

Teacher Effectiveness and Teacher Compensation

Prepared for the Joint Committee on Education
By
Stacey Preis, Ph.D., Executive Director

September 2010

Executive Summary

Teacher compensation is among the most widely discussed school reform initiatives. While much has been written on performance-based compensation, formal studies of the effects have been somewhat limited. The research literature on performance-based compensation continues to expand as more states link teacher and student data and statistical models for determining the teacher's contribution to achievement gains are refined.

Consideration of performance-based compensation begins with the need to define effective teaching. Level of education and years of experience, the current salary determinants for most school districts, have not shown a correlation with student achievement. In that regard, any single measure of teacher quality will have some strengths and weaknesses. In many performance-based compensation programs, current practice is to use multiple measures to determine teacher effectiveness. Among those measures are gains in student achievement, demonstration of knowledge and skills, and evaluations.

Performance-based compensation programs exist in pockets throughout the country. In some cases programs are supported by state law, and others are specific to a city or school district. In Missouri, three programs offer some type of salary enhancement for teachers: Ladue School District's knowledge- and skills-based teacher compensation system, the Teacher Choice Compensation Plan for St. Louis Public Schools, and Career Ladder.

Costs associated with performance-based compensation present challenges. Developing and funding incentives sufficient to entice teachers to participate is the primary issue, but administrative costs are also a factor.

Table of Contents

Introduction.....	1
Discussion of Performance-Based Compensation.....	2
Rationale for consideration	
Potential disadvantages	
Defining and Measuring Teacher Effectiveness.....	3
Teacher credentials	
Knowledge and skills	
Growth in student achievement	
Considerations with Performance-Based Compensation.....	5
Multiple measures	
Value-added models	
Teacher evaluations	
Schoolwide incentives	
Q Comp and ProComp	
Developing and refining systems	
Research on Performance-Based Compensation and Student Achievement Gains.....	8
Teacher characteristics and achievement	
Evaluations and achievement	
Student achievement growth and value-added models	
Quasi-experimental studies	
Limitations of the research	
Enhancements to Teacher Compensation in Missouri.....	10
Ladue School District	
Teacher Choice Compensation Plan	
Career Ladder	
Funding Performance-Based Compensation.....	12
Conclusion.....	12
References.....	13
Appendix A Missouri Teaching Force Profile.....	19
Appendix B Statutory References for Performance-Based Compensation.....	20

Introduction

The majority of public school teachers are currently paid according to a uniform salary schedule that was first introduced in the 1920s. By the late 1940s, this salary schedule had become the predominant salary model with the intention of creating greater equity between the salaries of male and female teachers (Koppich, 2010; Springer & Gardner, 2010).

In the 1980s, a significant increase in the implementation of performance-based compensation plans followed the publication of *A Nation at Risk*, but many of those programs have since been discontinued (Dee & Keys, 2005). Today performance-based compensation is most often used in private schools although the majority of private schools do not use performance-based compensation (Ballou, 2001; Goldhaber, DeArmond, Player, & Choi, 2008). Most recently, performance-based compensation was part of the national conversation on school reform when it was included as a substantial component in the Department of Education's Race to the Top grant ("Race to the Top," 2010). The Great Teachers and Leaders section of the Race to the Top application was weighted more heavily than any other subsection accounting for nearly 30% of the criteria on which the application was evaluated. Within this section, the grant called for a measure of teacher effectiveness which included growth in student achievement. Further, the grant application indicated that the evaluations should be used in decisions regarding additional compensation ("Race to the Top Fund," n.d.).

Research has consistently shown that the two components represented on the traditional salary schedule – level of a teacher's education and years of experience – have little if any bearing on teacher quality and subsequently student achievement. With that, the conversation around performance-based compensation has persisted (Hanushek, 2007; Podgursky & Springer, 2007; Springer & Gardner, 2010).

Reports and articles on teacher effectiveness and performance-based compensation are abundant. For that reason there is a strong likelihood of finding writing to support either position (Berry, Daughtrey, & Wieder, 2009; Ritter & Jensen, 2010). Empirical research demonstrating a relationship between teacher compensation and student achievement growth (arguably the primary indicator of teacher effectiveness) is not as prevalent. Reasons for this include limited implementation of performance-based compensation programs, individual school district case studies with results that cannot necessarily be generalized, and the inability in many states and districts to link student achievement growth data to teachers (Ballou, 2001; Odden, 2004; *Teacher merit pay*, 2010).

Discussion of Performance-Based Compensation

Discussion of performance-based compensation can refer more generally to a "pay for contribution" system that may use varying compensation based on teacher effectiveness, hard to staff schools, or hard to staff subjects (E. A. Hassel & B. C. Hassel, 2007). With the limited research available for drawing definitive conclusions, the effects of performance-based compensation are left open to speculation as to the possible impact of implementing such a system (Ritter & Jensen, 2010).

