

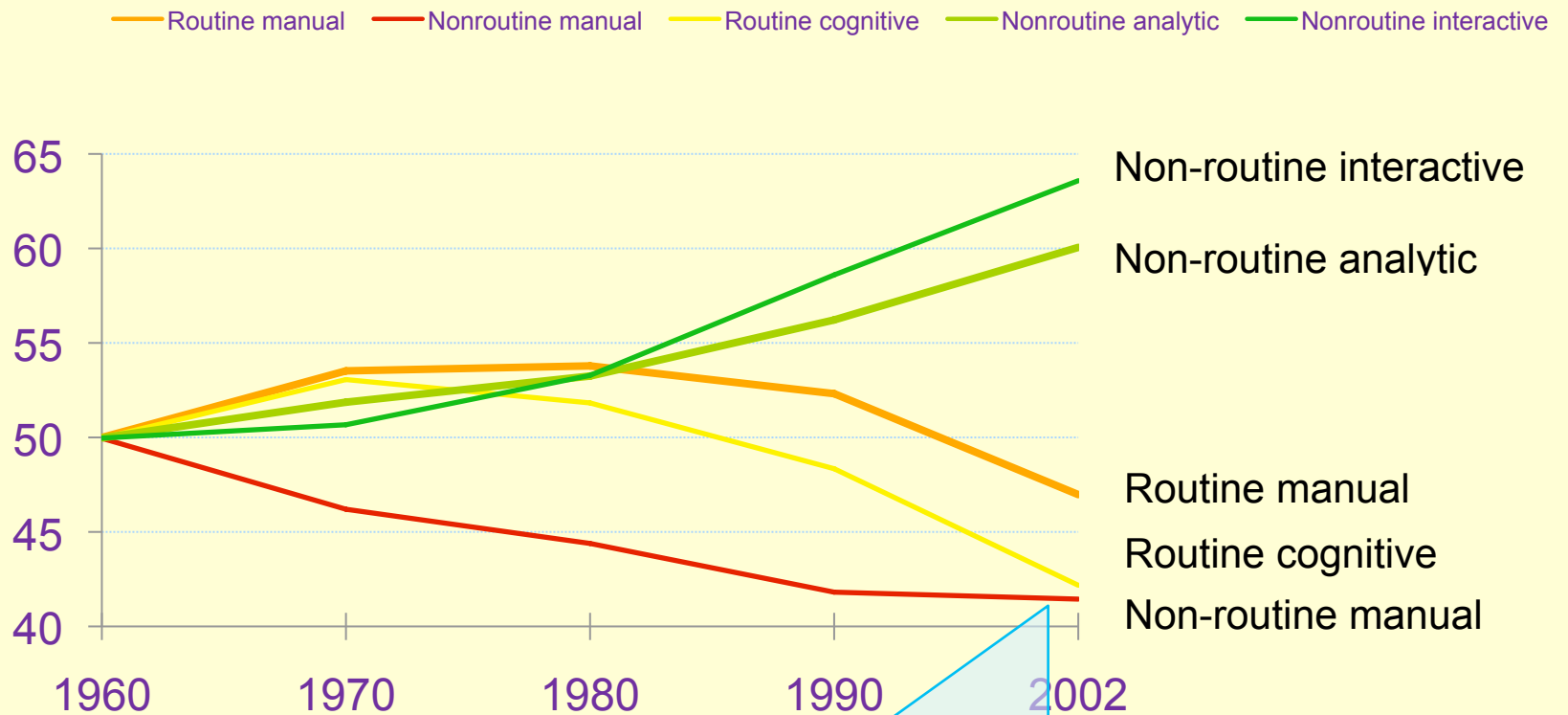


## **Creating Empowering Education Systems: What Can We Learn from Each Other?**

# How the demand for skills has changed

Economy-wide measures of routine and non-routine task input (U.S.)

