



**Year Two Evaluation of the Achievement Challenge Pilot  
Project in the Little Rock Public School District**

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## **i. Executive Summary**

This report describes the results of an evaluation of the Achievement Challenge Pilot Project (ACPP), a teacher merit pay program in the Little Rock School District which offered substantial year-end bonuses to teachers based on student improvement on standardized exams. The primary focus of this evaluation is the impact of the program on student achievement. We also assess the program's impact on teacher perceptions, attitudes, and behaviors.

Supporters of merit pay in education argue that it encourages teachers to be more innovative, to work harder, and to be more satisfied with their salaries. Supporters believe these changes will result in improved student achievement. Opponents argue that such programs increase negative competition among teachers, negatively affect the school environment, and encourage teachers to neglect low-performing students. Opponents fear that these disadvantages will lead to declining student achievement. Despite the passionate arguments made by supporters and opponents, little is known about the actual impacts of merit pay programs on students or teachers because rigorous evaluations are rare.

To determine whether the ACPP led to improvements in student achievement, we analyzed student data from standardized tests for students in all Little Rock elementary schools from 2004-05 to 2006-07. Next, we examined data from teacher surveys, which were administered to over 300 teachers to evaluate the impacts of merit pay on teacher attitudes and school climate. Finally, we also conducted a series of interviews with teachers in the five ACPP schools.

We conducted a similar study of the first two ACPP schools in the Fall of 2006 and released the results in January 2007. In the year one ACPP evaluation, we found that student achievement in math improved in ACPP schools and teachers were modestly supportive of the program.

The year two evaluation of the ACPP improves upon the year one evaluation in several ways. In particular, the introduction of the ACPP in three new schools in 2006-07 greatly increased the sample of students and teachers exposed to the program. Additionally, the introduction of the Iowa Test of Basic Skills in the 2004-05 school year allowed for three years of consistent student achievement data in three key subject areas – math, language, and reading. Though this year two report draws on more data, the findings are quite similar to those in the year one report.

The following key findings emerged:

1. Based on the student achievement comparisons, students in the three schools where the ACPP began operation in 2006-07 showed an improvement in achievement in multiple subject areas.
  - a. In math, students whose teachers were eligible for bonuses outperformed students in schools whose teachers were not eligible by 3.52 normal curve

equivalent (NCE) points. This differential gain represents a program impact of nearly seven percentile points.

- b. In language, students whose teachers were eligible for bonuses outperformed students whose teachers were not eligible by 4.56 NCE points. This differential gain represents a program impact of nearly nine percentile points.
  - c. In reading, students whose teachers were eligible for bonuses outperformed students whose teachers were not eligible by 3.29 NCE points. This differential gain represents a program impact of nearly six percentile points.
2. Based on the surveys of over 300 Little Rock elementary school teachers and on interviews with faculty in ACPP schools, teachers have mixed feelings about the program.
- a. The data do not indicate that ACPP teachers, in general, are more innovative or work harder, despite the fact that these are two oft-cited potential benefits of merit pay schemes. However, teachers in schools that have participated for multiple years in the ACPP reported being more satisfied with their salaries than their peers in first-year ACPP schools and in comparable nonparticipating schools.
  - b. The data do not indicate that ACPP teachers experience divisive competition, suffer from a negative work environment, or shy away from working with low-performing students – despite the fact that these are three oft-cited potential problems inherent in merit pay schemes.
  - c. Teachers in the three schools implementing merit pay for the first time in 2006-07 highlight some problems with the implementation of the program, which resulted in teacher discontent and decreased program support.
  - d. ACPP teachers, however, did report being more effective teachers than comparison teachers in non-ACPP schools.

## ii. Preface

### A. About the Authors

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## **B. Acknowledgements**

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# I. Introduction

This program evaluation report is an investigation of how the Achievement Challenge Pilot Project (ACPP), a teacher merit pay program in the Little Rock School District, impacted student achievement and teacher perceptions, attitudes, and behaviors. We have organized the report into five sections. First, the introduction explores the history and theory behind merit pay. Second, we present information about the creation and payout plan used within the Achievement Challenge Pilot Project. Third, we present the effects of the program on student achievement. Fourth, we discuss the effects of the program on teacher perceptions, attitudes, and behaviors. Fifth, we offer the program evaluation conclusions.

## A. Background Information on Merit Pay

Supporters of merit pay programs in education argue that such programs encourage teachers to be more innovative, to work harder, and to be more satisfied with their salaries. They believe that these advantages will result in better instruction and improved student achievement. Opponents argue that such programs increase negative competition among teachers, negatively affect the school environment, and encourage teachers to neglect low-performing students. Opponents fear that these disadvantages will lead to poor instruction and declining student achievement. Despite the passionate arguments made by merit pay supporters and opponents alike, little is known about the actual impacts of merit pay programs on students or teachers because rigorous evaluations are rare (Eberts, Hollenbeck, & Stone, 2002; Figlio & Kenny, 2006; Podgursky & Springer, 2006).

Difficulties in assessing merit pay programs fit into two general categories. The first problem deals with available resources. Due to strong opposition from teacher groups and lack of funding, many merit pay programs do not last long enough to gauge actual impacts (Ballou & Podgursky, 1997). Also, the developers of many merit pay programs may be unable to provide a large enough bonus to serve as an incentive, and/or the programs developed are not implemented on a large enough scale to determine impacts (Murnane & Cohen, 1986; Odden, Kellor, Heneman, & Milanowski, 1999).

To determine whether the Little Rock ACPP led to improvements in student achievement, we analyzed student performance data from standardized tests from 2004-05 to 2006-07, which were reported by the district. We also examined teacher survey data, which were obtained during visits by our research team to district schools. The teacher surveys were administered to evaluate whether the existence of a merit pay plan impacts teacher attitudes and school climate. Specifically, we investigated changes in the behaviors and attitudes of teachers with regard to innovation, working harder, salary satisfaction, competition, environment, and teaching focus. As another data source on how the ACPP affected teachers, we conducted a series of interviews with teachers from participating schools. The results of this evaluation provide information for the Little Rock School District, the Arkansas Department of Education, and other state and local policymakers as they consider ways to improve student performance and reward and retain high quality teachers.

## B. Theory Behind Merit Pay

The theory behind merit pay plans suggests that such performance incentive schemes might have both motivational and compositional effects. First of all, proponents contend that the possibility of

earning merit rewards will motivate current teachers to improve the performance of students through additional effort and innovation, where teachers work to learn and implement new effective teaching strategies. Second, merit pay advocates hope that this type of reform will result in an improved composition of the teacher workforce. As the most effective teachers consistently earn the greatest bonuses, a natural selection should occur within the school, whereby more effective teachers remain and less effective teachers leave the field due to a lack of bonuses. As less effective teachers leave the profession, more teachers should begin applying for positions in these schools due to the increased salary potential. These new teachers may be those who would expect to perform well under a merit pay program. Ultimately, administrators would have larger applicant pools from which to select potentially-effective beginning teachers. This process can lead to a systematic change of the teacher workforce.

With these goals in mind, the Little Rock School District and the Public Education Foundation of Little Rock partnered to create the Achievement Challenge Pilot Project (ACPP) at Meadowcliff Elementary School in 2004. The ACPP operated in Meadowcliff in 2004-05 and expanded to Wakefield Elementary in 2005-06. The ACPP further expanded in 2006-07 to include three more elementary schools – Geyer Springs, Mabelvale, and Romine. Thus, in 2006-07, five different Little Rock elementary schools were employing the ACPP performance pay strategy.

## II. Achievement Challenge Pilot Project (ACPP)

In this section, we explain the creation of the Achievement Challenge Pilot Project. Additionally, we show the payouts used within the Project for different schools by year. Finally, we summarize the year one evaluation.

### A. Origins

The Achievement Challenge Pilot Project (ACPP) is a teacher and staff pay-for-performance program that operated within the Little Rock School District (LRSD) for three years since the 2004-05 school year. The purpose of the program is to motivate faculty and staff to bring about greater student achievement gains. The ACPP uses student improvement on nationally-normed standardized tests as the only basis for financial rewards.

The funding for this project has come through a partnership between private foundations and the LRSD. The private foundations which have supported this project are the Hussman Foundation, the Brown Foundation, Inc, and the Walton Family Foundation. In year one, private foundations supported ACPP at Meadowcliff Elementary. In year two, LRSD paid for the program at Meadowcliff, and private foundations shifted their support to a new participant, Wakefield Elementary. In the third year, the LRSD took on Wakefield, and private foundations supported the program at three new participating elementary schools: Geyer Springs, Mabelvale, and Romine.

The five elementary schools were selected to participate in ACPP based on their high percentages of students who were academically struggling and economically disadvantaged.<sup>1</sup> About 70 % of the LRSD students qualify for the federal free and reduced lunch program, and 68 % of the students in the LRSD are African American. The schools participating in the ACPP serve a more disadvantaged group of students, 89 % of whom qualify for the federal free and reduced lunch program and 78 % of whom are African American.

### B. Payouts

The payout procedures differed slightly among different schools and over the years. During the 2004-05 school year, the program was in place in one school, Meadowcliff Elementary. All students in the school took the Stanford Achievement Test in the Fall of 2004 and again in the Spring of 2005. Percentage change scores, based on NCE scores, were computed for each student who took both the Fall and Spring exams. For example, if a student had an NCE score of 50 on the pretest and 55 on the posttest, that student had 10% growth  $[(55-50)/50 = .10 * 100 = 10\%]$ . Teachers were eligible to earn bonuses for each student in their classroom who demonstrated test score achievement gains.

The teacher payout schedule for Meadowcliff included: a \$100 bonus for each student who gained from 0-4%, a \$200 bonus for each student who gained from 5-9%, a \$300 bonus for each student

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<sup>1</sup> The teachers in the five schools that were selected to participate voted to allow the ACPP program to operate in their schools. For the ACPP to be accepted, 50% of the teachers, plus one additional teacher, in a school had to vote in favor of the program. Only these five schools were given the option to participate.

who gained from 10 -14%, and a \$400 bonus for each student who gained over 15%. For example, if 10 students in a Meadowcliff teacher's class gained between 0-4% and 10 gained between 10-14%, that teacher's bonus would be \$4,000 [(10 students\* \$100) + (10 students\*\$300)].

