

**Robert J. Marzano, Ph.D.**

**Senior Scholar, Mid-Continent Research for Education and  
Learning**

**Associate Professor, Cardinal Stritch University**

**President, Marzano and Associates**

**Nominated by**

**Dr. Larry Nyland**



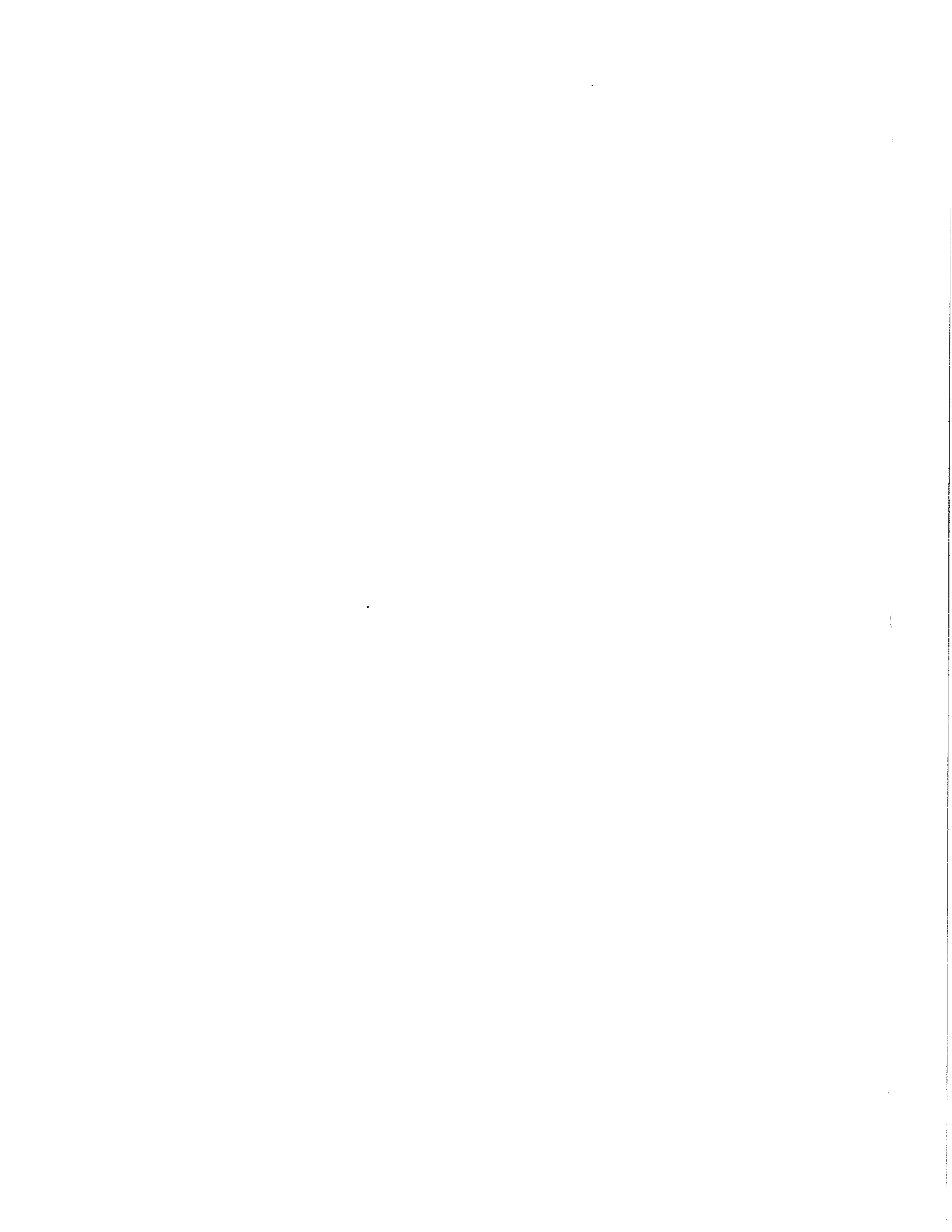
## **Dr. Larry Nyland . . .**

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Superintendent Larry Nyland is a long-time educator with a passion for building teams that improve students learning. Recently, Dr. Nyland was named Washington State Superintendent of the Year, and National Finalist. He was recognized for leading the district work in literacy and improving student achievement while also establishing better relationships with employees and union leaders after a challenging teacher strike. Nyland's leadership also helped the district rebound from financial difficulty and lower enrollment to see the voter approval of a \$120 million bond to build two new schools.

Dr. Nyland's passion is building teams of people who do great things for kids. He is personally invested in teaching and learning: leading professional development and participating in 100's of classroom walk throughs each year. His focus is on learning how to learn ... and teaching others how to learn. Teachers have taken on the literacy work, watch each other teach and challenge each other to grow professionally.

Nyland has been superintendent of the Marysville School District, serving 12,000 students, since 2004. He previously served as academic officer and human resources director at Highline School District near Seattle. Dr. Nyland additionally held superintendent roles in the Shoreline and Pasco school districts and in Alaska. Outside of school districts, he formerly directed the superintendent preparation program at Seattle Pacific University and has been a consultant / advisor to many of the statewide instructional initiatives in Washington State.



## **Robert J. Marzano Introduction**

**The purpose of this brief narrative is to describe the focus of my work throughout my career. I have worked in K-12 public education for four decades as a classroom teacher (early on) and as professor of education for seven years. For the last 25 years I have been associated with Mid-continent Research for Education and Learning (McREL), a research and development firm in Denver, Colorado. In 2001 I founded the educational consulting firm Marzano & Associates to work more closely with districts, schools, and teachers.**

**The thrust of my work has been to translate research and theory into practice. To this end I have authored 26 books, over 150 articles and chapters in books, and over 100 curriculum materials. I have included the first chapter from three representative works for your consideration. Additionally I have worked with schools and districts in every state and a number of countries other than the U.S. Topics I have addressed include: leadership, formative assessment and grading, instruction, classroom management, school reform, building background knowledge and vocabulary, and thinking skills.**

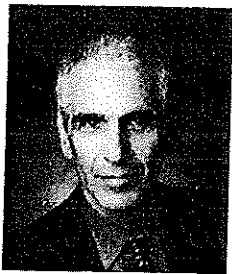
**It is difficult to comment on my influence on educational practice. Members of your committee are probably better able to address this issue than I am. If book sales are an indicator then one could say I have had some influence. For example, the book *Classroom Instruction that Works* has sold over 900,000 copies to date and is the biggest seller in the history of the Association for Supervision and Curriculum Development (ASCD). (As a side note, I receive no royalties for that book or any of the books I wrote while in the full time employment of McREL). The book *What Works in Schools* has sold over 150,000 copies. Most of my recent books have sold 50,000 or more copies. To my knowledge my work has been used by districts, schools, and teachers to improve student achievement in a variety of settings.**

**I am honored to be considered for this award. I hope this provides you with the information you seek.**

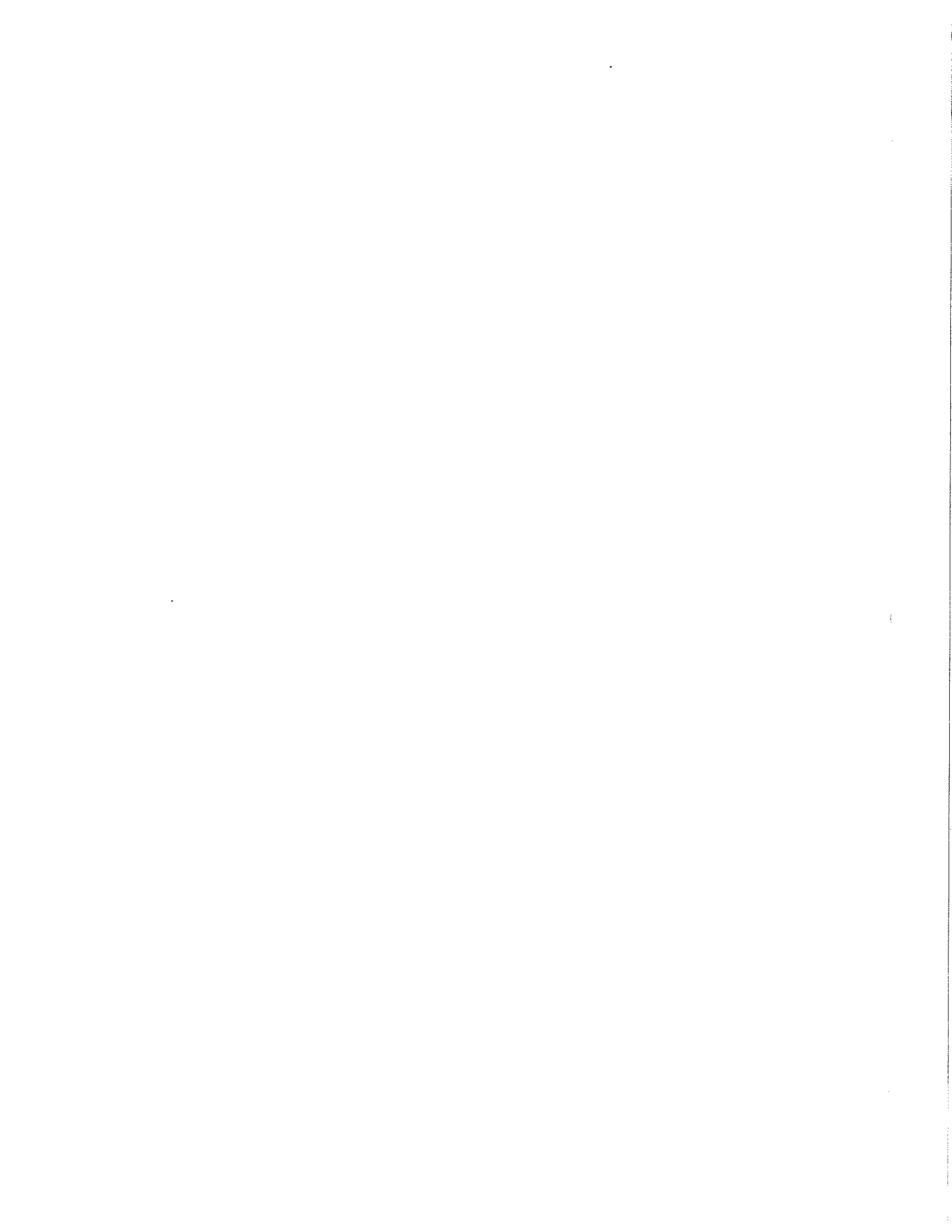


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## About the Author



Robert J. Marzano is a senior scholar at Mid-continent Research for Education and Learning in Aurora, Colorado; an associate professor at Cardinal Stritch University in Milwaukee, Wisconsin; and president of Marzano & Associates. He has developed programs and practices used in K-12 classrooms that translate current research and theory in cognition into instructional methods. An internationally known trainer and speaker, Marzano has authored 26 books and more than 150 articles and chapters in books on such topics as reading and writing instruction, thinking skills, school effectiveness, restructuring, assessment, cognition, and standards implementation. Recent titles include *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement* (ASCD, 2001), *Classroom Management That Works: Research-Based Strategies for Every Teacher* (ASCD, 2003), *What Works in Schools: Translating Research into Action* (ASCD, 2003), *Building Background Knowledge for Academic Achievement* (ASCD, 2004), *School Leadership That Works* (ASCD, 2005), *Classroom Assessment and Grading That Work* (ASCD, 2006), and *The New Taxonomy of Educational Objectives* (Corwin, 2007). Marzano received his bachelor's degree in English from Iona College in New York, a master's degree in education in reading/language arts from Seattle University, and a doctorate in curriculum and instruction from the University of Washington. Address: 7127 S. Danube Court, Centennial, CO 80016 USA. Telephone: (303) 796-7683. E-mail: robertjmarzano@aol.com.





## ROBERT J. MARZANO

### EDUCATION

Ph.D. Curriculum and Instruction, University of Washington, Seattle - June, 1974  
M.Ed. Reading/Language Arts, Seattle University, Seattle - June, 1971  
B.A. English, Iona College, New York - June, 1968

### EXPERIENCE

2001 - present **Senior Scholar, McREL/ Associate Professor, Cardinal Stritch University/  
President, Marzano & Associates**

1998 – 2001 **Senior Fellow, Mid-continent Research for Education and Learning**

1994-1998 **Vice-President, McREL Institute**

1989-1994 **Deputy Director of Training and Development, Mid-continent Regional  
Educational Laboratory**

1983-1989 **Director of Research, Mid-continent Regional Educational Laboratory (full-time)**

1981-1983 **Director of Research, Mid-continent Regional Educational Laboratory (On leave  
from University of Colorado at Denver)**

1978-1981 **Associate Professor, University of Colorado, Denver (Tenured)**

1974-1977 **Assistant Professor, Reading, Language Arts, Research Methodology,  
University of Colorado, Denver**

1972-1974 **Triple T Project Participant - University of Washington**

1969-1971 **Chairman of English Department - O'Dea High School, Seattle, Washington**

1967-1968 **English Teacher, New York Public Schools**

### PUBLICATIONS

#### A. Articles, Chapters in Books, and Monographs

Marzano, R.J. & Pickeing, D.J. (2007). The case for and against homework. *Educational Leadership*. 64(6), 74-79.

