

## Improving Academic Achievement

Research has established a clear link between children's academic achievement and their long-term success. Children's academic performance and educational attainment are tied to income and employment status later in life. Additionally, we know that early academic performance is a good predictor of later performance. For example, children who do well academically are more likely to graduate from high school and go on to college than those who do not. Indeed, in a comprehensive review of the literature published by Child Trends<sup>1</sup>, all studies that included a measure of prior achievement as a predictor of later achievement found it to be positive and statistically significant.

In response to this research and to the growing concern in the United States that our children are not achieving at the level of children in other developed nations, the federal government enacted the *No Child Left Behind Act of 2001*. *No Child Left Behind* (NCLB) established an impressive goal: All students will meet high achievement standards by 2014. It changed the federal government's role in K-12 education by focusing on school success as measured by student achievement. It mandates each state to identify learning standards, implement measures to track success and, by imposing sanctions on schools and districts that fare poorly, holds every school accountable for making "adequate yearly progress." This action has dramatically expanded the role of standardized testing in public education, requiring that stu-

dents in grades three through eight be tested every year in reading and math.

Since the implementation of *No Child Left Behind*, students in Ohio have made gains in academic achievement. Since 1999, according to the Ohio Department of Education, average student test scores (as measured by a performance index ranging from 0 to 120) have increased by more than 19 points – from 74 to 93. However, despite this improvement, in the 2005-06 school year Ohio did not meet the standard (75 percent of students at or above the proficient level) for elementary school math in grades three, four, and six; and reading scores were only slightly above the standard between 75 and 77 percent in grades three, four, and five. Additionally, almost 14 percent of Ohio students did not graduate from high school, and 12 percent of Ohio schools were classified as being under "academic watch" or "academic emergency."

In addition to the federal NCLB Act, efforts to boost early academic success are being undertaken in a variety of ways. Communities, schools, teachers, and parents across the country are searching for and experimenting with ways to improve teaching methods, motivate students, engage parents, and otherwise help our students learn and our schools succeed. One approach is being implemented in rural Ohio and studied by researchers at Case Western Reserve University.

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# Improving Academic Achievement: The Effect of Financial Incentives on Elementary School Test Scores



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Dr. Eric Bettinger is interested in the economics of education, educational vouchers, and predicting college success. He has studied these issues both in the United States and abroad. One of his recent projects, evaluating the effect of providing financial incentives on academic achievement among grade school children, is attracting significant attention.

Coshocton City Schools, a 2,000-pupil district about 75 miles from Columbus, in the Appalachian region of Ohio, is in the last year of a three-year experiment to test the effect of financial incentives on students' academic achievement. In this study, students in grades three through six receive \$15 for every score of "proficient" (above the 75th percentile) and \$20 for a score of "accelerated" or "advanced" (above the 85th percentile) on the state proficiency exams. Students can collect a total of \$100 if they have high scores in all five subjects (math, reading, writing, science, and social studies). Children are paid in "Coshocton Children's Bucks," a gift certificate redeemable at local establishments to be used only on items for the child. The program is currently in its final year, but could be continued if data show the incentives boosted student test scores. The final data will be compiled this summer.

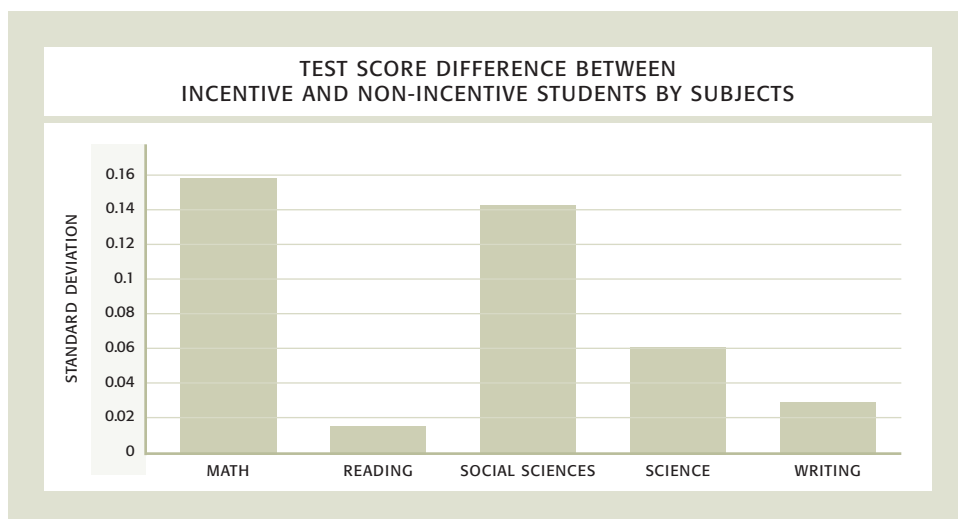
For the experiment, entire grades from the city's four elementary schools were randomly chosen to either receive the rewards or not. The randomization was done by lottery, conducted at the begin-

ning of each school year (2004-05, 2005-06, and 2006-07). Because lotteries were conducted each year, many students were eligible for the program one year, but not the next. This allows the research team to examine both the effect of receiving the voucher and "year after" effects among student who receive it one year but not the next. Additionally, the design of the Coshocton experiment may help answer important questions about the effect of external motivation on intrinsic motivation – a question that has long been debated in the field.