Rationale for consideration

A report by the Committee for Economic Development referred to the single salary schedule as inflexible for recruitment of best teachers and noted that other fixed salary structures such as the federal government's General Schedule (GS) system have more flexibility than the average teacher salary schedule (*Investing in learning*, 2004). Guthrie (2005) wrote "teaching is the largest single professional undertaking still devoid of significant performance rewards" (p.7).

In addition to performance, supporters of a the more general "pay for contribution" system believe education should be responsive to market demands (i.e., be willing to pay more for teachers in high demand content areas or who will teach in hard-to-staff schools) (Koppich, 2010).

Potential disadvantages

Some supporters of performance-based compensation acknowledge that skepticism among teachers is understandable as many performance-based compensation plans have not been successful (Koppich, 2010). In one survey of teachers in their first year of a performance-based compensation system, teachers indicated their apprehensions about the system were about fairness in how they would be evaluated (Kellor, 2005). A frequent claim is that teaching is too difficult to evaluate objectively (Goldhaber et al., 2008).

Another apprehension that has been expressed regarding performance-based compensation is that money as a motivator may be detrimental to the long-term health of the organization by causing competition and reducing cooperation (Chamberlin, T. Wragg, Haynes, & C. Wragg, 2002; Holt, 2001). Chamberlin et al. (2002) cited studies showing that intrinsic motivation increases productivity better than external motivation. However, they proposed that teachers may be reluctant to admit to performance pay as a motivating factor because it could be construed as admitting to not putting forth full effort without a financial incentive (Chamberlin et al., 2002; Gratz, 2005).

Along those lines, other commentary on performance-based compensation noted in articles and reports is the concern that unrewarded responsibilities will be neglected.

Furthermore, rewards for growth in student achievement might influence teachers to focus only on those students who are just under the threshold of proficiency, ignoring those at the highest and lowest performance levels (Chamberlin et al., 2002).

Defining and Measuring Teacher Effectiveness

Before identifying effective teachers, reformers must agree on what an effective teacher is (Guthrie, 2005). What characteristics are indicators of quality? Can quality only be judged by performance? (Goldhaber & Anthony, 2007). A teacher considered "good" by some does not necessarily indicate that the teacher is the most *effective* teacher as it relates to student learning. The perception of "good" may be more a reflection of enjoyable, entertaining, feel-good qualities with no distinction between "good" teaching and successful teaching. One is concerned with process; the other addresses outcome (Black & Howard-Jones, 2000; Fenstermacher & Richardson, 2005; Walls, Nardi, & Von Minden, 2002). Conversely, the way in which a teacher produces good results matters. Coercion is an extreme but clear example of unacceptable teaching behavior regardless of whether or not it produces the desired result (Fenstermacher & Richardson, 2005).

Teacher compensation can be based on a number of different variables intended to capture the overall effectiveness of the teacher.

Teacher credentials

The two measures currently used to determine teacher salary on the traditional salary schedule – years of experience and level of education – have not been shown to be correlated with student achievement (Goldhaber & Anthony, 2007; Hanushek, 2007). Though acknowledging notable differences between novice and more experienced teachers, research has identified an "experience plateau" of approximately three years (E. A. Hassel & B. C. Hassel, 2007). Regarding level of education, advanced degrees in mathematics have been associated with better performance in secondary mathematics teachers. Beyond that, compensation for advanced degrees has not been linked with a measurable difference in student achievement growth (E. A. Hassel & B. C. Hassel, 2007).

Though an advanced degree may not reflect a teacher's aptitude, some researchers have reported finding a correlation between a teacher's own measures of academic proficiency and his or her effectiveness as a teacher (Goldhaber & Anthony, 2007; Hanushek, 2007; E. A. Hassel & B. C. Hassel, 2007). For entry level teachers, aptitude (specifically verbal ability) is a good predictor of successful teaching. The downside of this statistic is that teachers in the top quartile of verbal ability on standardized tests are twice as likely to leave teaching after five years (E. A. Hassel & B. C. Hassel, 2007).

In addition, researchers are examining the quality of teacher preparation institutions against measures of successful teaching. This research is in its early stages as states make advances in data collection and management (*Investing in learning*, 2004).

Knowledge and skills

Knowledge- and skills-based compensation systems provide an alternative to the traditional salary schedule and performance-based compensation determined by student achievement measures. With knowledge- and skills-based compensation, any teacher who demonstrates the identified skills receives the incentive (E. A. Hassel & B. C. Hassel, 2007; *Investing in learning*, 2004; Odden, 2004). The assumption is that the demonstrated skills will lead to improved student achievement (Gallagher, 2004; *Investing in learning*, 2004; Milanowski, 2003).

