Evidence-Based Investments in Education

What research tells us about strategies to elevate student academic performance

Adam Gamoran, University of Wisconsin–Madison, USA

Part 2
1. Investments in Tools

- Time
- Class size
- Curriculum
2. Investments in Tools: Time

- Aside from personnel, time is a school’s most precious resource
  - Time for teacher learning
  - Time for student learning
2. Investments in Tools: Time for Student Learning

- Correlational studies indicate increased time for learning leads to higher achievement
- Largely sustained in experimental studies
  - Comprehensive reforms
    - Success for All
    - Direct Instruction
  - One-on-one tutoring
  - Double time for struggling students
- *Lack* of time is often the downfall of failed experiments
  - Instructional technology study: 15 minutes/week
2. Investments in Tools: Time for Student Learning

Israeli schools spend more time on instruction than typical schools in other nations.

However, the extra time is not spent in core academic subjects.

Source: Ben-David, 2010.
2. Investments in Tools: Class Size

- U.S. research indicates that smaller classes in the early elementary grades promote higher achievement
  - Mechanism: Better classroom management
  - Requires enabling conditions: High-quality teachers and classroom space

- U.S. class size evidence reflects comparisons of 23 versus 17 students

- Class sizes in Israel are much larger, so effects of reductions could be greater
2. Investments in Tools: Curriculum

- International comparisons demonstrate that achievement is higher in countries with curricula that are more:
  - **Focused** -- Fewer content topics per grade level
  - **Coherent** -- Connected across grade levels, topics build upon one another
  - **Rigorous** -- High level of complexity
- Findings hold in math, science, and reading
2. Investments in Tools: Curriculum

- Latest example: PISA 2009 reading
- Many countries improved performance compared to 2000, including Israel
  - Performance improved most for lowest-achieving students
- OECD: A common curriculum for all students contributes to high performance
Change in the percentage of low and top performers in reading since 2000

Share of top performers increased
Share of low performers decreased

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<th>Change in mean performance between 2000 and 2009</th>
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Source: OECD, 2011
Change in the percentage of low and top performers in reading since 2000

Source: OECD, 2011
2. Investments in Tools: Curriculum

- Not clear that international differences reflect causal factors
- Within-country comparisons can help assess the causal role of curricular coherence, rigor, and focus
  - Over time
  - Across administrative regions e.g. states
Minnesota case study (Bill Schmidt)

- Increases in curricular focus and coherence between 1995 and 2007 coincided with dramatic rise in TIMSS performance
- Other states that did not exhibit changes in curricular standards did not experience changes in student performance
Another example: Upgrading the high school mathematics curriculum
New York and California
Elimination of low-level, dead-end courses
Replaced by “transition” courses designed to bridge the gap between elementary and advanced mathematics
Found: enhanced performance, attributable to greater curricular coverage
Increasing Curricular Rigor in U.S. Secondary Math

![Graph showing learning gains by course type](image)

Source: Gamoran, Porter, Smithson, & White, 1997
Increasing Curricular Rigor in U.S. Secondary Math

Source: Gamoran, Porter, Smithson, & White, 1997
2. Investments in Tools: Curriculum

- Another case: Reform of the Scottish secondary curriculum in the 1980s
- Increased access to the academic secondary curriculum
- Boosted academic performance
- Largest effects for more disadvantaged students

Source: Gamoran, 1997
3. Investments in Systems

- Systemic improvements may be necessary to allow teachers to become more productive
  - Organizational conditions that support teaching
  - Climate that supports learning
3. Investments in Systems: Organizational Conditions

- Chicago study of organizational supports for learning
- Findings based on relation between school conditions and value-added achievement growth
- Five essential supports for learning
  - Leadership that is strategic and focused on instruction
  - Positive parent-community ties
  - High capacity teaching faculty
  - Safe and orderly learning environment
  - Clear goals and a coherent curriculum
When Israeli parents are asked about the biggest problem facing schools, they do not focus on low achievement. Particularly among parents from disadvantaged backgrounds, school violence is seen as the greatest problem.
3. Investments in Systems: Student Climate

- Are there effective programs to reduce school violence?
- What Works Clearinghouse includes a focus on “What works in character education”
- Several programs improve behavior, including violence reduction
- Also tend to boost achievement
3. Investments in Systems: Student Climate

- Example: *Positive Action*
  - 6 curricular units include classroom discussion and role-play
  - Aim: use positive actions to help students feel good about themselves
  - Experimental studies included 36 schools in Florida and 20 schools in Hawaii
    - Lower rates of violent behavior, fewer suspensions
    - Lower rates of retention in grade
    - Higher academic achievement
Conclusions

- Despite advances, research-based knowledge is still limited
- Investments in teachers and leaders are key
  - Compensation incentives can be *part* of the plan
  - On its own, performance pay is not enough to improve teaching and learning
  - Teacher development holds promise but is difficult to scale up and sustain
Teaching is more effective when better tools are available
- More time for instruction
- Smaller classes in early elementary grades (if space and personnel are available)
- Curricula that are more focused, coherent, and rigorous
Conclusions

- Investments in systems may also pay off
  - Greater learning is more likely in schools with more supportive professional climates
  - Programs are available to address the challenge of school violence
- Research in all of these areas is needed to identify which programs and policies work for Israel
References