Psychology’s Role in Improving Math and Science Education: A School Psychologist’s Perspective

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• American Psychology and Schools: A Critique (2001)
• ...education was an early focus of psychology (James, Dewey, Witmer, Hall)
• ...tenuous relations after Boulder Conference
• ...focus on individual and pathology/treatment; not on contexts for optimal learning
• Work closely with kindergarten and first-grade teachers to help newly admitted children make a smooth transition from their homes to the classroom to prevent learning/social problems
  ▪ Help teachers to assess the repertoires of their children and would help them to arrange suitable individual pupil programs.
  ▪ Help teachers modify programs when children encounter difficulties.
Bijou, continued

- Work with counselors, teachers, school social workers, and parents on mitigating or eliminating problem behavior, adjustment, and/or achievement.
- Help teachers in dealing with problems of classroom management and subject-matter programming.
  - Design remedial courses of action with the teacher, and evaluate them in terms of data from observational procedures. Data indicating that the new procedure was ineffective would lead to reassessment and alteration of the plan until a satisfactory solution is found.
  - Help teachers to program instructional material; the school psychologist's task would consist of analyzing each child's daily academic records and modifying
Bijou, continued

- Conduct in-service training for the teacher's assistants.
  - Support aides who would conduct individual and small group tutorials
  - Be responsible for keeping the teachers and others informed of advances in technology of teaching and the specific ways of incorporating them into the school system.
Contemporary Issues/Concerns re: Teachers and Teaching

- Teacher Exodus (50% after 5 years)
- Teacher Effectiveness (research -- practice gap)
- Teacher Needs (in-service support)
- Teacher quality (preservice and in-service)
Focus #1: Teacher Support

• Psychology(ists) need to treat teachers with respect. For example... Teachers need access to tools that work. National Center to Improve the Tools of Educators, Carnine.

• Psychology(ists) need to recognize teachers for their work; and, that teachers’ work occurs in challenging/unique contexts. Intervention/education programs need to be sensitive to contextual fit. See Horner et al., PBIS.
Teacher Support (cont.)

• Psychology(ists) need to be supportive of and responsive to teacher needs and circumstances. Proactive administration support; Stan Paine’s work.
psychology for education requires increased expansion of research types (Power, 2002)

• Basic research (theory development)
• Efficacy research (intervention, prevention evaluation, highly controlled)
• Effectiveness research (intervention, prevention evaluation, in communities)
• Dissemination research (evaluate efforts to disseminate effective
Focus #3: Math and science understanding

- Student understanding of math and science
- Focus on early understanding and its relation to later achievement is commendable
- Focus on vocabulary/language development may be critical...common to achievement across areas of learning
- Take care to insure a blend of contextual understanding of teaching/learning, with and
Focus #4: Motivational influences

• Expectancy X Value = Effort is critical
• Feather’s perspective on multiplicative is important...especially for students whose expectancy for success is at or near zero
• Need to focus on teachers as well as learners
• Need to focus on specific populations of students (e.g.,
Focus #5: Assessment

- Need increased attention to integrating nomothetic and idiographic assessment
- Increased attention to educational utility: what to teach, how to teach, when,
- Increased attention to integration of mastery models of assessment, with general outcome models of curriculum based assessment
Summary

• Sarason, Bijou, revisited
• Preparation, effectiveness, retention of teachers is a critical element to integration of psych/educ
• Healthy dose of contextualism is needed to better understand learning/teaching relationships
• Relevant assessment
• What psychology has to offer education, now...revisited...