Teacher Performance-Based Accountability: Why, What and How

by

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Abstract

Recent research has identified teacher quality as the most important variable in increasing student achievement. The effect of the teacher on student achievement has been shown to be greater than effects due to class size, school, and student socio-economic status (Sanders & Horn, 1998). Yet proxies implemented by states and districts to determine teacher quality have been woefully inadequate. Teacher entrance and exit examination scores, years of experience, advanced degrees, and teaching credentials are either not related to student achievement and ratings of teacher performance by administrators or researchers, or the relationship is small. This article reviews the research on teacher quality. The author then proposes that by implementing rigorous teacher performance-based accountability systems, teacher quality can be defined, leading to targeted professional development to improve teachers' teaching practices and student achievement.

Introduction

It is funny to think that the education community and the public needed research to demonstrate that the quality of a teacher is the most important variable when it comes to student learning and achievement (Education Trust, 1998). But William Sanders's research provided evidence for the obvious. Sanders found that students with comparable achievement levels in second grade had drastically different outcomes in fifth grade. The results were not primarily due to socio-economic status, class size, or even the school the student attended, but to the sequence of teachers the student had (Sanders & Horn, 1998).

Unfortunately, Sanders's work and other supporting research that demonstrates quality teachers matter does not inform principals or districts how to develop and produce quality teachers. Sanders's research provides no insight about what personal attributes, knowledge, skills, characteristics, or teaching methods and behaviors distinguish high quality educators from mediocre ones. Yes, teacher quality matters, but what quality looks like and how quality is developed remains unclear. So unclear that a recent review from the National Institute of Child Health and Human Development claims "rigorous experimental and qualitative research that defines and characterizes effective teaching methodologies that demonstrate improved student performance is limited. This persistent gap in the extant knowledge base must be addressed (p.20, National Reading Panel, 2000)."

Why Teacher Performance-Based Accountability Is Needed

For the past 35 years researchers – mostly economists – have been studying teacher characteristics and attributes (inputs) that relate to student achievement instead of studying and characterizing effective teaching. This line of research has been ineffective in finding any conclusive results. What is rarely looked at is how the teacher actually performs in the classroom and how that performance translates into both student achievement and evaluations by peers, administrators, and outside "experts."

Why teacher performance-based accountability? Because, it can focus efforts on actual teaching performance and provide a constructive knowledge base to develop teacher quality. Effective teaching is out there. It needs to be defined, measured, and related to student achievement.

Teacher Quality: Review of the Research

The release of the report, A Nation At Risk (1983), spurred public interest in increasing America's teacher quality. A Nation At Risk reported:

- Too many teachers are being drawn from the bottom quarter of graduating high school and college students;
- The teacher preparation curriculum is weighted heavily with courses in educational methods at the expense of courses in subjects to be taught;
- Half of the newly employed mathematics, science, and English teachers are not qualified to teach these subjects; and
- Low teacher salaries are causing many teachers to supplement their income with part-time and summer employment.

Faced with these dismal data, states and school districts set out to increase teacher quality. Because the goal was to fix teacher quality in a hurry, simple, efficient, and cost-effective solutions took precedence. And the simplest, most efficient, and most cost effective solutions involved teacher testing. Teachers took admission tests, graduate tests, verbal ability tests, and most recently subject matter tests. Researchers, in turn, studied these tests and their effects on student achievement and administrative ratings of teaching performance.

Admission Tests. Educational Testing Service's (1999) report, The Academic Quality of Prospective Teachers, demonstrated that students who intend to major in education earn lower scores on the SAT and ACT than other college bound students. Yet, the report conveniently neglected to analyze data to show whether or not a teacher's scores on these tests related to their student's academic achievement, or their performance ratings by administrators. Fortunately, other researchers have studied this relationship or lack there of. Baker (1970), Ducharme (1970), and Maguire's (1966) research found no relationship between teacher SAT scores and principals or supervisors teacher performance ratings. Evertson, Hawley, and Zlotnik's (1985) review of the research that attempted to link teacher SAT scores to either student achievement or principal ratings of teacher performance similarly found no relationship. The only shred of evidence for a teacher's ACT score and its influence on student achievement is Ferguson's and Ladd's (1996) widely cited study of 30,000 primary school teachers in Alabama. A one standard deviation difference in a teacher's ACT score generates a .1 standard deviation difference in fourth-grade students' reading score. There was no effect for teachers' ACT scores on students' math achievement. Why then, does it matter that prospective teachers score 40 points lower than other college bound seniors on the SAT?

