

# Evidence-Based Education Making Money Matter

Grover J. Whitehurst  
Director  
Institute of Education Sciences  
United States Department of Education



## What I will try to do

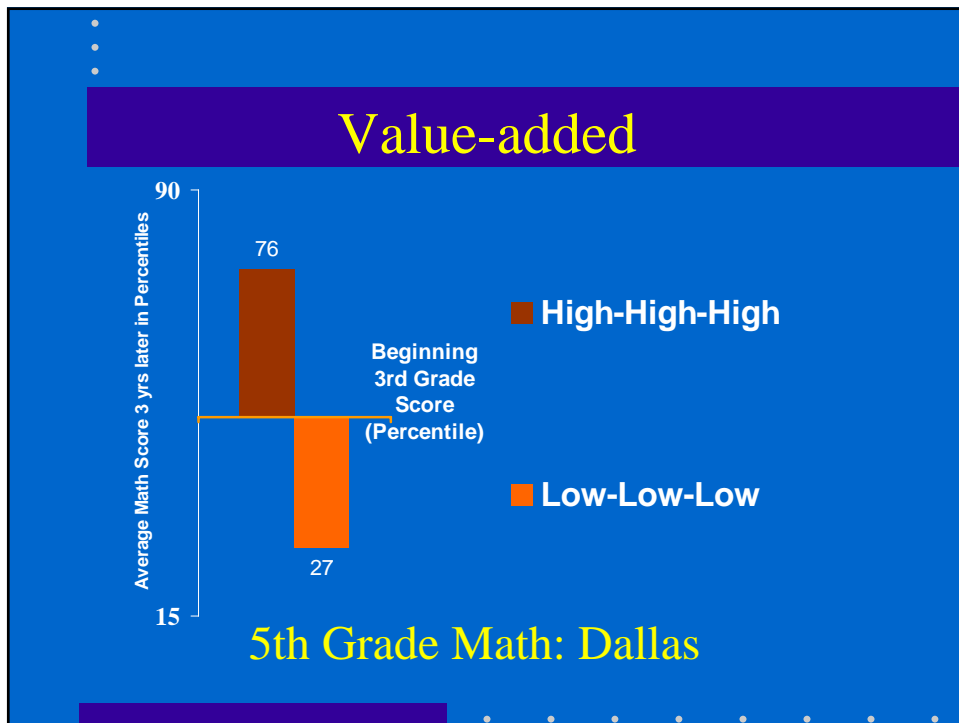
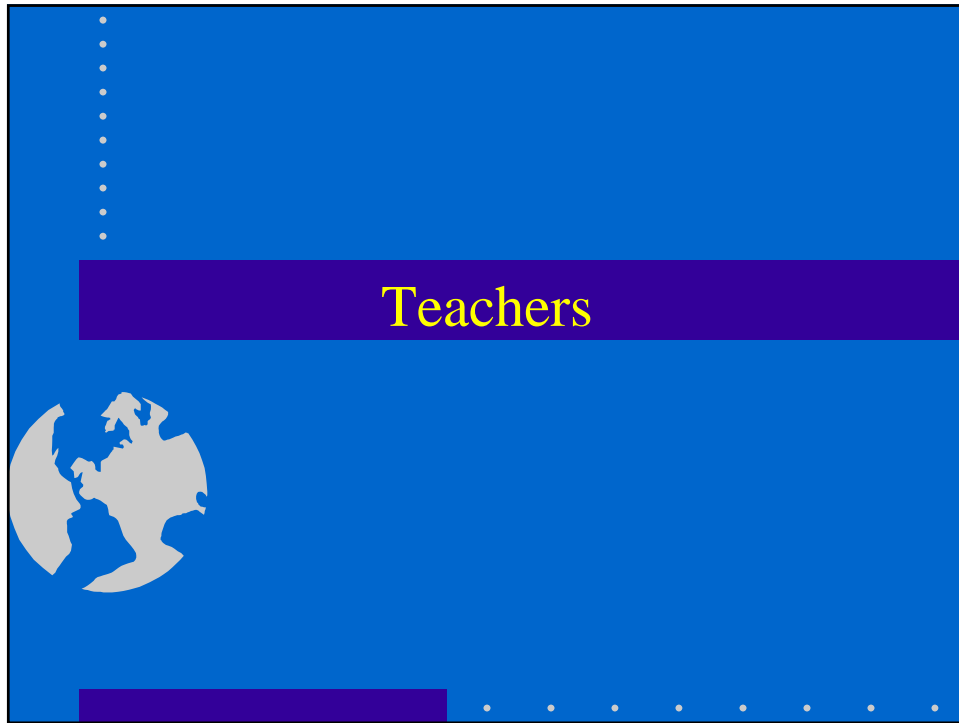
- Highlight research findings on how to improve academic achievement and low-performing schools
- Distinguish between levels of evidence (suggestive to strong)