With a standards- and knowledge-based evaluation, how explicitly the standards are communicated regarding what teachers should know and be able to do and the procedures for how evaluations should be conducted will be essential to the success of the program (Odden, 2004).

Cincinnati is one school district that has used a knowledge- and skills-based approach to teacher compensation. Teachers must demonstrate the requisite knowledge and skills that *should* improve student achievement. Unlike the traditional salary schedule with steps for every year of experience, this model has five different levels through which teachers can be "promoted" based on demonstrated knowledge and skills (*Investing in learning*, 2004).

To determine what the essential knowledge and skills of a good teacher are, many districts have used external definitions such as those produced by the National Board for Professional Teaching Standards (Milanowski, 2003).

Growth in student achievement

One area in which there is generally consensus is the need to measure growth in student achievement and not raw scores from a single point in time (Gratz, 2005; E. A. Hassel & B. C. Hassel, 2007). Statistical models can be used to determine a student's growth over a period of time based on his or her prior achievement. Among the most recognized and widely-used growth measures is the Tennessee Value-Added Assessment System (TVAAS).

One study of value-added models was conducted in response to criticism that TVAAS does not control for student demographics. However, researchers argued that prior student achievement will capture that influence because demographics are not only about what a student brings to a school or classroom but the rate at which a student could be expected to make progress (Ballou, Sanders, & Wright, 2004).

Another limitation of value-added models is the lack of random assignment of teachers to students which can bias the amount of growth attributable to an individual teacher. Teachers who would generally be regarded as highly-qualified teachers tend to gravitate toward higher-performing, higher socioeconomic status schools (Goldhaber & Anthony, 2007). Principals in practice may intentionally place students with a particular teacher. A principal might give a favorable teaching assignment as a reward to high-performing teachers in lieu of monetary compensation, an unknown which jeopardizes the validity of a value-added assessment of the teacher (Ishii & Rivkin, 2009; Player, 2010). The concern is not unwarranted. In one study, Player (2010) found that teachers with three or more years of experience and teachers with higher PRAXIS¹ scores were systematically given students who generally had higher test scores, were nonminority, were not English language learners (ELL), did not have an Individualized Education Plan (IEP), and did not qualify for free or reduced-price lunch (FRL). Regardless of a teacher's credentials or abilities, the working environment can complicate an assessment of the quality of their teaching (Berry et al., 2009).

Considerations with Performance-Based Compensation

While there is no perfect measure of teacher effectiveness and no perfect system of performance-based compensation, sufficient information exists to assemble a list of best practices from districts and states that use performance-based compensation.

Multiple measures

Because each method of measurement of teacher effectiveness has limitations, multiple measures will result in a more equitable system (Eckert & Dabrowski, 2010; Heck, 2009). Further, standardized tests alone do not measure all that is valuable to employers, and districts have other objectives including meeting the social emotional needs of their students (Goldhaber et al., 2008; Gratz, 2005). However, even with those considerations, it is reasonable to assume that student achievement is the predominant goal (Goldhaber et al., 2008).

Value-added models

Although a measure of student achievement growth is a better reflection of a teacher's contribution to learning than achievement status at a single point in time, Kupermintz (2003) noted that value-added models have their strengths and limitations. An example of considerations that must be made with value-added when a proficiency-based measure is used is ceiling effects; in other words, students with high raw scores do not have as much room for gain (Koedel & Betts, 2010). In addition, in the previous section, it was noted that teachers whose students scored well in a given year were more likely to be assigned higher achieving students in the following year which creates statistical problems for value-added models if this trend continues over time as it compounds the

¹ PRAXIS is the standardized exam given to all teacher certification candidates.

problem with nonrandom assignment (Rothstein, 2008). Even with those caveats, value-added models add a necessary dimension to a comprehensive assessment of teacher effectiveness (Levačić, 2009).

Teacher evaluations

As with any individual measure of teacher effectiveness, evaluations have their limitations. The reality is that most teachers receive satisfactory evaluations with few distinctions in overall quality, nor is there typically a method of distinction or recognition for those teachers who truly are excellent (Weisberg, Sexton, Mulhern, & Keeling, 2009).

For an evaluation to be useful in a performance-based compensation system, the evaluation must provide a fair and accurate measurement (Guthrie, 2005). In addition to a supervisor's evaluation, peer evaluations are a component of performance evaluations in Toledo and Columbus, Ohio; Rochester, New York; and Montgomery County, Maryland (Koppich, 2010). Strong inter-rater reliability is a good indicator of the accuracy of the evaluation (Odden, 2004).

Schoolwide incentives

Multiple teachers may contribute to a single student's learning (Valli, Croninger, & Walters, 2007). In a study that included more than 150 elementary schools, Heck (2009) found a "school effect" independent of individual teacher effects, an indication that the overall learning environment of the school matters. Additionally, some teachers have reported that school-wide merit increases create positive peer pressure (McCollum, 2001).