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- Wile, J., Marzano, R. J., & Paynter, D. E. (1992). Teaching friendship [Review of the book The real thief]. Columbus, OH: Zaner-Bloser.
- Paynter, D. E., & Marzano, R. J. (1992). Teaching survival as a theme [Review of the books Call it courage, Island of the blue dolphins, and The sign of the beaver]. Columbus, OH: Zaner-Bloser.
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- Marzano, R. J., Paynter, D. E., Kendall, J. S., Pickering, D. J., & Marzano, L. (1991). *Getting started: Taking the first steps in developing a comprehensive approach to literacy development*. Columbus, OH: Zaner-Bloser.
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- Marzano, R. J., Paynter, D. E., Kendall, J. S., Pickering, D. J., & Marzano, L. (1991). Teaching historical fiction [Review of the book Sarah, plain and tall]. Columbus, OH: Zaner-Bloser.
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Brown, V. S., Marzano, R. J., & Paynter, D. E. (1991). Teaching mystery [Review of the book The case of the cat's meow]. Columbus, OH: Zaner-Bloser.

Paynter, D. E., & Marzano, R. J. (1991). *Teacher's guide to spelling and word meaning*. Columbus, OH: Zaner-Bloser.

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### **E. Computer Software**

Demonstration disc on "Buying a Used Car." Produced for Relevant Productions, Inc., Indian Rocks Beach, Florida, 1980. 48K, Apple II, BASIC.

"Diagnostic Spelling Program" 48K, Apple II, BASIC.

"Diagnostic Writing Program" 48K, Apple II, BASIC.

### **F. Video Tapes**

Marzano, R. J. (1997). *Implementing standards-based education in K-12 classrooms*. Phoenix, AZ: National Schools Conference Institute.

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## **PRESENTATIONS AND WORKSHOPS**

In the last 20 years, over 800 workshops and presentations to approximately 150,000 educators. Presentations and workshops have been made in all 50 states and in 14 different countries.



## **PROFESSIONAL MEMBERSHIPS**

International Reading Association  
National Council of Teachers of English  
American Educational Research Association  
Association for Supervision and Curriculum Development  
National Council of Measurement in Education

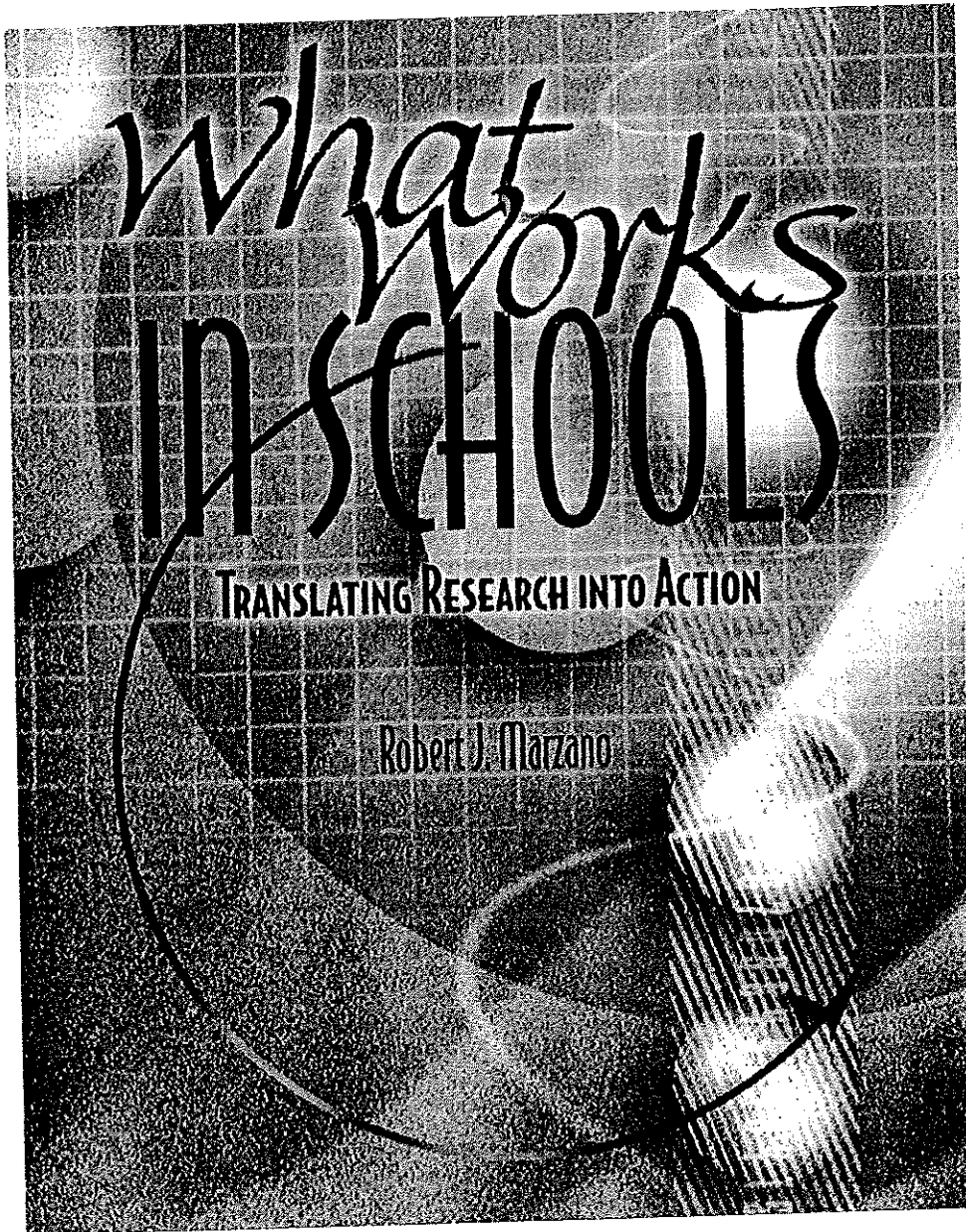
## **AWARDS**

National Service Award, Minnesota Association for Supervision and Curriculum Development, 1996

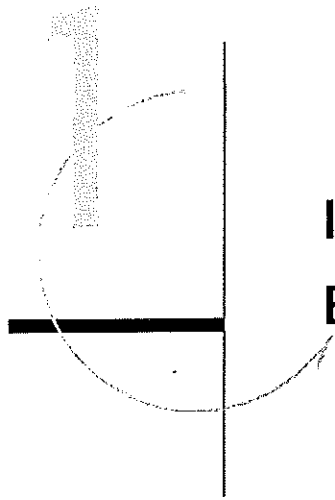
Finalist in NCTE competition for "Promising Researcher," 1975

"Outstanding Researcher in the Field of Reading," 1976 - Colorado Council of the International Reading Association





ASSOCIATION FOR SUPERVISION AND CURRICULUM DEVELOPMENT  
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## INTRODUCING THE BEST OF TIMES

Perhaps now more than ever the quotation from Charles Dickens's *A Tale of Two Cities* describes the position of public education: "It was the best of times, it was the worst of times." Actually, given the criticisms of public education, some of those directly involved in K through 12 education might argue that the only relevant part is "it was the worst of times." This book, however, is about *possibility*, specifically the possibility that K-12 education is on the brink of the best of times if we so choose. My premise is that if we follow the guidance offered from 35 years of research, we can enter an era of unprecedented effectiveness for the public practice of education—one in which the vast majority of schools can be highly effective in promoting student learning. As subsequent chapters detail, any school in the United States can operate at advanced levels of effectiveness—if it is willing to implement what is known about effective schooling. Before examining this possibility, let us consider the

criticisms of U.S. education—the argument for the worst of times.

### The Case for the Worst of Times

The history of public education, particularly during the 20th century, is rife with criticisms (Tyack, 1974; Tyack & Tobin, 1994). Indeed, the century began with a massive effort to improve K-12 schooling, which was spearheaded by the Carnegie Foundation for the Advancement of Teaching. One significant aspect of that reform effort was the establishment of the "Carnegie unit" as the uniform standard for defining academic achievement.

Criticisms of public education and their accompanying reform efforts flourished for the first five decades of the century. However, it is the criticisms and reform efforts of the second half of the century that most profoundly affect us today. The first of these was spawned by the launching of

Sputnik in 1957. Shocked by this event, the U.S. public began to question the rigor and viability of our schools. Indeed, influential figures such as Admiral Hyman Rickover (1959) forwarded the position that public education was weakening the intellectual capacity of our students. Rickover's book, *Education and Freedom*, made direct links between the security of the nation and the quality of education.

In the 1960s there was no hiatus from the harsh criticisms of public education. In fact, the study that arguably produced the most concrete evidence of the failures or inadequacies of public education was conducted in that decade. It was in the context of President Johnson's "war on poverty" that the Civil Rights Act of 1964, a cornerstone of Johnson's initiative, specified that the Commissioner of Education should conduct a nationwide survey of the availability of educational opportunity. The effort mounted was impressive even by today's standards. More than 640,000 students in grades 1, 3, 6, 9, and 12 took achievement and aptitude tests and were categorized into six ethnic and cultural groups. Sixty thousand teachers in 4,000 schools completed questionnaires about their background and training. The resulting report, *Equality in Educational Opportunity*, was published in July 1966. Although the work of a team of researchers (Coleman, Campbell, Hobson, McPartland, Mood, Weinfield, & York, 1966), it has become known as the "Coleman report" in deference to its senior author, James Coleman. To say the least, the findings did not paint a flattering picture of public education:

Taking all of these results together, one implication stands above all: that schools bring lit-

tle to bear on a child's achievement that is independent of his background and general social context; and that this very lack of an independent effect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront life at the end of school. (p. 325)

The report had a profound impact on public perceptions of schooling in the United States (Madaus, Airasian, & Kellaghan, 1980; Madaus, Kellaghan, Rakow, & King, 1979). Specifically, it dealt a veritable deathblow to the belief that schools could overcome students' backgrounds. Perhaps the most publicized finding from the report was that schools account for only about 10 percent of the variance in student achievement—the other 90 percent is accounted for by student background characteristics.

The findings in the Coleman report were corroborated when Christopher Jencks and his colleagues published *Inequality: A Reassessment of the Effects of Family and Schooling in America*, which was based on a reanalysis of Coleman's data (Jencks et al., 1972). Among the findings articulated in the Jencks study were the following:

- Schools do little to lessen the gap between rich students and poor students.
- Schools do little to lessen the gap between more and less able students.
- Student achievement is primarily a function of one factor—the background of the student.
- Little evidence exists that education reform can improve a school's influence on student achievement.

The conclusions stated and implied in the Coleman and Jencks studies painted a sobering picture of U.S. education. If schools have little chance of overcoming the influence of students' background characteristics, why put any energy into school reform?

Although the nation viewed public education poorly in the 1960s and 1970s, the 1980s were even darker times. As Peter Dow (1991) explains in his book *Schoolhouse Politics: Lessons from the Sputnik Era*:

In 1983 educators and the general public were treated to the largest outpouring of criticism of the nation's schools in history, eclipsing even the complaints of the early 1950s. Nearly fifty reports totaling more than six thousand pages voiced a new wave of national concern about the troubled state of American education. They spoke of the fragmented state of the school curriculum, the failure to define any coherent, accepted body of learning, the excessive emphasis on teaching isolated facts, and the lack of attention to higher order skills and concepts. They called for more individualism of instruction, the development of a closer relationship between teachers and students, and methods that encourage the active participation of the student in the learning process. (p. 243)

Again, a single report laid the foundation for the outpouring of criticism. Without a doubt, *A Nation at Risk: The Imperative for Educational Reform*, issued by the National Commission on Excellence in Education, was considered by some as proof that K-12 education had indeed devolved to a state of irreversible disrepair. The report noted that "the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a

nation and a people" (National Commission on Excellence in Education, 1983, p. 5). To punctuate the importance of the message about public education, the report claimed that "we have, in effect, been committing an act of unthinking, unilateral disarmament" (p. 5).

