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THE BENWOOD PLAN:

A Lesson in Comprehensive Teacher Reform

By Elena Silva

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Hamilton County, Tennessee, is home to one of the nation's most widely touted school reform success stories. Beginning in 2001, eight low-performing elementary schools began an ambitious upward trek.¹ With \$5 million from the Chattanooga-based Benwood Foundation and funding from several other local organizations, school and community officials launched an intensive teacher-centered campaign to reform the inner-city Chattanooga schools. The effort, now known as the “Benwood Initiative,” drastically improved student achievement, and education observers took notice. Former U.S. Secretary of Education Rod Paige cited Benwood's success in his 2003 annual report to Congress. And national media outlets have trumpeted the Benwood story since, including the *Washington Post*, *Reader's Digest*, and *Education Week*.²

Most of these accolades have focused on a distinct approach to improving teaching in low-performing schools. In short: get better teachers. To some extent, this is what happened. School district officials reconstituted the faculties of the Benwood schools, requiring teachers to reapply for their jobs and hiring replacements for those who didn't make the cut. Community officials established financial incentives to attract new talent, including free graduate school tuition, mortgage loans, and performance bonuses. The press, policymakers, and education organizations have pointed to these incentives as the source of Benwood's success. “They're offering cold cash ... and they're getting results,” declared the *Dallas Morning News* in 2003.³ Two years later, Arizona Senator Jon Kyl cited Benwood's “incentive package” as evidence of the wisdom of merit pay for teachers.⁴ And more recently, the Education Commission of the States and the national Working Group on Teaching Quality praised Benwood's teacher compensation initiatives.⁵

But the arguments that these initiatives brought a flood of new and better teachers into the schools' classrooms have been overstated. Most of the teachers who reapplied for their jobs were hired back, and less than 20 of the 300 teachers in the Benwood schools received bonuses in the first year of the much-touted financial-incentive plan.⁶

Benwood's success has had at least as much to do with a second, equally important teacher-reform strategy: helping teachers improve the quality of their instruction. A new analysis of “value-added” teacher effectiveness data conducted for this report indicates that over a period of six years, existing teachers in the eight Benwood elementary schools improved steadily. Before the Benwood Initiative kicked off, they were far less effective than their peers elsewhere in the Hamilton County district. By 2006, a group of mostly the same teachers had surpassed the district average.

This improvement was by design. The Benwood Initiative was about much more than pay incentives and reconstitution; the district invested heavily in mentoring programs to train teachers, in additional staff to support curriculum and instruction, and in stronger and more collaborative leadership at the school level. At the same time, the Benwood Initiative was buoyed by better labor-management relations and a host of other reform efforts at the district level.

These findings have implications for other districts looking to turn around low-performing schools—of which there are many in the era of the federal No Child Left Behind Act (NCLB). There is no doubt that disadvantaged students are disproportionately likely in American education to be taught by less experienced, less qualified, less effective

teachers. Given the strong relationship between teacher quality and student learning, this disparity is one of the reasons that schools like the pre-reform Benwood eight do so poorly. But solving that problem is not only a matter of playing the politically treacherous zero-sum game of redistributing teachers from one school to another.

As the Benwood Initiative demonstrates, individual teacher effectiveness is not a fixed trait. School systems can take many steps, as Hamilton County has, to improve teachers' work in classrooms.

A Reason for Reform

The impetus for change in Hamilton County began in the late 1990s when the county school system officially merged with the Chattanooga city system. The county's schools were scoring in the 90th percentile on state tests, and the district had no pressing need to improve its stable and successful teaching force. But, when the two systems merged in 1997, the city of Chattanooga became, like many other urban centers, the poorer "doughnut hole" of an otherwise middle-class suburban district.⁷ And the newly consolidated Hamilton County district was faced with the challenge of serving the entire community—rich and poor, black and white, high-performing and low-performing.

The extent of this challenge became clear when the state of Tennessee released student achievement results two years after the merger. Hamilton County officials anticipated lower scores. But they did not expect eight of the district's elementary schools—all located in central Chattanooga—to be ranked among Tennessee's 20 worst schools. An independent research institute developed the rankings, which included all 890 public elementary schools in the state, and based them on the average scores from the state's standardized achievement test. Hamilton County's then-Superintendent Jesse Register and other city and county leaders were appalled. If the district needed a focus for its reform, this group of schools—with only 11 percent of its mostly poor and African-American student population reading at grade level—was it.

