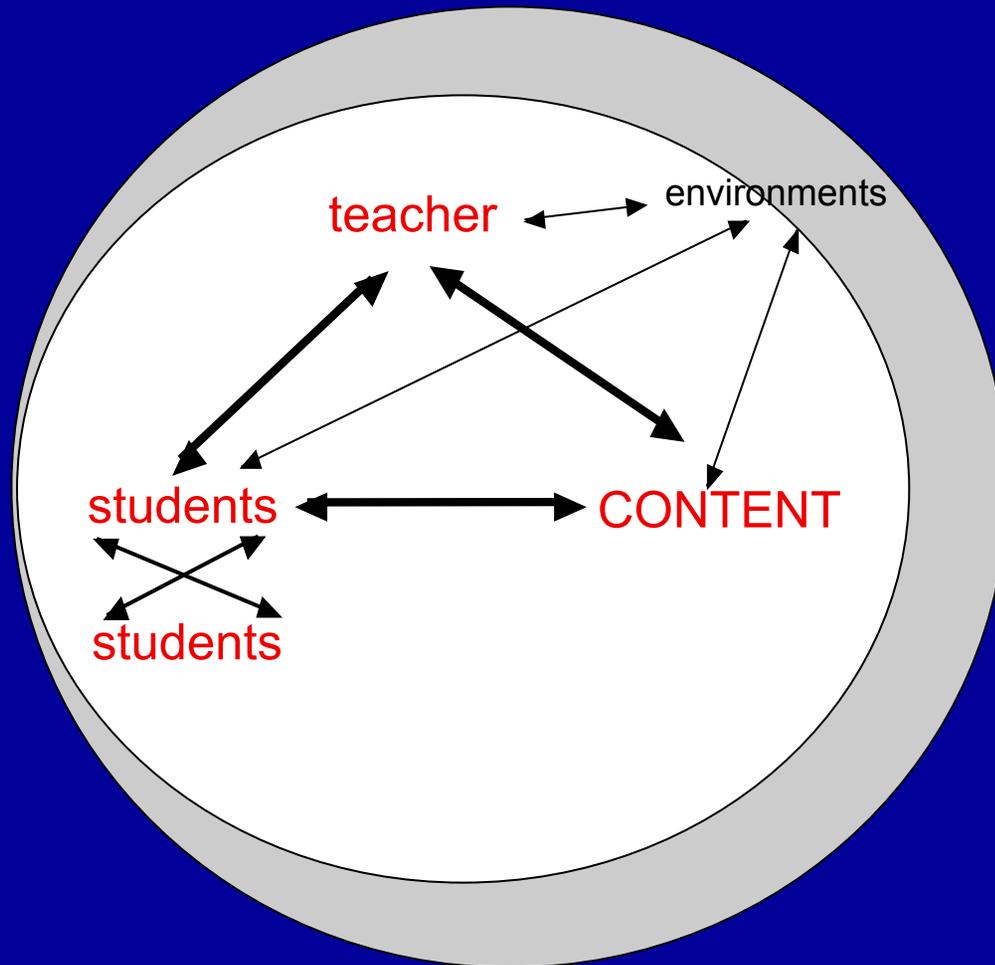


Intervening in Instruction to Enhance Teaching and Learning

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WHAT IS INSTRUCTION (IN WHICH WE INTERVENE)?



ELEMENTS OF INTERVENTION?

- INTERACTION.
- ATTEND TO USE.
- USE FILTERED THROUGH USERS' KNOWLEDGE, NORMS.
- SO, MATERIALS ALONE ARE UNLIKELY TO SUCCEED.

Instruments of practice

– THE INSTRUMENTS

- Curriculum.
- Assessments linked to curriculum, timely and usable.
- Professional opportunities to learn.
- Incentives.

– DIFFERENCES FROM POLICY?

Policy and Practice

- POLICIES THAT CREATE A NEW EXOSKELETON FOR SCHOOLS.
 - Statewide tests
 - Academic standards
 - Accountability
- HOW GET TO PRACTICE?

USERS AND THEIR SITUATION?

- Generally modest knowledge of science and math.
- School managers know less.
- Conflicting guidance.
- Professional development is weak.
- How one state dealt with these problems.

LEARNING POLICY: THE CALIFORNIA STORY (1985-1995)

- POLICY GOAL: More ambitious mathematics instruction.
- Means:
 - Math framework.
 - New state test matched to framework (CLAS).
 - New curriculum materials which embodied ambitious instruction (replacement units).
 - Professional development around both.

WHY REPLACEMENT UNITS?

- Honig text debacle.
- Denham and Akers' initiative.
- The strategy (implied):
 - Feasible change in classrooms (key topics, 4-6 weeks, compatability).
 - Build markets and political support.
 - Rely on professionals/non-government.
- The first unit.
- The response.

Sample Replacement Unit Lesson

- “SEEING FRACTIONS”
- Teacher poses problem to class
- Students develop their own method for comparing fractions
- Present and explain methods to others
- Practice

“I was at the amusement park last Saturday. I bought gumballs from one machine—I got three gumballs for eight pennies. My friend told me that she’d found a different machine where gumballs were 12 for 20 cents. How could we compare them to find out which was the better buy?”

Sample CLAS item

Your friend says she has 12 coins that add up to \$1.00. She says that one of the coins is a quarter.

A. What coins might she have? Show as many possibilities as you can.

B. Could her 12 coins add up to \$1.00 and not include one quarter? Explain your answer. (1993 Sampler of Mathematics Assessment)

California Policy Instruments

- Grounded in practice—materials and assessments used in classrooms
- Educative for teachers
 - As is
 - Through professional development for teachers
 - “Replacement unit workshops”
- Consistent with one another, and with state policy frameworks

LEARNING POLICY: THE STUDY

- Initial case studies (OERI, CPRE, Carnegie, Pew)
 - How did teachers respond to CA math reform?
 - What influenced their responses?
- Survey (NSF, Carnegie, Pew)
 - One-time survey of California elementary school teachers about mathematics
 - 600 teachers responded (60% response rate)

SURVEY ISSUES

- TEACHERS' OPPORTUNITIES TO LEARN
 - topics (coop learning, diversity, math, assessment)
 - duration.
- TEACHING PRACTICE
 - use of materials, assessments
 - instructional methods
- SCHOOL CONDITIONS
- STUDENT ACHIEVEMENT (CLAS)

DID THE INITIATIVES AFFECT PRACTICE?

- Special topics workshops = NO effect on teachers' practice. Continued to use presentation/practice instruction.
- Use of replacement units did.
- Learning about student work on CLAS did.
- Workshops on replacement units did.

NATURE OF EFFECTS?

- Teachers with conditions above used more discussion, investigations, less drill.
- Still, much conventional practice.
- Impact on student CLAS scores, net of SES and school conditions (.3 sd, one yr).
- Special topics = No effect.
- Consistent with research on student learning.
- 10 % of teachers Why?

Conclusions

- 1. Interventions can change instruction
 - When instruments grounded in practice
 - When instruments consistent (aligned).
 - When teachers have OTL, grounded in practice.
 - When steps in change are manageable, given teachers' situations.

- 2. Such interventions can influence learning.

Conclusions (cont'd)

- 3. Context crucial
 - State, . National assessments (NAEP)
 - Texts
 - Teacher OTL
- 4. Knowledge counts
- -- Use knowledge to guide improvement, report on effects (basic skills in CA?).
- 5. Plan for incremental change:
 - Professional capability
 - Professional and political support.