## Background assumptions

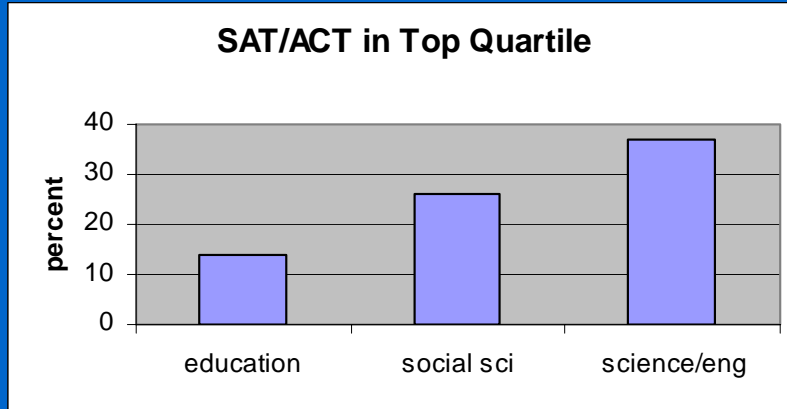
- Funding is necessary but not sufficient
- Academic achievement is the primary outcome of interest
- Focus on inputs that can be influenced by policy
- Evidence supports better bets than intuition

## Topics

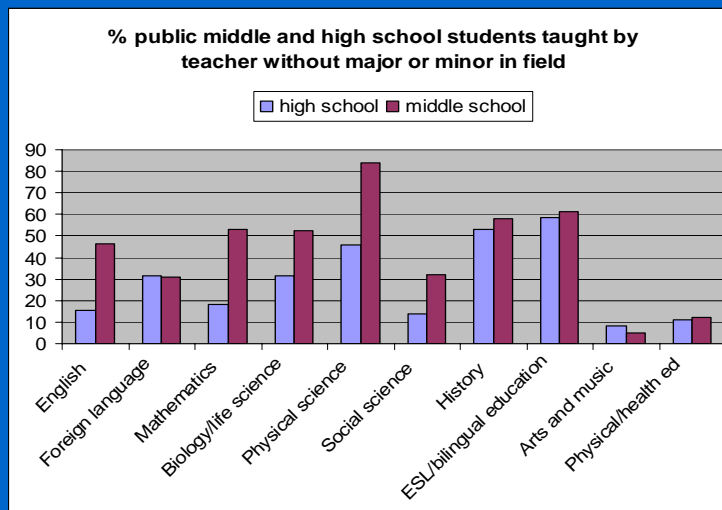
- Teachers
- Curriculum
- Assessment
- Preschool
- Remediation
- Setting
- Time-on-task
- Management
- Alignment



