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School, Teacher, and Leadership Impacts on Student Achievement

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School, Teacher, and Leadership Impacts on Student Achievement

by Kirsten Miller

After more than 30 years of research on schools and classrooms, a science of education has begun to emerge. Although there is no silver bullet that guarantees that every student will be successful, now more than ever research provides guidance about the characteristics of effective schools and effective teachers that, if followed, can help maximize school and ultimately student performance.

This brief is based on McREL's meta-analyses of quantitative research on teacher, school, and leadership practices. Through these meta-analyses, McREL has identified a number of variables that influence student achievement. This brief offers suggestions for implementing policies and practices that can positively impact these variables.

School Practices

Meta-analysis, or a statistical analysis of a collection of individual studies, can be a compelling research method for determining what really works in education. McREL's meta-analysis of research on the school and teacher impacts on student achievement (Marzano, 2000) found that school-level and teacher-level factors account for approximately 20 percent of the variance in student achievement. Student characteristics — home environment, learned intelligence/background knowledge, and motivation — account for 80 percent of the variance in student achievement, as Exhibit 1 shows.

At first blush, these findings might appear to suggest that school and classroom improvement have, at best, a marginal impact on student achievement. Marzano (2003) offers a compelling argument to the contrary. To illustrate this point, imagine that all of the nation's 92,000 public schools could be rank-ordered according to their effectiveness — that is, in terms of the variables they control, such as instruction, curriculum, and parent involvement. Next, consider the schools to the far right of the distribution curve — that is, schools ranked at the 99th percentile in terms of their effectiveness. In these schools, 84.7 percent of students would be expected to pass a test on which the normal pass rate is 50 percent. This would be true for any school in this group, regardless of the background of students who attend the school.
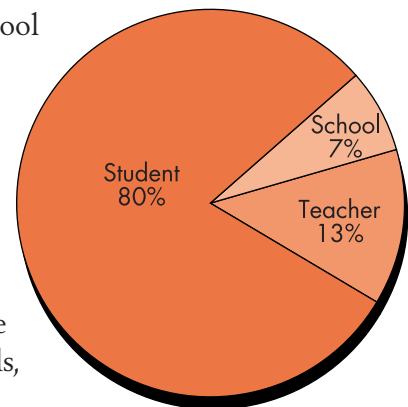
Student
80%

School
7%

Teacher
13%

Exhibit 1: Factors Accounting for Variance in Student Achievement

Put another way, a student scoring at the 50th percentile who spends two years in an average school, with an average teacher, is likely to continue scoring at the 50th achievement percentile. That same student, having spent two years in a "most effective" school with a "most effective" teacher, rockets to the 96th achievement percentile. The converse also holds: If this same student spends two years in a "least effective" school with a "least effective" teacher, that student's achievement level plunges to the third percentile (Marzano, 2003). Because schools can have such a significant impact on student achievement, it is critical that they put into place policies and practices that support students' learning.

For a number of years now, students' learning has been equated with students' proficiency relative to the knowledge and skills captured in state standards. Nearly every state, and most districts, have developed academic standards for what students should know and be able to do before graduating from high school. In fact, the No Child Left Behind Act now mandates that states implement statewide accountability systems "based on challenging State standards."

States should consider distilling their current standards and benchmarks into a core of essential standards, identifying which content is essential for students to learn and which is not essential.

A long-recognized problem, however, is the large number of standards teachers must address given the finite amount of time available for instruction in the typical school day and year. In many schools and districts, attempting to teach all of these standards has resulted in a curriculum that is too extensive and therefore affects students' in-depth understanding as well as their performance on standardized achievement tests. To address this problem, states should consider distilling their current standards and benchmarks into a core of essential standards, identifying which content is essential for students to learn and which is not essential. When identifying essential content, it is also important to consider what knowledge and skills students will be held accountable for in state assessments.

The Importance of Effective Teaching

Numerous studies reveal the tremendous impact schools and teachers can have on student achievement. For example, a study conducted by Sanders and Horn (1994, reviewed in Marzano, 2003) reveals a 39 percentage-point difference in student achievement between students with "most effective" and "least effective" teachers. In classrooms headed by teachers characterized as "most effective," students posted achievement gains of 53 percentage points over the course of one academic year, whereas in classrooms led by "least effective" teachers, student achievement gains averaged 14 percentage points (Marzano, 2003).