Graduation Tests. The National Teacher Examination (NTE) was established as an exit examination for teachers from teacher colleges. It tested a core battery of general knowledge and teacher professional knowledge. Yet, similar to

the SAT and ACT, researchers have found no relationship between teacher test scores on the National Teacher Examination and student achievement (Summers & Wolfe, 1977; Pugach & Raths, 1983). Even after the NTE was revised in the 1980's, researchers still were unable to show the link between teacher NTE scores and student achievement (Evertson, Hawley, & Zlotnik,1985). In a more recent study of 266 secondary-level student teachers, Ferguson and Womack (1993) found that NTE scores accounted for a mere 3 percent of the variance in teacher performance as judged by content experts, teacher supervisors, and experienced educators. Lovelace (1984) found no relationship between teacher NTE scores and gains in student achievement or observer assessments of teacher performance. And Ayers (1988) research showed that NTE scores of 48 teachers did not predict principal ratings of teacher effectiveness, outside observer ratings, or student ratings of teacher effectiveness.

Verbal Ability Tests. Hanushek (1989) states in his review of over 150 studies on teacher quality, "perhaps the closest thing to a consistent conclusion across studies is the finding that teachers who perform well on verbal ability tests do better in the classroom, but even there the evidence is not very strong." A more recent review of the research by Greenwald, Hedges, & Laine (1996) demonstrated that teacher verbal ability exerts a positive and significant effect on student achievement in 30 of the 60 studies they examined. Even though teacher verbal ability has been found to be correlated with student achievement, one should note that the correlation is weak to moderate at best, and that teacher tests of verbal ability predict student achievement in only half of the hundreds of studies conducted.

Subject Matter Knowledge Tests. Although there is much press about teachers' subject matter knowledge being related to increased student achievement, educational research only supports this assertion for mathematics educators. Linda Darling-Hammond (1999) used fourth and eighth grade math NAEP data to demonstrate that 60 percent of the variance in student math achievement was due to teacher math content knowledge and holding a teaching credential. Mark Fetler (1999) studied 1.3 million high school students' standardized mathematics test scores and found that students taught by teachers who took over 30 units of college math significantly outperform students taught by teachers without this level of math knowledge. Goldhaber and Brewer (1999) used the National Education Longitudinal Study database to find that teachers who had a B.S. in math produced students who scored higher on math achievement tests than teachers without math degrees. Finally, Hawk, Coble and Swanson (1985) demonstrated that mathematics teachers who tested high in advanced mathematical knowledge produced greater student math achievement gains than teachers who scored low on these tests.

Strangely, in other subjects, teacher performance on subject matter tests is either not related to student achievement, or the evidence is mixed. The 1990 Science Report Card by the National Center for Education Statistics found no link between the amount of teachers science knowledge and student science achievement (Owen, 1992). Goldhaber and Brewer (1999) found no statistically significant link between teachers who had a B.S. or M.A. in science and tenth- and twelfth-grade science achievement. On the other

hand, a recent ETS report sponsored by the Milken Family Foundation found a positive and significant link between teachers with B.S. degrees in science and eighth graders' science NAEP achievement scores (Wenglinsky, 2000).

For the subject areas of English, history, and the humanities, the American Council on Education (1999) reports no research has been conducted to demonstrate teachers with degrees in these areas produce students who achieve more than teachers without these degrees. Ferguson and Womack (1993) who reviewed 83 studies on teacher subject matter knowledge came to the conclusion that teacher subject matter knowledge beyond knowledge required for certification is an insignificant variable for predicting student achievement.

