Formative Assessment in Mathematics: Current Status & Guidelines for Future Development

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Presentation Overview

• Project Phases

• Formative Assessment Case Studies
  ✓ Selection process
  ✓ Purpose
  ✓ Methods
  ✓ Highlights from findings

• Discussion
Current Status of Formative Assessment – Project Phases

Phase I
- Interviews
  - District Coordinators
  - States’ Assessment Coordinators & Experts

Phase II
- Survey CA School Sites
  - Teacher surveys
  - Principal surveys
  - FA examples
  - Student performance data

Phase III
- Case Studies
  - Observations
  - Teacher interviews
  - Principal interviews
Case Study - Site Selection

Phase II

• Identified 250 CA districts that serve high proportions of academically challenged, at-risk populations
• Recruited principals/teachers to complete surveys and submit sample formative assessment tools
• 122 schools enrolled in study (252 teachers, 120 principals)

Phase III

• Aim – to select schools with promising FA practices
• Criteria used to select 7 case study sites:
  ✓ Phase II results (surveys, tool analysis)
  ✓ School characteristics (% ELL, %FRL, math performance)
  ✓ Similar School Ranks, average over 2 years
  ✓ Academic Performance Index (API) ranks, average over 2 years
Case Study - Purpose

• To explore current status in FA practices through classroom observation.
  ✓ Strengths and areas to develop.
  ✓ Areas to focus on in future phases.

• Examine teacher/principal understanding of FA in relation to observed.

• Gather information about supports & barriers associated with FA.
  ✓ What can help you do FA better?
Case Study – Methods (Participants)

- 7 Principals (at 7 schools in 5 districts)
- 14 teachers
  - Grades 2, 4, 6 - 1 teacher/grade
  - Grade 5 - 4 teachers
  - Grade 8 – 7 teachers
- 86 classroom period observations
  - Minimum of 4 observations per teacher
- Observed over a 4 month period
Case Study - Methods (Procedures)

Classroom Observations

- Complementary approach; 2 observation protocols – 1 targeted, 1 open-ended
- Adapted from existing tools, most notably FAST SCASS
- Sample of key dimensions focused on:
  - Learning goals/objectives
  - Criteria for success
  - Teacher questioning
  - Attention to/involving all students
  - Feedback

Interview protocols

- At least 2 interviews per teacher
- 1 interview per principal
Case Study - Methods (Analysis)

- Qualitative analysis of field notes, teacher interviews.
- Descriptive statistics of observation ratings:
  - Average score
  - Variability within across teachers observed
- Reliability checks:
  - Within and across raters
  - Weekly or biweekly debriefs as a group
Case Study – Findings on Key Dimensions

Attention to individual students/involvement of students

- Relative strength, teachers gave attention to individual students
- Teachers observed using systematic strategies to get all students involved

Teacher questioning

- Questions tended to focus on procedure, seldom probed student reasoning
- Some examples of high level questioning, teachers adjusting instruction based on student responses
Strength: Attention to Individual Students

Captures:
- Extent of teacher support for individual student needs

High rating:
- Teacher patience and probing, regular reteaching and demonstrations that address individual needs.
Area Needing Growth: Teacher Questioning

Anchors for questioning ratings:

- 1- no/non-math/yes-no
- 4-occasional questions about student reasoning
- 7-most questions explore student reasoning

Most questions related to correct computation or procedure rather than reasoning

Average Rating of 4  \((M = 3.78)\):

- Occasional “why” questions with a procedural response. For example, find the number of roots and explain why that number was selected. When the response is “2” the why is “because the discriminant is positive”
Case Study – More Findings on Key Dimensions

Learning goals & criteria for success

- Teachers often stronger concerning goals than criteria for success
- Some teachers higher and others relatively low across observations
- Generally implicit; students did not necessarily know criteria
- Some examples of more systematic introduction of learning goals, criteria for success

Feedback quality

- Relatively low levels of quality feedback
- Few feedback loops (building upon student comments)
Strength (for some): Learning Goals

Captures:

- Extent to which the teacher articulates the learning goal(s) for the lesson in a way that students can understand and that connects the lesson to larger learning goals or concepts covered

High score (4 – extending):

- Teacher explicitly states goal (both written and verbal), refers to throughout lesson, connects with previous and future learning, clearly indicates what students should know/understand at end of lesson
Area Needing Growth: Feedback Quality

Captures:

- Frequency, extent of feedback loops
- Focus on class (vs. individual) feedback loops

High score (4 – extending):

- Students building on one another’s responses, push to more elaboration, way to draw all students into deeper discussion of ideas
So…What is the Current Status of FA?

Commonalities across observations:

- Some FA practices appeared to be familiar part of teacher routine, but quality varied.
- Opportunities for meta-cognition, reflection often missing.
- Instruction tended to focus on procedures/computation vs. deeper understanding.
- Under-utilization of productive peer support/feedback.
- Adoption of FA strategies vary (connections between FA and Common Core often noted).
Discussion

• How would you describe the current status of formative assessment in math at your school, district, etc.?
  ✓ What do you feel are current strengths?
  ✓ Areas needing growth?

• What kinds of tools & resources are most needed to support teachers’ implementation/improvement of formative assessment in math?