## Cognitive Ability



## Content Knowledge

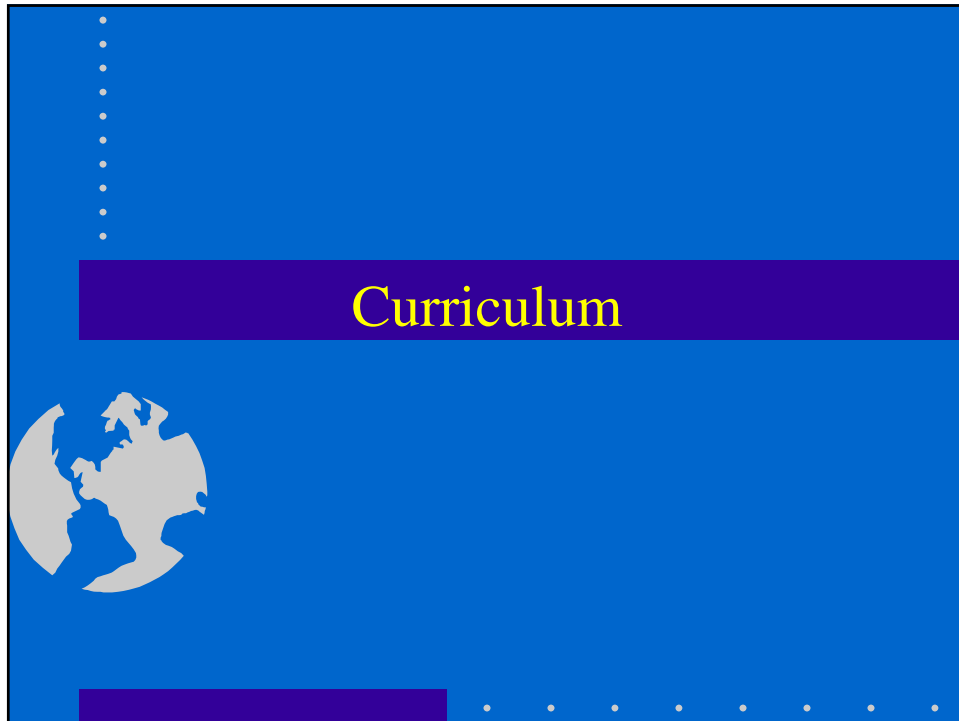


## Other factors

- Focused and sustained professional development
- Experience
- Deployment

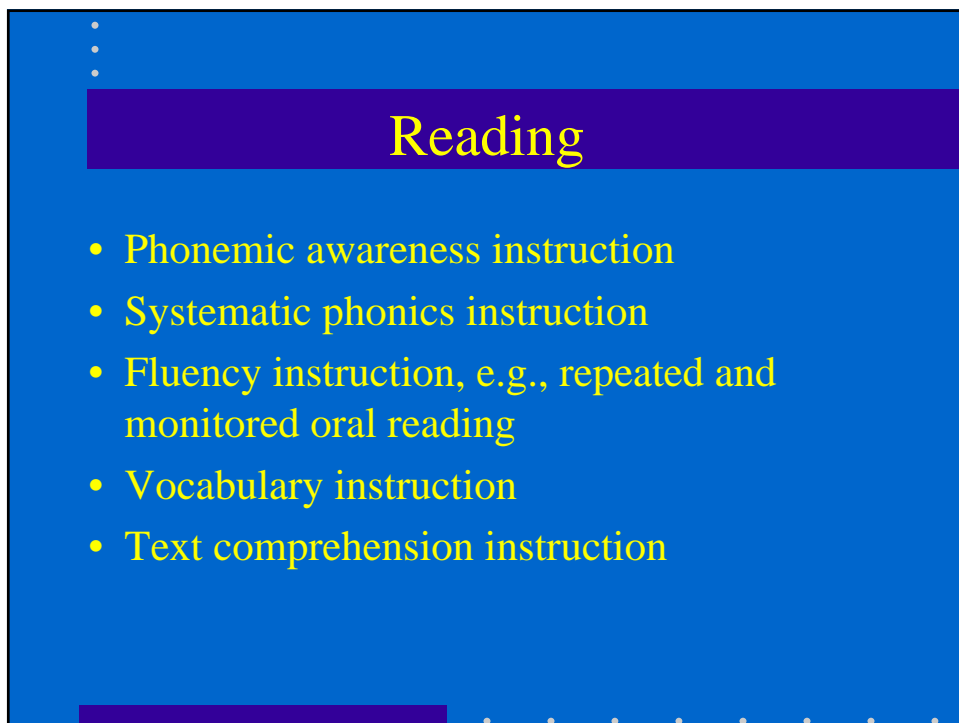

## Program Implications

- Alternative routes to teaching
- Adjunct and part-time teaching
- Differential pay
  - For performance
  - For shortages
  - For schools of high-need
  - For cognitive ability
- Time for professional development
- Induction, mentoring, training



A blue slide with a purple horizontal bar at the top containing the word "Curriculum" in yellow. A white globe icon is on the left side. There are white dots in the top-left and bottom-right corners.

## Curriculum



A blue slide with a purple horizontal bar at the top containing the word "Reading" in yellow. Below the bar is a list of five bullet points in yellow. There are white dots in the top-left and bottom-right corners.