Conclusion. Teacher performance on entrance and exit examinations exert no effect on student achievement or teacher performance. Teacher performance on tests of verbal ability exercise a small effect. Finally, teacher performance on subject matter tests for math produce significant effects on student achievement, but for all other subjects, and elementary education the results for student achievement are either mixed or have not been researched.

Tests Did Not Work, Let's Measure Other Stuff

In light of various teacher tests not being all that effective in determining teacher performance and student achievement, researchers set out to find other potential teacher inputs that were related to teacher quality. Reported below are the effects of teachers: (a) holding an advanced college degree, (b) years experience, and (c) possessing a teaching credential.

Teachers Who Hold Advanced Degrees. One would think that teachers who earn a graduate degree would produce both better achieving students as well as perform better in the eyes of those who evaluate them. Yet, little to no research supports this theory. Hanushek's (1989) analysis of 113 studies found that teachers who hold advanced degrees did not predict higher levels of student achievement in 100 out of 113 studies. Of the 13 studies where teacher advanced degrees were a significant predictor variable, the results were split between positive and negative relationships. In other words, teachers with an advanced degree had a negative impact on student achievement in 6 of the 13 studies. Greenwald et al. (1996) found that in 15 percent of the 60 studies they reviewed, teachers who had a master's degree produced students who achieved more than teachers without a master's degree, but in 13 percent of the studies teachers with master's degrees had a negative effect on student achievement. A third study by Ferguson and Ladd (1996) found no student achievement advantage in either reading or math for students who were taught by teachers with master's degrees. The results from 174 studies demonstrate that teachers who hold advanced degrees do not produce better performing students.

Teachers with More Years Experience. Surprisingly, teacher experience has only a small effect on student learning. While many studies have established that inexperienced teachers (those with less than two years of experience) are typically less effective than more senior teachers, the benefits of experience appear to level off after about five years (Darling-Hammond, 1999).

Again, Hanushek's review of 140 studies found that in only 30 percent of the studies teacher experience was correlated with student achievement. Hanushek, however, claims that the positive correlation may result from senior teachers being permitted to select schools and classrooms with higher achieving students and less discipline problems. Of the 60 studies Greenwald, Hedges and Laine (1996) reviewed, 30 percent showed a positive and statistically significant relationship between teacher experience and student achievement. Yet, why is there no effect for teacher experience on student achievement in 70 percent of the studies reported? Finally, Rubenstein (2000) in his analyses of teachers' years experience in Massachusetts, Texas, Virginia, Florida, and Georgia found that elementary teachers with more than 25 years experience produced students with significantly lower National Assessment of Educational Progress scores than teachers with between 6–10 years experience. Further, gains for student achievement were nonexistent for teachers teaching between 11–24 years. If teacher experience and advanced degrees have little to no relationship to student achievement or observer ratings of teacher performance, why are teacher salary schedules and raises based on these criteria?

Teachers Who Possess Teaching Credentials. For this variable there is some evidence that teachers who possess a teaching credential in the subject area they teach have better performing students and are rated higher in teaching by administrators and peers. A report released by the Charles Dana Center (1999) used data from Texas' 250,000 public school teachers to determine the achievement effect that certified versus non certified elementary instructors had on the state's third-grade student population. Using Texas' third-grade performance tests, the data showed that 75 percent of third graders taught by teachers with a teaching credential passed all sections of the tests. The figure dropped to 64 percent when fewer than 85 percent of third grade teachers were certified. In Evertson, Hawley, and Zlotnik's (1985) review of the research compared regularly certified teachers to provisionally or emergency certified teachers, 11 of the 13 studies showed that regularly certified teachers were ranked higher in effectiveness in terms of both student achievement and teaching performance judged by administrators. Ferguson and Womack (1993) found that the amount of education coursework completed by regularly certified teachers explained more than 4 times the variance in teacher performance than did measures of teacher content knowledge. Guyton and Farokhi (1987) demonstrated consistent, strong, and positive relationships between teacher education coursework completed and teacher performance in the classroom. Finally, in their research of 2,101 high school math teachers and 1,380 high school science teachers, Goldhaber and Brewer (1999) found that "teachers who have a standard certification in the subject they teach have a statistically significant positive impact on student test scores relative to teachers who either are not certified or are certified out of the subject (p.94)."