The effects of the report were profound, due in no small part to the fact that it was perceived as the sanctioned opinion of the White House. As David Berliner and Bruce Biddle note in their book *The Manufactured Crisis: Myths, Frauds, and the Attack on America's Public Schools* (Berliner & Biddle, 1995):

... in 1983, amid much fanfare, the White House released an incendiary document highly critical of American education. Entitled *A Nation at Risk*, this work was prepared by a prestigious committee under the direction of then Secretary of Education Terrell Bell and was endorsed in a speech by President Ronald Reagan. (p. 3)

The effects of *A Nation at Risk* persisted through the 1990s. Indeed, some authors (Bennett, 1992; Finn, 1991) cite the report as one of the primary sources of evidence for public education's decline.

Although *A Nation at Risk* was sufficient to cast a negative shadow on education throughout the 1990s, a newer study, the Third International Mathematics and Science Study (TIMSS), was interpreted as evidence of the ineffectiveness of U.S. education. It involved a large-scale, cross-national comparison of the education systems in 41 countries. TIMSS researchers examined mathematics and science curricula, instructional practices, and school and social factors. In general, U.S. 4th grade students performed moderately well

when compared to students of similar ages in other countries; 8th grade students less so; and 12th grade students performed quite poorly. Both technical reports of TIMSS (Schmidt, McKnight, & Raizen, 1996; U.S. Department of Education, National Center for Educational Statistics, 1998) and commentaries on TIMSS (Stevenson & Stigler, 1992; Stigler & Hiebert, 1999) interpret the results as evidence of a dire need for public education reform. Perhaps at the extreme, Chester Finn (1998), in a provocative article in the *Wall Street Journal* entitled "Why America Has the World's Dimmest Bright Kids," described the findings in the following way:

Today the U.S. Department of Education officially releases the damning data, which come from the Third International Mathematics and Science Study, a set of tests administered to half a million youngsters in 41 countries in 1995. But the results have trickled out. We learned that our fourth-graders do pretty well compared with the rest of the world, and our eighth-graders' performance is middling to poor. Today we learn that our 12th-graders occupy the international cellar. And that's not even counting Asian lands like Singapore, Korea and Japan that trounced our kids in younger grades. They chose not to participate in this study. (p. A22)

Given the criticisms of public education that have flourished over the last half of the last century, it is clear that those who believe that it is the worst of times for public education have plenty of evidence for their position. Indeed, it is hard to imagine an argument for the position that it can be the best of times for public education.

## The Case for the Best of Times

My case for the position that public education is at the dawn of the best of times is not necessarily based on refuting the reports mentioned. Such arguments have been made for *A Nation at Risk* and, to some degree, TIMSS. Perhaps the most noteworthy of these arguments are found in David Berliner and Bruce Biddle's (1995) *The Manufactured Crisis: Myths, Frauds, and the Attack on America's Public Schools* and Gerald Bracey's (1997) *Setting the Record Straight: Responses to Misconceptions about Public Education in the United States*. These works take a rather aggressive stance that past research has been either misleading or misinterpreted to paint an unwarranted negative perspective of U.S. education. Although I do not share this view entirely, both works present compelling arguments and provide perspectives with which all educators should be familiar.

My basic position is quite simple: Schools can have a tremendous impact on student achievement if they follow the direction provided by the research. As evidence for this position, I will not use examples of specific schools mainly because other writers have already done so (see Darling-Hammond, 1997a; Reeves, 2002; Schmoker, 1999, 2001). Indeed, perhaps the most compelling evidence for this conclusion is the impressive list of schools that have "beat the odds" compiled by Education Trust (Barth et al., 1999). These high-poverty schools are referred to as "beat the odds" schools because they sport impressive academic achievement from students whose background characteristics would

logically preclude it. Rather than present specific examples, I present evidence based on my attempts to synthesize the extant research over the last 35 years, which I assert has provided clear and unprecedented insight into the nature of schooling. I have presented technical and nontechnical descriptions of these efforts in several publications (Marzano, 1998a, 2000a; Marzano, Pickering, & Pollock, 2001). Although my case is made in detail in the chapters to come, it begins with three basic assertions.

**Assertion 1: Even those studies that have been interpreted as evidence that schools do not significantly affect student achievement do, in fact, support the potential impact of schools when interpreted properly.**

The Coleman report was arguably the first high-visibility study of the second half of the 20th century to advance the position that schools have little impact on student achievement. Recall that its fundamental finding was that schools account for only about 10 percent of the variance in student achievement—a finding that was corroborated later by Jencks and colleagues (1972). Understanding the problems with using percentage of variance as the measure of a school's impact is the key to understanding how these findings could actually support the position that schools do make a difference. (For a technical discussion of issues regarding percentage of variance, see Technical Note 1, pp. 187–188.)

In nonstatistical terms, findings like those from the Coleman report are frequently interpreted in the following way: Assume you are examining the academic achievement of a

group of 1,000 8th grade students who attend five different middle schools—200 in each school. Also assume that these students vary in their achievement scores—some have very high scores, some have very low scores, many have scores near the average. Taken at face value, the findings from the Coleman report imply that only about 10 percent of the differences in scores from student to student (more accurately, the squared differences) are a function of the quality of the schools these students attend. In other words, going to the best of the five schools as opposed to the worst of the five schools generates only about 10 percent of the differences in students' scores. What accounts for the other 90 percent of the differences in scores? Coleman and others (1966) concluded it is the background of the students.

How can these findings possibly be interpreted as evidence that schools can have a positive and significant influence on student achievement? Since the Coleman report was published, statisticians have found that using percentage of variance as an indication of a factor's importance is not the most useful way of interpreting research findings on academic achievement. In fact, as is the case with the Coleman report, this technique can paint an unnecessarily gloomy picture of a school's possible effects on student achievement.

Researchers Robert Rosenthal and Donald Rubin (1982) devised a more practical way to interpret research findings reported in terms of percentage of explained variance. Their approach is referred to as the Binomial Effect Size Display or BESD. (For a technical and more detailed explanation of the BESD, see Technical Note 2, pp. 189–190.) To illustrate Rosenthal and Rubin's BESD, consider Figure



**FIGURE 1.1**  
**Reinterpretation of Coleman's Findings Using the BESD**

Group	Outcome	
	Percentage of Students Who Pass the Test	Percentage of Students Who Fail the Test
Effective Schools	65.8%	34.2%
Ineffective Schools	34.2%	65.8%

BESD = Binomial Effect Size Display

1.1, which is based on Coleman's findings that schools account for only 10 percent of the variance in student achievement.

Although schools would be better described as representing many gradations of effectiveness from highly ineffective to highly effective, Rosenthal and Rubin's approach requires placing schools into one of those two broad categories. That is, a school is classified as being either effective or ineffective. Rosenthal and Rubin's approach also requires assuming that the students in the effective and the ineffective schools are given a test on which you would normally expect half of the students to pass and half to fail. Given these assumptions, we can now interpret Figure 1.1. The columns in Figure 1.1 are labeled "percentage of students who pass the test" and "percentage of students who fail the test." In general, in the effective schools, 65.8 percent of students would pass the test, and only 34.2 percent would fail the test. Conversely, in general, in the ineffective schools only 34.2 percent of the students would pass the test, and 65.8 percent would fail it.

This perspective paints a far different picture of the findings from the Coleman report. In effective schools almost twice the

percentage of students would pass the test (on which half are expected to fail and half to pass) than in the ineffective schools. The logical conclusion to draw from the Coleman report, then, is that effective schools do make a difference in student achievement.

**Assertion 2: The research on the effectiveness of schools *considered as a whole* paints a very positive image of their impact on student achievement.**

The Coleman report and the Jencks follow-up study were the first in a series of studies to explore the impact of schools. Scores of similar studies have been conducted since. In a review of some of this research, Charles Teddlie, David Reynolds, and Pam Sammons (2000) indicate that many studies report that schools account for more variance in student achievement than Coleman's meager 10 percent. I have also synthesized much of that research (Marzano, 2000a). I analyzed the findings from 10 high-visibility studies (Bosker, 1992; Byrk & Raudenbush, 1992; Coleman et al., 1966; Creemers, 1994; Jencks et al., 1972; Luyten, 1994; Madaus et al., 1979; Rowe & Hill, 1994; Scheerens & Bosker, 1997; Stringfield & Teddlie, 1989)

and discovered that the average finding was that schools account for 20 percent of the variance in student achievement—twice as much as that reported by Coleman. Why were the Coleman findings so low? George Madaus and his colleagues (1979) and Berliner and Biddle (1995) discussed this in detail. In brief, although Coleman and colleagues had access to student scores on standardized academic achievement tests, they chose to use a general measure of verbal ability (focused on vocabulary knowledge) as the primary outcome measure. This created a situation in which student background variables almost by definition were highly correlated with student achievement. Madaus and colleagues (1979) explain

... the construct "verbal ability" in the Coleman study has become equated with "school achievement" and the results have been generalized to the now popular myth that school facilities, resources, personnel, and curricula do not have a strong independent effect on achievement. Coleman's findings have been interpreted in the widest and most damaging sense. . . . To assert that schools bring little influence to bear on a child's general verbal ability that is independent of his background and general social context is not the same as asserting that schools bring little influence to bear on pupils' achievement in a specific college preparatory physics course. . . . The fact that home background variables seem to be vastly more influential in explaining verbal ability should not preclude or cloud any expectations we have that schools should have some independent effect on traditional curriculum areas which are systematically and explicitly treated as part of the instructional process. (p. 210)

The Coleman researchers' use of verbal ability as the primary dependent measure resulted in an underestimate of the effect of schools on student achievement.

How does the picture change if we use the updated estimate of 20 percent? To answer this question, we turn again to Rosenthal and Rubin's BESD approach in Figure 1.2 (p. 8).

As Figure 1.2 illustrates, the updated research indicates that effective schools generally have a fairly substantial impact on student achievement. Specifically, if a test on which you would normally expect half the students to pass and half the students to fail were given to students in effective schools, 72.4 percent of those students would pass the test and the remainder would fail. In the ineffective schools, however, only 27.6 percent of the students would pass the test. In the aggregate, then, the research indicates that schools, when run effectively, make a big difference in student achievement. Again, to quote Madaus and others (1979), the findings from studies that use appropriate student achievement measures "provide strong evidence for the differential effectiveness of schools; differences in school characteristics do contribute to differences in achievement." (p. 223)

**Assertion 3: The schools that are highly effective produce results that almost entirely overcome the effects of student background.**

Assertions 1 & 2 are based on the convention of classifying schools into two broad and contrived categories—effective schools and ineffective schools. Given that there are about 92,000 public schools in the United

**FIGURE 1.2**  
**Effective Versus Ineffective Schools, Assuming 20 Percent of Variance**

Group	Outcome	
	Percentage of Students Who Pass the Test	Percentage of Students Who Fail the Test
Effective Schools	72.4%	27.6%
Ineffective Schools	27.6%	72.4%

States (National Center for Educational Statistics, 2002), we can assume that they approximate a normal distribution in terms of effectiveness, as depicted in Figure 1.3.

Let's consider those schools to the far right of the distribution in Figure 1.3—those schools at the 99th percentile in terms of their effectiveness. What effect do these schools have on students' achievement? Using the BESD approach, we find that 84.7 percent of the students in those schools would pass a test on which we would normally expect half the students to pass and half the students to fail. (The explanation for this is presented in Technical Note 3, p. 190). This would be true *regardless of the background of the students who attend the school*. Specifically, these schools provide interventions that are designed to overcome student background characteristics that might impede learning. These interventions are detailed in Section III of this book. For now, it is sufficient to say that this is a remarkable possibility—one that provides great hope for public education.