Mean task input as percentiles of the 1960 task distribution



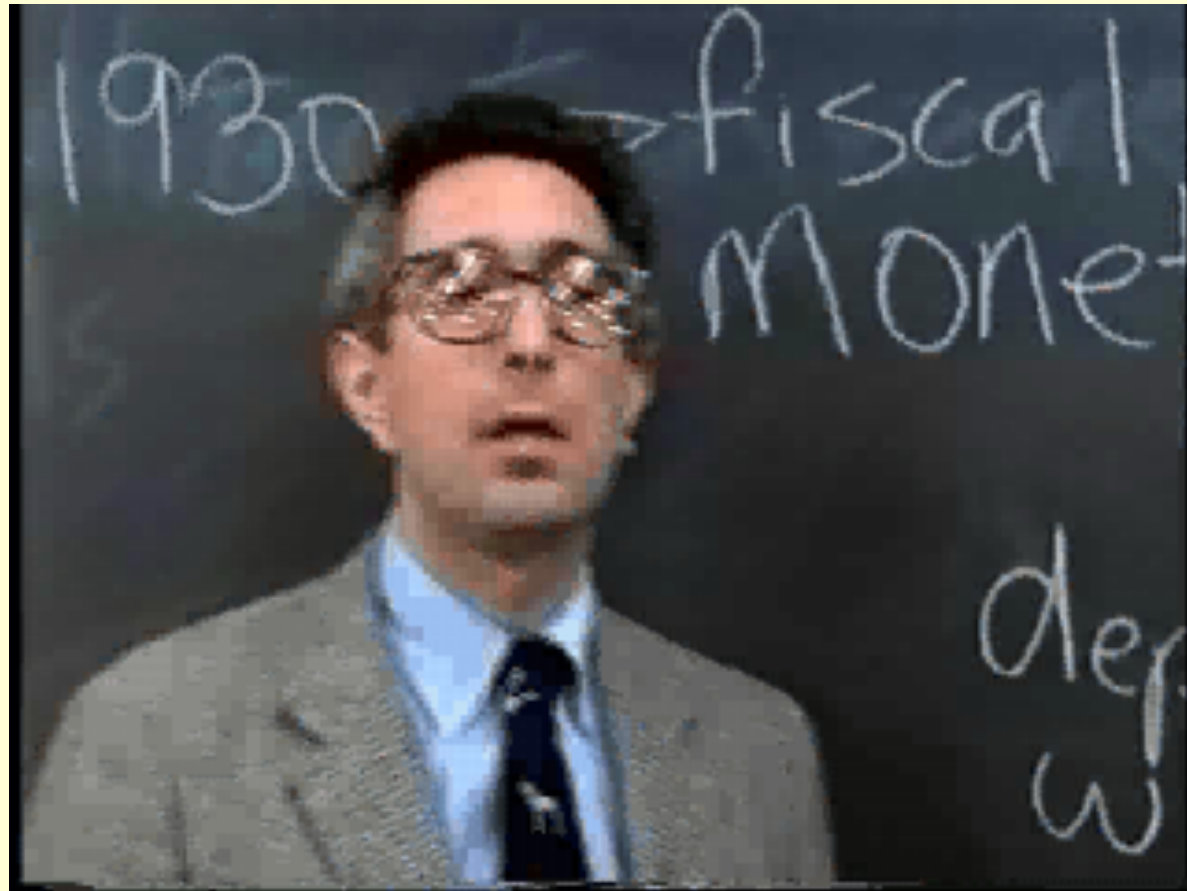
(Levy and Murnane)

## The dilemma of schools:

The skills that are easiest to teach and test are also the ones that are easiest to digitize, automate, and outsource

# 20<sup>th</sup> Century Teaching Cannot Meet 21<sup>st</sup> Century Demands

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# What Might 21<sup>st</sup> Century Teaching Look Like?

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# What Kind of Policies Can Help?



"Today you're going to learn the meaning of 'irony'."

# No Child Left Behind: Noble Goals but Unintended Effects

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- Demand for higher achievement, but incentives for
  - Narrowing curriculum
  - Chasing teachers from high-need schools
  - Excluding low-scoring students
- Demand for “highly qualified teachers,” but incentives for reducing preparation