Q Comp and ProComp

The Minnesota Quality Compensation Plan (Q Comp) and the Denver ProComp plan are two of the more widely known models of alternative compensation. Q Comp contains five components: career ladders, professional development, instructional observations and standards-based assessments, student achievement growth measures, and alternative teacher compensation or performance pay (E. A. Hassel & B. C. Hassel, 2007; *Minn. Stat 122A.413-415*, 2009).

Extensive planning went into the development of ProComp, and the program has continued to evolve since it was first piloted in 1999 (Gratz, 2005). The first version of ProComp allowed teachers, with the principal's approval, to choose one or two objectives to meet during the course of the year, and bonuses were awarded for each objective met. Although Gratz (2005), who served on the original committee to develop ProComp, expressed concern that this approach would lead to the identification of the objectives most attainable rather than the most pertinent.

Developing and refining systems

From the performance-based compensation plans that have been implemented various cities and states, researchers and reformers have noted lessons that can be learned. Soliciting teacher input helped to develop programs in Cincinnati; Denver; Douglas County, Colorado; and Robbinsdale, Minnesota (Milanowski, 2003). Kelley, Heneman, III, and Milanowski (2002) advised setting clear program expectations and communicating them clearly. Moreover, some studies showing that performance-based compensation programs were not successful included programs that did not offer an adequate financial incentive. Determining what incentives are necessary to serve as a sufficient motivator will impact the success of the program (Hanushek, 2007; Levačić, 2009). Finally, developing appropriate assessments for non-instructional personnel (Gratz, 2005), training principals on evaluation methods (Levačić, 2009), and creating an appeals process (Kellor, 2005) have all been cited as aspects worthy of contemplation.

Examples of common features in various performance-based compensation systems are shown in Table 1.

Table 1. Features of Performance-based Compensation Systems

Program Feature	City, State, or Country
Measure of student achievement growth	Cities: Denver, Hamilton Co. (TN), Little Rock, Washington, D.C. States: Minnesota
School-wide achievement growth	Cities: Charlotte-Mecklenburg, Little Rock States: Georgia, Kentucky, Minnesota
Supervisor evaluation	Cities: Denver, Little Rock, Vaughn-Los Angeles, Washoe County (NV) States: Minnesota
Peer evaluation	Cities: Rosemont (CA), Vaughn-Los Angeles
Self-evaluation	Cities: Vaughn-Los Angeles
Salary tiers based on expertise	Cities: Cincinnati Countries: England
Voluntary participation	Cities: Denver States: Minnesota ²
Knowledge- and skills-based pay	Cities: Cincinnati, Coventry (RI), Denver, Douglas Co. (CO), Ladue (MO), Limon (CO), Manitowac (WI), Philadelphia, Robbinsdale (MN), Steamboat Springs (CO), Vaughn-Los Angeles,
Incentives for hard-to-staff subjects or schools	Cities: Denver
(Chamberlin et al., 2002; Goldstein, 2009; Gratz, 2005; "IMPACT," 2010; <i>Investing in learning</i> , 2004; Kelley et al., 2002; Kellor, 2005; Milanowski, 2003; <i>Minn. Stat 122A.413-415</i> , 2009; Morice & Murray, 2003; Odden, 2004; Ritter & Jensen, 2010; Silva, 2008)	

² Participation is voluntary by school district not by individual teacher.

Research on Performance-Based Compensation and Student Achievement Gains

Research linking teacher performance to student achievement gains is somewhat limited because there are many places where teacher data and individual student data is not linked³ (Odden, 2004).

The following studies are examples of empirical research on teacher effectiveness.

Teacher characteristics and achievement

Goldhaber and Anthony (2007) found a correlation between national board certified teachers and teacher effectiveness as measured by growth in student achievement. Teachers certified by the National Board for Professional Teaching Standards (NBPTS) were more effective than non-NBPTS teachers or unsuccessful applicants for NBPTS. From the results of the study, Goldhaber and Anthony did not infer that NBPTS causes greater effectiveness, but rather that NBPTS could serve as a variable to identify teacher quality. They were able to attribute some value to the NBPTS process because NBPTS teachers were no more or less effective than non-NBPTS teachers in the year they began their application process (Goldhaber & Anthony, 2007).

Evaluations and achievement

Kimball, White, Milanowski, and Borman (2004) studied the relationship between the quality of supervisors' standards-based evaluations of teachers and student learning gains. They found a positive relationship between teacher evaluations and student achievement gains using a value-added model though some coefficients were not statistically significant. Their conclusion was that the evaluations provided "only tentative evidence" as to the utility of evaluations as a good predictor of teacher effectiveness. Nonetheless they concluded by noting that the standards-based evaluations were able to explain more variation in teacher effects than the standard salary schedule (Kimball et al., 2004).