Although these results demonstrate that regularly certified teachers outperform non-certified or provisionally certified teachers in terms of student achievement and observations by administrators and others, this research, should be viewed with some skepticism. First, only a small portion of the studies conducted relate

teacher certification to student achievement. Second, survey research of teachers shows that few value their training experiences in schools of education (Feistritzer, 1999).

Conclusion. Teachers who hold advanced degrees do not produce better-performing students. Teacher experience beyond five years does not produce better-achieving students nor does it predict better ratings of teaching by administrators. The only teacher variable that predicts better-achieving students is whether or not the teacher possesses a teaching credential. Yet, even in this case, evidence is mixed and only a small number of studies have related teacher certification to student achievement.

Why Teacher Performance-Based Accountability

Based on the analyses presented above, the research base on teacher quality is far from convincing. Teacher tests have not been highly effective or conclusive in increasing teacher quality. Holding an advanced degree or teaching more years has carried little weight in terms of improved student achievement and administrative rating of teacher performance. Teachers who possess a valid teaching credential appear to exert some, but by no means an overwhelming effect on student achievement. Since so few of these teacher quality levers are related to student achievement or teacher performance ratings, one wonders why states, districts, and schools use and require them. The bottom line is that simple, efficient, and cost-effective solutions to measure teacher quality have not been fruitful.

In light of the fact that little else has worked to improve teacher quality, the Milken Family Foundation has taken the stance that one aspect of improving teacher quality should be through rigorous teacher performance-based accountability. The Foundation recognizes that teacher performance-based accountability is only one part of improving teacher quality and for that reason has embedded teacher performance-based accountability within a larger system of reform entitled the Teacher Advancement Program (see Lowell Milken, 1999; 2000). Because of space constraints only teacher performance-based accountability is discussed here.

What Is Teacher Performance-Based Accountability?

The idea behind teacher performance-based accountability is that to evaluate a teacher, like evaluating any other professional, one needs to determine what that professional needs to know and be able to do, and then how that professional demonstrates this knowledge through performance. This idea of teacher performance-based accountability is hardly new. Yet, performance-based accountability has not reached all teachers, and when it has, one can easily question the definition of performance and the rigor of the evaluation and accountability mechanisms.

Examples of Performance-Based Accountability

Below I highlight some exemplary teacher performance-based accountability systems at the national, state, and district levels. I then briefly describe the Milken Teacher Performance-Based Accountability model (see Teacher Advancement

Program Toolkit v.3 2000 for more detail).

National. The National Board for Professional Teaching Standards is the most comprehensive effort to implement teacher performance-based accountability. Yet the board only certifies outstanding teachers. The Board has spent over 200 hundred million dollars setting advanced standards in more than 30 certificate fields. To assess those standards, board teachers undergo multi-part assessments that include submitting an extensive portfolio of their work, videotapes of their teaching performances, and taking written tests and simulations at testing centers. A recent validation study compared a sample of National Board Certified teachers to a sample of other teachers that did not achieve National Board Certification. They also compared students' work from these two groups of teachers. National Board Certified teachers scored significantly higher on 11 of 13 dimensions of teaching. The analysis of student work revealed that 75 percent of students with National Board Certified teachers comprehended the concepts they were taught compared to 30 percent of the work samples taught by teachers without National Board Certification. These results provide initial evidence that assessing teaching performance rigorously is highly related to ratings of teaching performance and student achievement (National Board for Professional Teaching Standards, 2000).