In 2005-06, the ACPP continued at Meadowcliff and expanded to Wakefield Elementary, which began a slightly different bonus payout plan. The primary difference between the two payout plans is that the Meadowcliff plan bases bonuses on the *number of individual students* who achieve growth, whereas the Wakefield plan bases bonuses on the *average growth of each teacher's class*. Wakefield, like Meadowcliff, administered standardized tests in the Fall as the pretest and in the Spring as the posttest to determine achievement gains.

For Wakefield, payouts work as follows: teachers whose students have an average achievement growth between 0-4% earn \$50 times the number of students in their class; teachers whose students have an average achievement growth between 5-9%, earn \$100 times the number of students in their class; teachers whose students have an average achievement growth between 10-14%, earn \$200 times the number of students in their class; teachers whose students have an average achievement growth over 15%, earn \$400 times the number of students in their class. There were limits of \$11,200 for teachers in grades 4-5, \$10,000 for teachers in grades 1-3, and \$8,000 for kindergarten teachers. For example, if a first grade teacher at Wakefield has 20 students and 10 students improve by 10 NCE points and 10 students decline by 10 NCE points, then the class average growth is 0. The teacher receives a bonus of \$1,000 (20 students \* \$50).

Both plans also provided opportunities for bonuses for other staff in the school. Administrators, academic support staff, and all other staff members were eligible to earn bonuses based on average school-wide NCE gains. Different personnel could earn different maximum awards, corresponding to their level of responsibility in the instructional process. For principals, the payouts were: a \$2,500 bonus for a school-wide average gain of 0-4%, a \$5,000 bonus for a school-wide average gain of 5-9%, a \$7,500 bonus for a school-wide average gain of 10-14%, and a \$10,000 bonus for a school-wide average gain of 15% or more. For aides by comparison, the payouts were: a \$250 bonus for a school-wide average gain of 0-4%, a \$500 bonus for a school-wide average gain of 5-9%, a \$750 bonus for a school-wide average gain of 10-14%, and a \$1000 bonus for a school-wide average gain of 15% or more.

For the 2006-07 school year, three more elementary schools – Geyer Springs, Mabelvale, and Romine – joined the ACPP. The year two analysis is focused on the impact of performance-pay for these three schools in particular. Stakeholders at these three new schools adopted the Wakefield payout model. For these schools (and for Wakefield) in 2006-7, the baseline test scores were not the result of pretests given in the Fall. Instead, student achievement changes at these four schools were based on the difference from the 2006 Spring test score (i.e. from the prior school year) to the 2007 Spring test score. Tables 1 and 2 below present the payout amounts by job description in the participating schools.

**Table 1: Payouts for Geyer Springs, Mabelvale, Romine & Wakefield for 2006-07**

Employee Type / Position	0-4 % Growth	5-9 % Growth	10-14 % Growth	15 %+ Growth	Maximum Payout
Principal	\$2,500	\$5,000	\$7,500	\$10,000	\$10,000
Teacher <sup>2</sup> (Grades 4-5)	\$50	\$100	\$200	\$400	\$11,200
Teacher (Grades 1-3)	\$50	\$100	\$200	\$400	\$10,000
Teacher (Kindergarten)	\$50	\$100	\$200	\$400	\$8,000
Coach <sup>3</sup>	\$1,250	\$2,500	\$3,750	\$5,000	\$5,000
Specialist <sup>4</sup>	\$1,000	\$2,000	\$3,000	\$4,000	\$4,000
Music Teacher	\$1,000	\$2,000	\$3,000	\$4,000	\$4,000
Special Education	\$1,000	\$2,000	\$3,000	\$4,000	\$4,000
Physical Examiner	\$500	\$1,000	\$1,500	\$2,000	\$2,000
Aide	\$250	\$500	\$750	\$1,000	\$1,000
Secretary	\$125	\$250	\$375	\$500	\$500
Custodian (full time)	\$125	\$250	\$375	\$500	\$500

**Table 2: Payouts for Meadowcliff Elementary for 2006-07**

Employee Type / Position	0-4 % Growth	5-9 % Growth	10-14 % Growth	15 %+ Growth	Maximum Payout
Principal	\$2,500	\$5,000	\$7,500	\$10,000	\$10,000
Teacher (K-5) <sup>1</sup>	\$100	\$200	\$300	\$400	\$8,000
Specialists	\$1,000	\$2,000	\$3,500	\$5,000	\$5,000
Coaches	\$1,000	\$2,000	\$3,500	\$5,000	\$5,000
Music Teachers	\$1,000	\$2,000	\$3,500	\$5,000	\$5,000
Special Education	\$800	\$1,600	\$2,800	\$4,000	\$4,000
Physical Examiner	\$250	\$500	\$750	\$1,000	\$1,000
Aides	\$250	\$500	\$750	\$1,000	\$1,000
Secretary	\$250	\$500	\$750	\$1,000	\$1,000
Custodian (full time)	\$250	\$500	\$750	\$1,000	\$1,000

In 2004-05 and 2005-06, teachers earned bonuses ranging from \$1,800 to \$9,200 with an average bonus of approximately \$6,000. In 2006-07, however, payouts were lower overall when comparing the amount of total bonuses awarded to each school from 2004-05 to 2006-07. Additionally, in 2006-07, fewer teachers earned bonuses. The reduced bonus amounts and bonus recipients were likely due to the fact that the student achievement scores, which determine payout amounts, were based on changes from Spring to Spring rather than from the previously used method of Fall to

<sup>2</sup> Teacher payouts are on a per-child basis, while all other payouts are for total payouts.

<sup>3</sup> Coaches include literacy, math, and instructional coaches.

<sup>4</sup> Specialists includes math and reading specialists, reading recovery specialists, gifted and talented instructors, library specialists, counselors, and pre-school (4 year old) instructors

Spring change.<sup>5</sup> Table 3 displays the bonuses that were actually earned in the schools over the life of the program.

**Table 3: Summary of ACPP Payouts by Year and School**

School	Year	Total Bonus	Highest Teacher Bonus	Lowest Teacher Bonus (Other Than \$0)	Average Bonus for Teachers who Received Bonus	% of Teachers Receiving Bonus
Meadowcliff	2004-2005	\$134,800	\$8,600	\$1,800	\$5,417	100%
Meadowcliff	2005-2006	\$200,926	\$7,300	\$3,700	\$5,928	93%
Wakefield		\$228,300	\$9,200	\$4,000	\$6,709	100%
Meadowcliff	2006-2007	\$101,535	\$5,100	\$1,100	\$3,153	100%
Wakefield		\$51,716	\$7,600	\$300	\$2,335	48%
Mabelvale		\$39,550	\$6,400	\$450	\$2,111	56%
Geyer Springs		\$64,530	\$7,600	\$350	\$3,105	92%
Romine		\$12,450	\$5,200	\$450	\$2,713	27%

### C. Year 1 Results Recap

The year one ACPP evaluation presented our findings from the investigation of the effects of this merit pay program on student achievement and on teacher perceptions, attitudes, and behaviors in 2005-06. In the year one report, which was released in January 2007, we also analyzed standardized test scores and teacher survey responses. Based on our comparison of students and teachers in the ACPP schools to students and teachers from similar non-ACPP schools in Little Rock, we noted several key findings:

1. Students in schools where the ACPP operated in 2004-05 showed an improvement of 3.5 normal curve equivalent points. For the average student, this gain represents an improvement of nearly 7 percentile points.
2. There are also some differences between teachers at ACPP schools and comparison schools.
  - Teachers in the merit pay program reported that they were no more innovative than comparison teachers.

<sup>5</sup> This distinction in calculating payouts is most evident when viewing the percentage of teachers receiving bonuses in Meadowcliff, where the achievement scores continued to be computed by Fall to Spring differences, compared to other schools. In other words, measuring student gains with a Fall pre-test from the same year rather than with a Spring pre-test from the prior year results in a lower starting point for those using a Fall pre-test. The rationale for the lower Fall pre-test scores is that student generally experience summer learning loss.

- Teachers in the merit pay program reported that they were more satisfied with their salaries than comparison teachers.
- Teachers in the merit pay program reported no more counterproductive competition than comparison teachers.
- Teachers in the merit pay program reported that they were no more likely to work harder than comparison teachers.
- Teachers in the merit pay program reported that their work environment became more positive than comparison teachers.
- Teachers in the merit pay program were less likely than comparison teachers to agree that low-performing students were a burden in the classroom.
- Teachers in the merit pay program were more likely than comparison teachers to report that the academic performance of their students had improved over the past year.

The remainder of this report focuses on the results of the year two evaluation. Section III explains the effect of the program on student achievement. Section IV explains the effects of the program on teacher perceptions, attitudes, and behaviors. Section V concludes the report and provides lessons learned.

### III. Effects on Student Performance

In this section, we explore the impact of the ACPP on student performance. Below, we describe the method employed in the analysis, provide a discussion of the data used within the analysis, and explain the results.

#### A. Student Performance Effect Model

In this section, we determine the impact of the ACPP on student performance. We might determine the impact by simply comparing the mean score of students in the program to the mean score of students not in the program. However, we know other factors influence a student's performance, such as: previous performance, socio-economic status, race, age, school attended, grade, and year tested.

To determine more accurately the effect of the ACPP on student performance, we use an ordinary least squares regression procedure to account separately for all of the factors that are known to affect a student's performance. The model uses data provided by the Little Rock School District's Planning, Research, and Evaluation Department to compare students' math, language, and reading test scores, as reported in Normal Curve Equivalent (NCE) units.<sup>6</sup> The variables incorporated into the model are:

- Each student's Iowa Test of Basic Skills (ITBS) NCE points in math, language, and reading for 2005, 2006, 2007;
- Student level demographic information, including race, socio-economic status, gender, age, and grade level;
- School level demographic data, including percentage of free and/or reduced lunch students, percentage of minority student, and number of students; and
- Type of school attended by student (ACPP or comparison).