Research in the last 35 years demonstrates that effective schools can have a profound impact on student achievement. The remaining chapters articulate the guidelines provided by that research. Before articulating and discussing those guidelines, however, we must

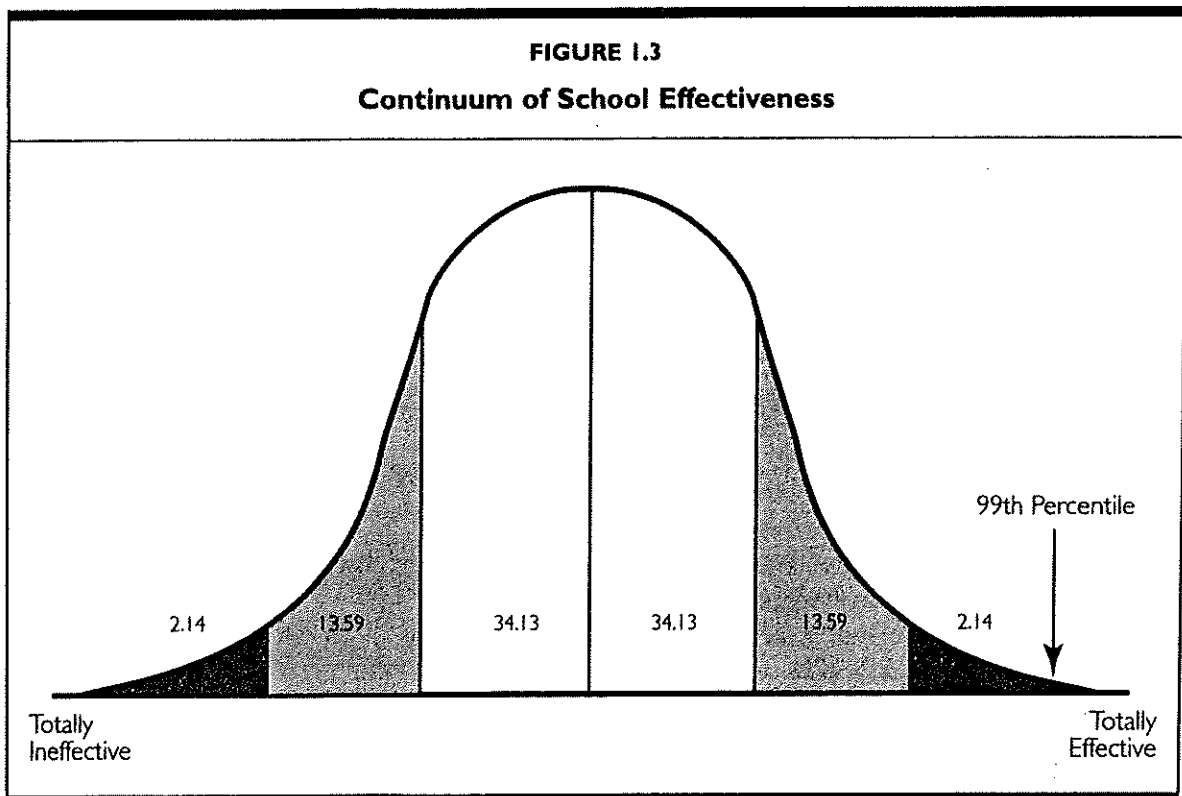
consider another perspective: Although the research provides clear guidance regarding effective schooling, is the U.S. public education system up to the challenge of following it?

## Are Public Schools Up to the Challenge of Research-Based Reform?

In 1990 John Chubb and Terry Moe authored an influential book entitled *Politics, Markets and America's Schools* (Chubb & Moe, 1990). After conducting a study that involved more than 400 high schools and 10,000 high school teachers, Chubb and Moe reached some of the same conclusions that I have:

All things being equal, a student in an effectively organized school achieves at least a half-year more than a student in an ineffectively organized school over the last two years of high school. If this difference can be extrapolated to the normal four-year high school experience, an effectively organized school may increase the achievement of its students by more than one full year. That is a substantial school effect indeed. (p. 140)

Although this book asserts that public educators are up to the challenge of implementing



what we know about effective schooling, Chubb and Moe assert that bureaucratic underpinnings of public schools doom to failure any attempts at school reform:

... we can only believe that the current "revolution" in American public education will prove a disappointment. It might have succeeded had it actually been a revolution, but it was not and was never intended to be, despite the lofty rhetoric. (p. 228)

They ultimately conclude that school choice (presumably in the form of vouchers) is the only viable way to implement the findings from the research.

Chubb and Moe offer compelling evidence. In brief, they demonstrate that the more district-level control or constraints put

on a school, the lower the chances of the school being organized in an effective manner. According to Chubb and Moe, centralized control over personnel can be particularly debilitating to a school's effectiveness:

Among the reasons why direct external control may interfere with the development of an effective school, perhaps the most important is the potentially debilitating influence of external control over personnel. If principals have little or no control over who teaches in their schools, they are likely to be saddled with a number of teachers, perhaps even many teachers, whom they regard as bad fits. In an organization that works best through shared decisionmaking [sic] and delegated authority, a staff that is in conflict with the leader and with itself is a serious problem. . . . Personnel policies

that promote such conflict may be a school's greatest external burden. (p. 152)

It is a small step from here to the necessity of vouchers and charter schools. Much of Chubb and Moe's argument has been criticized as "ideologically driven" (Berliner & Biddle, 1995, p. 75) as opposed to objectively driven by research results, but I believe their point is well taken. In effect, we stand at a crossroads—will we implement the research-based guidelines to produce schools that don't just work but that work remarkably well? To do so requires a powerful commitment to change the status quo.

## How This Book Is Organized

Following the categorization scheme used by many researchers (Carroll, 1963; Cotton, 1995; Creemers, 1994; Elberts & Stone, 1988; Goldstein, 1997; Raudenbush & Byrk, 1988; Raudenbush & Willms, 1995; Rowe, Hill & Holmes-Smith, 1995; Scheerens, 1992; Scheerens & Bosker, 1997; van der Werf, 1997; Walberg, 1984; Wright, Horn, & Sanders, 1997), I've organized the results of 35 years of research into three general factors that influence student academic achievement: (1) school-level factors, (2) teacher-level factors, and (3) student-level factors.

School-level factors are primarily a function of school policy and schoolwide decisions and initiatives (a guaranteed and viable curriculum, challenging goals and effective feedback, parent and community involvement, a safe and orderly environment, and collegiality and professionalism).

Teacher-level factors are primarily under the control of individual teachers (specific instructional strategies, classroom management techniques, and classroom curriculum design). Student-level factors are generally associated with student background (home environment, learned intelligence and background knowledge, and motivation). Figure 1.4 depicts this model.

Factor	Example
School	<ul style="list-style-type: none"> <li>• Guaranteed and viable curriculum</li> <li>• Challenging goals and effective feedback</li> <li>• Parent and community involvement</li> <li>• Safe and orderly environment</li> <li>• Collegiality and professionalism</li> </ul>
Teacher	<ul style="list-style-type: none"> <li>• Instructional strategies</li> <li>• Classroom management</li> <li>• Classroom curriculum design</li> </ul>
Student	<ul style="list-style-type: none"> <li>• Home atmosphere</li> <li>• Learned intelligence and background knowledge</li> <li>• Motivation</li> </ul>

Implicit in Figure 1.4 is the notion that the school (as opposed to the district) is the proper focus for reform. Indeed, this is a consistent conclusion in the research literature (Scheerens & Bosker, 1997; Reynolds & Teddlie, 2000; Wang, Haertel & Walberg, 1993). While I share Chubb and Moe's concern that district-level central administration can sometimes impede school reform, I believe that the current structure of public

education is malleable enough to benefit from the changes recommended in this book.

In keeping with the organization depicted in Figure 1.4, this book is divided into the following major sections. Section I deals with the five school-level factors, Section II deals with the three teacher-level factors, and Section III deals with the three student-level factors. Finally, Section IV addresses how a school might use the information in the three previous sections to engage in substantive change.

## Summary

Thirty-five years of research provides remarkably clear guidance as to the steps schools can take to be highly effective in enhancing student achievement. Although the guidance from the research is clear, researchers and the public continue to debate whether public education is up to the task of following it. Following the lead of other studies, I have organized the research into three broad categories: school-level factors, teacher-level factors, and student-level factors.

Robert J. Marzano

BUILDING  
BACKGROUND  
KNOWLEDGE

*for Academic Achievement*

Research on What Works in Schools



Association for Supervision and Curriculum Development  
Alexandria, VA USA

# I

## *The Importance of Background Knowledge*

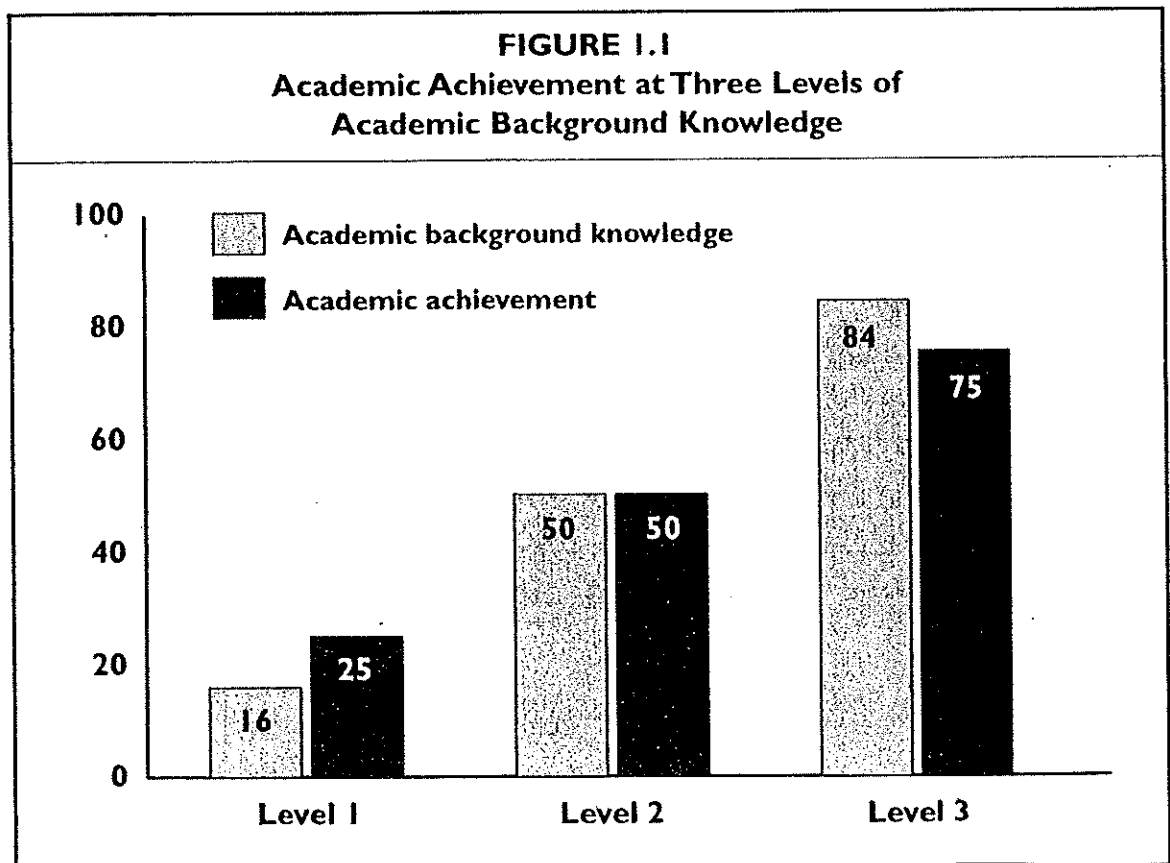
According to the National Center for Education Statistics (2003), every day from September to June some 53.5 million students in the United States walk into classes that teach English, mathematics, science, history, and geography and face the sometimes daunting task of learning new content. Indeed, one of the nation's long-term goals as stated in the *The National Education Goals Report: Building a Nation of Learners* (National Education Goals Panel, 1991) is for U.S. students to master "challenging subject matter" in core subject areas (p. 4). Since that goal was articulated, national and state-level standards documents have identified the challenging subject matter alluded to by the goals panel. For example, in English, high school students are expected to know and be able to use standard conventions for citing various types of primary and secondary sources. In mathematics, they are expected to understand and use sigma notation and factorial representations. In science, they are expected to know how insulators, semiconductors, and superconductors respond to electric forces. In history, they are expected to understand how civilization developed in Mesopotamia and the Indus Valley. In geography, they are expected to understand how the spread of radiation from the Chernobyl nuclear accident has affected the present-day world.

Although it is true that the extent to which students will learn this new content is dependent on factors such as the skill of the teacher, the interest of the student, and the complexity of the content, the research literature supports one compelling fact: what students *already know* about the content is one of the strongest indicators of how well they will learn new information relative to the content. Commonly, researchers and theorists refer to what a person already knows about a topic as "background knowledge." Numerous studies have confirmed the



relationship between background knowledge and achievement (Nagy, Anderson, & Herman, 1987; Bloom, 1976; Dochy, Segers, & Buehl, 1999; Tobias, 1994; Alexander, Kulikowich, & Schulze, 1994; Schiefele & Krapp, 1996; Tamir, 1996; Boulanger, 1981). In these studies the reported average correlation between a person's background knowledge of a given topic and the extent to which that person learns new information on that topic is .66 (see Technical Note 1 on p. 127 for a discussion of how the correlation was computed).

