and use (e.g. signaling as priority)
  – Practical constraints (e.g. testing time, cost)

• Verify assumptions along the way (e.g. unidimensionality, independence)

• Clarify comparability claims (e.g. across form, time, mode, unit)
If measurement (or assessment) is our religion no one can question that we have established validity as our god.

Living in a Post-Validity World: Cleaning Up Our Messick

Charles A. DePascale
Validation

• We can and should build from a robust (if not entirely unified) base of validity approaches

• Sources of evidence from the 2014 Joint Standards
  – Evidence based on test content
  – Evidence based on response process
  – Internal structure
  – Relationship to other variables
  – Consequences

Validation

• Traditional external forms of validation, which emphasize consistency with other measures, as well as the search for indirect indicators that can show this consistency statistically, should be supplemented with evidence of the cognitive and substantive aspects of validity

• Emphasize fairness and opportunity to learn

Implementation

BRACE YOURSELF

IMPLEMENTATION IS COMING
Implementation

- Beware of Pyrrhic ‘victories’
- Summative assessment can’t and shouldn’t shoulder a disproportionate burden
- Don’t underestimate the support necessary to provide adequate opportunity to learn.
  - In particular, how are we supporting traditionally underserved groups?
- What will it take to get ‘buy-in’ particularly when (if?) initial results are not particularly encouraging?
- QA at every step is critical.
  - Little things become big things.
Center for Assessment
www.nciea.org

Chris Domaleski
cdomaleski@nciea.org
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A Look Back and a Look Ahead at Educational Assessment and Accountability