The regression models controls for all the variables that are believed to be associated with student performance and includes a treatment variable. The estimate associated with the treatment variable represents the program impact. This regression model has gained widespread use in the social science and education research community and is the most appropriate methodology to respond to our question regarding the effect of the ACPP on student achievement.

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<sup>6</sup> NCEs rank the student on a normal curve compared to a nationally representative group of students who have taken the test. NCEs are similar to percentile scores but differ in that they are equal-interval scaled; this scaling means that the difference between two scores on one part of the curve are equivalent to the difference of a similar interval on another part of the curve. NCE scores are scaled between 1 and 99 with a mean of 50.

## **B. Student Performance Effect Sample**

To estimate the model correctly, we must make decisions regarding which students to include in the dataset. First, we limit the dataset to include only cohorts (defined by grade level) with three years of ITBS test scores. This step is important because we need to have cohorts with both pre- and post-intervention scores. That is, the cohorts must have achievement data from 2004-05, 2005-06, and 2006-07.<sup>7</sup> An important point about this decision is that we excluded students in the schools that began the performance pay program before 2007. In other words, we did not include students in Meadowcliff Elementary and Wakefield Elementary because these students do not have pre-intervention scores to serve as a baseline. The cohorts included in the analyses differ for each of the three subjects due to the testing schedule in Little Rock elementary schools.<sup>8</sup>

- For math, students were administered the ITBS subtest in grades K-5 in each of the three years from 2005-2007; therefore, four math cohorts are included in the analysis.
- For language, only students in grades K, 1, and 2 were administered the ITBS subtest in 2005; therefore, only three language cohorts are included in the analysis.
- For reading, only students in grades 1 and 2 were administered the ITBS subtest in 2005. Therefore, only two reading cohorts are included in the analysis.

Second, students within the cohorts must have two consecutive test scores to be included in the dataset. The regression model controls for prior year test score; therefore, to be included, students must possess 2005 and 2006 scores, 2006 and 2007 scores, or 2005, 2006, and 2007 scores to be included in the analysis. Students excluded in this second step are those who have only one test score and those who only possess 2005 and 2007 scores. Given these requirements, Tables 4, 5, and 6 show the pre-program comparisons between the ACPP and comparison schools with regard to socio-economic status, race, and test scores.

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<sup>7</sup> Hereafter only the Spring year is used to indicate the testing year. For example, the school year 2004-05 will be written as 2005.

<sup>8</sup> The ITBS test measures used in analyses were the Math Total without Computation, the Language Total, and the Reading Total scores.

**Table 4: Descriptive Data for ACPP and Comparison Schools, Math**

Students	Number of Students	% of Free and/or Reduced Lunch Students	% of Minority Students	Average Math NCE Points, 2005	Average Math NCE Points, 2006	Average Math NCE Points, 2007
ACPP	422	88%	94%	39.86	38.57	40.58
Comparison	6,720	63%	72%	49.01	51.15	49.61
<i>Total</i>	<i>7,142</i>	<i>65%</i>	<i>74%</i>	<i>48.47</i>	<i>50.41</i>	<i>48.69</i>

**Table 5: Descriptive Data for ACPP and Comparison Schools, Language**

Students	Number of Students	% of Free and/or Reduced Lunch Students	% of Minority Students	Average Language NCE Points, 2005	Average Language NCE Points, 2006	Average Language NCE Points, 2007
ACPP	402	88%	93%	41.96	40.21	41.54
Comparison	3,853	63%	72%	50.70	50.88	50.25
<i>Total</i>	<i>4,255</i>	<i>65%</i>	<i>74%</i>	<i>49.87</i>	<i>49.88</i>	<i>49.36</i>

**Table 6: Descriptive Data for ACPP and Comparison Schools, Reading**

Students	Number of Students	% of Free and/or Reduced Lunch Students	% of Minority Students	Average Reading NCE Points, 2005	Average Reading NCE Points, 2006	Average Reading NCE Points, 2007
ACPP	255	87%	94%	39.34	40.53	41.71
Comparison	2,565	63%	73%	49.22	51.12	49.44
<i>Total</i>	<i>2,820</i>	<i>65%</i>	<i>75%</i>	<i>48.33</i>	<i>50.16</i>	<i>48.69</i>

## C. Student Performance Results

In each subject we find a statistically significant, positive effect of participation in the performance pay program.<sup>9</sup> The analyses suggest that the performance pay program led to an increase of 3.52 NCE points in math, 3.29 NCE points in reading, and 4.56 NCE points in language (see Table 7). The size of these effects is significant and substantial. In terms of standard deviation units, our results indicate that performance pay increased student proficiency by 0.16 standard deviations in math, 0.15 standard deviations in reading, and 0.22 standard deviation units in language.

**Table 7: Student Impact of ACP Program**

Subject	Treatment Coefficient	t-value	Significant	Estimated Percentile Point Gain
Math	3.52	2.84	Yes***	7
Reading	3.29	2.35	Yes**	6
Language	4.56	2.77	Yes***	9

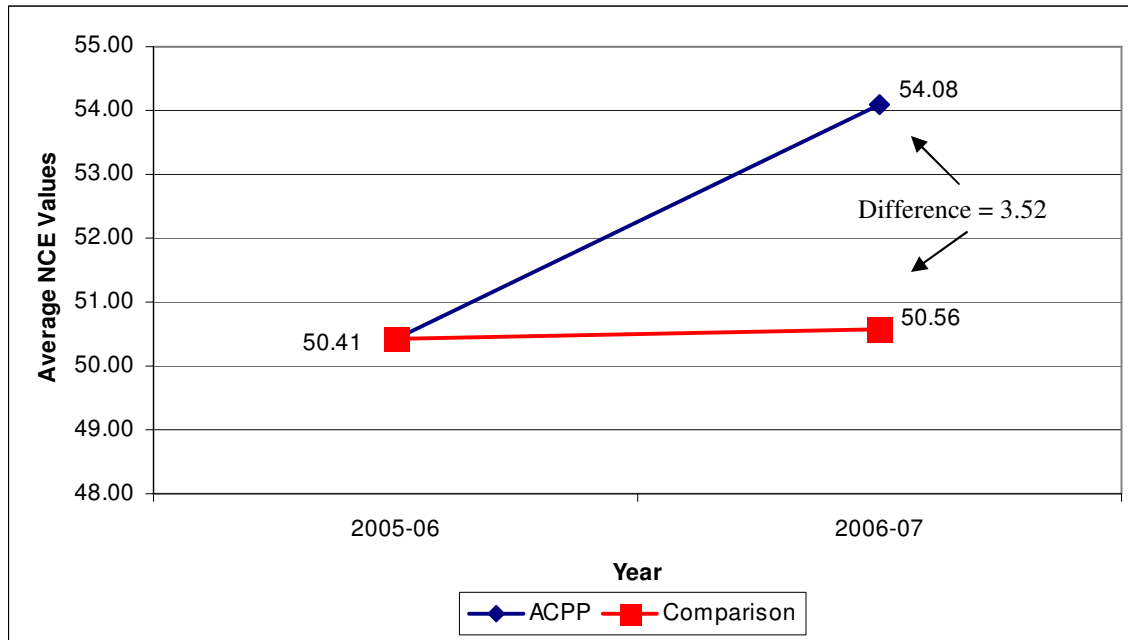
\*\*\*significant at  $p < .01$

\*\*significant at  $p < .05$

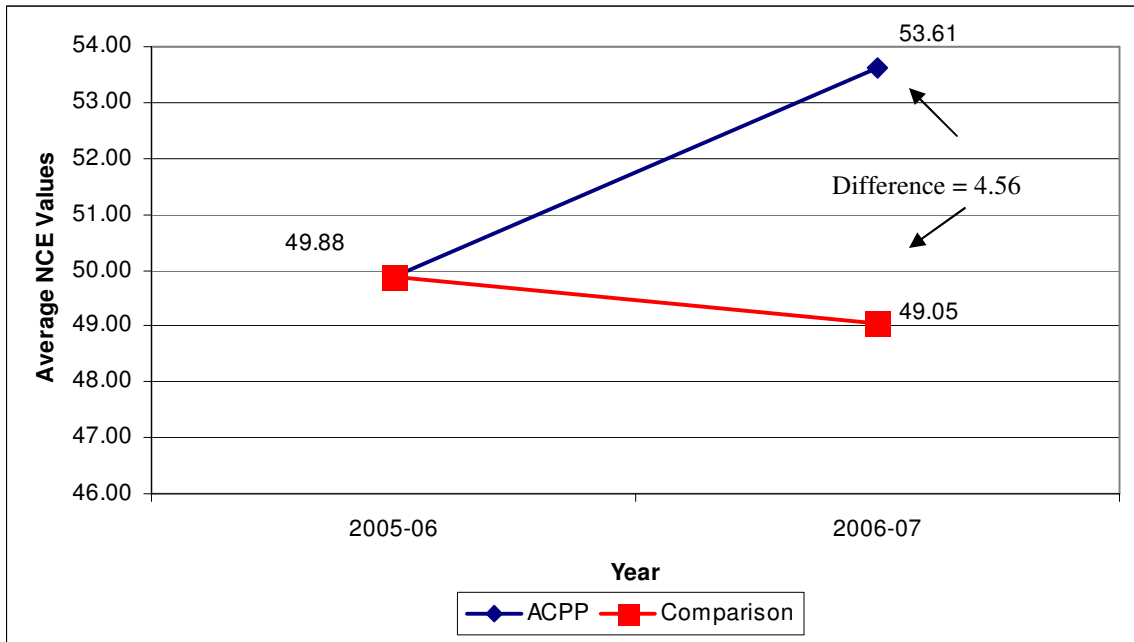
Figures 1, 2, and 3 provide graphical representations of the effect of the program in math, language, and reading, respectively. The 2005-06 score represents the average Little Rock School District student's score, irrespective of ultimate treatment status, prior to implementing the ACP. For example, in Figure 1, the starting point in 2005-06 of 50.41 is the estimated score for the average student in the data set. The top (blue) line that emanates from that starting point represents how this "average" student would have performed if he/she were in an ACP school, and the bottom (red) line shows how this same student would have performed if he/she were in a comparison school. The difference between the projected 2006-07 scores for the average ACP student and the average comparison student is the program effect of 3.52 NCE points in math.