The Benwood Foundation teamed up with the Chattanooga-Hamilton County Public Education Foundation (PEF) to adopt the failing schools. PEF added \$2.5 million to Benwood's \$5 million, and together they set an ambitious goal: get 100 percent of the schools'

third-graders reading at or above grade level by 2007. Although the goal remains unmet, the Benwood schools have posted impressive gains, increasing the number of third-graders scoring proficient or above on the state reading test from 53 percent to 80 percent in the last five years. (See sidebar on Page 3.) In 2007, all but one of the eight Benwood schools earned A's in reading/language and math on a state report card, indicating exceptional progress in student growth.⁸ And the Hamilton County school system met Tennessee's standards under NCLB in 2007, removing it from the state's list of high-priority districts for the first time since 2003.⁹

The Benwood Initiative was decidedly teacher-centered from the start, in part due to the district's awareness of its failure to ensure that quality teachers were distributed equitably throughout the county. A 2000 study by the district and the PEF documented the inequities in the distribution as well as the retention of high-performing teachers throughout Hamilton County. The predominantly low-income, African-American student population of Chattanooga had by far the fewest qualified teachers and the highest teacher turnover.¹⁰ Register described a "revolving door" of teachers and a "culture crisis" in these schools. "There were plenty of things we could have focused on," says Register. "But nothing mattered more than getting strong leaders in those schools and good teachers in front of those kids."¹¹

For the next six years, from 2001 to 2007, the district and its community partners, including the local teachers union and business and philanthropy leaders, implemented a series of reforms aimed at tackling the teacher problem in these elementary schools. It was clearly an ambitious undertaking. So troubled were the Benwood schools that one Hamilton County resident was quoted in the *Chattanooga Times Free Press* as saying, "[The] Benwood Foundation would be better off making a huge bonfire with that \$5 million instead of giving it to those elementary schools. At least [then], the community would get a few minutes of heat and light."¹² Surveys of central office staff and school leaders highlighted extremely poor staff morale and a negative school culture that seemed to doom the eight schools.

System Shock

Register quickly moved to reconstitute the schools' teaching staffs. He dismissed every one of the more

than 300 teachers in the Benwood schools at the end of the 2001–02 school year and told them they had to reapply for their jobs for the following school year. Some teachers bristled at the idea, calling it “demoralizing.”¹³ But many of the teachers who reapplied for their positions and stayed agreed the staff turnover was necessary. We needed to “weed out the poison,” one teacher went so far as to say.¹⁴ Stephanie Spencer, who directed the Benwood Initiative for the PEF between 2001 and 2005, lauds the reconstitution effort. “Turning around these schools meant building a better staff,” says Spencer, who is now the principal of a Maryland elementary school. “We were all about recruiting, training, and keeping the best ones we could. ... This was the best kind of teacher turnover, [it was done] for all the right reasons.”¹⁵

Register also credits the financial incentives plan, launched by then-Chattanooga Mayor Bob Corker, with changing the community’s attitude toward these poorer, central city schools. Corker, who is now a U.S. senator, established the Community Education Alliance, an advisory group of a dozen local business leaders. The group created the high-profile array of incentives for Benwood teachers, including mortgage loans, a tuition-free master’s degree, and, most notably, pay bonuses of up to \$5,000 for teachers who demonstrated student gains. Mayoral attention helped to precipitate change, Register says, and “sent a strong signal to the entire community that these weren’t second-class jobs, that we valued these schools and these teachers.”

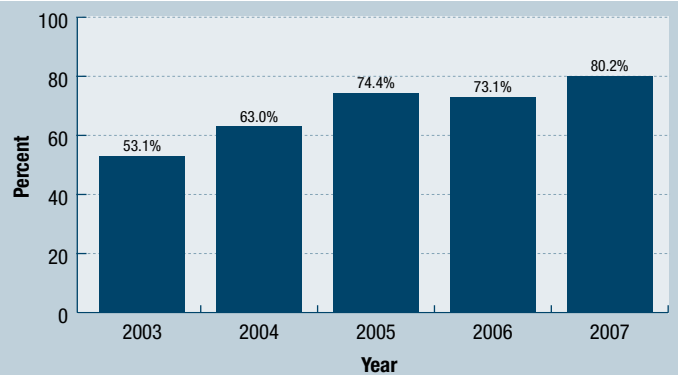
Despite support from the local teachers union, the Hamilton County Education Association, the reconstitution and accompanying incentives were controversial.¹⁶ Bolstered by local media accounts that cast the staff overhaul as a tale of teacher redistribution, suburban parents, in particular, feared that the worst teachers would be sent to the surrounding suburban schools, and the best teachers would be recruited with financial incentives to teach in the Benwood schools. In fact, Register did ask suburban principals to take on ineffective teachers, a move that school board member Rhonda Thurman spoke out against, saying, “If a teacher isn’t good enough for one set of students, we should fire that teacher altogether rather than ship her off to another school.”¹⁷