In another study, Gallagher (2004) found that the teacher evaluation system used by one elementary school⁴ was positively correlated with growth in student achievement. At the same, a teacher's level of education and years of experience were not associated with growth in student achievement.

³ The Missouri Student Information System (MOSIS) has all of the elements necessary to develop a quality value-added assessment system. DESE is working with a group of national experts on growth measures to select a model to use for evaluating schools. The system would also have application as part of an assessment of teacher performance.

⁴ Authors acknowledge that their study was a small sample of teachers and recommends replication of the study and further research.

Student achievement growth and value-added models

While TVAAS is among the most recognized of the student achievement growth models, it has not been exempt from criticisms. In the original TVAAS, the assumption was that demographic controls were implicit when measuring gains because they were captured by prior achievement. Ballou, Sanders, and Wright (2004)⁵ argued that including demographic variables can confound the issue because more affluent parents make the choice to live in the areas where they feel the teachers and schools are best. In most instances, students are not assigned to teachers and schools randomly so if there is correlation between weak teachers and lower SES schools and vice versa, this creates a problem for introducing those variables into a statistical equation (Ballou et al., 2004; Berry et al., 2009; Ishii & Rivkin, 2009). Ballou et al (2004) wrote that peer effect is another lurking variable that is difficult to estimate in a statistical model. Nevertheless, to address the criticisms of TVAAS, they modified TVAAS to include student-level demographics but found little difference between results from the original TVAAS and modified TVAAS.

Other considerations with value-added models account for how long the student has been at a school (McCaffrey, Lockwood, & Koretz, 2004), adjust for regression to the mean⁶ (McCaffrey et al., 2004), and acknowledge ceiling effects (Koedel & Betts, 2010).

Quasi-experimental studies

Glazerman, McKie, and Carey (2009) reviewed the changes in student achievement after the induction year of the Teacher Advancement Program (TAP) in Chicago. TAP schools were measured against a group of control schools in Chicago that did not participate in TAP. The study revealed no statistically significant differences in changes in student achievement or teacher job satisfaction. The study concluded that TAP impacted teacher behaviors, but student achievement did not show gains in the first year (Glazerman et al., 2009)

Eberts, Hollenbeck, and Stone (2002) conducted a case study of two alternative high schools in the same county: one used a performance-based incentive and the other did not. The measures teacher performance were student attendance, course completion, and enrollment at the end of the quarter. They found a positive relationship between the school with the incentive and final course enrollment. However, the school with the incentives also experienced a slight decline in GPA and pass rates. This result is not entirely surprising given that the students who were retained might otherwise have dropped out thus lowering the GPAs and pass rates (Eberts et al., 2002).

⁵ William Sanders, formerly Professor at the University of Tennessee and currently a researcher with the SAS Institute, created TVAAS which has been used by Tennessee since 1993.

⁶ If a student's gains in one year were significantly above or below the mean, there is a strong likelihood that the following year the score will move closer to the mean irrespective of the teacher's contribution.

Limitations in the research

Inconclusive or limited findings may be attributable to limited implementation of programs, insufficient funding of incentives, or insufficient data (*Teacher merit pay*, 2010). Many studies of performance-based compensation are case studies which do not produce results that can be widely generalized (Ballou, 2001). Furthermore, many researchers rely on data from state or national standardized tests which are administered annually to third through eighth graders as required by No Child Left Behind. While this provides an accessible and efficient source of data, it does reveal teacher value-added effects for teachers in grades or subjects not tested.

Enhancements to Teacher Compensation in Missouri

Outside of the traditional salary schedule, Missouri has three examples of enhanced compensation programs. Two of these programs have been in existence much longer than most performance-based compensation programs though neither program determines additional compensation based on gains in student achievement. The third program, the Teacher Choice Compensation Plan for St. Louis Public Schools, was authorized under SB 291 (2009) and is based on student achievement gains and teacher evaluations.

Ladue School District

The Ladue School District has had an alternative compensation system in place for more than 50 years. The knowledge- and skills-based program was designed by teachers and administrators. The district has never linked incentives to student achievement, and awards are not based on a limited amount of funding so teachers are not competing for awards. Student achievement is consistently high in this district, and it is a community with attributes that are positively correlated with student achievement such as parents' level of education and higher socioeconomic status. It is difficult to draw conclusions about the impact of performance-based compensation based on Ladue because it is a community where statistically students have a strong likelihood of success and where high-quality teachers will want to teach (Morice & Murray, 2003).

Teacher Choice Compensation Plan

The Teacher Choice Compensation Plan is a performance-based compensation plan for teachers in St. Louis Public Schools. Incentive awards are based student achievement as measured by a value-added model, as well as evaluations by administrators, parents, and students.⁷ Awards of \$5000 may be received in increments up to \$15,000, but not to exceed 50% of a teacher's base salary. In exchange, the teacher must agree to forgo an indefinite contract (tenure) in order to participate in the program. Statute indicates a \$5

⁷ Both the value-added model and the evaluation instrument to be used must be developed and/or approved by the Department of Elementary and Secondary Education.

million appropriation to support the program, but since its introduction in 2009 no funds have been appropriated.