Effective teaching begins with effective teacher preparation. In teacher preparation programs, states should focus their efforts on ensuring that graduates have strong content expertise and are equipped to use research-based instructional strategies.

Efforts are underway in many states to identify essential versus non-essential content. The South Dakota Department of Education, for example, has identified the essential core of the state's content standards in mathematics and reading.

To assist practitioners in identifying essential standards, McREL has recently completed a guide for identifying essential content and performance levels (Kendall & Snyder, 2003) (see www.mcrel.org for details).

To ensure that prospective teachers have gained these competencies, several states, including North Carolina, Indiana, and Kansas, have implemented or have begun the move toward performance-based teacher licensure systems.

In teacher preparation programs, states should focus their efforts on ensuring that graduates have strong content expertise and are equipped to use research-based instructional strategies.

Kansas, for example, has developed a performance-based licensure system in which teacher candidates receive a two-year conditional license upon completion of a teacher preparation program. In order to receive a professional teaching license, teachers are required to complete a performance assessment developed by a committee of practitioners and higher education faculty. Teachers select a unit on which they would like to be assessed, administer pre- and post-tests to students on that unit, and turn in a report to the state department of education. The report includes student demographic data and a self-reflection component, which details why a teacher believes students did or didn't learn, and what that teacher might do differently in the future. (See www.ksbe.state.ks.us/ for more information.)

One mark of an effective teacher is the ability to use an array of research-based instructional strategies. McREL's meta-analysis of the research on instruction (Marzano, 1998) identifies nine instructional strategies that enhance student achievement.

- Identifying similarities and differences: The classroom practices associated with the instructional category of identifying similarities and differences include comparison tasks, classifying tasks, the use of metaphors, and the use of analogies.

- Summarizing and note taking: Summarizing and note taking focus on distilling and analyzing information, thus strengthening students' understanding of the content.

- Reinforcing effort and providing recognition: By reinforcing effort and providing recognition, teachers underscore that students' efforts make a difference in their levels of achievement.

- Homework and practice: Homework and practice provide opportunities for students to deepen their understanding and strengthen their skills.

- Nonlinguistic representations: Nonlinguistic representations can take a variety of forms including graphic representations, physical models, mental pictures, drawings, and kinesthetic classroom activities.

- Cooperative learning: There are five defining elements of cooperative learning: positive interdependence, face-to-face promotive interaction, individual and group accountability, interpersonal and small-group skills, and group processing.

- Setting goals and providing feedback: Goal setting establishes a direction for learning. Involving students in the goal-setting process can increase students' accountability for their own learning.

- Generating and testing hypotheses: Processes that encourage students to generate and test hypotheses include systems analysis, invention, experimental inquiry, decision making, and problem solving.

- Activating prior knowledge: Cues, questions, and advance organizers give students a preview of what they are about to learn or experience and thus help activate students' prior knowledge.

By integrating these strategies into their current classroom practice, teachers can help students deepen their understanding and strengthen their proficiency. Recommendations for implementing these nine research-based strategies are detailed in *Classroom Instruction that Works* (Marzano, Pickering, & Pollock, 2001).

Ensuring that teachers have the knowledge and skills needed to implement research-based instructional strategies requires policies that specifically support teachers' learning. Professional development is the dominant approach to improving teachers' knowledge and skills and is critical to maintaining teachers' effectiveness; yet, it can sometimes be given short shrift. In Education Week's 2001 *Quality Counts* report, for example, 28 percent of teachers surveyed said that, during the previous year, they had had no training in understanding and using state standards. Sixty-eight percent of teachers noted that they had had "some" or "little" access to training in state assessments.

To positively influence teachers' effectiveness in the classroom, schools need to implement coherent, meaningful professional development programs and ensure that teachers are given adequate time and supports to put what they have learned into practice.