But the dreaded “Hamilton County shuffle,” as one former principal described it, was not much to speak of for the actual number of teachers involved.¹⁸ Of the roughly 300 teachers who had to reapply for their jobs, more than

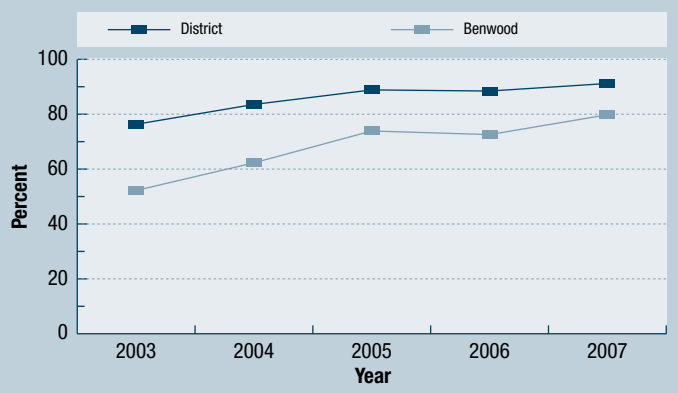
Measures of Success

The Benwood Foundation and the Public Education Foundation set a high bar when they teamed up with Hamilton County educators to make a difference in the county’s lowest-performing schools: get 100 percent of third-graders reading at or above grade level by 2007. Today, that goal remains unmet, but the Benwood schools have posted significant gains. From 2003 to 2007, the number of third-graders scoring proficient or advanced on state reading tests increased by 26.9 percent. At the same time, the gap between Benwood schools and the district average has narrowed.

Benwood Third-Graders Scoring Proficient or Advanced in Reading, 2003–2007



District and Benwood Third-Graders Scoring Proficient or Advanced in Reading, 2003–2007



Source: Public Education Foundation, available online at www.pefchattanooga.org.

two-thirds were re-hired at Benwood schools. Despite all of the media coverage of city-suburban teacher swaps, most of the teachers who left Benwood schools retired, left for another district, or were reassigned within the city limits. Only a handful of city teachers were distributed out to suburban schools, and only a few more than that were drawn from the outer suburbs of Hamilton County to the inner city.

To be sure, the teacher incentive plan created a lot of buzz. And with teachers making an average salary of \$39,000 in Hamilton County, these financial incentives were certainly a selling point.¹⁹ But the argument that these perks brought a flood of new and better teachers immediately into the system has been overstated. Just 16 of the more than 300 teachers in Benwood schools received bonuses in the first year of the financial incentive plan.²⁰ In the years that followed, as teachers continued to steadily improve, the number of teachers receiving pay bonuses more than doubled.

The Teacher Effect

School reformers in Tennessee looking to improve teacher effectiveness have a unique asset: the state’s nationally recognized system for assessing the effectiveness of districts, schools, and teachers. The Tennessee Value-Added Assessment Systems (TVAAS) was developed in the early 1990s by a University of Tennessee statistics professor named William Sanders. TVAAS is a statistically complicated system, but its purpose is fairly straightforward: It provides a way of isolating the impact of classroom instruction on year-to-year growth in student achievement.²¹ With TVAAS, the state and its districts can assess how effective a given teacher, school or district is in improving standardized test scores from the previous year.²²

The performance bonuses for Benwood teachers are based, in part, on value-added scores. In schools with value-added scores that demonstrate gains beyond expected outcomes, individual teachers can earn bonuses of up to \$2,000. Individual Benwood teachers with teacher value-added scores that demonstrate student growth are eligible for a \$5,000 bonus each year.²³

Until now there have been no analyses of teacher TVAAS data for Hamilton County.²⁴ For this analysis, Sanders, who now leads value-added assessment and research for the Statistical Analysis Software (SAS) Institute, and his colleague Paul Wright used TVAAS indicators for 563 fourth- and fifth-grade math teachers in Hamilton County to compare the effectiveness of teachers in Benwood schools and teachers in non-Benwood schools from 2000 to 2006.²⁵ (See Figure 1.)