<sup>9</sup> In order to test for student achievement effects, three regression models were employed. The first model, which is explained within the text, indicated the program effect was 3.52 NCE points in math, 3.29 NCE points in language, and 4.56 NCE points in reading. The second model is the same as the first model except it includes a teacher-fixed effect variable. The second model indicated the program effect was 5.23 NCE points in math, 3.05 NCE points in language, and 2.04 NCE points in reading. The third model is also the same as the first except it includes a student-fixed effect variable. The third model indicated the program effect was 6.34 NCE points in math, 2.89 NCE points in reading, and 5.53 NCE points in language. All three models consistently indicate that student performance improved in each subject; however, the first model was selected since it included the most number of students.

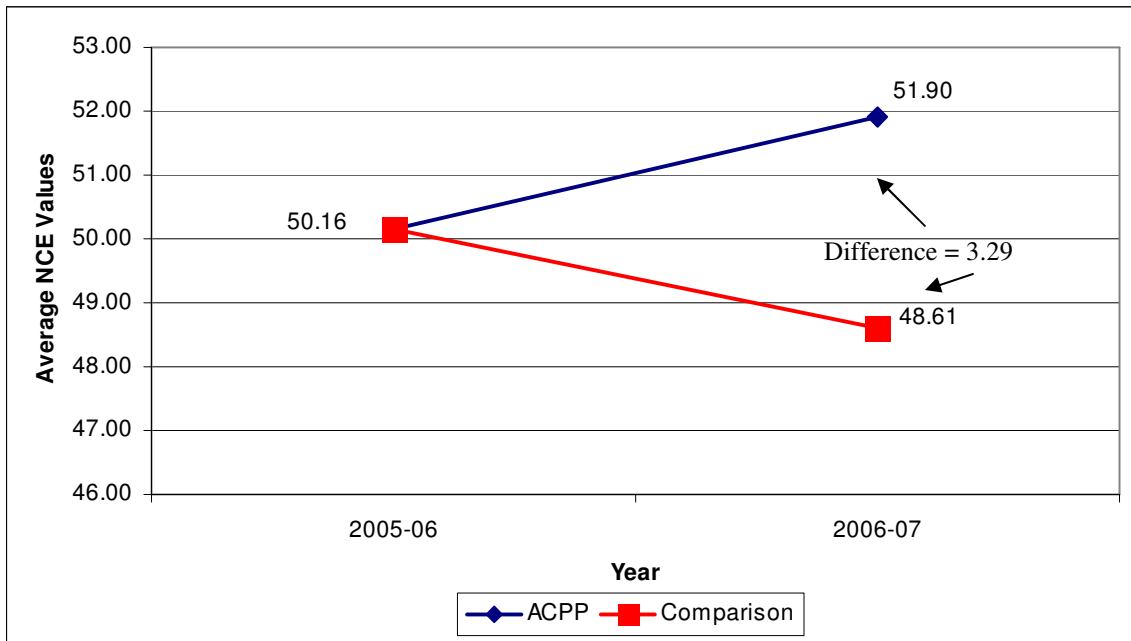
**Figure 1: ACPP and Comparison Student Math Performance, 2006 – 2007**



**Figure 2: ACPP and Comparison Student Language Performance, 2006 – 2007**



**Figure 3: ACPP and Comparison Student Reading Performance, 2006 – 2007**



## **IV. Effects on Teacher Perceptions, Attitudes, and Behaviors**

In this section, we examine the teachers' perceptions of the ACPP. Below, we describe the method employed in the analysis, provide a discussion of the sample used within the analysis, and explain the results.

### **A. Surveys**

To explore the impact of the ACPP on teachers in participating Little Rock elementary schools, we designed a survey to measure teacher attitudes and perceptions regarding their own work effort, work satisfaction, and overall school climate.

Our objective was to examine the extent to which the predictions of merit pay proponents and opponents held true in the ACPP. In particular, we asked teachers to report their views on the following three possible benefits of a merit pay program tying financial bonuses to improved student achievement:

- Teachers would put forth additional effort to foster greater student achievement;
- Teachers would employ innovative teaching methods in an effort to promote greater student achievement; and
- Teachers would be more satisfied with their compensation packages and enjoy recognition for good work.

We also asked teachers to report their views on the following three possible problems associated with a merit pay program, which could negatively impact student achievement:

- Teachers would shy away from useful collaboration with their colleagues because of the competitive environment that a merit pay program would create;
- The overall work environment in the school would suffer because of the stressful and competitive environment that a merit pay program would promote; and
- Teachers would be less willing to work with disadvantaged or low-performing students due to a fear that these students would limit the teachers' opportunities to receive financial awards.

Finally, we asked teachers about their perceptions of their own effectiveness. Surveys were administered to teachers at each school by project evaluators. The survey packet for each teacher included the survey and a letter of informed consent. Survey administration occurred at the end of the school day, generally between 2:45 and 3:30. The survey instrument can be found below in Appendix A.

#### **1. Survey Instrument**

The survey instrument consisted of 32 Likert-type items. Teachers were to respond to a statement by giving their level of agreement on a scale of 1 – 4. The answer “1” corresponded to “Strongly Disagree”, “2” to “Disagree Somewhat”, “3” to “Agree Somewhat”, and “4” to “Strongly Agree”.

Based on these individual items, we developed seven constructs (or themes) that allowed us to assess the legitimacy of the predictions of merit pay proponents and opponents listed above. For clarity, the seven constructs are listed below:

- Construct 1: I am innovative.
- Construct 2: I work hard.
- Construct 3: I am satisfied with my salary.
- Construct 4: My school does not suffer from counterproductive competition among teachers.
- Construct 5: My school has a positive work environment.
- Construct 6: I view low-performing students as a positive challenge.
- Construct 7: I am an effective teacher.

The items that are included in each construct are listed in Appendix B. In the analysis presented in this section, the construct scores are reported as average index scores; the index has a minimum of one and a maximum of four.<sup>10</sup>

## 2. Survey Sample

Five Little Rock elementary schools participated in the ACPP during the 2006-07 school year. Three of those schools – Geyer Springs, Mabelvale, and Romine – were participating for the first time, while the other two schools had already implemented the merit pay program in prior school years (Meadowcliff began in 2004-05 and Wakefield began in 2005-06).

This set of ACPP schools allows us to gauge the impact of the implementation of the merit pay program in three different ways:

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<sup>10</sup> For those interested, we have included scaled scores and standard deviations by survey item in Appendix D and by construct in Appendix E. Second, since the unit of assignment for participation in the treatment – i.e. being a merit pay school – is at the school level, we would presumably have had to compare mean scores of a group of 3 to a group of 7. In doing so, we would lose the benefit of having so many individual teacher responses. The trade-off is over which type of error we were willing to risk. Instead of risking type II error by running the analysis at the school level, we have opted to risk type I error by running the comparisons at the individual teacher level. We were careful to use this level of analysis consistently, even in evaluating pre-treatment equality of our treatment and comparison groups.

In addition to reporting average scores, we created a binary categorization: each survey respondent was coded as being in agreement or disagreement with the construct based on whether his or her index score was above or below the midpoint. These percent agree scores are included in Appendix C. To be scored as “Agree” for data summary tables, a teacher had to have an average index score of 2.5 or higher on a given construct. For example, Construct 1 includes questions 12, 19, 20, 24, 28. If a teacher answered “2”, “3”, “3”, “4”, and “4” on those questions, he or she would average 3.2, and we would record that teacher as “Agree” with Construct 1.

1. We can examine teacher attitudes at the two schools (Meadowcliff and Wakefield) with entrenched merit pay programs as compared to teacher attitudes at the three schools (Geyer Springs, Mabelvale, and Romine) about to embark upon a merit pay program. This comparison is interesting as both sets of teachers have shown themselves to be willing to consider a merit pay plan. The difference in attitudes between these two groups (assessed in Fall 2006 before the three schools began the first ACPP school year) is one way to estimate the effect of the program on teachers.
2. We can examine whether teacher attitudes at the two schools with entrenched merit pay programs (Meadowcliff and Wakefield) persist over time by comparing the attitudes of these same teachers in the Fall of 2006 to their attitudes in the Spring of 2007.
3. We can examine the change in teacher attitudes over the course of the 2006-07 school year at the three schools (Geyer Springs, Mabelvale, and Romine) in their initial ACPP year as compared to the annual change in teacher attitudes at a set of seven similar comparison schools. The comparison group is important here because there may be a natural change in teacher attitudes that occurs over the course of the year. That is, we might expect that teachers have a different attitude in the Fall at the start of the school year than they might have in the Spring at the end of a long year. We do not want to mistake this possible “cyclical” attitudinal change for a change that is due to the implementation of merit pay. Thus, the difference in attitudinal change between these two groups (assessed in Spring 2007, after the three schools completed the first ACPP school year) is one way to judge the impact that the initial implementation of a merit pay plan can have on teacher attitudes.

Teachers in the seven comparison group schools<sup>11</sup> were not in the ACPP and continued to receive compensation based on the standard salary scale. These schools, chosen for their achievement and demographic similarities to the treatment schools, were: Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, and Woodruff.

For the sake of clarity and brevity, for the rest of this section we will refer to the three different groups as:

*Treatment 2* – Meadowcliff and Wakefield

*Treatment 3* – Geyer Springs, Mabelvale, and Romine

*Comparison 7* – Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, and Woodruff

Tables 8 and 9 show that each of the groups used in this analysis are similar with respect to relevant, observable characteristics. Each set of schools served similar student populations with regard to racial composition, income levels, and performance. Interestingly, we do observe differences among the groups with respect to teacher age and experience: teachers in schools that volunteered for the ACPP were younger and less experienced than their peers across the district.

