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*Bridging the gap between research and public policy to improve the lives of children and families*

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## North Carolina Math/Science/ Special Education (MSSE) \$1,800 Teacher Bonus Program: AN INITIAL EVALUATION<sup>1</sup>

By Charles Clotfelter, Ph.D., Elizabeth Glennie, Ph.D.,  
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As in other states, many North Carolina schools face the challenge of hiring and retaining high quality teachers. Recruiting and retaining qualified teachers in math, science and special education is particularly difficult, especially for the schools serving disproportionate shares of disadvantaged or low-performing students. In 2001, North Carolina responded to these challenges by introducing a salary bonus program paying up to \$1,800 to certified teachers of math, science and special education in eligible middle and high schools. To be eligible, schools had to meet one of the following criteria: more than 80 percent of its students had to receive free or reduced price lunches, or the failure rate on both Algebra 1 and Biology end-of-course tests had to exceed 50 percent. Funding for this initiative was discontinued in the recent session of the Legislature, so bonuses were not available for 2004-05.

The goal of the bonus program was to use financial incentives to induce teachers of subjects in short supply to teach in schools serving educationally disadvantaged students. That such schools have difficulty recruiting teachers emerges clearly from previous research, from survey responses from principals for this evaluation, and from pre-program data on turnover rates in the eligible schools. Though other states have experimented with various types of financial incentives, little is known about the effectiveness of such programs or about how big the financial bonuses need to be to induce the desired outcomes. Hence, a thorough evaluation of the North Carolina Bonus Program could provide useful information for the design of comparable programs in the future.

This evaluation of the North Carolina Bonus Program is necessarily preliminary, owing to the program's short life. Even in the best of circumstances, the full effects of a program such as this would take several years to emerge. It takes time for district officials, principals, and eligible teachers to learn about the program, to gain confidence that the state will follow through on its commitments, and to change their behavior accordingly. Our quantitative analysis of the effects of the program on teacher retention rates and student achievement is based on only one year of post-program data (2002-03). Unfortunately, only one additional year of post-program data (2003-04) will ever be available, given that the legislature ended the program in the summer of 2004.

Our evaluation of this program is based on information from the following sources:

- 1) documents related to the legislation and its implementation;
- 2) personal interviews with selected state officials;
- 3) telephone interviews with human resource and finance personnel in 49 of the 65 districts that had eligible schools in the summer of 2004;
- 4) surveys distributed in the spring of 2004 to the principal of every school that was eligible for the program in 2003-04 and to every half

- teacher who received a bonus that year (overall response rate of 73 percent);
- 5) teacher employment records in eligible and comparison schools over a four-year period;
  - 6) student test scores from end-of-grade and end-of-course tests over a four-year period.

## MAJOR FINDINGS

### Program design and implementation

The program specified two levels of eligibility, one for schools and one for teachers. For schools, eligibility was based on either of two criteria: the percentage of students eligible for free or reduced price lunch or the percentage failing Algebra 1 and Biology. For teachers, eligibility depended initially on being certified and teaching in a specified subject in an eligible school. Eligibility continued in subsequent years as long as the teacher continued teaching that subject in that school even if the school was no longer eligible. *Largely because of the complexity of these various requirements, the program was neither cleanly implemented nor well understood.*

The program was enacted in September 2001, well after the start of the school year. In its efforts to start the program quickly, the Department of Public Instruction (DPI) made numerous errors in identifying the eligible schools the first year. The state conducted audits to determine whether local school districts identified the right set of eligible teachers; however, these were not completed until after the school started in the following year.

For incentives to work, the relevant actors must know about and understand them. Our surveys showed that 17 percent of the principals of eligible schools in 2003-04 did not know their school had ever been eligible. Similarly, 13 percent of the teachers receiving the bonus that year did not know they were eligible. Of those teachers who did know they were eligible, almost half did not know why they were receiving the bonus. This finding may reflect the fact that slightly more than

of teachers learned about the program through unofficial channels, such as the media or other teachers.