## Reading

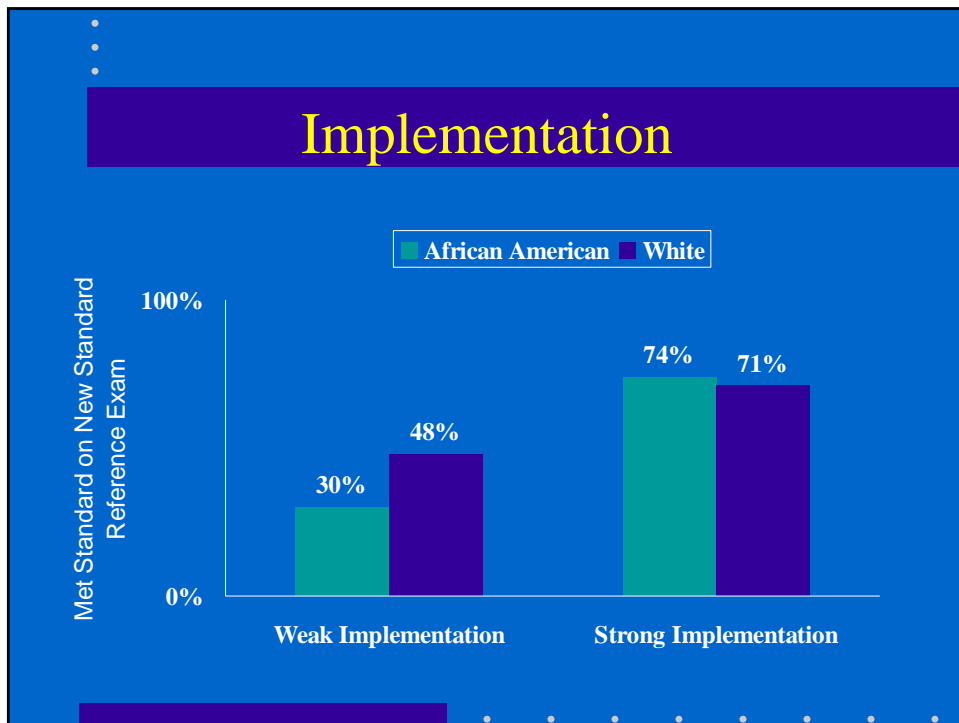
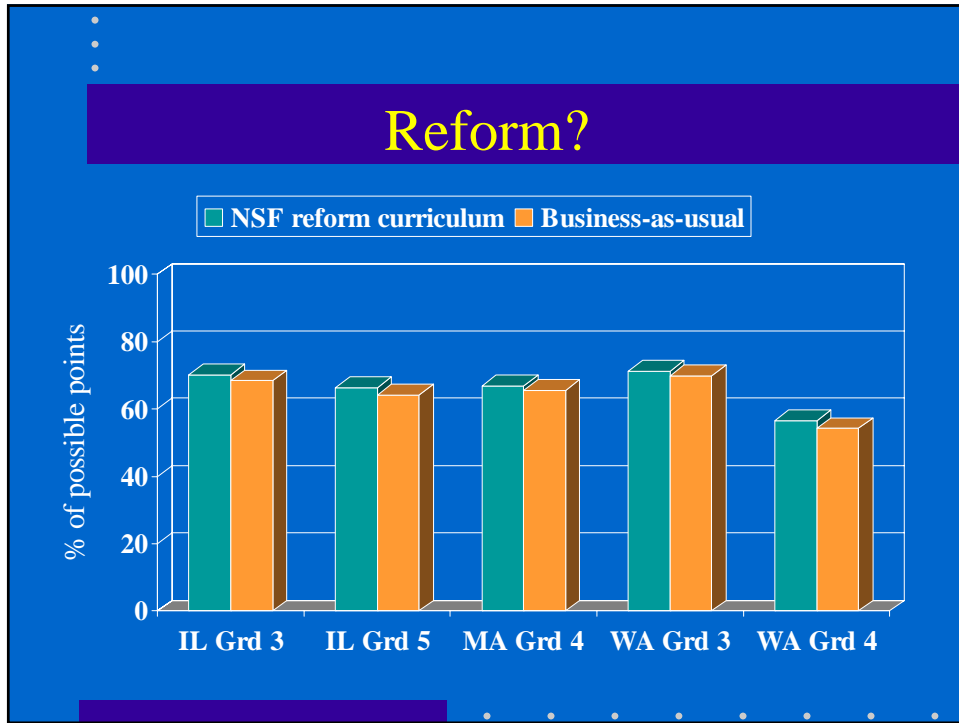
- Phonemic awareness instruction
- Systematic phonics instruction
- Fluency instruction, e.g., repeated and monitored oral reading
- Vocabulary instruction
- Text comprehension instruction