**Table 8: Characteristics of Student Populations by Group for Fall 2006**

Group	Average Enrollment	% FRL	% Minority	% Prof. Math on State Tests	% Prof. Reading on State Tests
Treatment 2	407	91	91	39	32
Treatment 3	322	86	92	31	29
Comparison 7	401	87	92	32	32

(**Treatment 2:** Meadowcliff, Wakefield; **Treatment 3:** Geyer Springs, Romine, Mabelvale; **Comparison 7:** Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, Woodruff)

<sup>11</sup> Selection into the treatment group was voluntary, so it could be that unobservable differences between the treatment and control groups would be responsible for any differences we might observe. In other words, the same unobservable factors that made groups willing to participate in the program may also have driven any differences in attitudes and perspectives. Therefore, so that we would be able to reasonably conclude that any differences in survey responses would be due to the intervention and not preexisting differences in the two groups, we were careful to choose a comparison group from district schools with observable characteristics that most closely approximated those of the treatment group.

**Table 9: Age, Experience, and Education of Classroom Teachers by Group for Fall 2006**

Group	N	Age	Experience	% Masters or better
Treatment 2	35	41	14	26
Treatment 3	50	42	14	31
Comparison 7*	132	47	18	27

(**Treatment 2:** Meadowcliff, Wakefield; **Treatment 3:** Geyer Springs, Romine, Mabelvale; **Comparison 7:** Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, Woodruff, \*Watson not included)

As another measure of pre-treatment equivalence, we also analyzed the potential presence of pre-existing differences between Treatment 3 and Comparison 7 on their stated attitudes toward merit pay. In Table 10 below, we present the mean scores for the two groups by construct.

**Table 10: Pre-Treatment (Fall 2006) Attitudes Comparing Treatment 3 to Comparison 7**

Construct	T3	C7	Difference	t	p
	Mean Score	Mean Score			
1: I am innovative.	2.96	3.07	-0.11	-1.64	0.10
2: I work hard.	3.09	3.26	-0.17	-1.77	0.08
3: I am satisfied with my salary.*	1.88	2.09	-0.21	-2.06	0.04
4: My school does not suffer from negative competition among teachers.*	3.20	3.37	-0.17	-3.12	0.00
5: My school has a positive work environment.	2.57	2.62	-0.05	-0.51	0.61
6: Low-performing students are a good challenge.	2.56	2.49	0.07	0.69	0.49
7: I am an effective teacher.*	2.84	3.07	-0.23	-2.47	0.01

(**Treatment 3:** Geyer Springs, Romine, Mabelvale; **Comparison 7:** Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, Woodruff)

The data in Table 10 indicate that respondents held similar views on four of seven constructs. The two groups of respondents significantly differed on three constructs, and in each case, the comparison respondents reported more positive attitudes.

### 3. Research Questions and Answers

There are three questions that these groupings allow us to ask:

1. Do teachers who have worked in merit pay schools for the entirety of one or two years have different views than their peers in other district schools, who were similarly willing to participate in a merit pay program and who serve similar student populations?

2. Do teachers who have participated in a merit pay program for multiple years maintain their perceptions and attitudes toward the program?
3. Do teachers in schools implementing merit pay for the first time change their views differently over the course of the year than teachers in similar district non-participating schools?

In this section, we report the results of surveys completed in the Fall of 2006 to answer research question 1. To answer question 2, we use results of surveys administered in the Spring of 2007. For question 3, we compare the survey responses of Treatment 3 and Comparison 7 from the Fall of 2006 to their responses from the Spring of 2007.

**Survey Research Question 1:** *Do teachers who have worked in merit pay schools for the entirety of one or two years have different views than their peers in other district schools, who were also willing to participate in a merit pay program and who serve similar student populations?*

To answer this question, we compared Treatment 2 teachers – i.e. those in schools which had participated in merit pay for at least one full year – to Treatment 3 teachers – i.e. those in schools that had only participated in merit pay since the Fall of 2006. The data reported in Table 11 show a comparison of mean scores by construct of teachers by group.

**Table 11: Comparison of Teacher Attitudes in Treatment 2 and Treatment 3 Schools (Fall 2006)**

Construct	T2 Mean Score	T3 Mean Score	Difference	t	p
1: I am innovative.	2.96	2.96	0.00	0.03	0.97
2: I work hard.	3.06	3.09	-0.03	0.27	0.79
3: I am satisfied with my salary.**	2.34	1.88	0.46	-3.47	0.00
4: My school does not suffer from negative competition among teachers.	3.33	3.20	0.13	-1.78	0.08
5: My school has a positive work environment.**	3.04	2.57	0.47	-4.39	0.00
6: Low-performing students are a good challenge.**	3.01	2.56	0.45	-4.06	0.00
7: I am an effective teacher.**	3.25	2.84	0.41	-3.70	0.00

(**Treatment 2:** Meadowcliff, Wakefield; **Treatment 3:** Geyer Springs, Romine, Mabelvale)

For this comparison, Treatment 3 is acting as a baseline for Treatment 2, which is the treatment group of interest. In this comparison, the schools in the Treatment 2 group had participated in merit pay for at least one year. Here, the treatment group (Treatment 2) did not report being any more innovative or working any harder than the control group (Treatment 3). However, the treatment group (Treatment 2) did report being more satisfied with their salary. Thus, on the constructs which

measure three potential advantages often associated with merit pay, the data in this comparison support one advantage.

With regard to the three constructs that measure potential disadvantages often leveled against merit pay, the data do not show that any of these disadvantages hold true. On the final summary question, treatment teachers did report that they perceived themselves as more effective.

**Survey Research Question 2:** *Do teachers who have participated in a merit pay program for multiple years maintain their perceptions and attitudes toward the program?*

**Table 12: Comparison of Early Adopters to Themselves from Fall 2006 to Spring 2007 to Determine if Perceptions and Attitudes Persist over Time**

Construct	T2 Fall Mean Score	T2 Spring Mean Score	Difference	t	p
1: I am innovative.	2.96	2.91	0.05	0.57	0.57
2: I work hard.	3.06	3.15	-0.09	-0.61	0.54
3: I am satisfied with my salary.	2.34	2.44	-0.10	-0.63	0.53
4: My school does not suffer from negative competition among teachers.	3.33	3.35	-0.02	-0.16	0.87
5: My school has a positive work environment.	3.04	2.96	0.08	0.65	0.52
6: Low-performing students are a good challenge.	3.01	2.87	0.14	1.10	0.28
7: I am an effective teacher.	3.25	3.21	0.04	0.32	0.75

(Treatment 2: Meadowcliff, Wakefield)

This comparison between Treatment 2 in the Fall of 2006 and Treatment 2 in the Spring of 2007 shows no difference on any of the seven constructs. This lack of difference reinforces the findings from survey research question 1 above. In other words, the positive gains (Constructs 4-7) that were reported by teachers in Treatment 2 in the Fall of 2006, after participating in the program for at least one year, continued over the course of the second (Wakefield) or third year (Meadowcliff) of participation in the ACP.

**Survey Research Question 3:** *Do teachers in schools implementing merit pay for the first time change their views differently over the course of the year than teachers in similar district non-participating schools?*

To answer this question, we evaluated the survey responses of Treatment 3 and Comparison 7 in Fall of 2006 and then viewed these two groups again in the Spring of 2007. Again, we were looking to see if the three potential positive and negative arguments associated with merit pay proved true.

**Table 13: Fall 2007 Comparison of Treatment 3 and Comparison 7 by Group**

Construct (Fall)	T3	C7	Difference	t	p
	Mean Score	Mean Score			
1: I am innovative.	2.96	3.07	-0.11	-1.64	0.10
2: I work hard.	3.09	3.26	-0.17	-1.77	0.08
3: I am satisfied with my salary.*	1.88	2.09	-0.21	-2.06	0.04
4: My school does not suffer from negative competition among teachers.*	3.20	3.37	-0.17	-3.12	0.00
5: My school has a positive work environment.	2.57	2.62	-0.05	-0.51	0.61
6: Low-performing students are a good challenge.	2.56	2.49	0.07	0.69	0.49
7: I am an effective teacher.*	2.84	3.07	-0.23	-2.47	0.01

(**Treatment 3:** Geyer Springs, Romine, Mabelvale; **Comparison 7:** Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, Woodruff)

**Table 14: Spring 2007 Comparison of Treatment 3 and Comparison 7 by Group**

Construct (Spring)	T3	C7	Difference	t	p
	Mean Score	Mean Score			
1: I am innovative.*	2.73	2.97	-0.24	-3.60	0.00
2: I work hard.*	2.84	3.20	-0.36	-4.30	0.00
3: I am satisfied with my salary.*	1.93	2.18	-0.25	-2.62	0.01
4: My school does not suffer from negative competition among teachers.*	3.13	3.28	-0.15	-2.64	0.01
5: My school has a positive work environment.	2.63	2.61	0.02	0.28	0.78
6: Low-performing students are a good challenge.	2.54	2.58	-0.04	-0.45	0.66
7: I am an effective teacher.	2.91	3.07	-0.16	-1.67	0.10

(**Treatment 3:** Geyer Springs, Romine, Mabelvale; **Comparison 7:** Bale, Rockefeller, Stephens, Washington, Watson, Western Hills, Woodruff)

Tables 13 and 14 above present the mean scores by construct for Treatment 3 and Comparison 7 in the Fall of 2006 and Spring of 2007. Our purpose here was to determine whether the predictions about merit pay proved true. Thus, we interpreted results using a one-tailed test. In other words, for a prediction to hold, the treatment group had to be significantly different from the comparison group and that difference had to indicate a treatment group decline on the constructs that predict a negative result of undertaking merit pay, or it had to indicate a treatment group increase on the constructs that predict a positive result of undertaking merit pay.