# PISA 2009 Results



## Reading

Korea  
Finland  
Singapore  
Canada  
New Zealand  
Japan  
Australia

**US is #14**

## Mathematics

Singapore  
Korea  
Finland  
Lichtenstein  
Switzerland  
Japan  
Canada

**US is #31**

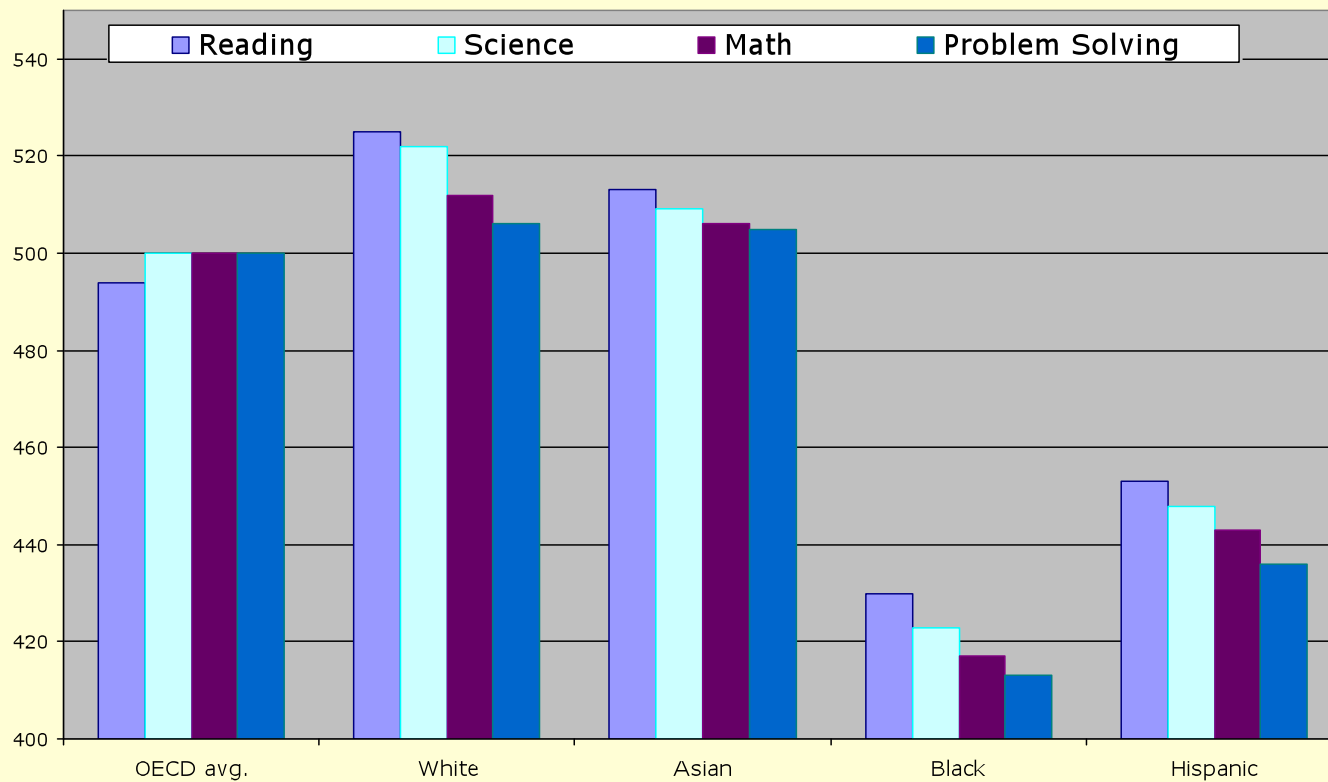
## Science

Finland  
Singapore  
Japan  
Korea  
New Zealand  
Canada  
Estonia

**US is #27**

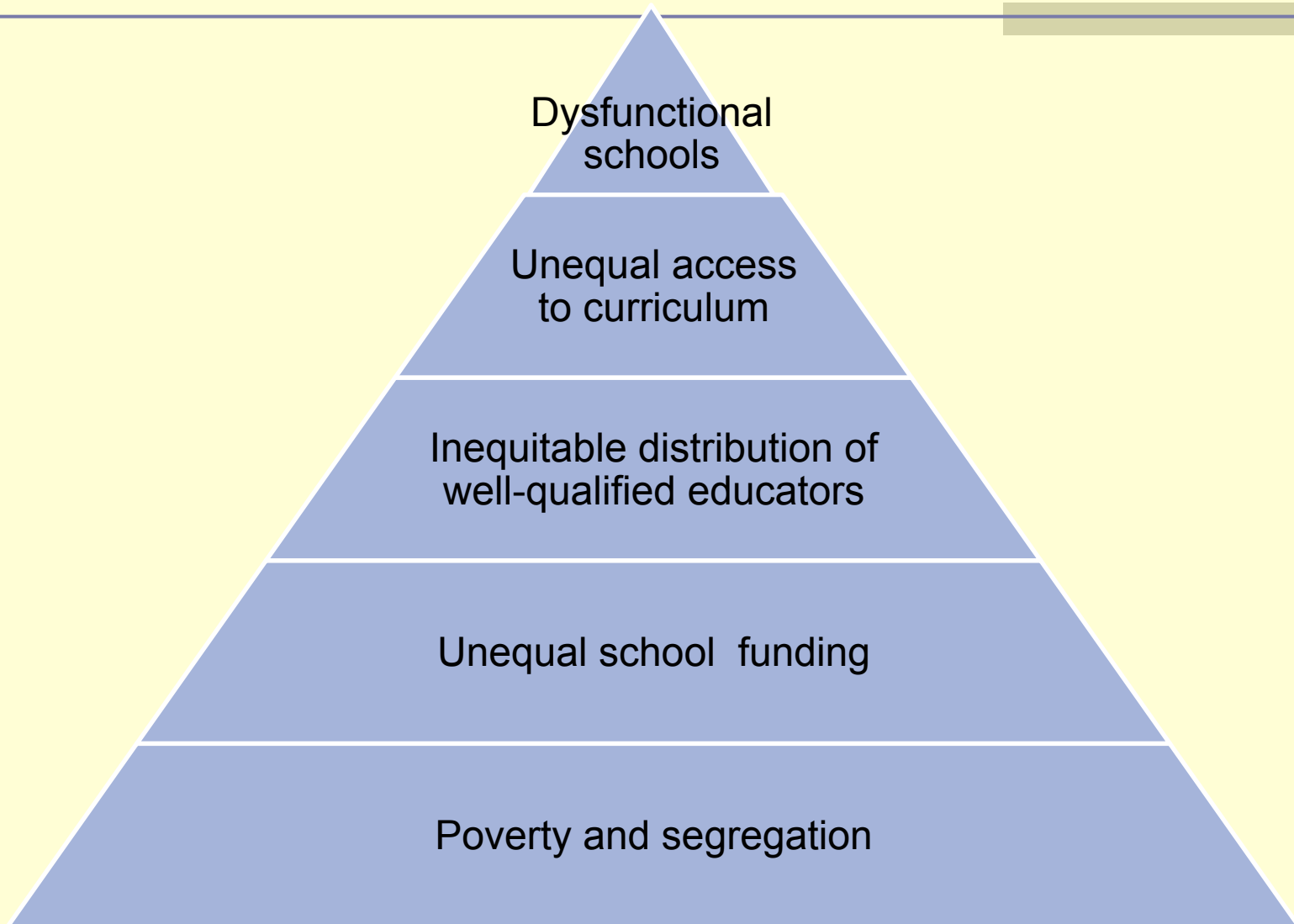
# Inequality Influences Low US Rankings

**Figure 1**  
**U.S. PISA Results, by Subgroup, Compared to OECD Average**

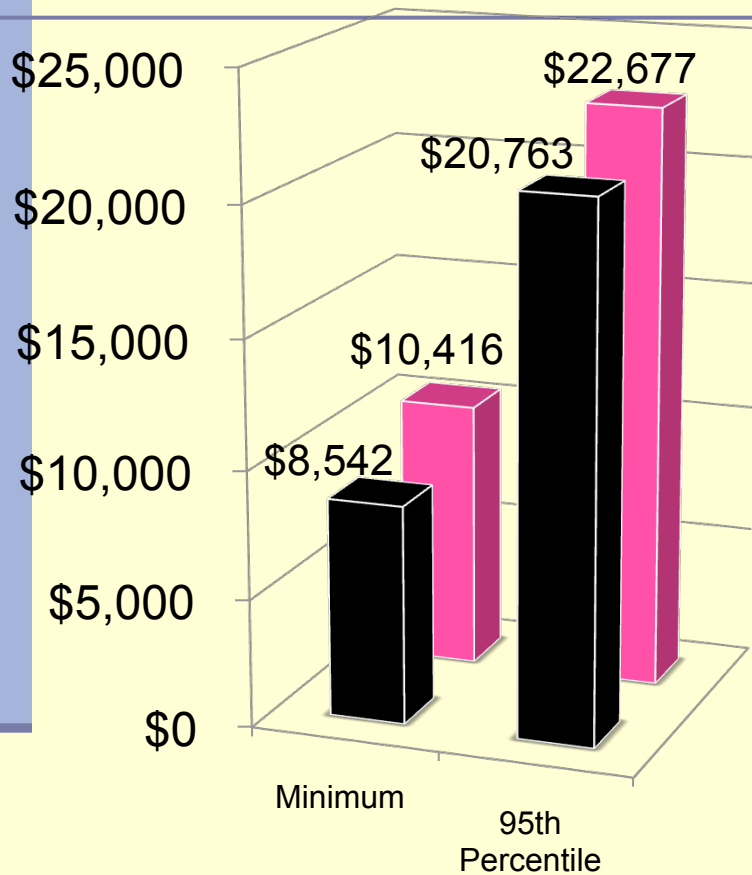




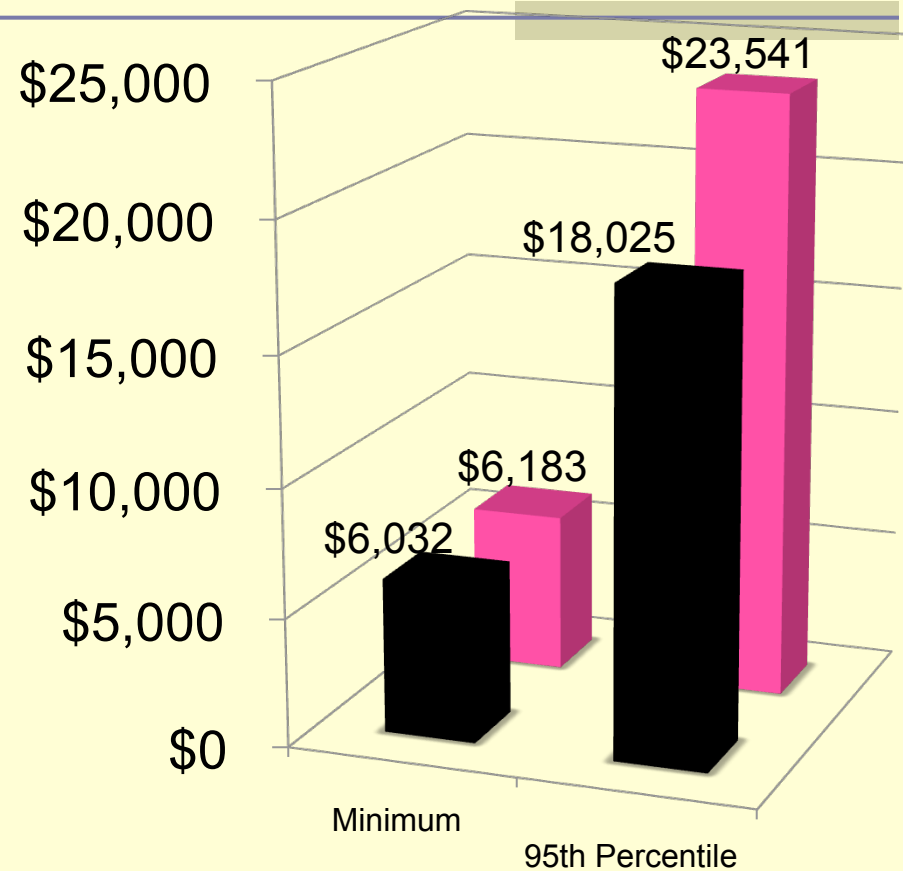
# The Anatomy of Inequality



# School Spending is Unequal Across and Within States



- Expenditures by NY district
- NY adjusted expenditures



- Expenditures by CA district
- CA adjusted expenditures

# Moving Backward after Moving Forward

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- Programs of the 1960s and '70s reduced poverty, unemployment, segregation, and teacher shortages while boosting school funding.
- Investments were made in teachers and innovative curriculum.
- Most of these programs were eliminated or sharply reduced during the 1980s.
- Had we continued the policies that closed the gap between 1971 and 1988, there would have been no racial achievement gap by 2000.

# What are the Highest-Achieving Nations Doing?

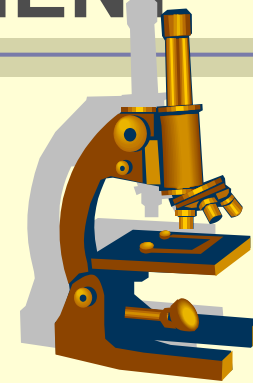
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- Societal supports for children's welfare