### **Perceived effectiveness of the program in recruiting and retaining teachers**

Many principals believed that the bonus program has had some effect on teacher recruitment and retention. However, a substantial number of principals thought it was too soon to tell whether the program had had an effect. For schools that had been eligible for only one or two years, there simply has not been enough time for any effects to become evident. In addition, given that some districts did not use the program to recruit new teachers, and that many principals did not know their school was eligible, did not learn about it in a timely manner, or did not learn about it from official channels, it is not surprising that some principals could not evaluate the program. *When they did evaluate it, most principals thought it had a positive impact, and most believed that this program was a good use of state resources.*

In general, teachers felt that this bonus program could influence teachers to come to and remain in their school. Of the teachers who knew they were eligible, about two-thirds said the program had influenced them or would influence them, and even more of them claimed the program would influence others.

### **Perceptions about the role of money**

Although both principals and teachers claimed that the North Carolina Bonus Program had affected teacher outcomes, *both groups also seemed to believe that \$1,800 was not enough to have a significant impact.*

### **Impact of the program on teacher retention**

A thorough understanding of the impact of the Bonus Program requires concrete information on measurable outcomes. One such outcome is year-to-year retention rates of teachers in eligible fields in eligible schools.

In the first year in which the program could have influenced retention, we find evidence that retention rates for math and science teachers in eligible schools were higher than they would have been in the absence of the program. In particular we found not only that the retention rate for math and science teachers in eligible schools rose after the program was introduced, but also that this rise could be attributed neither to other factors influencing the eligible schools nor to trends in other comparable schools. *Thus, we conclude that the Bonus Program has had a positive effect on the ability of eligible middle and high schools to retain math and science teachers.*

In contrast, the findings for special education teachers are far less consistent and much less clear, largely because of the much smaller sample sizes. Similarly, small sample sizes kept us from drawing any specific conclusions about the effect of the Bonus Program in ungraded or alternative schools.

### **Impact of the program on student achievement**

A similar approach is used to examine the impact of the program on student achievement. In particular, we examine the trends in student test scores in math and science in the eligible schools and compare those to the trends for other subjects in those same schools and in other comparable schools. Here we find essentially no impacts of the program. This finding should not be surprising. The program has simply not been in place long enough for a discernable impact on student outcomes to emerge.

## LESSONS FOR POLICY MAKERS

The state's experience with the Bonus Program contains several lessons or cautionary notes for policy makers contemplating similar incentive programs in the future.

### Policy Design

Regarding policy design, three lessons emerge.

- First, the complexity of the program design made it difficult for district officials, principals, and teachers to understand and act upon it. A simpler program may be more effective in influencing teachers' job decisions, but it may not precisely target schools and teachers.

- Second, although a salary bonus is potentially a strong incentive for teachers, the fact that not all teachers within these schools were eligible may create morale problems.

- Third, because certified teachers, particularly in math, science, and special education, may be in short supply in some poor and/or rural districts, setting full certification as a requirement for receipt of the bonus may place the bar too high to benefit those districts.

### Implementation

Four lessons emerge concerning the implementation of the program.

- First, the choice of when to launch a program necessarily involves a tradeoff between doing it as soon possible versus waiting until the most propitious time in the year to influence teacher decisions. Launching the program in the early spring may have been the best time to influence recruitment and retention in the following school year because that is the time of year when teachers may make decisions about their appointment for the following year.

■ Second, because the mistakes in identifying eligible schools and teachers surely undermined confidence in the program, it would have been worthwhile to spend more time to make sure the lists were correct. Implementing the program later in the school year may have given state and district officials time to verify the lists of schools and teachers.

■ Third, for any program to succeed, principals, teachers, and potential teachers must know about it and understand it. Thus, greater efforts should be made in promoting the provisions of such programs. This might include a letter sent to every principal in an eligible school to reiterate the program's provisions and to every eligible teacher to emphasize the personal benefit available by virtue of the program. Programs like this could be advertised at job fairs or in schools of education to encourage new teachers to apply for jobs in these schools.

■ Fourth, any incentive program needs to be applied with unwavering certainty. In this case, some school and district officials were not sure that the program would continue, so they did not actively promote it. If actors did not believe the state would follow through on the promises implicit in this statute, it is unlikely that the program influenced their behavior. The state's decision to end this program unfortunately proved these doubters correct. ■

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## NOTES

<sup>1</sup> This study was funded by the North Carolina Department of Public Instruction. For additional information about this study, please contact Elizabeth Glennie, Box 90545, Duke University, Durham, NC 27708; [eglennie@duke.edu](mailto:eglennie@duke.edu).



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