Resource Allocation: Targeting Funding for Maximum Impact

Questions Posed:
- To what extent are student performance gains linked to education resources?
- Do additional educational resources impact student achievement?
- How much money is needed?
- How can resources be best used to increase student achievement?

Key Points:
Targeted resource allocation especially benefits disadvantaged children.
Although some early literature reviews suggest that additional school expenditures do not consistently improve student outcomes (Hanushek, 1989, 1994), other studies indicate that more resources can have a significant impact on the achievement of minority and disadvantaged students (Krueger, 2000; Finn & Achilles, 1990). These differences suggest that resource allocation does matter for many students — and that states and policymakers may benefit from a closer examination of where their resources are being spent.

Improving the classroom environment for current teachers may be more cost-effective and yield greater gains than just raising teacher salaries.
- There is some evidence that providing teachers with additional resources (e.g., a flexible spending account for supplies) may also impact the classroom environment and increase student achievement, although more study is needed in this area. Preliminary estimates indicate that raising teacher-reported resource adequacy levels can impact student achievement for as little as $5.10 per pupil (Grissmer et al., 2000). Other possibilities for targeted resource allocation that warrant further study include offering differential pay and differential student loan forgiveness for teachers in geographic and content shortage areas.
- This is not to suggest that offering additional salary incentives to teachers is not important. Increasing teacher salaries is, by any measure, a laudable goal. Nevertheless, policymakers and educators should consider a range of ways of providing the current teacher workforce with the tools they need to raise student achievement, rather than concentrating all of their resources on raising salaries.

Family variables are among the strongest indicators of student achievement.
- Family variables, such as level of parental education and family income, remain among the strongest indicators of student achievement, accounting for 49 percent of the variance in math test scores in grades 3–5 (Darling-Hammond, 1997).
- Students whose mothers have completed college average more than a full standard deviation in test scores over students whose mothers have not completed high school. But over the years, the family circumstances of many American children have changed. In 1995, for example, just 68 percent of American children came from two-parent homes, down from 85 percent in 1970. During the same period of time, the number of children living in poverty increased, from 14.9 percent in 1970 to 20.2 percent in 1995 (Ehrenberg, Brewer, Gamoran, & Willms, 2001).]
- Despite the significant impact of family variables, there are differences in NAEP scores (as much as 12 percentile points) between states with students who have similar family characteristics (Grissmer et al., 2000).
Educating children costs money.

- Although overall spending levels are an important component, the key may not be simply to spend more — but rather, to spend more wisely. Educators and policymakers alike will benefit from further research and from new ways of thinking about resource allocation.
- Education is an investment in our nation’s children. By considering the costs and the returns on that investment, policymakers can ensure that education dollars are spent most effectively and help the children who need it most.
- Faced with pinched budgets and increasing numbers of children with special needs, policymakers need to be cognizant of the cost-effectiveness of different programs.

Allocating resources in these generally supported ways can help increase student achievement:
1. Funding programs and strategies to reduce average class size in lower grades for children who are most at risk of failure.
   - The most comprehensive study of class size in the United States to date has been the Student Teacher Achievement Ratio (STAR) project, which took place in Tennessee in the late 1980s. This state-sponsored study randomly assigned students entering kindergarten to one of three class sizes: small classes (13 to 17 students), standard-sized classes (22 to 26 students), or standard-sized classes that had a teacher and a full-time teacher’s aide.
   - The study found an increase in the achievement of all students in smaller classes, with larger gains for minority and disadvantaged children in smaller classes (Krueger, 2000; Finn & Achilles, 1999). Whereas in larger classes there was a 14.3 percent gap between the first-grade reading test scores of minority and non-minority students, the gap narrowed to just 4.1 percent in smaller classes (Finn & Achilles, 1990).
   - Other studies have supported the findings of the STAR project.
   - Decreasing class size across the board is an expensive proposition.
   - It is critical that teacher quality is maintained when decreasing class sizes.

2. Developing and funding sustained and intensive public pre-kindergarten programs for disadvantaged children.
   - There is evidence to suggest that targeted, intensive programs can provide considerable benefits to disadvantaged children.
   - There can be significant short-term effects on achievement and on the IQ levels of disadvantaged children. Of the 11 programs that tracked participants’ IQs beyond the age of five, roughly half showed continued positive effects when students entered third grade. An analysis of larger scale pre-kindergarten programs (such as Head Start) also indicated short-term gains, but these effects were less dramatic (Barnett, 1995).
   - Additional effects of early intervention, whether in small- or large-scale programs, are reduction in placement in special education classes, increase in graduation rates, and decrease in the likelihood that students will engage in criminal activity (Karoly et al., 1998).
   - An analysis of costs associated with some of these programs reveals their relative cost effectiveness. Raising public pre-kindergarten attendance by one percentage point, for instance, costs an average of $12.00 per pupil statewide and results in score gains of 0.0030.005 standard deviations (Grissmer et al., 2000).
   - The program must be supported by a high-quality staff.
3. Providing teachers with increased and flexible resources for teaching
   • Teacher quality has a substantial impact on student achievement.
     • Teacher quality can be defined as a teacher’s ability to help students meet high
       standards (Reichardt, 2001).
     • Teacher quality can be difficult to measure, may be influenced by factors out of the
       individual teacher’s control, such as the overall quality of the school’s curriculum, and
       can be difficult to reward. Current salary schedules typically award higher salaries for
       years of experience and education, rather than for quality of teaching.
   • Improving the classroom teaching environment is among the most cost-effective ways of
     increasing student achievement (Grissmer et al.’s (2000) analysis of the cost effectiveness).
     Each of the identified strategies can contribute to improving the classroom environment. For
     instance, children who attend pre-kindergarten programs may be better prepared for the
     classroom than those who do not, and smaller class sizes can make it easier for teachers to
     give students individualized attention.
   • Teaching is a demanding profession with a high rate of attrition.
     • Approximately six percent of all teachers leave the profession after just one year,
       with the majority leaving because of job dissatisfaction or because they intend to
       pursue different careers. (Ingersoll, 1999)
     • This high attrition rate has motivated many administrators and policymakers to
       explore ways to improve working environments and increase compensation in order to
       attract and retain quality teachers. Increasing teacher compensation can improve
       teacher qualifications, by attracting applicants who might not otherwise consider
       teaching careers.
     • Research, however, has failed to establish a link between increased teacher salaries
       and higher student achievement.
     • Research does suggest that teacher quality improves after the first three years of teaching,
       with improvements leveling off in later years (Hanushek, Kain, & Rivkin, 1998).

Investing in Education: Considering the Options
   • The cost-effectiveness of the strategies is, in large part, dependent on the circumstances of each
     state’s students.
     • For example, in states with large proportions of disadvantaged children, lowering pupil-
       teacher ratios will achieve a statewide score gain of .010 — or approximately three percentile
       points — for a statewide cost of $150 per student.
     • In a middle-SES state, achieving the same score gain would require an expenditure of $450
       per student. Notably, however, increasing teacher resources at a statewide per-pupil cost of
       $110 results in the same performance gains across state SES levels (Grissmer et al., 2000).

Estimate of Additional Per-Pupil Expenditures to Achieve .010 Gain in Achievement
   for States with Different SES ($)

<table>
<thead>
<tr>
<th>Type of Expenditure</th>
<th>Low State SES</th>
<th>Medium State SES</th>
<th>High State SES</th>
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<tr>
<td>Pupil-teacher (1-4)</td>
<td>150</td>
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<tr>
<td>Pre-kindergarten</td>
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<td>320</td>
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<tr>
<td>Teacher resources—medium</td>
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References