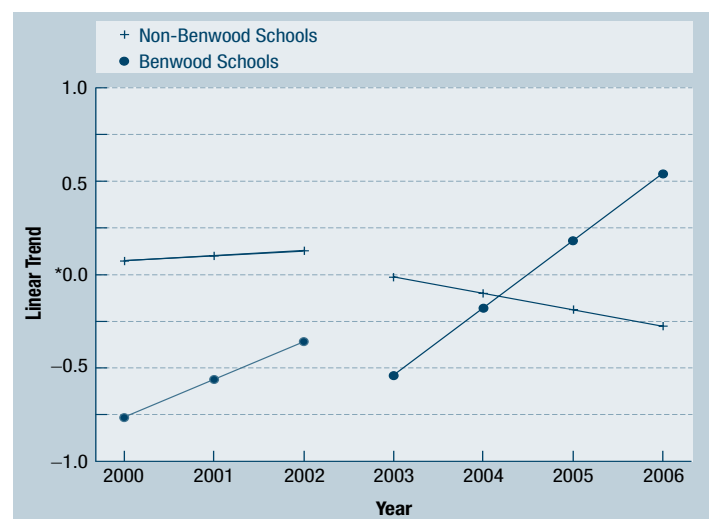
The analysis shows that the effectiveness of Benwood teachers was notably below average for the county from

2000 to 2004.²⁶ This is not unexpected given that these schools were designated among the lowest-performing in the state in 1999. Nor is it surprising that, during these early years, teachers in these eight low-performing elementary schools would be less effective than their peers in other higher-performing district elementary schools.

But Benwood teachers improved significantly over the next six years, moving to above-average effectiveness by 2005. Because only teachers with three consecutive years of tenure in Benwood schools are included in Figure 1, teachers who came to the schools through the 2003 reconstitution and pay incentive initiatives are only represented in the 2006 results, which simply continue the longer-term trend. For the most part, Figure 1 shows not how newer, better teachers came to the Benwood schools, but how existing Benwood teachers became significantly more effective over time.²⁷

Figure 1 also shows that while teacher effectiveness in Benwood schools was steadily improving, in non-Benwood schools teacher effectiveness remained flat. (The slightly negative trend from 2003–2006 is not statistically significant.) Thus, after just two years into the Benwood reforms, in the 2004–05 school year, the effectiveness of Benwood teachers reached that of the non-Benwood schools.

Figure 1. Value-Added Trends of Fourth- and Fifth-Grade Math Teachers in Hamilton County, 2000–2006



Source: Special analysis conducted by William Sanders and Paul Wright, SAS Institute, Inc.

*Zero represents the average performance for Hamilton County teachers.

While Benwood teachers would be expected to be below average and show some improvement, the rate of that improvement is striking. The continued upward trend for Benwood schools shows a pattern of improvement that surpasses that of the other district elementary schools. The analysis also shows that the upward improvement trend for Benwood teachers is evident both *before and after* 2002–2003, when the Benwood funding began flowing and both the reconstitution and the bonus pay plans were instituted.²⁸

What the Sanders analysis of Hamilton County teachers reveals is that while attracting new teachers helped, the improvement in the Benwood schools turns out to be in large part a function of other reforms, especially the many steps Hamilton County officials took to improve the performance of existing Benwood teachers.²⁹ Register, architect of the school reconstitution and supporter of the pay initiative, is the first to make this distinction. “Everyone wants to talk about the pay plan,” Register says. “And people did receive it, and it did change community attitude toward these schools. But it was one piece of a bigger puzzle. We did all of these other things too.”

All the Other Things

The reforms to which Register refers began with the tough and controversial merger of the city and county districts in 1997, which opened the door for unlikely, yet significant partnerships. In the years before Register’s arrival and the Benwood Initiative, the relationship between the district and the union was deeply adversarial, recounted in a recent report by the National Commission on Teaching and America’s Future.³⁰ One of the report’s authors, Rhonda Catanzaro of the Tennessee Education Association, says the merger of two very different systems fueled mistrust and misunderstanding between the district and union.