- Equitable resources with greater investments in high-need schools and students
- Substantial investments in initial teacher education and ongoing support
- Schools designed to support teacher and student learning
- Equitable access to a rich, thinking curriculum
- Performance assessments focused on higher order skills

# SINGAPORE'S SCHOOL-BASED SCIENCE PRACTICAL ASSESSMENT

## To Assess Experimental Skills and Investigations, Students...

- Identify a problem, design and plan an investigation, evaluate their methods and techniques
- Follow instructions and use techniques, apparatus and materials safely and effectively
- Make and record observations, measurements, methods, and techniques with precision and accuracy
- Interpret and evaluate observations and experimental data



# NAEP, 8<sup>th</sup> and 12<sup>th</sup> Grade Science

1. What two gases make up most of the Earth's atmosphere?

- A) Hydrogen and oxygen
- B) Hydrogen and nitrogen
- C) Oxygen and carbon dioxide
- D) Oxygen and nitrogen

2. Is a hamburger an example of stored energy? Explain why or why not.

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# Professional Learning Opportunities in High-Achieving Nations

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The highest-achieving nations:

- Ensure extensive initial preparation that includes clinical training in model schools
- Provide beginners with mentoring.
- Offer sustained learning opportunities embedded in practice:
  - Teachers have 15-25 hours a week for collaboration