## Mathematics: Hierarchical

Topic	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Whole Number Meaning	j	j	j	j	j			
Whole Number Operations	j	j	j	j	j			
Measurement Units	j	j	j	j	j	j	j	
Common Fractions			j	j	j	j		
Equations & Formulas			j	j	j	j	j	j
Data Representation & Analysis			j	j	j	j	j	j
2-D Geometry: Basics			j	j	j	j	j	j
Polygons & Circles				j	j	j	j	j
Perimeter, Area & Volume				j	j	j	j	j
Rounding & Significant Figures					j	j		
Estimating Computations					j	j		
Properties of Whole Number Operations				j	j			
Estimating Quantity & Size				j	j			
Decimal Fractions						j		
Relationship of Common & Decimal Fractions				j	j			
Properties of Common & Decimal Fractions					j	j		
Percentages					j	j		
Proportionality Concepts						j	j	j
Proportionality Problems					j	j	j	j
2-D Coordinate Geometry					j	j	j	j
Geometry: Transformations						j	j	j
Negative Numbers, Integers & Their Properties						j	j	j
Number Theory							j	j
Exponents, Roots & Radicals							j	j
Exponents & Orders of Magnitude							j	j
Measurement Estimation & Errors							j	j
Constructions w/ Straightedge & Compass							j	j
3-D Geometry							j	j
Congruence & Similarity							j	j
Rational Numbers & Their Properties							j	j
Patterns, Relations & Functions							j	j
Slope & Trigonometry							j	j

## Mathematics: Spiraled

Topic	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Whole Number Meaning	j	j	j	j	j	j	j	j
Whole Number Operations	j	j	j	j	j	j	j	j
Measurement Units	j	j	j	j	j	j	j	j
Common Fractions	j	j	j	j	j	j	j	j
Equations & Formulas	j	j	j	j	j	j	j	j
Data Representation & Analysis	j	j	j	j	j	j	j	j
2-D Geometry: Basics	j	j	j	j	j	j	j	j
Polygons & Circles	j	j	j	j	j	j	j	j
Perimeter, Area & Volume	j	j	j	j	j	j	j	j
Rounding & Significant Figures	j	j	j	j	j	j	j	j
Estimating Computations	j	j	j	j	j	j	j	j
Properties of Whole Number Operations	j	j	j	j				
Estimating Quantity & Size	j	j	j	j	j	j	j	j
Decimal Fractions	j	j	j	j	j	j	j	j
Relationship of Common & Decimal Fractions	j	j	j	j	j	j	j	j
Properties of Common & Decimal Fractions	j	j	j	j	j	j	j	j
Percentages	j	j	j	j	j	j	j	j
Proportionality Concepts	j	j	j	j	j	j	j	j
Proportionality Problems	j	j	j	j	j	j	j	j
2-D Coordinate Geometry	j	j	j	j	j	j	j	j
Geometry: Transformations	j	j	j	j	j	j	j	j
Negative Numbers, Integers & Their Properties	j	j	j	j	j	j	j	j
Number Theory	j	j	j	j	j	j	j	j
Exponents, Roots & Radicals	j	j	j	j	j	j	j	j
Exponents & Orders of Magnitude	j	j	j	j	j	j	j	j
Measurement Estimation & Errors	j	j	j	j	j	j	j	j
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Rational Numbers & Their Properties	j	j	j	j	j	j	j	j
Patterns, Relations & Functions	j	j	j	j	j	j	j	j
Slope & Trigonometry	j	j	j	j	j	j	j	j



## Program Implications

- Curriculum has strong effects in reading (choose wisely, based on evidence)
- Design of many mathematics curricula is questionable
- Effects of reform mathematics curricula are unclear
- Curriculum implementation is very important (nominal vs. enacted)

## Assessment





Preschool

A blue rectangular slide with a dark purple horizontal bar across the middle containing the word "Preschool" in yellow serif font. On the left side, there is a white silhouette of a globe. In the top-left corner, there is a vertical line of seven white dots. In the bottom-left corner, there is a dark purple horizontal bar. In the bottom-right corner, there is a horizontal line of seven white dots.