State. Currently, Connecticut appears to be the only state using rigorous performance based assessment to license beginning teachers (Jacobson,Lyman,Pecheone,1997). Connecticut's teacher performance-based portfolio requires all new teachers to create a portfolio over their first two years in the profession. The portfolio is designed to evoke the knowledge, skills, and dispositions necessary to determine that professional teaching standards are being met. Unit and lesson plans for two weeks of consecutive instruction, samples of student work, samples of classroom assignments and assessments, videotapes of instruction, and teacher reflection on what was taught are required elements. Notice the similarities to the National Board. Validation studies of the efficacy of Connecticut's performance-based processes have not yet been conducted. However, researchers have made the case that Connecticut's efforts of raised teaching standards, rigorous performance-based licensing, and professional development are related to significant gains over the past six years on the National Assessment of Educational Progress for reading and mathematics despite an increase in student poverty rates during this period (Darling-Hammond & Loewenberg Ball, 1998).

School Districts. Several school districts are implementing rigorous teacher performance-based accountability programs not just for outstanding teachers or beginning teachers, but for all teachers. Coventry School District in Rhode Island, Douglas County School District in Colorado, Cincinnati School District in Ohio, Vaughn Next Century Charter School in Los Angeles, and Charlott-Meckenberg School District in North Carolina are some excellent examples. Each of these districts has produced detailed plans and requirements for teacher performance-based accountability. Each is driven by rigorous teacher standards, most require teachers to submit portfolios, most differentiate teacher performance based on where the teacher is in his or her career, and finally most compensate the teacher based on performance. Nearly all of these

plans have been in place less than five years, and there is little to no research on the impact they have on ratings of teacher performance or relationships to student achievement.

Teacher Performance-Based Accountability – What's Missing

From the national, state, and district plans referenced above one element that all of the plans are consistently missing is the achievement gains each teacher produces in his or her students. Some teacher accountability systems award schools for achievement gains (see California Academic Performance Index and Allan Odden's research at the Consortium for Policy Research in Education at the University of Wisconsin-Madison), but few to none accurately measure student achievement at the teacher level. The only district I am aware of is Colonial School District in Pennsylvania.

What most if not all teacher performance-based accountability system's measure are samples of a few students' work. Evaluators then make determinations as to whether the teacher helped the student make sizable gains in that work over the course of the school year. This approach, although effective for analyses of teacher skills and knowledge, is ineffective for assessing student learning gains (Millman et al., 1997) for the following reasons: the teacher selects the students; the student work each teacher selects is different; the student work is not submitted in pre- and post-test form; and those who rate the work do not have a common scale because the tasks all vary. The inability to solve these student achievement problems is an inherent weakness of all teacher performance accountability systems.

Milken Family Foundation Teacher Performance-Based Accountability Model

The Milken Family Foundation has recently developed and is piloting a teacher performance-based accountability system in five public schools in Arizona. Teacher performance is measured by:

1. The skills, knowledge and responsibilities a teacher exhibits through his or her daily practice as measured through observation and a teacher portfolio;
2. The gains the teacher produces in student achievement on standardized tests, criterion referenced standards-based assessments, and performance assessments;
3. The gains a school produces on standardized tests, and criterion referenced standards-based assessments, and performance assessments;

In the Milken model, teaching processes (observable and documented instructional skills, teacher responsibilities, and knowledge) and teaching products (student achievement gains attributed to the teacher and school) play an equal role in determining teacher effectiveness. Four components distinguish the Milken teacher evaluation system from previous performance-based systems. One, because performance-based accountability is part of the Milken Teacher Advancement Program initiative, a teacher career path (master, mentor, associate/specialist) establishes different roles and job responsibilities for different level teachers. Thus, all teachers are not evaluated based on the same criteria, and not all teachers are held to the same performance

expectations. Two, student achievement gains are measured, attributed to the teacher, and count as a part of the teacher's evaluation. Three, school achievement gains count as a part of each teacher's evaluation. Four, judgments of performance are based on self, peer, master teacher, and administrator review. Figure 1 (p. 14) is a graphical representation of the Milken Teacher Performance-Based Accountability model. Tables 1 and 2 (pp. 15-16) are text representations delineating the specifics of the model.