In synthesizing these results, we first identified whether the two groups were statistically equivalent in the Fall of 2006. Treatment 3 and Comparison 7 were equivalent on Constructs 1, 2, 5, and 6. When the groups were equivalent, we could more easily draw inferences about program effects by looking at the comparison in the Spring of 2007. A movement to a statistically significant difference in the proper direction would indicate a program effect – or would validate a prediction – when employing our unidirectional decision rule.

Next, we analyzed the constructs on which there was not pre-treatment equivalence between the treatment and comparison groups. Constructs 3, 4, and 7 did not reveal pre-treatment equality. For these constructs, we evaluated whether the two groups maintained their status or whether the gap between them narrowed to such an extent that they were no longer statistically distinguishable. When we observed no change in the status, we determined that there was not a treatment effect. Alternatively, when we observed a statistically-significant narrowing, we inferred a possible treatment effect. The results reported in Table 15 below indicate that none of the predictions regarding positive or negative effects of merit pay proved true in the comparison between Treatment 3 and Comparison 7. The only construct that indicated a change in status was Construct 7, which was concerned with Treatment 3 teachers’ perceptions of their own effectiveness.

**Table 15: Treatment 3 and Comparison 7 Changes from Fall 2006 to Spring 2007**

Construct	Does Construct Hold?	Conclusion Concerning Teachers’ Perceptions of the ACP
1: I am innovative.	No	Is not associated with teachers reporting more innovation.
2: I work hard.	No	Is not associated with teachers reporting working harder.
3: I am satisfied with my salary.	No	Is not associated with teachers reporting greater salary satisfaction.
4: My school does not suffer from negative competition among teachers.	No	Is not associated with teachers reporting more negative competition among themselves.
5: My school has a positive work environment.	No	Is not associated with teachers reporting a less positive work environment.
6: Low-performing students are a good challenge.	No	Is not associated with teachers reporting an increase in viewing low-performing students as a burden.
7: I am an effective teacher.	Yes	May be associated with having teachers feel more effective.

#### 4. Overall Findings of Teacher Survey

In this section, we combine the results from survey research question 1 and survey research question 3. This synthesis of results is particularly informative because it shows how two different treatment groups responded to the first-year implementation of merit pay. In Table 16, Treatment 2 is the treatment group and Treatment 3 is functioning as the comparison group for the Fall 2006 comparison. For the Spring 2007 comparison, Treatment 3 is the treatment group and Comparison 7 is the comparison group. To determine whether predictions held, we applied the same decision rules indicated in section three above.

**Table 16: Treatment and Comparison Groups Teacher Survey Results Regarding Predictions about Outcomes of Adopting Merit Pay**

Predictions Concerning Merit Pay	Does Prediction Hold? T2 v T3 Fall 2006	Does Prediction Hold? T3 v C7 Spring 2007	Conclusion Concerning Teachers' Perceptions of the ACPP in the First Year of Implementation
1: Teachers will report becoming more innovative.	No	No	Is not associated with teachers reporting more innovation.
2: Teachers will report working harder.	No	No	Is not associated with teachers reporting working harder.
3: Teachers will report being more satisfied with my salary.	Yes	No	May be associated with teachers reporting greater salary satisfaction.
4: Teachers will report that counterproductive competition among teachers will increase in the school.	No	No	Is not associated with teachers reporting more counterproductive competition among themselves.
5: Teachers will report that the work environment will become more negative.	No	No	Is not associated with teachers reporting a more negative work environment.
6: Teachers will report an increase in the view that low-performing students are a burden.	No	No	Is not associated with teachers reporting an increase in the view that low-performing students are a burden.
7: Teachers will report being more effective.	Yes	Yes	Tends to be associated with having teachers feel more effective.

These results indicate that teachers do not associate the implementation of merit pay with becoming more innovative, working harder, having a more negative work environment, increased counterproductive competition, or seeing low-performing students as a burden. They do report that merit pay may make them more satisfied with their salary and that merit pay makes them feel more effective.

## B. Interviews

As a follow-up to the survey instrument, we conducted interviews in Fall 2007 with teachers in the ACPP schools in order to gauge their attitudes and perceptions regarding merit pay.<sup>12</sup> The rationale for conducting these interviews was to explore what teachers may have done differently that led to an increase in student achievement and what could have been done to improve the program. Our intent was to use the data from the interviews to complement information gathered from teacher surveys. Although surveys are powerful instruments for collecting information about respondent perceptions, interviews can fill out the picture of a given phenomenon. Thus, building on the information gained from surveys, we asked teachers to elaborate on how the ACPP affected work ethic, innovation, school climate, and compensation.

In the teacher interviews, we also explored several potential disadvantages which have been cited in the literature as arguments against merit pay. These potential problems include the prospect of counterproductive competition, a degraded work environment, and viewing low-performing students as burdensome. Teachers were also asked about their perceptions of their own effectiveness, whether the implementation of merit pay instilled more effective teaching, and if merit pay promotes teacher retention.

### 1. Method

Project evaluators administered voluntary interviews to teachers at each ACPP school. In total, 40 teachers agreed to be interviewed, along with three principals. Table 17 illustrates the number of school personnel interviewed at each school.

**Table 17: Number of Teachers and Principals Interviewed by School**

School	Teachers	Principals
Meadowcliff	8	0
Wakefield	11	1
Romine	4	0
Mabelvale	7	1
Geyer Springs	10	1

<sup>12</sup> Interviews were conducted two months after merit pay bonuses were disbursed, which may have resulted in different teacher responses than were given on the surveys, which were administered prior to teachers receiving bonuses.

The interview protocol for teachers and principals included a letter of informed consent and a detailed explanation of the role of interviews in the project's evaluation. In addition, teachers were informed that their responses would be kept anonymous. The interview instrument can be found below in Appendix F.<sup>13</sup>

Of the 43 school personnel interviewed, 21 were coded as having predominately positive responses, 16 were mostly negative, and six were neutral in their attitudes and perceptions of merit pay. After coding teacher responses, we found that teachers in some schools support the program less than others. It is important to note that teachers and principals were not required to participate in the interview process. Instead, personnel who volunteered were interviewed, which may have led to an unrepresentative sample of responses due to a self-selection bias.

## 2. Results: Teacher Support for ACPP

While responses varied widely, teachers indicated general support for merit pay and the ACPP. The results of the interviews suggest that favorable attitudes toward merit pay eroded somewhat over the course of the school year. Indeed, while all of the ACPP schools had to generate a level of support exceeding 50% plus one vote to participate in the ACPP, the results of our Fall 2007 interviews show a wide range of views concerning merit pay. The possibility that support for the ACPP declined from the original vote in 2006 to Spring 2007 likely stems from how the bonuses were disbursed, and, further, how the specific details of the ACPP were communicated at the school level.

Nevertheless, our interviews suggest that ACPP teachers still generally support merit pay. Of those we interviewed, 15 expressed a positive attitude regarding merit pay, 11 held a negative view, and one teacher had a neutral view. Within the broader question of assessing attitudes toward merit pay, teachers expressed various views as to what they do or do not like about the program. One teacher maintained that merit pay could be an effective way to recruit new, highly-qualified teachers into the field, noting that:

*“I think we could use merit pay to maybe recruit some of the best teachers to work with some of the hardest to teach children.”*

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<sup>13</sup> Following transcription, we organized interviews by construct and subsequently coded them according to whether a given response indicated a positive, negative, or neutral perception. For each construct, we posed a series of sub-questions aimed at gauging specific attitudes. Responses were coded as positive if they adhered to what the literature describes as advocacy for performance pay. For example, when we asked teachers whether merit pay led to more collegiality among faculty, a positive response was noted when a teacher affirmed that indeed, increased collegiality was a byproduct of the ACPP. Within this same construct, a given response was considered positive if it expressed the view that collegiality did not erode as a result of the ACPP's implementation. For instance, we deemed the following response – to the question of whether the program encouraged teachers to innovate more – to be a positive answer: “It caused us to think of other strategies of how we could teach [students]... it was us collaborating as a team.”

Similarly, evaluators considered a response negative when, again, in the case of the collegiality construct, a teacher asserted that collegiality declined as a result of merit pay, as when one teacher claimed, “When that money came around, it's like they pushed you aside and said... ‘You do your thing, I'm doing mine. I'm not sharing with you.’ That's what I saw.”

Finally, responses were deemed to be of a neutral character when teachers expressed contradictory views, ambivalence, or, in a few cases, failed to answer a specific question directly. For instance, when a teacher was asked about her general attitudes regarding merit pay, she responded “I have mixed feelings about it. It all depends on the group of children.” Accordingly, this, and similar responses, were noted by project evaluators as neutral answers.

Another teacher argued that, broadly speaking, merit pay bolstered curriculum:

*“It helps us drive our instruction. And so, it does help. It really does.”*

Of those we interviewed, teachers who held negative views toward merit pay in general argued, among other things, that regardless of design, merit pay is unfair. According to one teacher:

*“I couldn’t work any harder if they offered me a million dollars.”*

Another detractor commented:

*“I thought that was so unfair. And all that we teach is about pride and inclusion and including everyone.”*

During the interviews, however, we drew a distinction between support for merit pay in general, and support for the ACPP specifically. When asked whether respondents initially supported the ACPP, 17 teachers affirmed their support, eight expressed a negative view, and one teacher held a neutral view.

Teacher perceptions toward merit pay and, in particular, how the ACPP unfolded during the course of the school year, differed among schools. Generally, teachers at Meadowcliff and Wakefield elementary maintained a greater level of support than their colleagues at other ACPP schools; Geyer Springs elementary teachers were largely ambivalent about the program; and Romine and Mabelvale teachers were far less inclined to support the ACPP than teachers at other treatment schools.

### 3. Results: Effect on Teacher Attitude and Behaviors

The following section outlines the effect of the ACPP on the attitudes and behaviors of teachers with regard to the often heralded advantages (e.g. increased innovation and increased work ethic) and disadvantages (e.g. negative competition, degraded school climate, and preference for high performing students) of merit pay. We did pose questions to teachers regarding the salary satisfaction and effective teaching constructs; however, responses to these questions proved insufficiently detailed, thus preventing evaluators from accurately gauging teacher sentiments concerning these issues.