Career Ladder

Missouri's Career Ladder program has been in operation since 1985. The Silman and Glazerman (2009) survey of teachers revealed that teachers primarily viewed Career Ladder as a salary supplement. Though the Department of Elementary and Secondary Education DESE recommends that one third of Career Ladder activities directly involve students, it is not formally required (Silman & Glazerman, 2009). (For a list of Career Ladder activities, see Appendix A.)

The program offers a state match of 40% to 60% to local school districts to support Career Ladder. Out-state districts participate most regularly in Career Ladder. It provides districts the opportunity to offer more competitive salaries and to improve recruitment and retention, particularly among mid-career teachers (Booker & Glazerman, 2009a; Silman & Glazerman, 2009).

The Performance-Based Teacher Evaluation (PBTE) is used with Career Ladder as an assessment of teacher quality (Silman & Glazerman, 2009). Both teachers and administrators have acknowledged concerns about the PBTE. Teachers expressed concern that a rating of "above expectations" varied between supervisors as there were no formal descriptions of what the expectations were. From the administrators' perspective, Silman and Glazerman wrote that "interviewees mentioned a number of accommodations for Career Ladder teachers; one refrain was that administrators wanted to avoid confrontations over PBTE ratings and thus would ensure that Career Ladder teachers met benchmarks for advancement, sometimes by correcting a poor evaluation or completing the PBTE with an eye toward the list of Career Ladder participants" (2009, p. 20).

In a study of Career Ladder and student achievement, Booker and Glazerman (2009b) used district-level data rather than student-level achievement growth data. They found small but statistically significant differences showing more district-level improvements in mathematics for Career Ladder districts. However, Booker and Glazerman noted the likelihood that results were influenced by confounding variables, namely that districts choose whether to participate in Career Ladder which may indicate characteristics within the district that are otherwise unmeasured. Another limitation of the study the authors acknowledged was the way districts implement career ladder varies considerably district to district making it difficult to make generalizations about Career Ladder districts. To further illustrate this point, some teachers surveyed by Silman and Glazerman (2009) said Career Ladder compensates them for things they are already doing. Based on that premise, one would not expect to find a discernable difference in achievement of students in that district with or without the Career Ladder stipend. Other teachers said that the additional time they spent with students allowed them to

get to know their students better and also that they participated in enrichment activities and professional development that they would not have participated in without Career Ladder.

Funding Performance-Based Compensation

One factor that may be difficult to accurately estimate is the cost associated with implementing and maintaining performance pay systems (Ballou, 2001; *Investing in learning*, 2004; Milanowski, 2003). In addition to the incentives, the administrative cost of managing a performance-based compensation system is not often included when determining cost. Some performance-based compensation systems have been discontinued because of budget constraints or lack of personnel to manage them (Chamberlin et al., 2002). However, some have argued that performance pay does not necessarily have to be all new funding and that current funding may be reallocated (E. A. Hassel & B. C. Hassel, 2007).

Another reason why some performance-based compensation programs may not have been successful is because the programs did not offer sufficient financial incentive (Hanushek, 2007). Substantial gains in achievement may not be seen with lesser incentives (Booker & Glazerman, 2009a; E. A. Hassel & B. C. Hassel, 2007). In November 2005, citizens of Denver voted in favor of a \$24 million tax increase to support ProComp (Goldhaber et al., 2008).

Conclusion

Changing the teacher compensation structure is regularly noted in the larger conversation around comprehensive education reform (Springer & Gardner, 2010). Using financial reward as an incentive to improve teacher effectiveness prompts much debate. While some of the conjecture intuitively makes sense, performance-based compensation programs have not necessarily had the longevity to determine their systemic impact.

As additional performance-based compensation plans are introduced in cities and states throughout the country, the long-term effects will begin to emerge. For now, researchers, reformers, educators, and parents are left to consider potential benefits and drawbacks and to observe best practices in performance-based compensation plans regarded as successful.