While the experiment still has another six months before conclusion and analysis is incomplete, some of the preliminary results look promising. Current data show positive effects in math scores. In fact, those eligible to receive the incentives scored about 0.15 standard deviations higher than those who did not. There also appears to be positive effects in social science and to a lesser extent, in science. However, no significant differences were found in reading and writing scores between the groups receiving the incentive and those who did not.

In terms of "year after" effects, while preliminary results show a positive effect in the first year, they do not appear to carry over into subsequent years when students are no longer eligible for the incentive, nor does there seem to be a cumulative positive effect for those in the experiment over two years. This may suggest that the existence of external motivation has a negative effect on the intrinsic desire to learn.

**THIS PROJECT IS FUNDED** by Coshocton manufacturer Robert Simpson with a \$100,000 grant from his family foundation. The Coshocton businessman funded the project after he read about a study in *Forbes* magazine that found incentives boosted attendance and test scores among girls who received cash rewards for passing exams in public schools in Kenya.



The significance and strength of the effects of incentives on test scores (especially in math) in Coshocton are promising. Previous research on similar incentive programs has found only modest effects or, in many cases, no significant effects or significant effects only for a small subset of children. The Coshocton experiment, by virtue of its research design, offers the opportunity to more fully understand why the program is working. As part of the data collec-

tion effort, teachers were extensively surveyed about modifications they made in the classroom as a result of the program. Qualitative data analysis will shed light on how, and in what ways, this impacted students learning. Additionally, grassroots support was established within the schools and the community before the program was implemented. A deeper understanding of this feature of the program may also provide guidance for future efforts.

## IMPLICATIONS FOR POLICY AND PRACTICE

The research being conducted by Eric Bettinger at Case Western Reserve University has significant implications for policy and practice. Preliminary results demonstrate the effectiveness of providing incentives directly to students, and also highlight questions that still need to be answered in future research. The attention paid to how the program was implemented and studied provides valuable information to practitioners and researchers about how to establish such programs and evaluate them in the future.

Providing incentives directly to students, like the experiment in Coshocton, is one of many efforts being made across the country to improve children's academic achievement. The federal *No Child Left Behind Act* is another. However, to reach all children, a combination of approaches targeting multiple levels may be necessary. A recent review of the literature published by Child Trends<sup>1</sup> examined a number of areas for targeted intervention including academic achievement, achievement motivation, and school engagement. For each of these areas, the report identified factors found

**Dr. Bettinger** and his colleagues also recently completed a study examining effectiveness of the PACES program – one of the largest educational voucher initiatives ever implemented. The program, in Bogotá, Colombia, provided over 125,000 economically disadvantaged children with vouchers that covered half the cost of private secondary school. The study found that the program increased secondary school completion rates by 15-20 percent.

## IMPLICATIONS FOR POLICY AND PRACTICE, CONTINUED

in the literature to be important at the individual, family, peer, school, neighborhood, program, and societal/policy level.

The Coshocton experiment, and others like it, provides some guidance on how to influence these factors on a number of levels. At the individual child level, it suggests that incentives matter. Even if a program does not provide direct incentives to students, program designers and policy makers should consider the effect of policies and programs on students' motivation to

do well. Additionally, at the neighborhood and community level, the Coshocton experiment is an example of a unique way a community, including its business leaders, came together on behalf of its children and schools. Programs and policies such as this, which lead to business leaders' increased commitment to and a greater stake in the community, may lead not only to direct benefits for children but also indirect benefits to the community by providing a seedbed for innovation and investment.

<sup>1</sup> Redd, Z., Brooks, J., and McGarvey, A. (2001). *Background for Community-Level Work on Educational Adjustment in Adolescence: Reviewing the Literature on Contributing Factors*. Child Trends: Washington, D.C.

Other examples of successful efforts to improve academic achievement by providing incentives to students include an experiment in Israel where financial incentives to high school students were found to improve scores on college entrance exams. In Dallas, students were compensated for the number of books they read on their own initiative. In Canada, college students were given bonuses if they kept their grade-point averages at a certain level. However, other programs have been discontinued due to lack of support. For example, in late 1980s, the Cleveland schools operated a Scholarship-in-Escrow program that rewarded students in grades 7 through 12 for good grades. Money was held in an account and could be used for college tuition. The program was discontinued in the early 1990s. In 2005, The New York City schools implemented an incentive program similar to Coshocton's, but it was discontinued due to lack of political and grassroots support.



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