Gerry Dowler of the Hamilton County Education Association confirms the report’s observations. “[Register] was surprised by the influence that the unions carried,” says Dowler. “It’s not like North Carolina [where Register worked previously]. He thought he could come in and just change the [teacher] transfer policy.”³¹ But, as Dowler explains, Register moved toward nurturing a more collaborative relationship between the district and union.

By 2001, the union and the district had made enormous strides, jointly developing a strategic plan for the district and negotiating a new contract with pivotal changes to teacher policy, including a revised teacher transfer policy with a renegotiated hiring timeline for teachers. The new hiring timeline would later make it easier for low-performing schools (like the Benwood schools) to recruit and hire better teachers. The new contract also gave the green light for Corker’s bonus pay plan for Benwood teachers.

All of this would have mattered far less without a strong district commitment to quality instruction. Even before the Benwood Initiative, the district began experimenting with a pilot project to improve literacy instruction at Calvin Donaldson Elementary, one of the Benwood schools. The “Donaldson model,” which would later be expanded to other Benwood schools, added an assistant principal to the school and required both new and existing assistant principals to spend at least 50 percent of their time monitoring and supporting academics. It also added a reading specialist to help teachers improve their literacy instruction.

An infusion of outside funding, prompted originally by the merger of a stable suburban school system with a struggling urban district, paid for a number of other initiatives. The Carnegie Corporation of New York and the Bill & Melinda Gates Foundation contributed \$8 million to improve the district’s high schools.³² The NEA Foundation supported middle school reform. And the Annenberg Foundation funded a systemwide leadership initiative designed to improve existing principals and to develop a pipeline for new principals.

In addition to the Benwood Foundation and PEF contributions, the Weldon F. Osborne Foundation committed over a million dollars and partnered with the University of Tennessee to create a free master’s program for Benwood teachers. The Urban League and Community Impact also contributed funds and offered after-school tutoring and parental-involvement programs. In all, more than \$10 million was committed to reform Chattanooga’s struggling elementary schools.

Register was willing to make bold moves to help the staff in the lowest-performing schools become better teachers. He removed all instructional support staff from the central office and placed them inside schools, recognizing that

“drive-by” development efforts would not work, nor would any strategy defined and controlled by the central office. He also asked principals and teachers what they needed to be effective. Topping the list for principals was the need for better staff morale and better quality teachers. Teachers suggested more opportunities for collaboration, mentor and peer support, constructive principal feedback, and more time for instruction and lesson preparation.³³ And that’s what they got.

When the Benwood funding began in earnest, support for teacher instruction grew enormously in the Benwood schools. Register hired a director of urban education to lead the efforts and invested heavily in professional development for teachers that was embedded in their daily work. Using funds from a reduced central office staff, he created new consulting teacher positions to support Benwood teachers. With no classroom assignments of their own, consulting teachers were able to provide full-time support in developing curriculum, aligning instruction with standards and test schedules, and examining and modeling teacher practice.³⁴ Principals and teachers at Benwood schools also benefited from the expansion of the Donaldson model, which provided literacy coaches for teachers and leadership coaches to work one-on-one with assistant principals, principals, and school-based leadership teams.

The entire district was focused on reforming its lowest performing schools, Register recalls. “Our focus was not on prescribing one way to improve these schools—it was on getting these schools the support they needed to be effective for [their] students,” he says.

That support also included the creation of a new district division of data and accountability to link student and teacher performance.³⁵ Staff members from the new office were sent into the schools to teach teachers how to read and use student achievement data. Teachers at Benwood schools learned how to use their students’ Tennessee Comprehensive Assessment Program (TCAP) scores, the most commonly examined indicator of student and school improvement.³⁶ They also learned how to use other assessment tools, including the Dynamic Indicators of Basic Early Literacy Skills, a set of standardized, individually administered measures of early literacy development, and ThinkLink Learning’s Predictive Assessment Series, a series of tests given to students in reading and math to help prepare for state tests. And

with the data and accountability office analyzing and organizing these data, and visiting regularly with school staff to discuss the data, the Benwood schools became a petri dish for linking student progress and teacher performance.