#### **Did the ACPP encourage teachers to become more innovative in the classroom?**

To ascertain whether there was a change in their approach to teaching after the inception of the merit pay program, we asked teachers about their teaching styles and techniques. We coded responses as positive if teachers reported that they had employed new teaching styles or techniques or if they had noticed a similar change in other teachers in their school. We coded teacher responses as negative if they reported no change in their teaching approach.

Fifteen of the 43 school personnel interviewed commented on their perceptions about the change in teaching strategies as a result of the merit pay program. Of those 15 teachers, five reported that there

was a noticeable difference in their approach to teaching. A teacher illustrated that point with the following comment:

*“So what we did was...at the end of February, even though it was three months early, we introduced those things so that the top kids had a chance to get a few of those points. And it would not have been as focused an energy before merit pay. I think I can say that truthfully.”*

While there were reports of an increase in more innovative teaching strategies, the majority of the teachers interviewed, ten in total, stated that merit pay had no significant impact on their teaching styles or techniques. Comments made by those teachers include:

*“I have to be honest on this one. I don't really think it's had a whole lot of effect on my teaching.”*

*“As far as a teacher totally changing her teaching style because of it...I didn't see anything like that.”*

### **Did the ACPP encourage teachers to work harder?**

To evaluate whether or not teachers worked harder as a result of the merit pay program, teachers were asked questions about their workload, and the number of hours spent during the week working on school-related tasks. Teacher responses were coded as positive if they reported that they had worked harder after the inception of merit pay, or had noticed other teachers exerting more effort in their teaching practice. Responses were coded as negative if they reported that there was no difference in their amount of effort while the ACPP was in place.

During the interviews, 24 teachers commented on whether they worked harder during the year(s) when the merit pay program was implemented. Responses were mixed, with 13 teachers stating that they had exerted more effort as a result of merit pay, and 10 teachers not noticing any change in teacher behavior (one teacher was neutral in her comments). An example of a positive comment was:

*“I think it challenged the teachers that were struggling with getting their act together. And there are always those. It challenged them to refocus and do a little bit more, a little bit different, a little bit harder to get some growth in those students...because if you think you're going to get a \$10,000 check to start your summer vacation with...then by golly...you're going to bust your buns a little bit harder.”*

Alternatively, one teacher commented:

*“For 28 years I'm here at 6 and I leave...I left last night at 6:30. I can't work any harder. Tell me how I can work harder, tell me. I'm doing 10 hours a day and on the weekend. How can I work harder?”*

### **Did the ACPP lead to counterproductive competition amongst teachers?**

One of the predominant criticisms of merit pay programs is that they lead to divisive, counterproductive competition among teachers. To gauge whether this occurred in ACPP schools, we asked teachers questions about their daily interactions with their colleagues. Statements were coded as positive if teachers reported that merit pay had a positive effect, or no effect at all, on teacher interactions. Responses coded as negative were those where teachers reported that the merit pay program led to competition and conflict among teachers.

Responses from teachers were overwhelmingly positive, as 10 of the 11 commenting teachers reported that the school environment did not become competitive as a result of the merit pay program. Some examples of statements provided by teachers who dismissed the notion that teachers became more competitive include:

*“I don't think the competitiveness came between the teachers. We were not really competitive as much as we're just...we're very supportive of each other.”*

*“It didn't matter if he got more than me or I got more than someone else. It was just the fact that you were receiving something...outside what you typically got for an everyday job.”*

### **Did the ACPP have a negative effect on the climate of the school?**

Teachers were asked several questions during the interview process about the school environment, to determine whether merit pay had a positive or negative effect on the climate of the school. Teacher responses were coded as positive if they responded that the climate of the school had become noticeably more positive, or if there was no environmental change as a result of merit pay. Statements were coded as negative if teachers reported that the climate of the school had become negative or hostile.

A review of teacher statements revealed that 13 of the 22 teachers who commented on the climate of their school felt that the environment had become more negative as a result of merit pay. This was likely attributed to the fact that a large number of teachers did not receive a bonus (see Table 3), even though many of them stated that they were told that everyone in their school would receive something. It should be noted that of the five schools where interviews were conducted, one school in particular had highly negative views, which may have skewed the overall picture of school climate. Some of the comments given by teachers include:

*“Teachers were handling things in their own classrooms. Everybody was happy to be here. And then...the merit pay fiasco. And it's been hell here ever since.”*

*“I mean...it was ugly...it was just constant people mad. The people that didn't get anything were upset, and I don't blame them, especially since we were told that everybody was going to get something.”*

However, seven teachers asserted that merit pay had a positive effect on the environment of the school, resulting in an increase in collaboration and staff morale. One teacher stated:

*“I think everybody was for merit pay. Everyone wanted us to succeed. It was just...it’s all positive. I only have positive things to say.”*

#### **Did the ACPP encourage teachers to work with lower-performing students?**

We also inquired about the perceptions of teachers toward students of varying abilities. Teachers were asked if they felt more inclined to work with low or high performing students, with responses coded as positive if teachers expressed an increased desire to work with low-performing students. Responses were coded as negative if teachers felt that merit pay encouraged working with higher-performing students. Teachers who stated merit pay had no effect on their choice of students were coded as neutral.

Eighteen teachers responded to questions in this construct, with 10 of those responses coded as neutral. Of the remaining eight responses, six were coded as positive, with teachers expressing a strong desire to work with lower-performing students, who would be able to demonstrate a higher level of growth. Examples of teacher comments include:

*“It encouraged me to work hard with my low-level students because...my lower-level students are the ones that made that check so high.”*

*“It gives that push to go ahead and pull that low group extra and help them out, especially in a building like this. Those low kids help you get paid more than the high kids do, because the high kids scored high last year.”*

#### 4. Teacher Recommendations

During interviews, teachers were asked whether they felt the goals of the ACPP were fair and attainable, and if not, what could be done to improve the program. Seventeen teachers responded to the fairness question, with the majority of them (13 negative responses) stating that they believed that the program was, in fact, not fair, specifically the way the program was implemented during the 2006-07 school year. Some of the comments from teachers include:

*“I think it should have been consistent across the board. The rules changed.”*

*“The way we did it the second year, it was just such a letdown. The first year it was more equitable. Last year, it was about as inequitable as I can imagine because more people were hurt.”*

*“I thought [the second year] was so unfair that I as a non-classroom teacher received merit pay when some of the best classroom teachers that I’ve ever experienced or worked with did not receive anything. That was hard.”*

*“I don’t know if it was a lack of understanding, miscommunication, or it was literally changed after we were told that it would be this way, and then it wasn’t done that way. It was done a different way. That caused a lot of conflict.”*

*“For a teacher who has been in the classroom with children all year long not to get a check, but then for support staff who haven’t been in the classroom all year long to get a check, that’s a kick in the mouth.”*

It became apparent during the interviews that teachers felt like the program had changed during the 2006-07 school year. Numerous teachers stated that the way growth was measured was different than the way it was explained to them, and many felt that using tests from the year before was an inaccurate measure of a student’s performance. Several teachers also reported that they had been told that everyone in their school would receive some type of bonus, even if it was just \$50, and when that did not occur, the school climate appeared to become significantly more negative than it was prior to the implementation of the ACPP.

When asked how the ACPP could be improved, several teachers offered suggestions that they felt would make the program more equitable and fair. Some of their comments include:

*“I like the pretesting in the Fall when they [the students] got here. I like the post-testing at the end of the year because that told me how good of a teacher...or what I needed to work on.”*

*“Things need to be consistent. And what someone tells you, that’s what it needs to be based on. And then you could make a decision whether you want to vote for it or against it.”*

*“I believe that no teacher should have gone without a check. That’s how strongly I feel. I’m a literacy coach. If I had to vote for this again, and they gave me a choice of it being all the staff, but there’s a chance that some teachers might not get it because of their whole class performance instead of individual student growth...then I would not vote for it.”*

*“Number one, I would pick a test that would be administered the second week the kids were in school. And then they would be retested the first week in May so that we had a good comparison. As far as the payoff, I think it should be according to individual student growth, not a class.”*

*“Clarifying the testing structure. Pretest, definitely. I think that’s fair.”*

*“I know the teachers are on the front lines. They obviously should receive more. I don’t think you should leave it up to the principals. And as far as the administration of the tests, I would have outside sources come in and do that.”*

*“They [teachers] would have to be in on the planning/making. And you would have the exact same discussion with them...what do you think? What do we want? And they would have to have so much ownership of it.”*

*“Have one set of rules for the entire district. Everything has to be transparent. Our situation wasn’t transparent.”*

## 5. Key Findings from Teacher Interviews

The majority of the teachers interviewed reported that the opportunity to earn a merit pay bonus did not cause them to become more innovative in their teaching approach. However, over half of them did report working harder, which may have had a positive impact on the test scores of their students. The type of students with whom teachers would choose to work was also positively affected by the ACPP, with the majority of teachers (six of eight) stating that they would choose to invest more time and energy on their lower-performing students.

In regards to the climate of the school, more than half of the teachers reported that the school environment had become more negative as a result of merit pay. This was most apparent after bonuses were dispersed, as there was noticeable frustration that teachers received their checks much later than they expected (September as opposed to June). Also, many of the teachers interviewed felt it was unfair that teachers were excluded from receiving a bonus, as they stated that they had been informed that all teachers in their school would receive something. There was also an expectation by teachers that their bonus checks would be larger than what they received, which also may have contributed to their perceptions of a negative school climate. However, it is important to note that teachers did not feel that competition had arisen as a result of merit pay, since the majority of teachers interviewed stated that the level of collegiality among teachers had not become more divisive.