To interpret this average correlation, let's consider one student, Jana, who is at the 50th percentile in terms of both her background knowledge and her academic achievement. Envision Jana's achievement at the 50th percentile as shown in the middle of Figure 1.1. (For a more detailed explanation of this example, see Technical Note 2 on pp. 127–129.) If we increase her background knowledge by one standard deviation (that is, move her from the 50th to the 84th percentile), her academic achievement would be expected to increase from the 50th to the 75th percentile (see the bars on the right side of Figure 1.1). In contrast, if we decrease Jana's academic background knowledge by one standard deviation (that is, move her from the 50th to the 16th percentile), her academic achievement would be



expected to drop to the 25th percentile (see the bars on the left side of Figure 1.1). These three scenarios demonstrate the dramatic impact of academic background knowledge on success in school. Students who have a great deal of background knowledge in a given subject area are likely to learn new information readily and quite well. The converse is also true.

Academic background knowledge affects more than just “school learning.” Studies have also shown its relation to occupation and status in life. Sticht, Hofstetter, and Hofstetter (1997) sought to document a relationship between background knowledge and power, with power defined as “the achievement of a higher status occupation and/or the ability to earn an average or higher level income” (p. 2). To test their hypothesis that “knowledge is power” (p. 3), they interviewed 538 randomly selected adults and gave them a test of basic academic information and terminology. They found a significant relationship between knowledge of this academic information and type of occupation and overall income.

This discussion paints a compelling picture of the impact of *academic* background knowledge on students’ academic achievement in school and on their lives after school. It is important to note the qualifier *academic*. Two students might have an equal amount of background knowledge. However, one student’s knowledge might relate to traditional school subjects such as mathematics, science, history, and the like. The other student’s knowledge might be about nonacademic topics such as the best subway route to take to get downtown during rush hour, the place to stand in the subway car that provides the most ventilation on a hot summer day, and so on. The importance of one type of background knowledge over another is strictly a function of context (Becker, 1977; Greenfield, 1998). The background knowledge of the second student is critical to successfully using public transportation in a specific metropolitan area, but probably not very important for success in school. The first student’s background knowledge is critical to success in school but not to successful public transit.

This book is about enhancing students’ academic background knowledge. This is not to say that other types of background knowledge are unimportant. Indeed, Sternberg and Wagner’s (1986) compilation of the research on practical intelligence makes a good case that success in many aspects of life is related to nonacademic types of background knowledge. However, it is also true that in the United States all children are expected to attend school, and success in school has a strong bearing on their earning potential. Figure 1.2 illustrates the dramatic rise in yearly income as the level of education increases. One particularly disturbing aspect of Figure 1.2 is the income level of those who have not graduated from high school—namely, \$10,838. This is not much above the official poverty line in the

<b>FIGURE 1.2</b>	
<b>Relationship Between Education and Yearly Income</b>	
<b>Level of Education</b>	<b>Yearly Income</b>
Not a high school graduate	\$10,838
High school graduate	\$18,571
Some college, no degree	\$20,997
Associate's degree	\$26,535
Bachelor's degree	\$35,594
Master's degree	\$47,121
Professional degree	\$66,968
Doctorate	\$62,275

Source: U.S. Census Bureau, March 2003

United States, which is \$9,359 per year for a single adult (U.S. Census Bureau, September 25, 2003). Students who do not graduate from high school likely condemn themselves to a life of poverty.

Enhancing students' academic background knowledge, then, is a worthy goal of public education from a number of perspectives. In fact, given the relationship between academic background knowledge and academic achievement, one can make the case that it should be at the top of any list of interventions intended to enhance student achievement. If not addressed by schools, academic background can create great advantages for some students and great disadvantages for others. The scope of the disparity becomes evident when we consider how background knowledge is acquired.

### **How We Acquire Background Knowledge**

We acquire background knowledge through the interaction of two factors: (1) our ability to process and store information, and (2) the number and frequency of our academically oriented experiences. The ability to process and store information is a component of what cognitive psychologists refer to as *fluid intelligence*. As described by Cattell (1987), fluid intelligence is innate. One of its defining features is the ability to process information and store it in permanent memory. High fluid intelligence is associated with enhanced ability to process and store information.

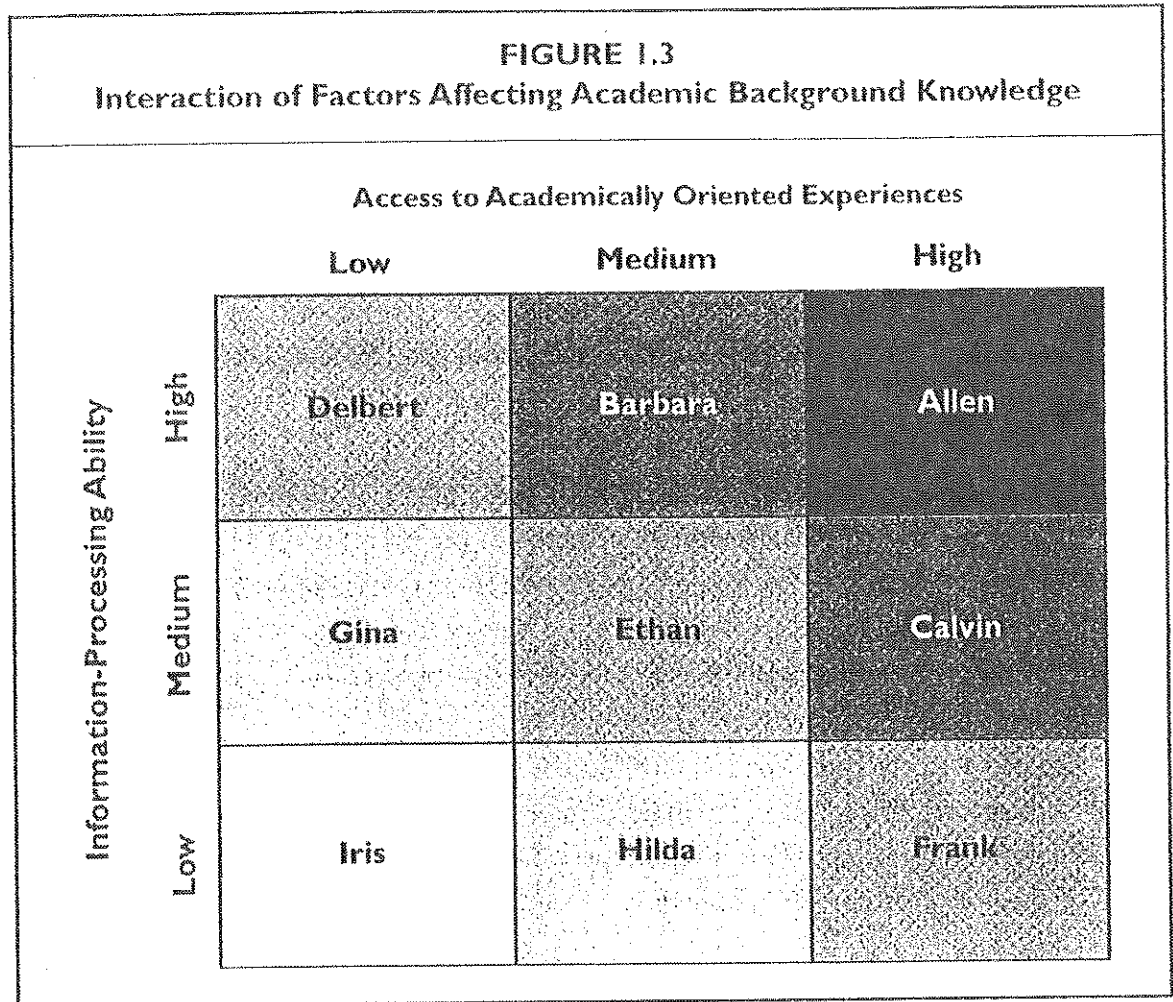
Low fluid intelligence is associated with diminished ability to process and store information.

Our ability to process and store information dictates whether our experiences parlay into background knowledge. To illustrate, consider two students who visit a museum and see exactly the same exhibits. One student has an enhanced capacity to process and store information, or high fluid intelligence; the other has a diminished capacity to process and store information, or low fluid intelligence. The student with high fluid intelligence will retain most of the museum experience as new knowledge in permanent memory. The student with low fluid intelligence will not. In effect, the student with the enhanced information-processing capacity has translated the museum experience into academic background knowledge; the other has not. As Sternberg (1985) explains: "What seems to be critical is not sheer amount of experience but rather what one has been able to learn from and do with experience" (p. 307).

The second factor that influences the development of academic background knowledge is our academically oriented experiential base—the number of experiences that will directly add to our knowledge of content we encounter in school. The more academically oriented experiences we have, the more opportunities we have to store those experiences as academic background knowledge. Again, consider our two students at the museum. Assume that one student has an experience like visiting a museum once a week and the other student has experiences like this once a month. The second student might have an equal number of other types of experiences, but they are nonacademic and provide little opportunity to enhance academic background knowledge. In effect, the first student has four times the opportunities to generate academic background knowledge as the second, at least from "museum-type" experiences.

It is the interaction of students' information-processing abilities and their access to academically oriented experiences, then, that produces their academic background knowledge. Differences in these factors create differences in their academic background knowledge and, consequently, differences in their academic achievement.

An examination of the interaction of these factors paints a sobering picture of the academic advantages possessed by some students and not others. Figure 1.3 depicts nine students with differing levels of access to academically oriented experiences and differing levels of ability to process and store information. The darker the box, the more academic background knowledge a student has. Allen has the most background knowledge. He has a great deal of access to experiences that build academic background knowledge and exceptional ability to process and



store those experiences. We might say that Allen is doubly blessed because of his ability to process information and his access to many experiences that will be translated into academic background knowledge. Barbara and Calvin are next in order of the amount of academic background knowledge but for slightly different reasons. Barbara has midlevel access to experiences but a highly developed ability to process and store information. She makes maximum use of her academically oriented experiences. Calvin doesn't have Barbara's ability to process and store information, but he has many experiences to draw from. As Figure 1.3 demonstrates, enhanced information-processing ability can offset to some degree lack of access to academically oriented experiences, and vice versa. Figure 1.3 also demonstrates the plight of certain students who—I assert—constitute the academically disadvantaged students in the United States. Consider the three students depicted in the first column of Figure 1.3—Delbert, Gina, and Iris.

Delbert has a moderate amount of background knowledge, but only because he has exceptional ability to process and store information. Even though he has

little access to experiences, he stores most of what he experiences. Gina has an average ability to process information, but her limited access to background knowledge plays havoc with her chances of developing a large store of academic background knowledge. Iris is in the worst situation of all. She has diminished information-processing ability and limited access to academically oriented experiences. Limited access to academic background experiences, then, represents “the great inhibitor” to the development of academic background knowledge. We might ask, which students characteristically have limited access to academic background experience? Stated differently, who are Delbert, Gina, and Iris?

### **The Consequences of Poverty**

The plight of Delbert, Gina, and Iris becomes particularly disturbing when we consider the direct relationship between access to academic background experiences and family income. Unfortunately, a great many children attending U.S. schools grow up in poverty. Brooks-Gunn, Duncan, and Maritato (1997) note that “in a given year from 1987 to 1996, about one in five of all American children—from twelve to fourteen million—lived in families in which total income failed to exceed even the Spartan thresholds used to define poverty” (p. 1). Relatively speaking, this is not an insignificant number. As Brooks-Gunn and colleagues explain: “Indeed, the United States has a higher rate of poverty than most other Western industrialized nations . . . and . . . child poverty has increased since the 1970s. . . .” (p. 12).

Even without considering the impact of poverty on access to academically oriented experiences, the relationship between poverty and academic achievement is almost self-evident. To illustrate, Smith, Brooks-Gunn, and Klebanov (1997) analyzed data from two studies: the National Longitudinal Survey of Youth (NLSY) and the Infant Health and Development Project (IHDP). The NLSY involved children of women who were first studied when they were teenagers. The children were tracked beginning in 1986 and every year after that. The IHDP followed children born in eight medical centers across the United States each year for the first five years of their lives. Aggregating the findings from both studies as reported by Smith and colleagues dramatizes the impact of family income on academic achievement. Consider two groups of children ages 3–7. The children in one group were born in or near poverty, and those in the other group were not. Assume that children in both categories took an academic test of mathematics, general verbal intelligence, and reading, and that test had an expected passing rate of 50 percent. Figure 1.4 indicates that based on the findings from Smith and colleagues, only 37 percent of those students born in or near poverty would pass the

test, whereas 63 percent of those not born in or near poverty would pass. What is most interesting about the findings reported in Figure 1.4 is that they characterize the relationship between poverty and academic success *after controlling for ethnicity, family structure, and mothers' education*. In other words, the relationship depicted in Figure 1.4 is what would be expected if all children in the studies from which the data were taken were equal in terms of their ethnicity, their mother's education level, and whether they came from a single-parent home, a two-parent home, or an intact family. These qualifiers put the impact of family income in sharp perspective. Even if children are equal in these admittedly important factors, the influence of family income creates huge discrepancies in academic success.