  - Teachers engage regularly in Lesson Study, Action Research, and Peer Observation and Coaching to evaluate and improve practice.

# The Effects of Sustained, Well-Designed Professional Development

*A review of experimental studies found that high-quality professional development programs of about 50 hours on average over 6 to 12 months increased student achievement by 21 percentile points. (Yoon et al., 2007)*

*PD of <14 hours had no effect on student learning.*



**"It's all about co-planning, co-teaching and analyzing, and having time out of the regular teaching day to do these analyses."**

**— A Sacramento District Official  
on New Tech High**



# Professional Learning Opportunities that Impact Practice are:

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- ✓ Focused on learning specific curriculum content
- ✓ Organized around real problems of practice
- ✓ Connected to teachers' work with children
- ✓ Linked to analysis of teaching and student learning
- ✓ Intensive, sustained and continuous over time
  - ✓ Supported by coaching, modeling, observation, and feedback
  - ✓ Connected to teachers' collaborative work in professional learning communities
  - ✓ Integrated into school and classroom planning around curriculum, instruction, and assessment



# Different Theories of Change

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- **Theory X:**

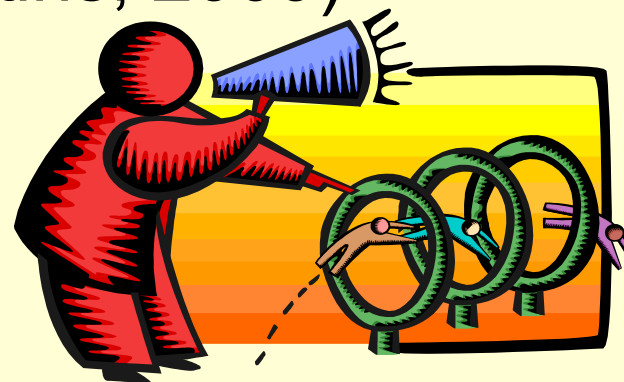
The key problem is motivation. People respond only to rewards and sanctions (“carrots and sticks”). Incentives are the major element of reform.