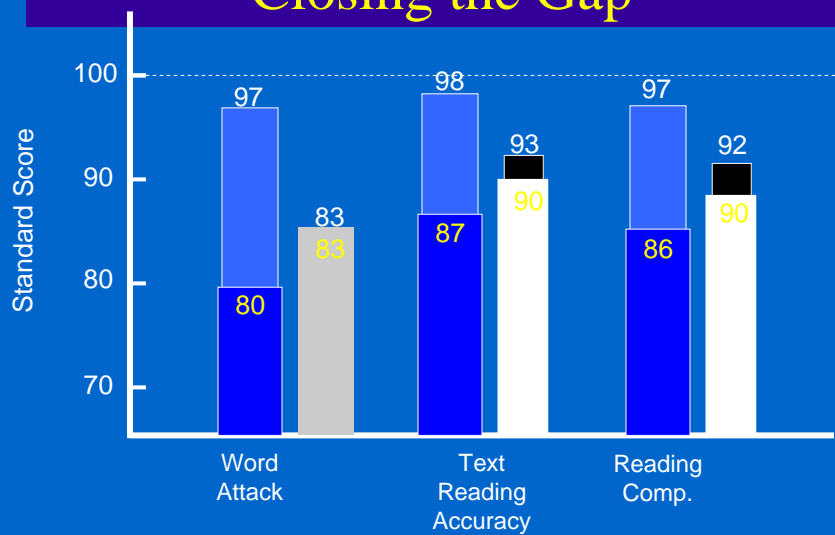
Remediation

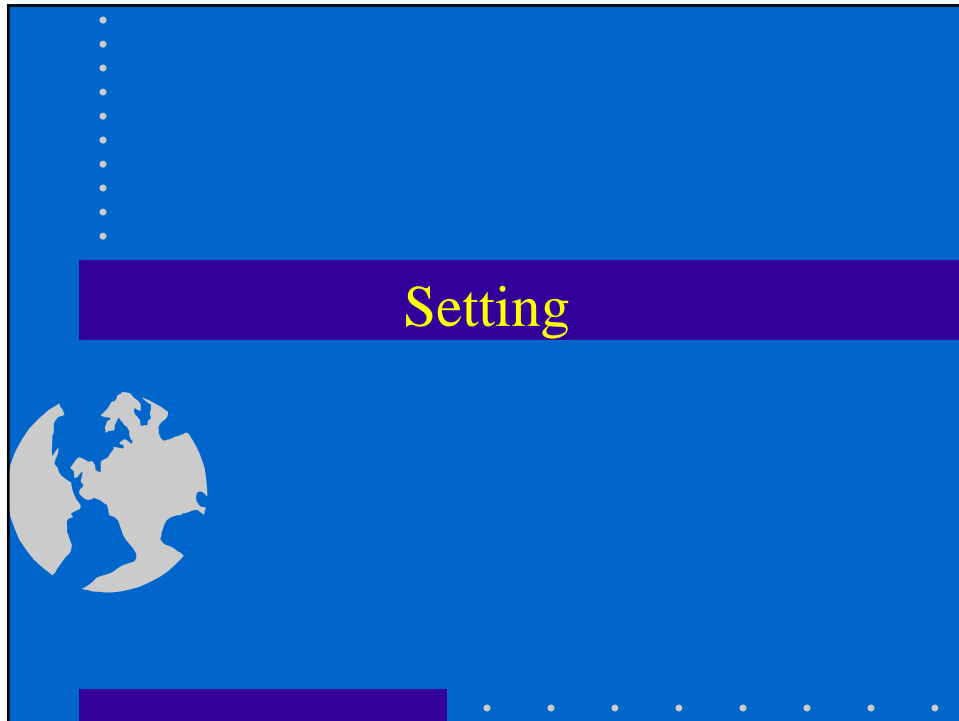
A blue rectangular slide with a dark purple horizontal bar across the middle containing the word "Remediation" in yellow serif font. On the left side, there is a white silhouette of a globe. In the top-left corner, there is a vertical line of seven white dots. In the bottom-left corner, there is a dark purple horizontal bar. In the bottom-right corner, there is a horizontal line of seven white dots.

## Struggling Readers

- Children between 8-10 years of age
- Poorest readers in grades 3-6
- Low SES (< 20% high school grads)
- Randomly assigned to treatment or control
- 35 hours of small group (3-5 students) instruction, 50 minutes a day for about 8 weeks