Many of the teachers interviewed also had suggestions about how to make the goals of a merit pay program fair and equitable for all involved in the program, with many of their comments focused on accurate measures of student achievement. Numerous teachers stated that they preferred a pre-test in the Fall and a post-test in the Spring as the best measure of student growth. Teachers also noted that it was important to have a plan that was transparent and clearly explained and that all participating schools be held to the same set of standards. Finally, teachers emphasized that a plan should not be altered once it was put in to place, as the majority of the teachers identified that as one of the major downfalls of the ACPP.

In sum, teachers were initially very supportive of the ACPP. With regard to the impact of the program, teachers expressed mixed feelings. Teachers reported several positives about the ACPP: encourages hard work, does not lead to counterproductive competition, and encourages working with low-performing students. Teachers also reported several negatives about the ACPP: does not encourage innovation, negatively affects the school climate, and was implemented unfairly.

Notwithstanding these mixed results, teachers were also asked if they supported merit pay as a reform, which resulted in another mixed response approximately half supporting and half opposing. Table 18 illustrates teacher responses for all areas addressed during the interview process.

**Table 18: Teacher Responses to Merit Pay and the ACPP**

Question	Positive Responses	Negative Responses	Overall Attitude
Did teachers initially support the ACPP?	17	8	Positive
Did the ACPP encourage teachers to become more innovative in the classroom?	5	10	Negative
Did the ACPP encourage teachers to work harder?	13	10	Positive
Did the ACPP lead to counterproductive competition amongst teachers?	10	1	Positive
Did the ACPP have a negative effect on the climate of the school?	7	13	Negative
Did the ACPP encourage teachers to work with lower-performing students?	6	2	Positive
Did teachers feel that the ACPP was fair during the 2006-07 school year?	4	13	Negative
Did teachers support merit pay as a reform?	15	11	Positive

## V. Conclusions

### A. Did Students Improve?

In the year one program evaluation of the ACPP, we found that math scores for students in Wakefield Elementary improved by roughly six percentile points after the ACPP was implemented. These findings provided some cautious optimism for proponents of merit pay programs but were limited by the small student sample and the fact that only math scores were available for analysis.

The year two evaluation of the ACPP improves upon the year one evaluation in several ways. In particular, the introduction of the ACPP in three new schools in 2006-07 greatly increased the sample of students exposed to the program. Additionally, the introduction of the Iowa Test of Basic Skills in the 2004-05 school year allowed for three years of consistent student achievement data in three key subject areas – math, language, and reading. Though this year two report draws on more data, the findings are quite similar to those in the year one report.

In each subject, we find a statistically significant, positive relationship between the performance pay program and student achievement. The analyses suggest that the performance pay program led to an increase of seven percentile points in math, six percentile points in reading, and nine percentile points in language. The size of these effects is significant and substantial. To put these results into context, the Tennessee Student Teacher Achievement Ratio (STAR) project, which evaluated the effect of reducing class sizes, showed approximately an eight percentile point benefit for students in small classrooms.

### B. Did Teachers Approve?

In the year one program evaluation of the ACPP, we found that the survey responses of teachers in ACPP schools did not confirm generally-anticipated problems, such as the increase of counter-productive competition among teachers. In fact, teachers did express some positive impacts of adopting merit pay that proponents promote. These findings provided some cautious optimism for proponents of merit pay programs but were limited by the fact that the study's sample of ACPP teachers was relatively small. That is, only two schools were included in the treatment group. The first year evaluation was also limited by the lack of pre-program data from the teachers.

An improvement upon the year one survey portion of the ACPP program evaluation, the year two survey of teacher attitudes, perceptions, and behaviors included two levels of comparison. In this year two report, five treatment schools are included. In the first comparison, for which we used the Fall 2006 surveys, Treatment 2 (Meadowcliff and Wakefield) was the treatment group and Treatment 3 (Romine, Mabelvale, and Geyer Springs) functioned as the comparison group. This comparison reveals how merit pay may impact teacher attitudes after at least one full year of program implementation. This comparison was particularly informative because teachers in both sets of schools volunteered for the ACPP. For the Spring 2007 comparison, Treatment 3 was the treatment group and Comparison 7 (a collection of district schools with similar demographic and achievement characteristics) was the comparison group. This comparison indicates teacher attitudes toward the end of the first year of implementation.

The overall conclusion to be drawn from the complete survey analyses from both years is that teachers do not associate the implementation of merit pay with becoming more innovative, with working harder, with having a more negative work environment, with increased counterproductive competition, or with seeing low-performing students as a burden. They do report that merit pay may make them more satisfied with their salary and that merit pay makes them feel more effective.

To further investigate these findings, we also conducted interviews with teachers in participating schools. The interviews partially confirmed the findings of the surveys. In particular, we found that teachers felt that the program encourages hard work, does not lead to counterproductive competition, and encourages working with low-performing students. On the other hand, teachers also reported several negatives about the ACPP; they state that the ACPP does not encourage innovation, may negatively affect school climate, and was implemented unfairly in some schools.

Based on a synthesis of results from the teacher surveys and from the teacher interviews, we conclude that teachers generally supported the ACPP. Further, when implemented fairly in teachers' views, the ACPP does not harm the school environment. If anything, the program may lead to greater salary satisfaction and a greater sense of effectiveness.

## **C. Lessons Learned**

Based on the year one and year two evaluations of the Achievement Challenge Pilot Project, we derive five key lessons regarding the design and implementation of merit pay programs.

**Lesson 1:** Program designers would benefit from considering several positive elements of the ACPP. Four factors in the ACPP design that effectively addressed often-cited pitfalls of merit pay schemes are:

1. Simplicity of design,
2. A payout scheme that is not a “zero-sum” game,
3. Dollar awards that are significant, and
4. A focus on growth in student performance.

First, the decision to make the payout scheme simple – based entirely on growth in student test scores – was helpful. This stands in contrast to other merit pay schemes which attempt to include a wide variety of factors including student performance, teacher evaluations, principal evaluations, and other inputs.

Second, the decision to allow for all teachers to obtain a maximum award, rather than having teachers compete against one another, likely influenced the lack of counterproductive competition observed by the teachers. Indeed, the competition for merit awards was not a “zero-sum” game in which one teacher's financial gain necessarily resulted in a loss for a colleague.

Third, the significant amount of dollars teachers could earn through the improvement of their students is unique to the ACPP, where teachers could earn up to nearly \$10,000. This is very

important as the goal of the intervention is to influence the behavior of teachers for an entire year; it is simply not likely that a small dollar amount could have such an influence.

Fourth, the decision to base the entire bonus on student improvement in test scores rather than on the absolute level of student test scores focused all energies within the school on improving student achievement. Further, this focus on growth addresses possible “gaming” of the system whereby teachers would focus their efforts only on a few high-achieving students and ignore other students. The ACPD payout scheme encourages a focus on all students as each student contributes equally to a teacher’s merit rating.

**Lesson 2:** Program designers should clearly articulate the parameters of the program to the participants.

The most notable concern voiced by teachers – particularly those in the three schools initially implementing the ACPD in 2006-07 – was that they felt the parameters of the ACPD had not been clearly explained prior to the start of the program. As such, there was a great amount of confusion in calculating student growth, determining payouts, and selecting who would receive a bonus. It became apparent that sustaining a merit pay program hinges on teacher support, which is more likely to occur when the teachers are fully informed about the nature of the program.

**Lesson 3:** Program designers should pay careful attention to teacher expectations.

The expectations of teachers play a significant role in the level of teacher satisfaction and in their support for the merit pay program. For instance, many of the teachers noted that they expected to receive a bonus similar to the amount that was distributed to teachers at Meadowcliff and Wakefield in the first and second years. When that did not occur after the 2006-07 school year, many teachers were extremely angry about the disparity in the bonus amounts, resulting in a school climate that became increasingly more negative than the previous school year. Several teachers also stated that they were under the impression that all teachers in the ACPD would receive some type of bonus, even if it was just \$50. However, the goals set forth by program designers did not entail disbursing bonuses to all participants; as such, the gulf between what teachers expected out of the ACPD and what actually occurred appeared to erode confidence in its overall fairness.

When asked for suggestions about how the program could be better implemented, a number of teachers expressed a need for the teachers to be a part of the development process in order to increase the level of teacher support. As one teacher noted:

*“I think the perception is that so much was done behind closed doors. So, therefore, if you do not include those people in the initial development plan, and get them to buy into it, then you've already got a problem because it appears secret. It looks like a back-door policy to them...just because they weren't a part of it. So that would be part of it. I think more teachers need to be involved in the development of it.”*

**Lesson 4:** Program designers should be careful when allowing for program variation or when allowing program modification.

A number of teachers also stated that once the rules and parameters of a program are agreed upon, they should remain consistent and unchanged throughout the duration of the program. Several teachers stated that they had been given one description of the rules prior to their vote to support the program, and then were told something entirely different midway through the 2006-07 school year. Teachers also expressed frustration about some schools in the program being evaluated differently than others, namely the way by which Meadowcliff measured student growth. Both of these inconsistencies had a significantly negative effect on the level of teacher support, which ultimately hindered the continuation of the program.

**Lesson 5:** It is critically important that program designers have clear communication with teachers involved in program.

Many of the problems highlighted in this section could have been avoided with better communication between program staff and participating teachers. For example, there were good reasons for some of the modifications that occurred during the life of the ACPP, but these justifications were simply not relayed to the teachers. In fact, teachers in the three schools implementing merit pay for the first time in 2006-07 highlighted how problems with the implementation and dissemination of accurate information resulted in teacher discontent and decreased program support

## **D. Future of Merit Pay**

We might expect that the improved student achievement found in this evaluation should lead to program support by members of the educational community. However, some participants expressed reservations about the program. As such, future performance pay models might avoid the implementation pitfalls encountered in Little Rock by emphasizing transparency and a uniform manner of communication from the district level to individual schools and teachers.

Notwithstanding the implementation issues in the ACPP, policymakers, education officials, and educators should be encouraged by the improved student performance. Indeed, perhaps the key finding from this year two evaluation, which echoes the finding of the year one evaluation, is that student achievement substantially increased in math, language, and reading.

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