Conclusion

Because other measures of teacher quality have had little to no effect on student achievement or ratings of teachers' classroom teaching, measuring teacher performance provides a promising and practical solution. Measures of teacher performance must be both comprehensive enough to capture the essence of good teaching, and also provide for student achievement accountability metrics the public can readily understand. The Milken Teacher Performance-Based Accountability model addresses these core elements that few other national, state, or district teacher evaluation systems possess.

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Figure 1.
Graphical Representation of Milken Teacher Performance-Based Accountability Model

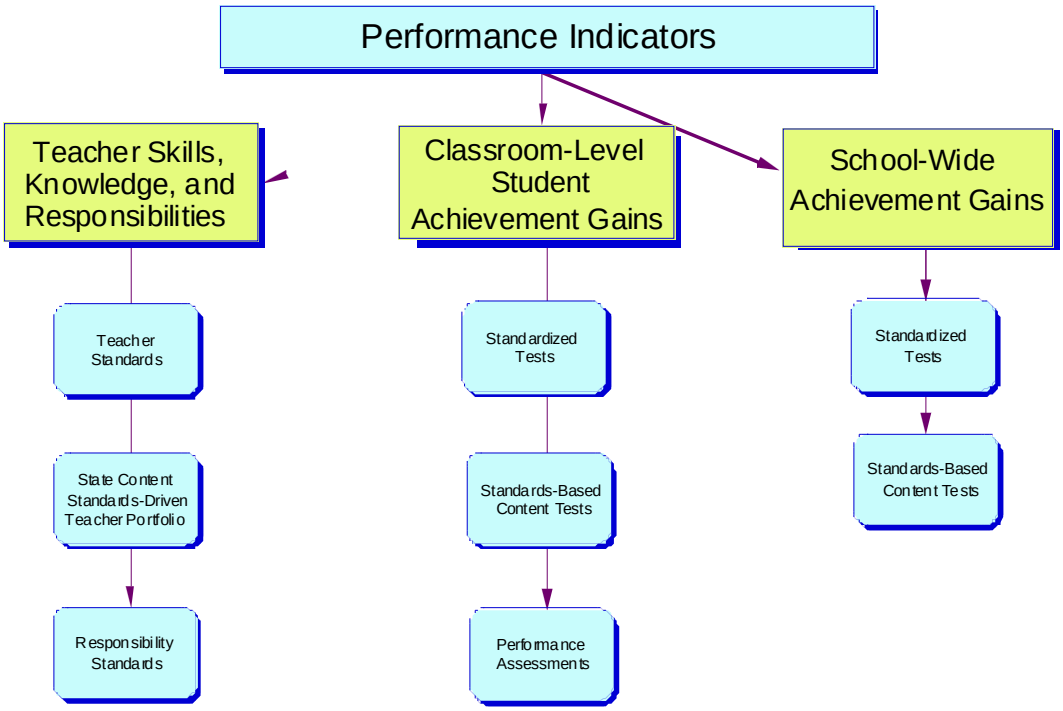

Table 1.
Milken Teacher Performance-Based Accountability Model

1	**Associate/Specialist**	**Mentor**	**Master**
2	25,000 - 40,000	35,000 - 60,000	55,000 - 80,000
3	**Teacher Skills, Knowledge, & Responsibilities - 50%**	**Teacher Skills, Knowledge, & Responsibilities- 50%**	**Teacher Skills, Knowledge, & Responsibilities - 50%**
4	Teaching 27 Standards (Minimum Averaged Score 2)	Teaching 35 Standards (Minimum Averaged Score 3)	Teaching 35 Standards (Minimum Averaged Score 3)
5	Designing and Planning Instruction	Designing and Planning Instruction	Designing and Planning Instruction
6	Implementing Instruction	Implementing Instruction	Implementing Instruction
7	The Learning Environment	The Learning Environment	The Learning Environment
8	Content (1 Content Standard Area addressed through a teaching portfolio per year)	Content (1 Content Standard Area addressed through a teaching portfolio per year)	Content (1 Content Standard Area addressed through a teaching portfolio per year)
9	Responsibilities (Minimum Score Averaged Standard 2)	Responsibilities (Minimum Averaged Score 3)	Responsibilities (Minimum Averaged Score 3)
10	Growing and Developing Professionally	Staff Development	Staff Development
11	Reflecting on Teaching	Instructional Supervision	Instructional Supervision
12		Mentoring	Mentoring
13		Community Involvement	Community Involvement
14		School Responsibilities	School Responsibilities
15		Growing and Developing Professionally	Growing and Developing Professionally
16		Reflecting on Teaching	Reflecting on Teaching
17	**Evaluators**	**Evaluators**	**Evaluators**
18	Self Evaluation - 10%	Self Evaluation - 10%	Self Evaluation - 10%
19	Mentor Review - 20%	Mentor Review - 20%	Mentor Review - 30%
20	Master Teacher Review - 35%	Master Teacher Review - 35%	Administrator Review - 60%
21	Administrator Review - 35%	Administrator Review - 35%	
22	**Measurement Instruments**	**Measurement Instruments**	**Measurement Instruments**
23	Portfolio Documentation	Portfolio Documentation	Portfolio Documentation
24	Observation	Observation	Observation