- **Theory Y:**

The key problem is learning. People want to be competent. They respond to information about how to succeed in doing their work. Investments in knowledge and capacity are the major elements of reform.

# Incentives Alone Do Not Improve Outcomes

- Studies have found that annual bonus pay for individual teachers allocated competitively based on student test scores has not improved student achievement.
  - Nashville experiment (Springer, 2010)
  - New York City experiment (Fryer, 2011)
  - Portugal experiment (Martins, 2009)



# Investments in Teacher Knowledge Matter a Lot

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Research in NC and NY found that student learning gains are related to:

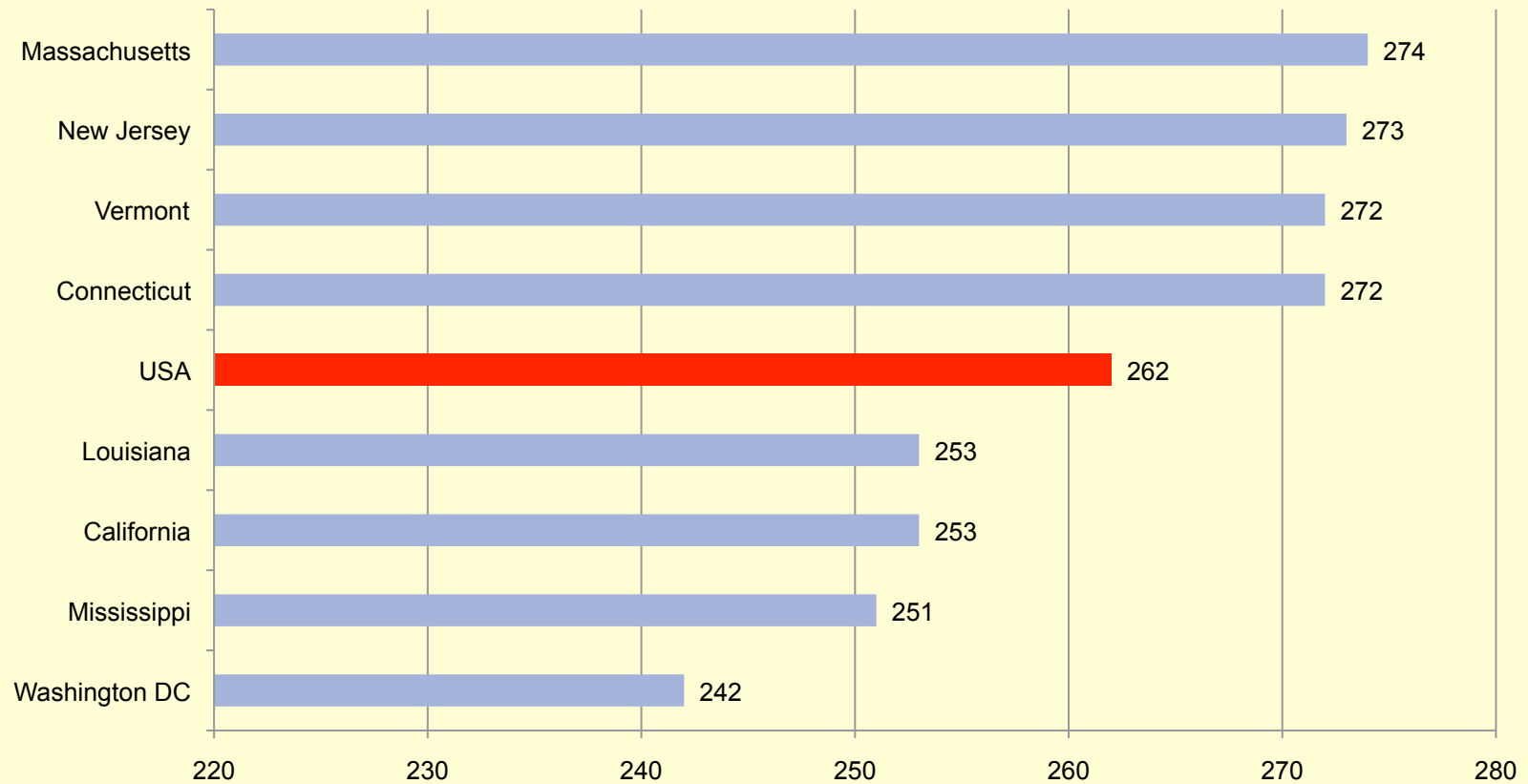
- Strong academic background
- Quality preparation prior to entry
- Certification in the field taught
- Experience (> 3 years)
- The skills measured by National Board Certification

In combination, these skills predicted more of the difference in student learning gains than race & parent education combined (Clotfelter, Ladd, & Vigdor, 2008).