To positively influence teachers' effectiveness in the classroom, schools need to implement coherent, meaningful professional development programs and ensure that teachers are given adequate time and supports to put what they have learned into practice. The U.S. Department of Education (1995) has identified a number of characteristics of an effective professional development program, including the following:

- Focuses on teachers as central to student learning, yet includes all other members of the school community

- Focuses on individual, collegial, and organizational improvement

- Respects and nurtures the intellectual and leadership capacity of teachers, principals, and others in the school community

- Reflects best available research and practice in teaching, learning, and leadership

- Is planned collaboratively by those who will participate in and facilitate that development

- Requires substantial time and other resources

- Is driven by a coherent, long term plan

Professional development committees would be well advised to design their overall plans to focus on clear personal development and organizational improvement goals, using research-based programs to achieve them.

The Critical Role of Leadership

Effective leadership adds value to the impact of classroom and teacher practices and ensures that lasting change flourishes. Awareness of the school and teacher practices that impact student achievement is critical, but without effective leadership, there is less of a possibility that schools and districts will address these variables in a coherent and meaningful way.

McREL has identified 21 leadership responsibilities with statistically significant relationships to student achievement that, when consistently implemented, can have a substantial impact on student achievement (Waters, Marzano, & McNulty, 2003). These responsibilities include such tasks as establishing a set of standard operating procedures and routines; involving teachers in the design and implementation of important decisions and policies; and monitoring the effectiveness of school practices and their impact on student learning.

The caliber of leadership in a school can have a dramatic effect on student achievement. According to Waters, Marzano, and McNulty (2003), the average effect size between leadership and student achievement is .25. Waters et al. explain this correlation as follows:

> Consider two schools (school A & school B) with similar student and teacher populations. Both demonstrate achievement on a standardized, norm-referenced test at the 50th percentile. Principals in both schools are also average — that is, their abilities in the 21 key leadership responsibilities are ranked at the 50th percentile. Now assume that the principal of school B improves her demonstrated abilities in all 21 responsibilities by exactly one standard deviation. . . .
> Our research findings indicate that this increase in leadership ability would translate into mean student achievement at school B that is 10 percentile points higher than school A. (p. 3)

Because leadership has such a significant impact on student achievement, state and district policymakers are shifting leader preparation programs toward a dual focus on leadership skills and management training. Principals need core knowledge, as well as management skills, to inform and lead change. Too, as districts and schools move toward increasingly data-driven systems, it is critical that principals understand how to interpret research findings and evaluative data.

To ensure that principals gain this necessary knowledge, states are moving toward a performance-based principal licensure system, in which prospective principals are required to demonstrate their effectiveness in the field prior to licensure. Other states are mandating that newly appointed principals undergo induction programs. In Louisiana, for instance, all new principals and assistant principals are required to participate in the Louisiana Principal Induction program. The purpose of the program, according to the Louisiana Department of Education, is to "build the capacity of new building-level administrators to provide leadership to their schools in both instructional and administrative areas within the school" (Louisiana Department of Education, n.d.).

> *Implementing intensive administrator training programs has the potential to increase the efficacy and retention of administrators, in that principals may be better prepared to handle the myriad challenges associated with running a school.*

Programs such as these might indirectly address an issue of concern for many states: administrator turnover. In urban and rural areas in particular, which can have high numbers of low-performing, high-poverty schools, it can be difficult for districts to attract and retain principals. Implementing intensive administrator training programs has the potential to increase the efficacy and retention of administrators, in that principals may be better prepared to handle the myriad challenges associated with running a school.

In the case of performance-based administrator and teacher licensure programs, educator preparation institutions have an important role to play. In order to create effective performance-based licensure systems, state boards of education are partnering with colleges and universities to develop educator training standards and align educator performance assessments with university courses. For example, Kansas's teacher performance assessment, which teachers complete prior to receiving professional certification, was developed in conjunction with higher education faculty.

Final Thoughts

Initiating focused, lasting change in a school system can be a daunting task. Implementing the policies detailed in this brief, however, can help states, districts, and schools edge closer to implementing meaningful reform. By focusing on policies that address the variables that have been shown to positively impact student achievement, policymakers can create conditions in which students have the resources and support they need to reach high standards.

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