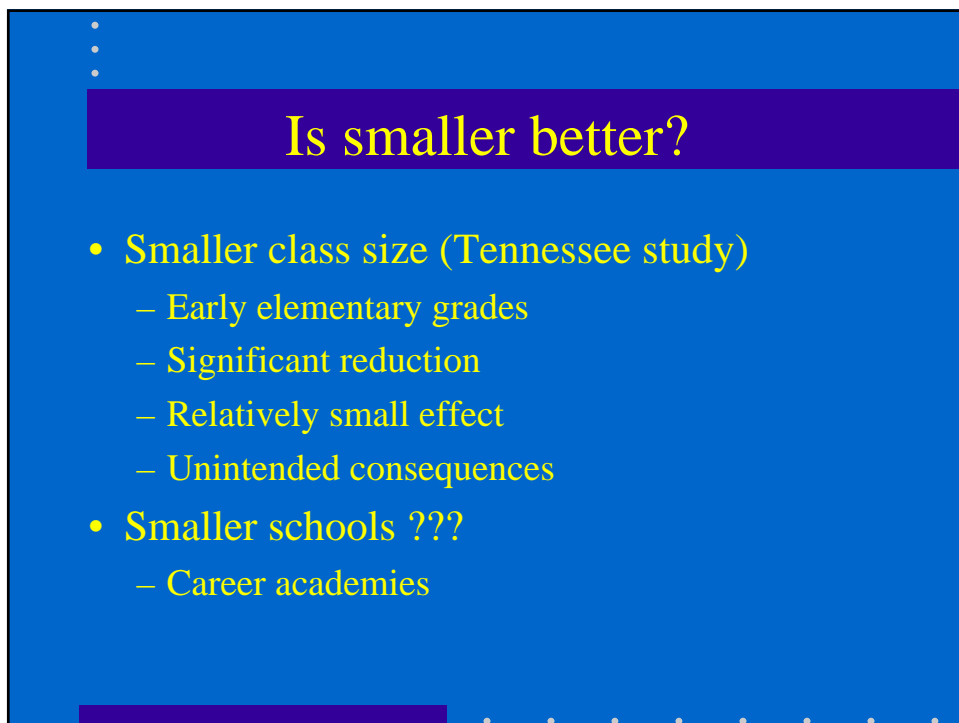
## Closing the Gap





Setting

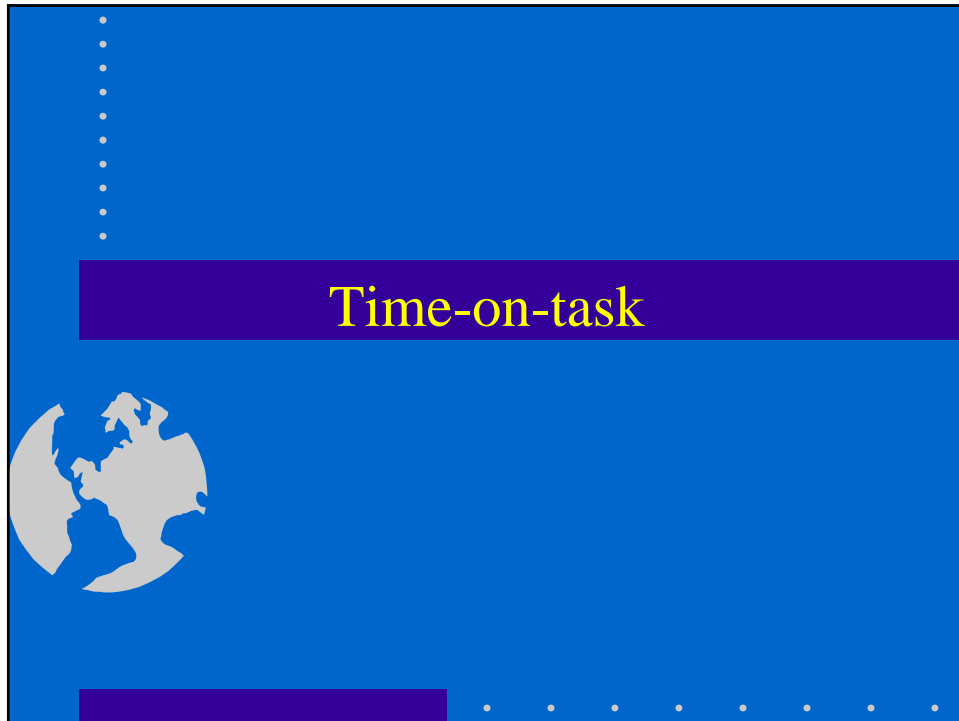
A slide with a blue background. At the top left, there is a vertical line of seven white dots. In the center, the word "Setting" is written in yellow serif font on a dark blue horizontal bar. To the left of the center, there is a white silhouette of a globe. At the bottom, there is a dark blue horizontal bar followed by a row of seven white dots.



Is smaller better?