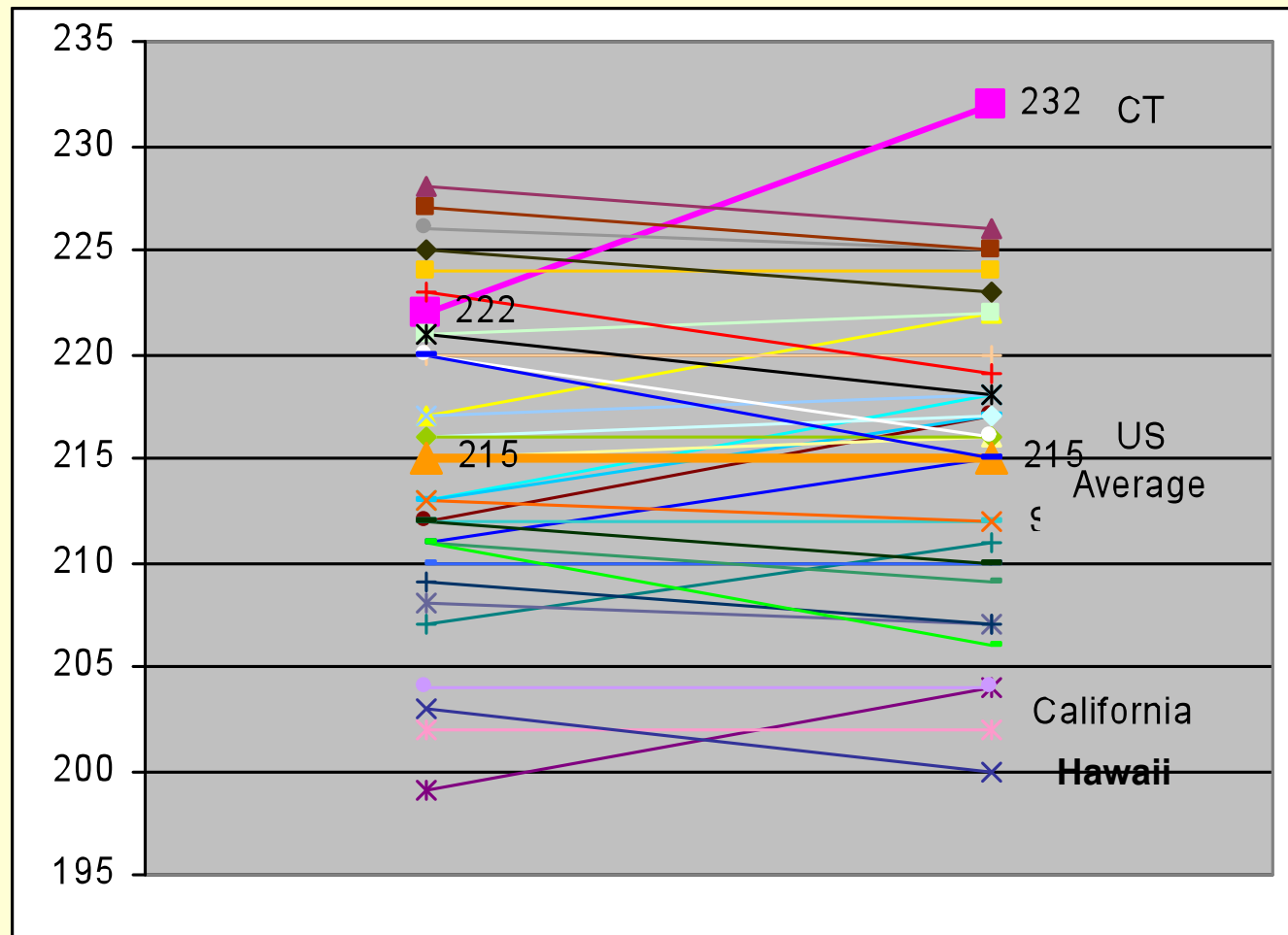
Policies should strengthen & equalize these features.

# What Policies Drive Achievement Differences?

8th grade reading scores, NAEP



# Student Achievement In Reading, 1994-1998



# CT Reforms Leading to High Achievement in the 1990s

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- Raised & equalized teacher salaries
- Raised standards for teaching and teacher education
- Offered service scholarships to attract and prepare high-need teachers
- Required mentoring focused on a clinical performance assessment
- Invested in high-quality professional development (Reading Recovery, National Writing Project, mathematics networks)
- Revised assessments to focus on higher-order skills
- Pursued steady policies for > 15 years

## More recent reforms in New Jersey have enabled it to become...

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- One of the top 5 states in the nation on NAEP reading, math and science, and is #1 in writing
- The only top-achieving state serving large proportions of low-income students of color – 45% of NJ students are “minority” and more than 1/3 are low-income
- Among the states experiencing the largest reduction in the achievement gap



