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Features

The Efficient Mix of Staffing Resources

An economist's surprising find: Improving school performance may hinge on increasing the number of administrators by MICHAEL L. MARLOW

How convenient it would be if we had a magic, one-size-fits-all formula for determining the most efficient way to allocate education funding. This formula might tell us, for example, that to reach the highest level of school performance, two-thirds of our education funding should be devoted to hiring teachers and that one-sixth of the budget should be earmarked for administrators.

Unfortunately, such a universal formula would suffice only in a world where all schools and the students and communities they serve were exactly the same and remained the same—clearly, not the world in which we live.
To be efficient, each school allocates money and resources to those areas that bring about the greatest improve-ment in perfor-mance. Some schools funnel additional funds toward books and computers, while others may consider funding a new auditorium to be more productive. The critical issue is determining which mix of resources contributes the most to school performance and in what combination.

A simple comparison is unlikely to provide much information about whether one school is allocating resources more efficiently than another because the needs and characteristics of each school are different. For example, the observation that School A employs more teachers per student than School B may convey nothing more than the fact that it may be more efficient for School A to average 19 students per class and for School B to average 22 students per class.

An Efficient Allocation
Education is a production process whereby various economic resources are combined. While educational output is an abstract concept that denotes production of knowledge, various performance indicators may be used to serve as a proxy for output. For instance, test scores on standardized tests and graduation rates are performance measures connected to the production of education.

Resource combinations are efficient when no other mix results in a higher performance level or in the same performance level at lower cost. An efficient allocation is therefore one where no other combination of teachers, administrators, books and other resources raises performance above current levels.

In effect, an efficient allocation is one that provides the most bang for the resource buck. Top priority should be awarded to those resources that improve performance the most. The key issue therefore is not whether greater use of a resource raises performance because all resources are likely to pass this test. The critical test is which resources contribute the most to performance, at the margin.

Effects on Performance

The current push toward universal class-size reduction actually may have the opposite of the desired effect on school performance by shifting funding toward teachers and away from other resources. If schools are mandated to allocate more funding toward hiring teachers to reduce class size, they may be forced to allocate fewer resources to those programs that are more important in promoting achievement among their specific student population, such as instructional technology, special education resources or even additional administrators.

In looking at the broader picture of the efficient use of staff resources, we must step beyond economic theory and conjecture and examine the empirical data related to staff allocation and school performance.

California provides a rich environment in which to examine this issue. The state's public school system (primary and secondary) is the nation's largest, with 1,002 school districts employing more than 410,000 employees, including more than 11,000 administrators, and serving in excess of 5.3 million students.

Through my research, I attempted to determine the most efficient allocation of funding for hiring administrators, teachers or non-teaching personnel as it related to increasing school performance. In other words, in keeping with the smaller class-size mandate, would increasing the number of teachers in a school yield higher SAT scores and/or lower dropout rates? What effect would increasing the number of administrators have on performance? Math SAT scores, verbal SAT scores and the high school dropout rate were used to measure performance characteristics based on the expectation that high SAT scores and low dropout rates were synonymous with high performance.

I conducted statistical analysis at the county level, using data from the early 1990s. Average SAT verbal scores were 419 and SAT math scores were 476. The mean dropout rate was 3.65 percent. On average, there were 333 students per administrator, 20 students per teacher and 143 students per non-teacher.

Four other factors were considered as possible influences on performance and were considered during the analysis.

Population density, as measured by population divided by square miles, varied considerably among counties. Higher density may increase the resources devoted to fighting crime, dealing with congestion, or educating a greater number of limited English-speaking students and therefore might adversely influence performance.

The percentage of high school seniors taking the SAT exam also varied considerably across counties. Previous studies show that performance is higher when the percentage of test-takers is low because larger testing pools tend to include more students of lower aptitudes, thus lowering average test scores.

Median education of the population controlled for the expectation that higher median income is associated with higher performance. Higher median income is likely linked to higher funding levels, higher education levels of parents, or other factors that might improve performance.

The number of schools in the area may affect expectations and thus student performance. This view is based on the theory that greater competition, as defined by greater abilities of consumers to choose from whom they wish to purchase products, leads to higher performance by the producers. When schools must vie for students, they are more likely to improve performance in an effort to "capture the business."

Empirical Evidence

Results of the California study indicate that contrary to popular opinion increasing the number of teachers in a school does not necessarily affect performance; variations in the number of teachers does not explain variations in verbal SAT scores and dropout rates. This suggests that adding teachers—and thereby decreasing class size—in itself does not change performance levels.

On the other hand, the evidence indicates that employing more administrators does raise verbal SAT scores and does lower dropout rates. This finding is likely to be a result of so little variation in numbers of teachers versus administrators. That is, there are many more cases where there are too few administrators than cases where there are too few teachers. Increasing the number of non-teachers may actually lower verbal SAT scores and raise dropout rates, thus providing some evidence that increasing reliance on this group is associated with lower performance.

With regard to the control factors' effects on performance, higher population density was associated with lower test scores and higher dropout rates. Test scores dropped as the percentage of seniors taking SAT tests rose. Higher median income was associated with higher test scores and lower dropout rates, and fewer school choice options was associated with lower test scores and higher dropout rates.

Rush to Judge

Could it be that, in response to calls for less bureaucracy and smaller classes as a means toward increased performance, public schools are hiring too few administrators and too many non-teachers? This seems to be the case, at least in California. The evidence also suggests that the public push toward smaller class sizes may not raise student achievement if the outcome is more teachers at the expense of fewer administrators.

The results of this study may have been influenced by the weak California economy during the period studied. Even under strong economic conditions it is debatable that resources are efficiently allocated, but it becomes more doubtful during times of economic distress.

Regardless, additional research and inquiry in other states will shed further light on how schools and school systems can allocate staffing resources to reach maximum performance.

Michael Marlow is a professor of economics at California Polytechnic State University, San Luis Obispo, CA 93407. E-mail: mmarlow@calpoly.edu. **His study, "Bureaucracy and Student Performance in U.S. Public Schools," appeared in the journal Applied Economics (www.tandf.co.uk/journals).**