Some researchers believe that family income has an even greater impact on achievement than that depicted in Figure 1.4. For example, McLanahan (1997) notes that "income is clearly the most important factor. It explains about 50 percent of the difference in the educational achievement of children raised in one- and two-parent families" (p. 37). Using McLanahan's figures to compute the impact of poverty on students' success on an academic test produces the results reported in Figure 1.5. As the figure shows, only 15 percent of students who grow up in or near poverty are expected to pass a test that we would normally expect half the students to pass and half the students to fail. Regardless of which figure (1.4 or 1.5) depicts the true relationship, the message is clear: Poverty has a profound impact on academic achievement.

### The Influence of Poverty on Factors Other Than Academic Achievement

Poverty's negative impact goes well beyond academic achievement. For example, poverty has been associated with an increase in conflicts at home. Conger, Conger, and Elder (1997) explain:

<b>FIGURE 1.4</b>		
<b>Relationship Between Poverty and Success on an Academic Test</b>		
<b>Students' Economic Status</b>	<b>Percent of Students Failing</b>	<b>Percent of Students Passing</b>
Born in or near poverty	63	37
Not born in or near poverty	37	63

Source: Based on data in Smith, Brooks-Gunn, & Klebanov, 1997. For an explanation of how this figure was constructed, see Technical Note 3 on pp. 129-130.

**FIGURE 1.5**  
**Relationship Between Poverty and Success on an Academic Test**  
**Using McLanahan's Estimates**

Students' Economic Status	Percent of Students Failing	Percent of Students Passing
Born in or near poverty	85	15
Not born in or near poverty	15	85

Source: Based on data in McLanahan, 1997. For an explanation of how these percentages were computed, see Technical Note 3 on pp. 129–130.

... we propose that the psychological stresses and strains associated with economic pressure increase the risk for conflicts between parents about their finances. Spouses who are angered and demoralized by their disadvantaged economic situation and who have to negotiate with one another about the use of scarce resources are living in a situation ripe for conflicts. . . . (p. 302)

It makes intuitive sense that a lack of financial resources puts extraordinary stress on spousal relationships, which translates into more frequent family conflict. Children who are unable to comprehend the dynamics of such conflicts might easily believe that they are somehow responsible for the strife. Also, because wealth is a symbol of success in U.S. society, it is not surprising that poverty is a symbol of failure, leading to a decrease in self-esteem. As Axinn, Duncan, and Thornton (1997) explain:

Parents' economic resources can influence self-esteem in several ways. Parents' income brings both parents and children social status and respect that can translate into individual self-esteem. Income can also enhance children's self-esteem by providing them with goods and services that satisfy individual aspirations.

Low income and other economic hardships may reduce children's self-esteem by reducing the emotional or supportive qualities of the parents' home. The pressure that limited economic resources can place on marital relationships can, in turn, translate into negative parent-child relations and lower levels of self-esteem. (p. 521)

Some of the more dramatic casualties of poverty are best seen through the lens of language, as demonstrated in a study by Hart and Risley (1995). For two and a half years they observed 42 one- and two-year old children and the manner in which their parents interacted with them. The levels of family income ranged from poverty to affluence. For research purposes, Hart and Risley categorized the families into three basic groups: welfare families, working-class families,



and professional families. On the positive side, one of their findings was that quality experiences for children, amount of attention and love shown, had nothing to do with family income:

We saw quality interactions in families in which the parents had all the advantages of higher education, challenging jobs, substantial incomes, and broad experience; we found quality interactions in middle- and low-income families and in families on welfare limited in both present advantages and future prospects for their children. We saw that quality experience does not depend on parents' material or educational advantages. (p. 91)

However, although children of poverty had equal or better access to loving parents, their access to resources was dramatically different. Whereas those children in working-class or professional families had lives rich in experiences and interactions with others, those on welfare were frequently isolated, sometimes because of the dangers associated with playing in the neighborhood. Additionally, "families too poor to live in public housing put their children through successive moves from one small deteriorating dwelling to another" (p. 69). But this did not stop welfare parents from engaging in heroic acts of sacrifice for their children:

Particularly striking among the welfare parents was their resilience and the persistence in the face of repeated defeats and humiliations, their joy in playing with their children, and their desire that their children do well in school. They could spend an hour on a bus holding a feverish child and wait longer than that in a public health clinic. They spent their scarce resources on toys for their children. . . . (pp. 69-70)

In spite of these sometimes Herculean efforts by parents in welfare families, their children were exposed to a fraction of the language that children in working-class and professional families were exposed to. This difference was strongly associated with differences in students' academic achievement. Sadly, the use of language also communicated a limited set of expectations:

In the welfare families, the lesser amount of talk with its more frequent parent-initiated topics, imperatives, and prohibitions suggested a culture concerned with established customs. To teach socially acceptable behavior, language rich in nouns and modifiers was not called for; obedience, politeness, and conformity were more likely to be the keys to survival. Rather than attempting to prepare their children with the knowledge and skills required in a technological world with which the parents had little experience, parents seemed to be preparing their children realistically for the jobs likely to be open to them. . . . (pp. 133-134)

Two of the more dramatic findings of the Hart and Risley study are the discrepancies between the three types of families in the frequency of affirmations and prohibitions. Affirmations are statements by parents that elicit independence and

self-efficacy. For example, telling a child to “keep trying, you can do it” while she attempts to tie her shoes is an affirmation. Prohibitions are statements that foster dependence and inhibit self-efficacy. For example, telling a child, “let me do that so that it’s done right” is a prohibition. Hart and Risley summarize their findings regarding affirmations and prohibitions in the following way:

We extrapolated to an average welfare child accumulating experience with 500 affirmatives and 1,100 prohibitions per week and an average working-class child accumulating experience with 1,200 affirmatives and 700 prohibitions per week. To keep the confidence-building experiences of welfare children equal to those of working-class children, the welfare children would need to be given 1,100 more instances of affirmative feedback per week—700 instances to bring the 500 affirmatives up to the 1,200 given an average working-class child plus 400 affirmatives to reduce the 1,100 prohibitions to the 700 of the average working-class child. It would take 26 hours per week of substituted experience for the average welfare child’s experience with affirmatives to equal that of the average working-class child. It would take 66 hours of substituted experience per week to lower the average welfare child’s experience with prohibitions to that of the average working-class child. Overall, 40 hours per week of substituted experience would be needed to keep the welfare children’s ratio of lifetime experience with encouragement relative to discouragement equal to that of the working-class children. (p. 202)

The implications of the Hart and Risley findings are profound. Children who grow up with financial resources have many direct and indirect experiences that children who grow up in poverty do not. By the time children of poverty enter school, they are at a significant disadvantage.

### **Poverty and Ethnicity**

The impact of poverty appears even more sinister when we consider the relationship between poverty and ethnicity. U.S. Census Bureau statistics dated September 26, 2003, indicate that 32.9 million (11.7 percent of the people) in the United States live below the poverty line. Recall that the poverty line for a single individual is \$9,359 a year. For a family of two adults, however, the poverty line is \$12,047 a year. For a family of two adults and two children, the poverty line is \$18,244 a year.

We might say, then, that in the United States, about 12 of every 100 people live at or below the poverty line. For African Americans and Hispanics, however, the percentage is higher. Specifically, 22.7 percent of African Americans and 21.4 percent of Hispanics in the United States live at or below the poverty line, whereas only 9.9 percent of whites live at or below the poverty line. In other words, if you are born African American or Hispanic in the United States, you have twice the chance of living in poverty as you do if you are born white. Further, when poverty

is examined across a number of years, the plight of African American and Hispanic children is exacerbated.

To illustrate, Corcoran and Adams (1997) analyzed data from the Panel Study of Income Dynamics that involved about 5,000 families who were studied annually since 1968. They focused on the relationship between poverty and being African American. They noted the following:

- White children's families reported almost twice as much income as did African American children's families.
- About 5 percent of African American children grew up in families whose income was only 50 percent of the poverty level.
- At least two out of three African American children were poor at least one year during the time they were observed. In contrast, only one in seven white children were poor during the time they were observed.
- Forty percent of the African American children were poor for more than half of the time they were observed. In contrast, fewer than 5 percent of the white children were poor for more than half of the time observed.
- More than 60 percent of African American children grew up in households that received welfare at some point, and 17 percent grew up in households that relied on welfare for more than half their income. In contrast, only 25 percent of white children lived in households that ever received welfare, and 4 percent of white children lived in households that relied on welfare for more than 15 percent of their income.

The primary conclusion reached by Corcoran and Adams (1997) was that "black and white children differed considerably in their access to material resources during childhood" (p. 468). The same alarming trends also affect Hispanic children (see Peters & Mullis, 1997; Hernandez, 1997). As Brooks-Gunn, Duncan, and Maritato (1997) explain, "Both single-year and multi-year estimates of poverty indicate that black and Hispanic children are much more likely to be poor, and for longer periods of time, than white children are" (pp. 4-5).

### **A Clearer Picture of Delbert, Gina, and Iris**

With the links made between family income and access to academic experiences and between ethnicity and family income, our pictures of Delbert, Gina, and Iris come into sharp focus. They are most likely to be African American or Hispanic. They are growing up in families at or near the poverty line. They have experienced a fraction of the rich language development opportunities that come so readily to

other students. Additionally, they experience twice as many discouraging messages as they do encouraging messages—the opposite ratio of their more affluent counterparts. Finally, they may regularly deal with income-related familial stresses not characteristic of more affluent homes.

These facts are staggering in their implications, and one marvels at the resilience of children who overcome their impact. Yet many if not most of these children will succumb under the weight of these factors without direct and prolonged interventions by schools.

## Schools Can Make the Difference

What can and should schools do? Before answering this question, it is important to acknowledge that some people assert that schools can make little difference in overcoming the background factors that negatively affect student academic achievement. At the extreme end of the continuum are theorists like Jensen (1980) and Heurnstein and Murray (1994), who make the case that the differences in knowledge and skill students bring to the classroom are largely due to genetic aspects of aptitude that are impervious to change. However, these arguments dramatically underestimate the importance of nongenetic background factors mentioned in the previous discussion. They also ignore the research indicating that innate intelligence is not as strongly related to academic achievement as once thought.

Previously, I discussed the nature of fluid, or innate, intelligence. A second type of intelligence is referred to as crystallized, or learned, intelligence. Crystallized intelligence is exemplified by knowledge of facts, generalizations, and principles. Although a certain level of innate intelligence is important to academic success, learned intelligence is the stronger correlate of success in school, as demonstrated in a study by Rolfhus and Ackerman (1999). They administered intelligence tests to 141 adults, along with knowledge tests in 20 different subject areas. They then examined the relationship between subject matter test scores and fluid versus crystallized intelligence. They found little relationship between academic knowledge and fluid intelligence, but a strong relationship between academic knowledge and crystallized intelligence. As stated by Rolfhus and Ackerman (1999), these findings suggest that academic “knowledge is more highly associated with [crystallized] abilities than with [fluid] abilities” (p. 520). Madaus, Kellaghan, Rakow, and King (1979) have reported similar findings.

Interestingly, it might even be the case that fluid intelligence can be altered. This is dramatically illustrated in the book *The Rising Curve: Long-Term Gains in IQ*

*and Related Measures* (Neisser, 1998), which seeks to explain the worldwide phenomenon in industrialized countries of rising IQ scores:

Scores on intelligence tests are rising [emphasis in original], not falling; indeed, they have been going up steeply for years. This rapid rise is not confined to the United States; comparable gains have occurred all over the industrialized world . . . Performance on broad-spectrum tests of intelligence has been going up about 3 IQ points per decade ever since testing began. (pp. 3-4)

What is most interesting about this rise in IQ scores is that it is at least as strong in terms of fluid intelligence as it is in terms of crystallized intelligence. That is, a systematic increase has occurred in the type of intelligence that is assumed to be innate as well as in the type that is assumed to be learned. Although researchers have posed a number of explanations for these increases, one of the strongest candidates is the influence of effective schooling. To illustrate, Greenfield (1998) reviewed research conducted in Africa and Israel comparing children who had attended school with those who had not. Those who attended school exhibited relatively large IQ gains. Her final conclusion was that "actual performance on intelligence tests is more closely related to years of schooling than it is to chronological age" (p. 89).