# What Happened?

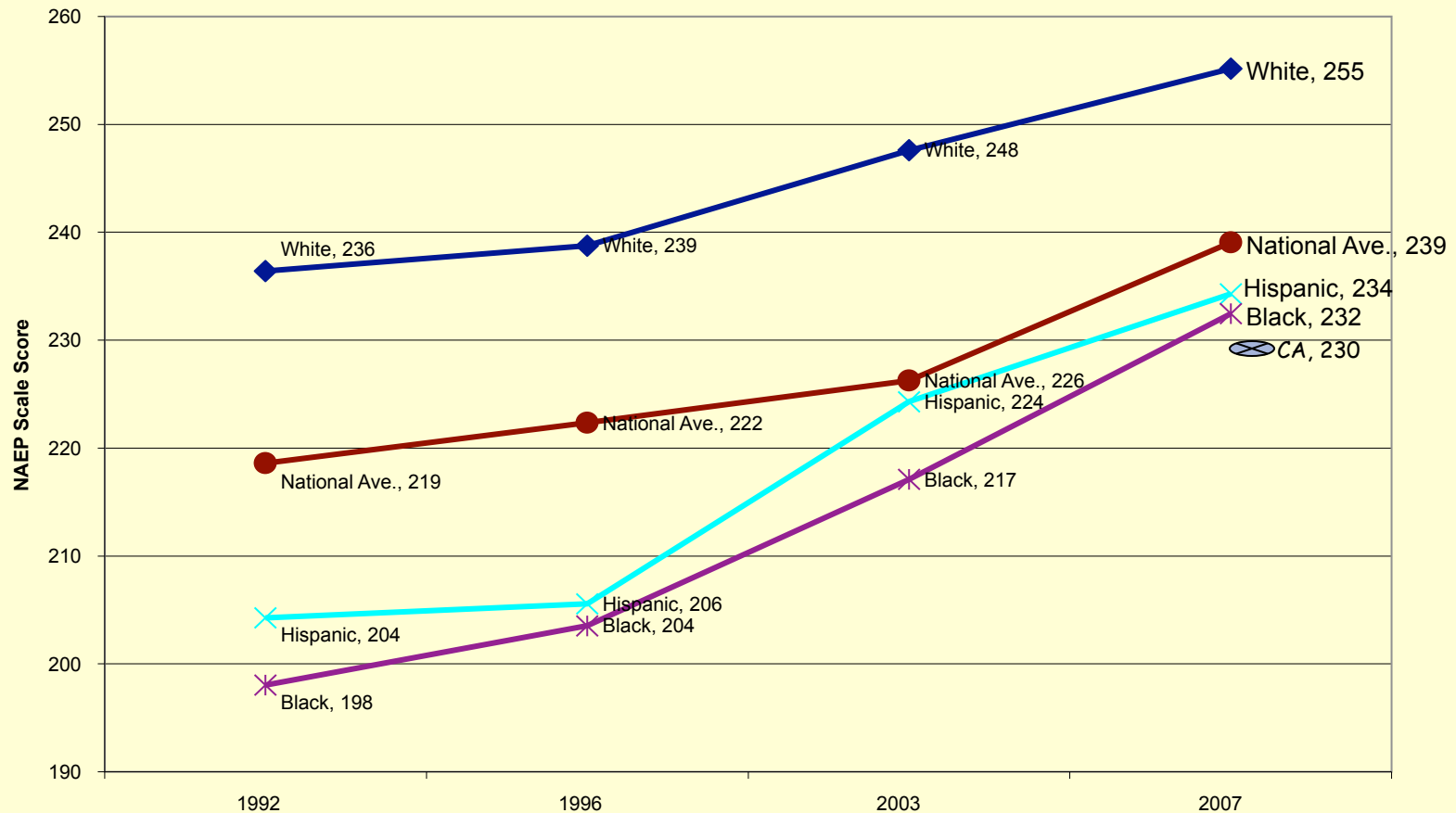
## The New Jersey Story

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- Parity funding for high-minority, low-wealth districts
- Investment in high-quality preschool with highly prepared teachers
- Whole school reform based on the Comer model supporting child development and parent involvement
- Teacher education & PD focused on urban teaching
- Focused literacy (and, later, mathematics) programs:
  - Expert coaches
  - Bilingual classroom libraries
  - Teacher development for language-rich teaching
- Curriculum and assessment focused on higher order skills

# What Happens When States Make Smart and Equitable Investments?

## New Jersey Math Achievement Trends 4th Grade NAEP



Source: National Assessment of Educational Progress, NAEP Data Trends

# Policy Strategies for an Equitable System of Good Schools

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- (1) Meaningful learning goals
- (2) Intelligent, reciprocal accountability systems;
- (3) Equitable and adequate resources;
- (4) Strong professional standards and supports;  
and
- (5) Schools designed for empowering forms  
of student and  
teacher learning



## A goal for high-achieving 21<sup>st</sup> century nations:

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- “Those who can, do. Those who understand, teach.”
- “Those who can, teach.  
Those who can’t go into a  
less significant line of work.”