25	Interview Process for between rank advancement only	Interview Process for between rank advancement only	Interview Process
26	**Student Achievement Attributed to Teacher - 20%**	**Student Achievement Attributed to Teacher - 20%**	**Student Achievement Attributed to Teacher - 0%***
27	Level 5 - 13% gain from current classroom score to the score at the 85th percentile		
28	Level 4 - 8% gain from current classroom score to the score at the 85th percentile		
29	Level 3 - 3% gain from current classroom score to the score at the 85th percentile		
30	Level 2 - 0% gain (1 year's growth) from current classroom score to the score at the 85th percentile		
31	Level 1 - Negative growth from current classroom score to the score at the 85th percentile		
32	SCHOOL-WIDE ACHIEVEMENT: AWARD IS EQUALLY DISTRIBUTED TO ALL STAFF AS A YEARLY BONUS - 30% (50% for Master Teachers)		
33	Level 5 - 6% gain from current school score to the score at the 85th percentile		
34	Level 4 - 3% gain from current school score to the score at the 85th percentile		
35	Level 3 - 0% gain from current school score to the score at the 85th percentile		
36	Level 2 and below - Negative growth from current school score to the score at the 85th percentile		

* Because Master Teachers do not carry a teaching register they do not receive a classroom-level score. The percentile is shifted to the school-wide award

Table 2.
Milken Teacher Performance-Based Accountability Model Line Item Descriptions

Row Number	Line Description
1	Different career level teachers in the Teacher Advancement Program Model (Associate/Specialist, Mentor, and Master Teacher).
2	Salary range for each career level teacher.
3	Recommended percentage (out of 100 percent) of the individual performance award that shall be designated for Teacher Skills, Knowledge, and Responsibilities for each level teacher.
4	Recommended number of teaching standards and the minimum average performance score for each level teacher.
5-7	Headings of the teaching standards that will be appraised.
8	Requires that each level teacher develop a teacher portfolio that addresses one state-level content standard area per year.
9-16	Recommended responsibility standards and minimum averaged performance score for each level teacher.
17-21	Possible evaluators of each teacher's performance and ideas for what percentage each evaluator's score should count in calculating the total score.
22-25	Measurement instruments to evaluate teacher process standards.
26-31	Recommended percentage of award that shall be designated for student achievement attributed to the teacher. Recommended criteria for teachers to earn the student achievement performance award at different levels of achievement.
32	Recommended percentage of the award that shall be designated for school-wide achievement gains.
33-36	Recommended criteria for a school to earn the school-wide performance award at different levels of achievement.