The clear message from the research is that schools can make a difference. If the knowledge and skill that students from advantaged backgrounds possess is learned rather than innate, then students who do not come from advantaged backgrounds can learn it too. Indeed, even aspects of intelligence once thought to be genetically based appear to be amenable to change through schooling. To accomplish such a task, schools must be willing to dedicate the necessary time and resources to enhancing the academic background knowledge of students, particularly those who do not come from affluent backgrounds. But how does a school do this?

### **Direct Approaches to Enhancing Academic Background Knowledge**

The most straightforward way to enhance students' academic background knowledge is to provide academically enriching experiences, particularly for students whose home environments do not do so naturally. I refer to such efforts as "direct approaches" to enhancing academic background knowledge.

By definition, a direct approach to enhancing academic background knowledge is one that increases the variety and depth of out-of-class experiences. Such experiences include field trips to museums, art galleries, and the like, as well as school-sponsored travel and exchange programs. Admittedly, these experiences

are powerful, but schools are limited in how many they can provide. In these days of shrinking resources, schools commonly must cut back or even cut out these activities.

Another type of direct approach is to help students establish mentoring relationships with members of the community. A mentoring relationship is a one-to-one relationship between a caring adult and a youth who can benefit from support. Although mentoring relationships can develop quite naturally between students and teachers, relatives, or coaches, planned mentoring relationships are those in which a student is matched with a mentor in a structured format (Brewster & Fager, 1998). Trust appears to be the *sine qua non* of effective mentoring relationships (Sipe, 1999), but it is not easily established between partners from different socioeconomic or ethnic groups. Although there is no well-established script for an effective mentoring relationship, the following appear to be critical factors (Sipe, 1999):

- Maintain a steady and consistent presence in the student's life.
- Take responsibility for keeping the relationship alive and realize that it will probably be one-sided.
- Involve the youth in decisions about how time will be spent and respect the youth's viewpoint.
- Recognize the youth's need for fun.
- Become acquainted with the youth's family.

Programs that follow this script have demonstrated impressive results. Grossman and Johnson (2002) report the research findings on two popular mentoring programs: Big Brothers Big Sisters (BBBS) and Philadelphia Futures' Sponsor-A-Scholar (SAS). BBBS pairs an adult volunteer with a student from a single-parent household. For at least a year, the volunteer and the student meet two to four times per month with meetings lasting two to four hours. Grossman and Johnson (2002) explain that "BBBS is not designed to ameliorate specific problems or reach specific goals, but rather to provide a youth with an adult friend who promotes general youth development objectives" (p. 8).

Whereas BBBS has general goals, SAS has rather specific goals. Its primary focus is to help disadvantaged students from Philadelphia's public schools "make it" to college. According to Grossman and Johnson: "This goal is sought through a range of support services chief among which are the provision of long-term mentoring and financial help with college-related expenses" (p. 8). Mentors work with students for five years, monitoring their academic progress in high school and helping them apply to college. Grossman and Johnson (2002) report the following

outcomes when SAS participants are compared with nonparticipants: higher GPA, higher likelihood to enroll in college, and higher likelihood to persist in college.

In summary, the most direct ways for schools to enhance students' academic background knowledge are to directly provide academically oriented experiences as a regular part of school offerings and to forge mentoring relationships between students and caring adults under the assumption that such relationships will provide more academically oriented experiences. Although I support such efforts wholeheartedly, I believe that a more viable solution is to focus on indirect approaches.

### **Indirect Approaches: A Viable Answer**

If schools had unlimited resources, then the answer to helping Delbert, Gina, and Iris would be straightforward—provide field trips and mentoring programs. These activities would go a long way toward leveling the playing field in terms of the students' academic background knowledge. But in this time of cutbacks in school resources, this solution is unlikely to prevail. So what options do schools have?

I believe that a thorough understanding of the nature of background knowledge and how it is stored in permanent memory demonstrates the usefulness of indirect approaches that schools can implement within the context of the current system and its available resources. I use the term *indirect* because the experiences to which I refer do not rely on students' physically going on trips to the museum or meeting with a mentor. Rather, indirect experiences can be fostered within the regular school day. They represent a realistic and viable approach to providing Delbert, Gina, and Iris with the academic background knowledge possessed by the other students depicted in Figure 1.3, p. 6.

This book provides the rationale for and research behind a systematic, indirect approach to enhancing students' academic background knowledge. I firmly believe that if schools were to implement the suggestions offered in this book, they would make great strides toward ensuring that all students, regardless of background, would develop the background knowledge essential for academic success. I strongly fear that if schools do not implement indirect approaches like those outlined in this book, they will continue to be a breeding ground for failure for those students who grow up in or near poverty.





# SCHOOL LEADERSHIP *that works*

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FROM RESEARCH TO RESULTS

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## In Search of School Leadership

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Each school day more than 53.6 million students (National Center for Education Statistics, 2002b) walk into more than 94,000 K–12 schools (National Center for Education Statistics, 2002a) in the hopes that the 13 years of schooling they will experience will dramatically enhance their chances of success in the modern world. Indeed, evidence of income in 2001 supports these hopes. According to the U.S. Census Bureau (March 2002), the earning potential (that is, the median income) of a student who graduates from high school is \$19,900, compared with \$11,864 for a student who does not. If the high school graduate completes college, that earning potential increases to \$37,203. A master's degree increases the figure to \$49,324. A doctorate raises annual income to \$63,952, and with a professional licensure, it reaches \$71,606. School, then, can be the door to advancement—at least financial advancement—in our complex society. For a particular school to be the launchpad to the levels of success sought by students, however, it must operate effectively.

Whether a school operates effectively or not increases or decreases a student's chances of academic success. Marzano (2003) has shown that students in effective schools as opposed to ineffective schools have a 44 percent difference in their expected passing rate on a test that has a typical passing rate of 50 percent. To illustrate, consider two schools—School A and School B. In terms of how they are run, School A is effective and School B is ineffective. (In Chapter 6 we consider the specific characteristics of effective versus ineffective schools.) Now assume that the two schools have a typical population of students—some with many advantages in their home environment and background experiences; some with few if any advantages; most somewhere in the middle. If students in both schools take a

test that has a typical passing rate of 50 percent, we would expect 72 percent of the students in the effective school to pass the test and only 28 percent in the ineffective school to pass—a difference of 44 percent. This is depicted in Figure 1.1. (For an explanation of this scenario, see Technical Note 1 on p. 124.)

Although the difference in expected student achievement in “effective” versus “ineffective” schools is dramatic, the difference is even greater when we contrast “highly effective” schools with “highly ineffective” schools—more specifically, the top 1 percent of schools with the bottom 1 percent. This scenario produces a difference

	Expected Pass Rate	Expected Fail Rate
Effective School (A)	72%	28%
Ineffective School (B)	28%	72%

in passing rates of 70 percent. In the top 1 percent of schools we would expect 85 percent of students to pass a test that has a typical passing rate of 50 percent; in the bottom 1 percent of schools we would expect only 15 percent to pass that same test. (See Technical Note 2 on p. 129 for a more detailed explanation.)

The central question addressed in this book is this: To what extent does leadership play a role in whether a school is effective or ineffective? That is, How much of a school's impact on student achievement is due to the leadership displayed in that school? We begin with some past and current beliefs about leadership.

### Past and Current Beliefs About Leadership

If we consider the traditions and beliefs surrounding leadership, we can easily make a case that leadership is vital to the effectiveness of a school. In fact, for centuries people have assumed that leadership is critical to the success of any institution or endeavor.

The concept of leadership dates back to antiquity. According to Bass (1981), the study of leadership is an ancient art. Discussions of leadership appear in the works of Plato, Caesar, and Plutarch. Additionally, leadership is a robust concept that “occurs universally among all people regardless of culture, whether they are isolated Indian villagers, Eurasian steppe nomads, or Polynesian fisher folk” (p. 5).

Theories of leadership abound. They include approaches such as the “great-man” theory, which suggests that, for example, without Moses the Jewish nation

would have remained in Egypt and without Churchill the British would have acquiesced to the Germans in 1940; trait theories, which contend that leaders are endowed with superior qualities that differentiate them from followers; and environmental theories, which assert that leaders emerge as a result of time, place, and circumstance. Regardless of the theory used to explain it, leadership has been intimately linked to the effective functioning of complex organizations throughout the centuries.

The traditions and beliefs about leadership in schools are no different from those regarding leadership in other institutions. Leadership is considered to be vital to the successful functioning of many aspects of a school. To illustrate, the list below depicts only a few of the aspects of schooling that have been linked to leadership in a school building:

- Whether a school has a clear mission and goals (Bamburg & Andrews, 1990; Duke, 1982)
- The overall climate of the school and the climate in individual classrooms (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Brookover et al., 1978; Brookover & Lezotte, 1979; Griffith, 2000; Villani, 1996)
- The attitudes of teachers (Brookover & Lezotte, 1979; Oakes, 1989; Purkey & Smith, 1983; Rutter, Maughan, Mortimore, Ouston, & Smith, 1979)
- The classroom practices of teachers (Brookover et al., 1978; Brookover & Lezotte, 1979; McDill, Rigsby, & Meyers, 1969; Miller & Sayre, 1986)
- The organization of curriculum and instruction (Bossert, Dwyer, Rowan, & Lee, 1982; Cohen & Miller, 1980; Eberts & Stone, 1988; Glasman & Binanimov, 1981; Oakes, 1989)
- Students' opportunity to learn (Duke & Canady, 1991; Dwyer, 1986; Murphy & Hallinger, 1989)

Given the perceived importance of leadership, it is no wonder that an effective principal is thought to be a necessary precondition for an effective school. To illustrate, a 1977 U.S. Senate Committee Report on Equal Educational Opportunity (U.S. Congress, 1970) identified the principal as the single most influential person in a school:

In many ways the school principal is the most important and influential individual in any school. He or she is the person responsible for all activities that occur in and around the school building. It is the principal's leadership that sets the tone of the school, the climate for teaching, the level of professionalism and morale of teachers, and the degree of concern for what students may or may not become. The principal

is the main link between the community and the school, and the way he or she performs in this capacity largely determines the attitudes of parents and students about the school. If a school is a vibrant, innovative, child-centered place, if it has a reputation for excellence in teaching, if students are performing to the best of their ability, one can almost always point to the principal's leadership as the key to success. (p. 56)

Given the perceived importance of leadership in schools and the central role of the principal in that leadership, one might assume that suggestions regarding leadership practice in schools are based on a clear, well-articulated body of research spanning decades. Unfortunately, this assumption is incorrect for at least two reasons. First, far less research on school leadership has been done than one might expect. To illustrate, in a review of the quantitative research from 1980 to 1995, Hallinger and Heck (1996) identified only 40 studies that address the relationship between school leadership and student academic achievement. In our analysis of the research over the last 35 years, we found more than 5,000 articles and studies that address the topic of leadership in schools, but only 69 that actually examine the quantitative relationship between building leadership and the academic achievement of students. (We discuss our study in depth in Chapter 3.) In spite of the relative paucity of empirical studies on school leadership, books recommending leadership practices for educational administrators abound.

Second, the research that has been done on school leadership is quite equivocal, or at least is perceived as such. For example, some assert that it provides little specific guidance as to effective practices in school leadership. As Donmoyer (1985) explains:

Recent studies of schools invariably identify the principal's leadership as a significant factor in a school's success. Unfortunately these studies provide only limited insight into how principals contribute to their school's achievements. (p. 31)

Others assert that the research does not even support the notion that school leadership has an identifiable effect on student achievement. For example, a recent synthesis of the research on school leadership concluded that statistically there is almost no relationship between school leadership and student achievement. Specifically, as a result of their analyses of 37 studies conducted internationally on the impact of building leadership on student achievement, Witziers, Bosker, and Kruger (2003) report almost no direct relationship. We deal with this particular study in Chapters 2 and 3. However, taken at face value, the findings from this study would lead one to conclude that little effort should be put into developing leaders at the school building level.

## A Different Perspective

The conclusions we offer in this book stand in sharp contrast to those suggesting that the research on school leadership provides no guidance as to specific leadership behaviors and to those suggesting that school leadership has no discernable direct effect on student achievement. Our basic claim is that the research over the last 35 years provides strong guidance on specific leadership behaviors for school administrators and that those behaviors have well-documented effects on student achievement. A logical question is, How can we make such claims in light of the previous statements regarding the research (or lack thereof) on school leadership? The answer lies partially in the research process we employed—a methodology referred to as meta-analysis—which is specifically designed for synthesis efforts such as ours.