References

- Ballou, D. (2001). Pay for performance in public and private schools. *Economics of Education Review*, 20(1), 51-61.
- Ballou, D., Sanders, W., & Wright, P. (2004). Controlling for student background in value-added assessment of teachers. *Journal of Educational and Behavioral Statistics*, 29(1), 37-65.
- Berry, B., Daughtrey, A., & Wieder, A. (2009). *Teaching effectiveness and the conditions that matter most in high needs schools: A policy brief*. Chapel Hill, NC: Center for Teaching Quality.
- Black, R. S., & Howard-Jones, A. (2000). Reflections on best and worst teachers: An experiential perspective of teaching. *Journal of Research and Development in Education*, 34(1), 1-13.
- Booker, K., & Glazerman, S. (2009a). *Effects of the Missouri Career Ladder program on teacher mobility*. Washington, D. C.: Mathematica Policy Research, Inc.
- Booker, K., & Glazerman, S. (2009b). *Does the Missouri teacher Career Ladder program raise student achievement?* Princeton, NJ: Mathematica Policy Research, Inc.
- Chamberlin, R., Wragg, T., Haynes, G., & Wragg, C. (2002). Performance-related pay and the teaching profession: a review of the literature. *Research Papers in Education*, 17(1), 31-49. doi:Article
- Dee, T. S., & Keys, B. J. (2005). Dollars and sense: What a Tennessee experiment tells us about merit pay. *Education Next*, 5(1), 60-63, 65-67.
- Eberts, R., Hollenbeck, K., & Stone, J. (2002). Teacher performance incentives and

- student outcomes. *Journal of Human Resources*, 37(4), 913-27.
- Eckert, J. M., & Dabrowski, J. (2010). Should value-added measures be used for performance pay? *Phi Delta Kappan*, 91(8), 88-92. doi:Article
- Fenstermacher, G. D., & Richardson, V. (2005). On making determinations of quality in teaching. *Teachers College Record*, 107(1), 186-213.
- Gallagher, H. A. (2004). Vaughn Elementary's innovative teacher evaluation system. *Peabody Journal of Education*, 79(4), 79-107.
- Glazerman, S., McKie, A., & Carey, N. (2009). *An evaluation of the Teacher Advancement Program (TAP) in Chicago: Year one impact*. Princeton, NJ: Mathematica Policy Research, Inc.
- Goldhaber, D., & Anthony, E. (2007). Can teacher quality be effectively assessed? National Board Certification as a signal of effective teaching. *The Review of Economics and Statistics*, 89(1), 134-150.
- Goldhaber, D., DeArmond, M., Player, D., & Choi, H. (2008). Why do so few public school districts use merit pay? *Journal of Education Finance*, 33(3), 262-289.
- Goldstein, J. (2009). Designing transparent teacher evaluation: The role of oversight panels for professional accountability. *Teachers College Record*, 111(4), 893-933.
- Gratz, D. G. (2005). Lessons from Denver: The pay for performance pilot. *Phi Delta Kappan*, 86(8), 568.
- Guthrie, J. W. (2005). An "Education Professions Performance Development Act": A prospectus for providing "highly qualified" and more motivated teachers and leaders for America's schools. *Peabody Journal of Education*, 80(3), 6-14.

Hanushek, E. A. (2007). The single salary schedule and other issues of teacher pay.

Peabody Journal of Education, 82(4), 574-586.

Hassel, E. A., & Hassel, B. C. (2007). *Improving teaching through pay for contribution*.

Washington, D. C.: National Governors Association. Retrieved from

<http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED499732>

Heck, R. H. (2009). Teacher effectiveness and student achievement: Investigating a

multilevel cross-classified model. *Journal of Educational Administration*, 47(2), 227-249.

Holt, M. (2001). Performance pay for teachers: The standards movement's last stand?

Phi Delta Kappan, 83(4), 312.

IMPACT (Performance Assessment) - DC Public Schools, Washington, DC. (2010). .

Retrieved September 2, 2010, from

[http://dcps.dc.gov/DCPS/In+the+Classroom/Ensuring+Teacher+Success/IMPACT+\(Performance+Assessment\)](http://dcps.dc.gov/DCPS/In+the+Classroom/Ensuring+Teacher+Success/IMPACT+(Performance+Assessment))

Investing in learning: School funding policies to foster high performance. (2004). . Washington,

D. C.: Committee for Economic Development. Retrieved from

<http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED502292>

Ishii, J., & Rivkin, S. G. (2009). Impediments to the estimation of teacher value added.

Education Finance and Policy, 4(4), 520-536.

Kelley, C., Heneman, III, H., & Milanowski, A. (2002). Teacher motivation and school-

- based performance awards. *Educational Administration Quarterly*, 38(3), 372-401.
- Kellor, E. (2005). Catching up with the Vaughn express: Six years of standards-based teacher evaluation and performance pay. *Education Policy Analysis Archives*, 13(7), 1-26.
- Kimball, S. M., White, B., Milanowski, A., & Borman, G. (2004). Examining the relationship between teacher evaluation and student assessment results in Washoe County. *Peabody Journal of Education*, 79(4), 54-78.
- Koedel, C., & Betts, J. (2010). Value added to what? How a ceiling in the testing instrument influences value-added estimation. *Education Finance and Policy*, 5(1), 54-81.
- Koppich, J. E. (2010). Teacher Unions and New Forms of Teacher Compensation. (Cover story). *Phi Delta Kappan*, 91(8), 22-26. doi:Article
- Kupermintz, H. (2003). Teacher effects and teacher effectiveness: A validity investigation of the Tennessee Value Added Assessment System. *Educational Evaluation and Policy Analysis*, 25(3), 287-298.
- Levačić, R. (2009). Teacher incentives and performance: An application of principal-agent theory. *Oxford Development Studies*, 37(1), 33-46.
- McCaffrey, D. F., Lockwood, J. R., & Koretz, D. (2004). Models for value added modeling of teacher effects. *Journal of Educational and Behavioral Statistics*, 29(1), 67-101.
- McCollum, S. (2001). How merit pay improves education. *Educational Leadership*, 58(5), 21-24.

