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Instructional Practices Task Group

First Major Step of Task Force

Framing of the Research Issues and Questions

January 11, 2007

New Orleans, LA



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- **Russell Gersten, Task Group Chair**
- **Camilla Benbow**
- **Tom Loveless**
- **Vern Williams**
- **Diane Jones**
- **Kathie Olsen**
- **Marian Banfield, staff**



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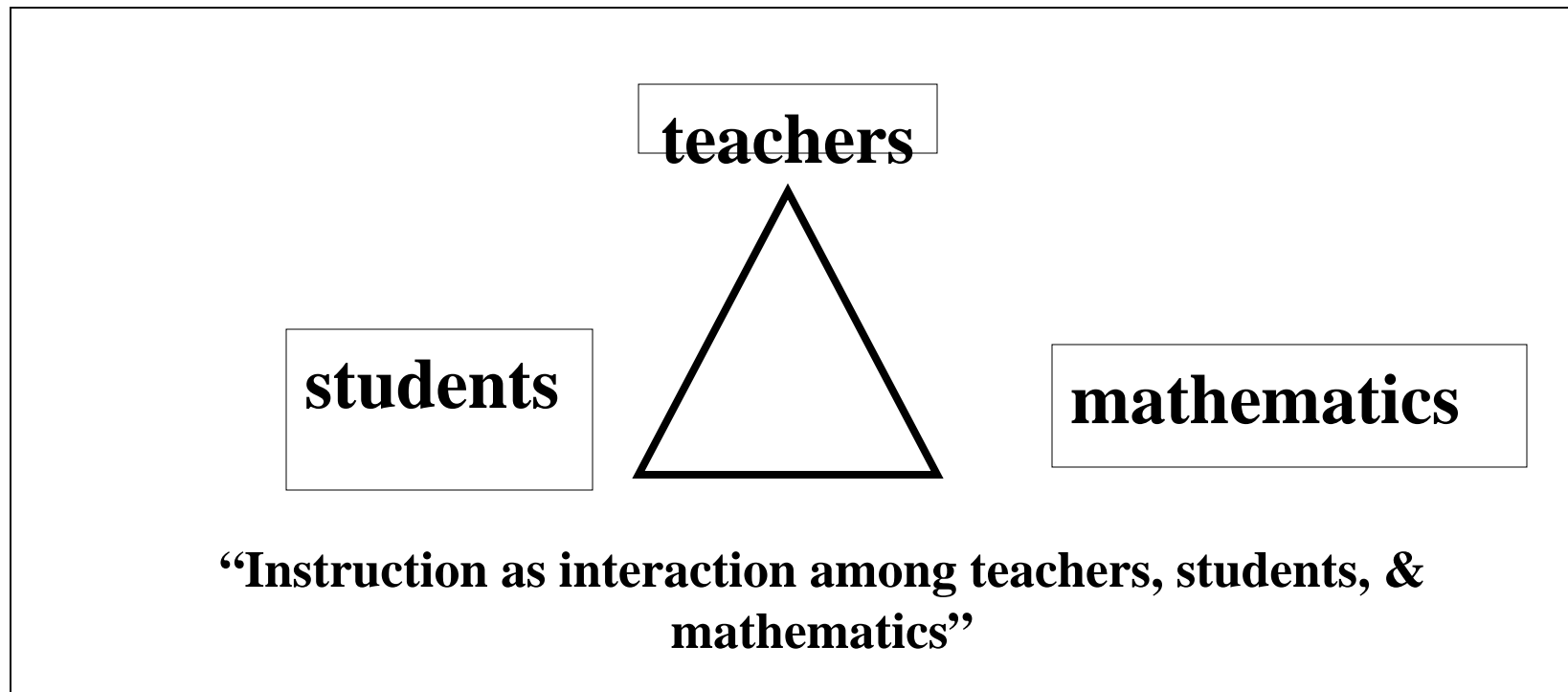
- We found the *instructional triangle* (described by Ball and Cohen) a helpful organizer to frame issues



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–The Task Group considered a long list of topics and issues of interest and selected priority areas for research literature review.



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Current Priorities

- 1. Direct instruction and Inquiry-based instruction**

(Teacher-centered and student-centered instruction)



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- 2. The types and uses of problems in the teaching of mathematics.**
 - Real world problems



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Real World Instruction: Why Is This Topic Important?

I. Embraced by Federal Policy

- One of the requirements of NSF grants for developing middle school math curricula in the 1990s was that they “focus on applications, real-world problems, that interest and motivate student investigation.” All five programs receiving these grants describe the focus on real-world problem solving as a program strength.



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- NAEP framework calls for “real-world problems” twelve times across all grade levels (4th, 8th, and 12th grade). (Mathematics Framework for the 2005 National Assessment of Educational Progress)
- NAEP Math Framework in 8th Grade calls for the NAEP to assess whether students can “Solve mathematical or real-world problems involving perimeter or area of plane figures such as triangles, rectangles, circles, or composite figures.” (Mathematics Framework for the 2005 National Assessment of Educational Progress, p. 20)



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- Solving real-world problems is a criterion for differentiating student performance standards (basic, proficient, and advanced). (Mathematics Framework for the 2005 National Assessment of Educational Progress).



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II. Embraced by State Standards

- **Fordham Foundations, State of State Math Standards, 2005, a review of the math standards of all fifty states, described “excessive emphases on “real-world problems.” The review warned, “Excessive emphasis on the “real-world” leads to tedious exercises in measuring playgrounds and taking census data, under headings like “Geometry” and “Statistics,” in place of teaching mathematics.” (David Klein, et al., Thomas B. Fordham Foundation, 2005 p.35)**



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Real World Instruction: Rationale and Criticism

I. Rationale

- Motivate students (pre-lesson)
- Boost student engagement (during lesson)
- Raise achievement (learning meaningful content leads to long term retention)



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II. What Will We Find in the Research?

Don't really know, however...

Spirited mid-1990's debate between John Anderson et al. and James Greeno in *Educational Researcher* on situated learning addressed some of the "literature" on real world instruction and what it means for offering practical guidance to teachers. ("Situated Learning and Education," John R. Anderson, Lynne M. Reder, Herbert A. Simon. *Educational Researcher*, Vol. 25, No. 4, May, 1996, pp. 5-11)



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Real World Instruction: Broadening The Topic

- Sequencing of tasks—e.g., might be appropriate at end of lesson to apply what has been learned in a real-world task; might boost motivation at beginning of lesson
- Time--if instruction focusing on real-world problems takes more time, time will become an element in any cost-benefit analysis.
- Subset of research on problem solving and intersects with research on situated learning.



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Studies Sorted into Four Categories

- **Tier 1: Experimental and Quasi-experimental Studies that Meet What Works Clearinghouse Standards (Evidence of Causal Claims)**
 - The Bin: Flawed Experimental or Quasi-experimental studies**
- **Tier 2: Other Quantitative Studies: Correlational/Descriptive**
- **Tier 3: Qualitative Research (including case studies, beat the odds schools)**



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Summaries of Tier 1 Studies:

- Will be clear about context, type of students taught etc.
- Mathematician (Dr.Wu) will review the mathematical quality of content taught (when possible)



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Role of Tier 2 and Tier 3 Studies

- Will Help Frame Research Questions And Issues
- Assist In Interpreting Findings From Experimental Research