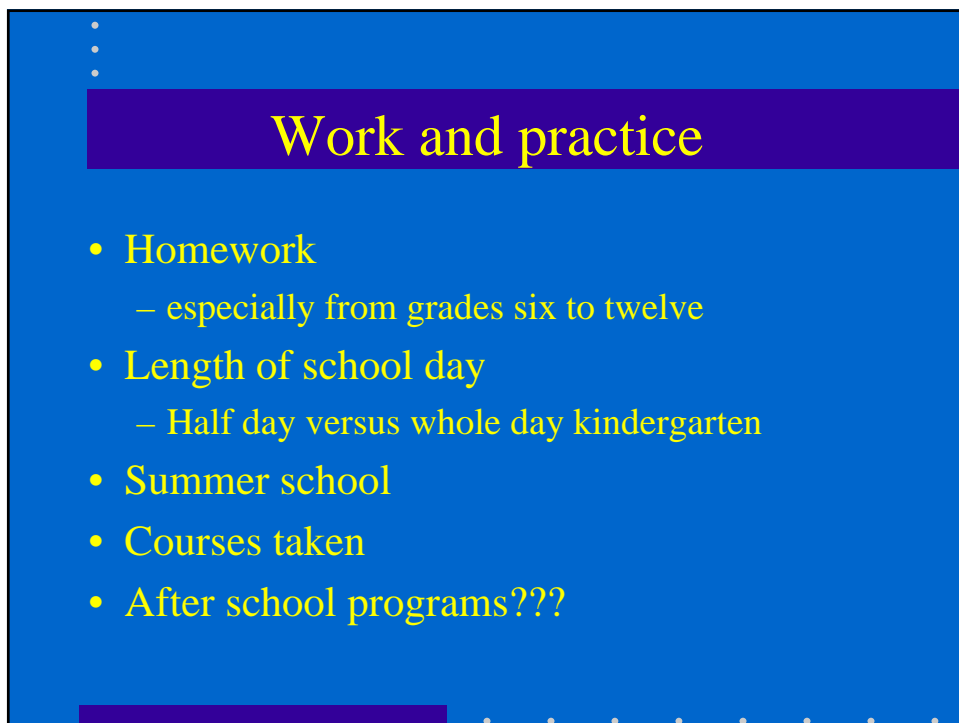
- Smaller class size (Tennessee study)
  - Early elementary grades
  - Significant reduction
  - Relatively small effect
  - Unintended consequences
- Smaller schools ???
  - Career academies

A slide with a blue background. At the top left, there is a vertical line of three white dots. In the center, the title "Is smaller better?" is written in yellow serif font on a dark blue horizontal bar. Below the title, there is a bulleted list in yellow. The first bullet point is "Smaller class size (Tennessee study)" with four sub-bullets: "Early elementary grades", "Significant reduction", "Relatively small effect", and "Unintended consequences". The second bullet point is "Smaller schools ???" with one sub-bullet: "Career academies". At the bottom, there is a dark blue horizontal bar followed by a row of seven white dots.



A blue slide with a purple title bar. The title "Time-on-task" is written in yellow serif font. To the left of the title is a white silhouette of a globe. The slide has a vertical dotted line on the left and a horizontal dotted line at the bottom.

## Time-on-task

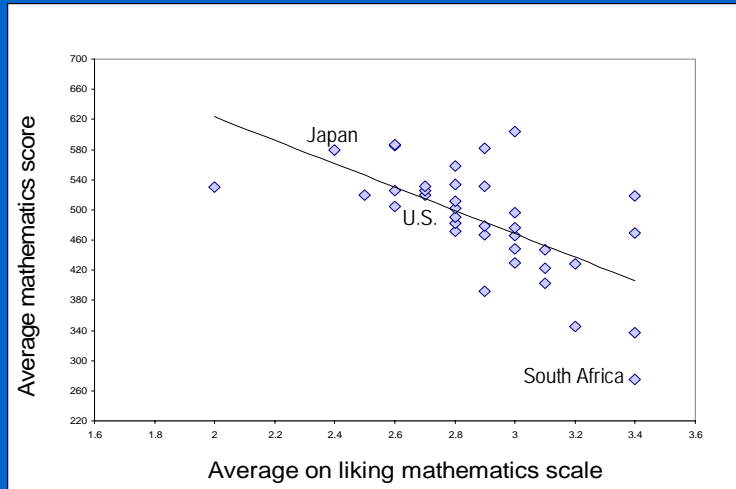


A blue slide with a purple title bar. The title "Work and practice" is written in yellow serif font. Below the title is a bulleted list in yellow serif font. The slide has a vertical dotted line on the left and a horizontal dotted line at the bottom.

## Work and practice

- Homework
  - especially from grades six to twelve
- Length of school day
  - Half day versus whole day kindergarten
- Summer school
- Courses taken
- After school programs???

## It doesn't have to be fun



## Management



## Schools matter

- How many high-poverty and high-minority schools nationwide have high student performance?
  - low-income students or minority in the school was at least 50% and ranked in the top third of schools
  - Students' reading AND math performance was in the top third among all schools in the state for two years running.

## The answer

1407

## Beating the Odds

- Focus on student achievement
  - Clear goals and expectations
  - Emphasize reading and mathematics
- Advanced assessment and accountability systems
- District-wide curricula
- Support for professional development and implementation
- Strong leadership

## Alignment



## Closing recommendations

- Use effective programs (as identified through the What Works Clearinghouse or other trusted source)
- Organize for implementation (leadership, training, materials, alignment)
- Measure performance and progress towards goals

## The Institute of Education Sciences



*The home of  
evidence-based education*