- Milanowski, A. (2003). The varieties of knowledge and skill-based pay design: A comparison of seven new pay systems for K-12 teachers. *Education Policy Analysis Archives*, 11(4). Retrieved from <http://epaa.asu.edu/ojs/article/viewFile/232/358>
- Minn. Stat 122A.413-415. (2009). . Retrieved from <https://www.revisor.mn.gov/statutes/?id=122A.414#stat.122A.414>
- Morice, L. C., & Murray, J. E. (2003). Compensation and teacher retention: A success story. *Educational Leadership*, 60(8), 40-43.
- Odden, A. (2004). Lessons learned about standards-based teacher evaluation systems. *Peabody Journal of Education*, 79(4), 126-137.
- Player, D. (2010). Nonmonetary compensation in the public teacher labor market. *Education Finance and Policy*, 5(1), 82-103.
- Podgursky, M., & Springer, M. G. (2007). Credentials versus performance: Review of the teacher performance pay research. *Peabody Journal of Education*, 82(4), 551-573.
- Race to the Top - ED.gov Blog. (2010). . Retrieved September 2, 2010, from <http://www.ed.gov/blog/topic/race-to-the-top/>
- Race to the Top Fund. (n.d.). . Retrieved September 7, 2010, from <http://www2.ed.gov/programs/racetothetop/index.html>
- Ritter, G. W., & Jensen, N. C. (2010). The delicate task of developing an attractive merit pay plan for teachers. *Phi Delta Kappan*, 91(8), 32-37. doi:Article
- Rothstein, J. (2008). *Teacher quality in educational production: Tracking, decay, and student achievement* (No. 14442). Cambridge, MA: National Bureau of Economic Research.

- Silman, T., & Glazerman, S. (2009). *Teacher bonuses for extra work: A profile of Missouri's career ladder program*. Princeton, NJ: Mathematica Policy Research, Inc.
- Silva, E. (2008). The Benwood Plan: A lesson in comprehensive teacher reform. *Phi Delta Kappan*, 90(2), 127-134.
- Springer, M. G., & Gardner, C. D. (2010). Teacher pay for performance. *Phi Delta Kappan*, 91(8), 8-15. doi:Article
- Teacher merit pay: What do we know?* (2010). Progress of Education Reform. Education Commission of the States.
- Valli, L., Croninger, R. G., & Walters, K. (2007). Who (else) is the teacher? Cautionary notes on teacher accountability systems. *American Journal of Education*, 113(4), 635-662.
- Walls, R. T., Nardi, A. H., & Von Minden, A. M. (2002). The characteristics of effective and ineffective teachers. *Teacher Education Quarterly*, 29(1), 39-48.
- Weisberg, D., Sexton, S., Mulhern, J., & Keeling, D. (2009). The widget effect: Our national failure to acknowledge and act on differences in teacher effectiveness. *Education Digest*, 75(2), 31-35.

Appendix A

Missouri Teaching Force Profile

Teacher Data 2008-09

Average Teacher Salary Regular Term	\$44,249
Average Teacher Salary (including extended contract, Career Ladder, and extra duty pay)	\$46,089
Average Years of Experience	12.2
% Teachers with a master's degree or higher	53.9
% Teachers with regular certificates (Life, PC I & II, Continuous Professional Certificate, and Provisional Certificate)	96.5

Summary of Career Ladder Activities 2007-08

Number of Districts Participating	341
Activity	% of total
Tutoring	20.50
Professional development	19.17
Other student contact	18.68
Curriculum development	12.25
Parent contact	11.14
Other instructional improvement	10.90
All other	6.24
Mentoring	1.11

Source: Missouri Department of Elementary and Secondary Education

Appendix B

Statutory References for Performance-Based Compensation

Florida⁸ – Fla. Rev. Stat 1012.225

Kentucky – KRS 157.075

Minnesota – Minnesota Revised Statutes 122A.413-414

Texas – Title 19 TAC Section 102.1073

⁸ Florida – April 2010. The Governor vetoed SB 6 which would have made student learning gains count for half of a teacher's evaluation that guides hiring and tenure decisions.