A New Environment

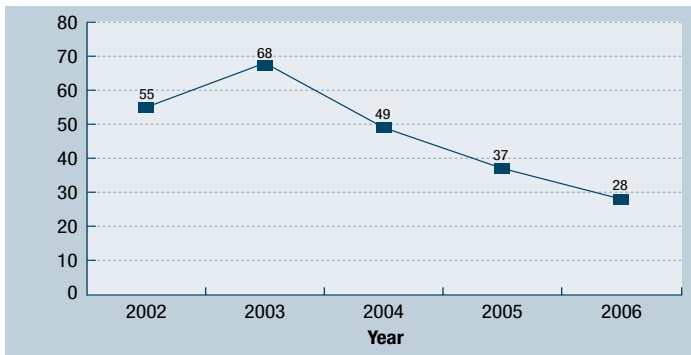
All of these reforms added up to schools that were far more conducive to teacher and student success. Teachers became more effective—and more likely to remain teaching in the Benwood schools. According to PEF data, teacher turnover declined in the Benwood schools from 2002–2006. At the height of the reconstitution efforts, in the 2002–2003 school year, 68 teachers were new to Benwood schools, but by 2006, the number had dropped to just 28 teachers. (See Figure 2.) Thus, the Benwood success story is not just about improved teacher effectiveness, but improved teacher retention as well.

Clearly, money was not the only or even the primary reason that most teachers moved to or stayed in Benwood schools. Surveys of new Benwood teachers in 2004 and 2005 found financial incentives to be one of many factors that teachers considered when deciding to move to a Benwood school.³⁷ Above all, Benwood teachers ranked the opportunity to work in a school with a visionary principal and a professionally supportive environment as their top reasons for choosing to work in Benwood schools. “Extra money is always nice,” explained one teacher who had successfully reapplied for her position at a Benwood school, “but it really felt like things were headed in a good direction. ... That’s why I’m still here.”³⁸

National opinion surveys of teachers find a similar pattern, with teachers citing the importance of mentoring, improved professional development, dedicated time for collaboration and planning, and strong leadership. This pattern is particularly evident among teachers in high-poverty urban schools. Researcher Richard Ingersoll, for example, found in his analysis of a national sample of public school teachers that more than half of teachers working in these schools are dissatisfied with their jobs because there is poor support from school leaders.³⁹

Today, those Benwood teachers who were looking for a professional and supportive climate appear to have

Figure 2. Number of Teachers New to Their Benwood Schools



Source: Public Education Foundation, available online at www.pefchattanooga.org.

found just that. Education researchers Dick Corbett and Bruce Wilson, who have been evaluating the Benwood Initiative through observations, interviews, and surveys for the past several years, find the Benwood schools to be “undeniably more professionally satisfying places to work and more consistently instructionally focused.”⁴⁰ Corbett and Wilson’s 2006 climate survey, administered to teachers in Benwood and non-Benwood elementary schools, shows that teachers in the eight Benwood schools find their school working conditions to be as good as those in some of the highest performing schools in the county on eight of 10 measures.⁴¹ On the two additional measures, “adequacy of professional development” and “the value of involvement with outside assisters,” Benwood teachers rated their schools even higher than their suburban counterparts.⁴²

The combined effect of a stable staff, better leadership, improved training, and community support appears to have remade the Benwood schools into institutions where teachers can and do succeed.

Beyond the Benwood Eight

In 2006, Jim Scales replaced Register as Hamilton County’s superintendent and inherited the high-profile and hard-won successes of the Benwood Initiative. But he also inherited the pressure to bring reform to other Hamilton County schools. The Benwood reforms have just begun a second five-year phase with more than \$7 million from the Benwood Foundation, and an additional \$1 million from the Public Education Foundation to

expand the initiative to eight additional schools. The original eight schools will continue to receive support, but the focus is no longer on bringing the worst schools up to proficient. The focus now is on getting students throughout the county achieving above grade level, explains Dan Challener, president of the PEF. “This is about excellence for students from Birchwood to Brown, from Hillcrest to Hixson,” said Challener, referring to schools both inside and outside of the city of Chattanooga.⁴³

Still, expanding the Benwood reforms will likely be just as difficult and resource-intensive as launching them. And the original eight Benwood schools have their work cut out for them as they seek to move their students to more advanced levels of achievement.

More broadly, policymakers and school leaders in other states and districts who read the many reports holding up Chattanooga as a national model would do well to consider the full picture of what happened in the Benwood schools. The reconstitution of the schools was a necessary step, removing the minority of teachers who were simply unable or unwilling to give the Benwood students a quality education. The pay incentives were positive—although less as a means of inducing talented teachers to relocate than as a way of signaling that the local community valued the Benwood teachers and supported their work.