## The Nature and Function of Meta-Analysis

There have been a number of calls for a new paradigm of research in educational leadership (see Heck & Hallinger, 1999; Hill & Guthrie, 1999). These calls come at a time when the methodology of meta-analysis has provided impressive advances in the art and science of synthesizing studies within a given domain.

The term *meta-analysis* refers to an array of techniques for synthesizing a vast amount of research quantitatively. The technique was formally developed and made popular by Gene Glass and his colleagues in the early 1970s (see Glass, 1976; Glass, McGaw, & Smith, 1981). Since then, individuals in a variety of fields have used meta-analysis to construct generalizations that were previously unavailable (see Hunt, 1997). For example, in his book *How Science Takes Stock: The Story of Meta-Analysis*, Hunt provides compelling illustrations of the successful use of meta-analysis in medicine, psychology, criminology, and other fields.

In simple terms, meta-analysis allows researchers to form statistically based generalizations regarding the research within a given field. We discuss some of the more technical aspects of meta-analysis in Technical Note 3 (see p. 130). Here we briefly consider some aspects of meta-analysis that are particularly important to our assertions about the research on school leadership and our reasons for using this particular methodology.

At least two questions might come to mind about our decision to use meta-analysis. First, why did we choose to synthesize the research of others as opposed to conducting a study of our own? That is, why didn't we study the relationship between school leadership and student achievement by examining a number of high- and low-performing schools and the leadership in those schools instead of

examining the research of others? The answer is that any study we would have conducted, no matter how well constructed, would have contained “uncontrolled error” influencing its outcome.

As an example, assume we had been able to identify 10 principals who were strong leaders and 10 principals who were weak leaders and randomly assign them to serve for three years in 20 schools with about the same average academic achievement. In educational circles, this type of study would be considered strong. In fact, the No Child Left Behind Act of 2001, passed by an overwhelming margin in both houses of Congress in December 2001 and signed into law on Jan. 8, 2002, recommends the use of research designs (like our hypothetical example) that employ random assignment to experimental and control groups as a form of what it refers to as “scientifically based research” (see Goodwin, Arens, Barley, & Williams, 2002). However, educators quickly note that using a design like our hypothetical example is not only impractical from a resource perspective (for example, how can you find 20 principals willing to work for three years in a school to which they have been assigned?), but unacceptable from an ethical perspective (how can you in good conscience assign 10 principals to schools knowing that they are weak leaders?). Nevertheless, for illustrative purposes, let’s assume that we employed this rather “tight” empirical design. Even with this tight level of control, the findings from the study might be strongly influenced by uncontrolled factors, such as substantive differences in the background and experience of the teachers and in the family circumstances of the students in the various schools. Such factors are sometimes referred to as “sampling error.”

In practice, it is impossible to control all the error that might creep into a study. This is precisely why researchers assign a probability statement to their findings. That is, when a researcher reports that her findings are significant at the .05 level, she is saying that her findings could occur 5 times in 100 or less if they are a function of some type of uncontrolled error. If she reports that her findings are significant at the .01 level, she is saying that there is even less of a chance—1 in 100 or less—that her findings are a function of this uncontrolled error. Meta-analysis helps control for this error by examining findings across many studies. Doing this tends to cancel out much of that uncontrolled error. Whereas the findings in one study might be influenced positively by the background of the teachers, let’s say, another study might be influenced negatively by this same factor. Across many studies the effect of this factor tends to cancel out.

The second question our use of meta-analysis might prompt is, Why did we use a quantitative approach to synthesis research as opposed to the more traditional approach others have used (for example, Cotton, 2003)? Indeed, every doctoral

dissertation and every master's thesis in education attempts to include a comprehensive review of the research relative to its specific research topic. However, these reviews typically use what is referred to as a narrative approach (see Glass, 1976; Glass, McGaw, & Smith, 1981; Rosenthal, 1991; Rosenthal & Rubin, 1982). With a narrative approach, a researcher attempts to logically summarize the findings from a collection of studies on a topic by looking for patterns in those studies. Unfortunately, the narrative approach is highly susceptible to erroneous conclusions. To illustrate, in a study of the quality of narrative reviews, Jackson (1978, 1980) found the following:

- Reviewers tended to focus on only part of the full set of studies they reviewed.
- Reviewers commonly used crude and misleading representations of the findings of the studies.
- Reviewers usually reported so little about their method of analysis that no judgment could be made about the validity of their conclusions.
- Reviewers commonly failed to consider the methods used in the studies they reviewed.

To examine the difference between reviewing research using a narrative approach versus a meta-analytic approach, Cooper and Rosenthal (1980) conducted a study in which 40 graduate students were randomly split into two groups. Both groups were asked to examine the same seven studies on gender differences in persistence. Their basic task was to determine whether the seven studies supported the hypothesis that gender is related to persistence. One group used the narrative approach and the other used a rudimentary form of meta-analysis. What the two groups were not told was that, statistically, the seven studies considered as a set supported the hypothesis that gender and persistence are related. The vast majority of graduate students in the narrative group incorrectly concluded that the studies did not support this hypothesis, whereas the vast majority of graduate students in the meta-analysis group correctly concluded that the studies did support the hypothesis. Discussing this study, Glass, McGaw, and Smith (1981) note that these are "strikingly different conclusions for equivalent groups trying to integrate only seven studies" (p. 17). They go on to hypothesize that conclusions based on narrative reviews of vast amounts of research are probably strongly biased by the conventional wisdom to which the synthesizer subscribes.

In summary, we chose to synthesize the research on leadership using a quantitative, meta-analytic approach because it provided the most objective means to answer the question, What does the research tell us about school leadership?



## Our Basic Findings

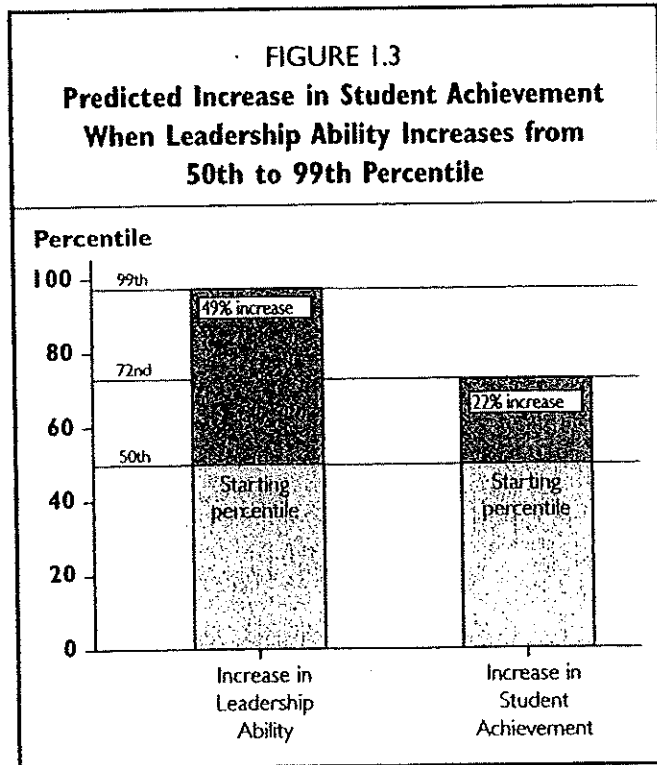
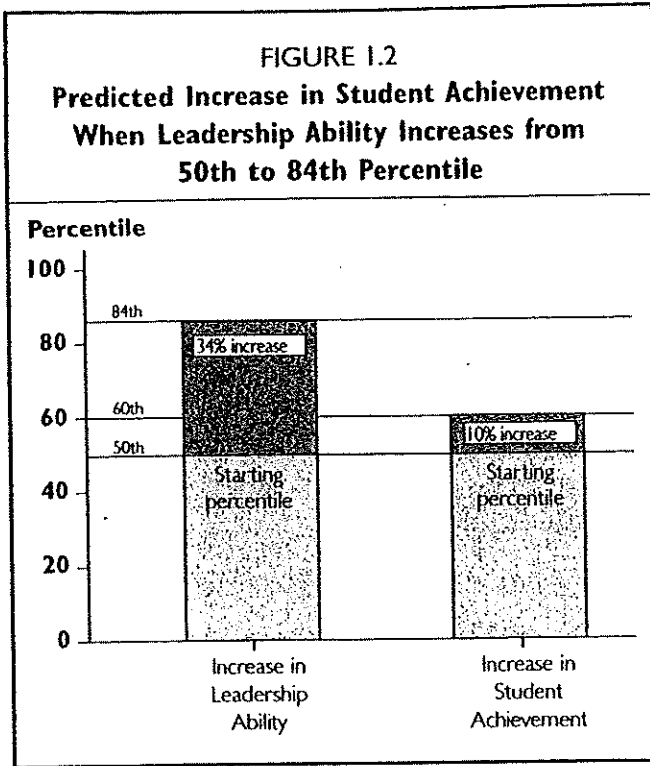
After examining 69 studies involving 2,802 schools, approximately 1.4 million students, and 14,000 teachers, we computed the correlation between the leadership behavior of the principal in the school and the average academic achievement of students in the school to be .25. We discuss the meaning of this correlation in depth in Chapter 3; however, we briefly consider it here. We should first caution that reducing the findings of a meta-analysis, particularly one that claims to be as comprehensive as ours, to a single correlation is at best an oversimplification of the findings. In fact, Glass, commonly considered to be the founder of modern-day meta-analysis, warns against this practice (Robinson, 2004). With this caution noted, we consider the average correlation found in our meta-analysis because it is still the most commonly used currency for discussing meta-analytic findings in educational research.

To interpret the .25 correlation, assume that a principal is hired into a district and assigned to a school that is at the 50th percentile in the average achievement of its students. (See Technical Note 1, p. 124, for further explanation.) Also assume that the principal is at the 50th percentile in leadership ability. We might say that we have an average principal in an average school.

Now assume that the principal stays in the school for a few years. Our .25 correlation tells us that over time we would predict the average achievement of the school to remain at the 50th percentile. But now let's increase the principal's leadership ability by one standard deviation—from the 50th percentile to the 84th percentile. This increase might have occurred as a result of the principal's attendance at an extended set of courses or seminars on leadership offered in the district. Our correlation of .25 indicates that over time we would predict the average achievement of the school to rise to the 60th percentile. This increase is depicted in Figure 1.2. In terms of the average achievement of students in the school, this is substantial.

To further examine the interpretation of the .25 correlation, let's increase the principal's leadership ability even more—from the 50th percentile to the 99th percentile. In other words, the leadership training the principal attends is so powerful that it places the principal at the top percentile in leadership behavior. Our correlation of .25 indicates that over time we would predict the average student achievement of the school to rise to the 72nd percentile. This is depicted in Figure 1.3.

Taken at face value, these findings are compelling. A highly effective school leader can have a dramatic influence on the overall academic achievement of students. Most teachers, parents, and students would be thrilled to see the average performance of their school increase 22 percentile points—even 10 percentile points.



## Toward Research-Based Principles of School Leadership

Our meta-analysis was designed to determine what 35 years of research tells us about school leadership. We report our findings in Chapter 3. However, we didn't stop with the findings. Rather, we wove those findings into what we consider to be perhaps the most rigorous and comprehensive set of principles regarding school leadership to date. The reader should note that we purposely avoid the use of the word *theory* in describing our conclusions. Anderson (1983) explains that a theory is a precise deductive system that allows one to accurately predict behavior given knowledge of the variables within the theory. Principles are general rules for behavior but do not constitute a precise predictive system. We offer principles as opposed to a theory in accordance with the most current thinking in educational research. Again, to quote Glass in his article marking the 25th anniversary of meta-analysis, "We need to stop thinking of ourselves as scientists listing grand theories, and face

the fact that we are technicians collecting and collating information" (2000, p. 12). Glass credits Meehl (1978) as first pointing out that the "soft social sciences" such as education simply cannot conceive, test, and advance theories in the same manner as the hard sciences such as physics, chemistry, medicine, and the like. This is

not to say that educators should not use the results of studies to develop general rules or principles of behavior to guide them in specific situations. This is precisely what we have attempted to do.

### **Summary and Conclusions**

Leadership has long been perceived to be important to the effective functioning of organizations in general and, more recently, of schools in particular. However, some researchers and theorists assert that at best the research on school leadership is equivocal and at worst demonstrates that leadership has no effect on student achievement. In contrast, our meta-analysis of 35 years of research indicates that school leadership has a substantial effect on student achievement and provides guidance for experienced and aspiring administrators alike.