But it would be a mistake to conclude that efforts to bring different, more effective teachers into the Benwood eight represent the only—or even the primary—lesson of the Chattanooga reforms. It seems that what the Benwood teachers needed most were not new peers or extra pay—although both were helpful. Rather, they needed support and recognition from the whole community, resources and tools to improve as professionals, and school leaders who could help them help their students.

In one sense, this is a sobering lesson—other districts probably can’t replicate Chattanooga’s success merely by replacing all the teachers or implementing a performance pay plan. It takes much more than that. But at the same time, the steady, marked increase in the effectiveness of Benwood teachers suggests that teacher effectiveness isn’t fixed. Many teachers who are currently struggling to help disadvantaged students can do much better.

Appendix. Methodology

Access to teacher TVAAS data is highly restricted; therefore, the data analyses for this paper were conducted by William L. Sanders and S. Paul Wright of the SAS Institute, Inc., where the Tennessee Department of Education's longitudinal data system currently resides. The analyses were conducted in August and September 2007.

Data Used in the Analysis

The analyses used TVAAS teacher effectiveness indicators for Hamilton County fourth- and fifth-grade mathematics and reading teachers during the years 2000–2006. (Third-grade teachers were excluded because, in recent years, no second-grade tests have been given; consequently, third-grade teacher effects do not represent value-added.) A relatively small number of teachers taught both fourth and fifth grades in certain years. These teachers were excluded from the analyses; none of them were Benwood teachers. All other teachers who had at least one fourth- or fifth-grade teacher effect during 2000–2006 were included in the analyses.

The teachers who were included in the analyses were classified into two categories: (1) Benwood teachers, all of whose teacher effects during 2000–2006 were at Benwood schools, and (2) non-Benwood teachers, all of whose teacher effects during 2000–2006 were at non-Benwood schools. A relatively small number of teachers were at Benwood schools some years and non-Benwood schools other years. These teachers were excluded from the current analyses. The years 2000–2006 were also classified into two categories: “before intervention” (2000–2002) and “after intervention” (2003–2006).

While teacher effect estimates were examined for both math and reading teachers, the focus of the analysis for this paper is limited to math teachers. The measurable effect of teachers on student reading achievement is generally smaller than it is for student math achievement. Consistent with this, the analysis shows a much smaller variance for teachers of reading than for teachers of math, contributing to the lack of significance in the analysis of trends for reading.

Estimates of Teacher Effect

The response variable is a teacher effectiveness indicator. Specifically it is a t-value: the TVAAS estimated teacher effect divided by its estimated standard error. The reason for using a t-value rather than the teacher effect itself is that the testing regime changed in 2004. Prior to 2004 a norm-referenced TCAP test was used, and TVAAS models were run on scale scores. Beginning in 2004, a criterion-referenced TCAP test was used, and a decision was made to use normal curve equivalents (NCEs) in the TVAAS models. The teacher effects under these two regimes are thus in different units and not comparable. By “standardizing” the teacher effects using a t-value, comparable teacher effectiveness indicators were obtained.

The change in testing regime also affects the analysis of reading teachers. In the norm-referenced regime, reading and language arts were tested separately. In the criterion-referenced regimes there is a single reading/language arts score. The current analyses of “reading” use reading teacher effects prior to 2004 and reading/language arts teacher effects for 2004–2006.

Because there were multiple teacher effectiveness estimates for any given teacher-subject-grade-year, it was necessary to choose among those estimates. For example, a teacher's effectiveness in 2003 could be obtained from the 2003 TVAAS run, the 2004 TVAAS run, the 2005 TVAAS run, or the 2006 TVAAS run. We used estimates that matched the year of the TVAAS run. That is, the 2006 estimates were from the 2006 TVAAS run; the 2005 estimates were from the 2005 TVAAS run, etc.

The Analyses

Teacher effectiveness over time was analyzed using a repeated measures analysis with one “between teachers” factor (Benwood versus non-Benwood) and one “within teachers” or “repeated measures” factor (Year: 2000–2006). Such analyses are implemented with currently available software (e.g., the MIXED procedure in SAS/STAT) even in the presence of incomplete data. In fact, very few teachers had data for all seven years. Estimable functions were written to estimate the (linear) trends in teacher effectiveness, separately for Benwood and non-Benwood teachers, before and after intervention, and to test for changes in trend from “before” to “after” and for differences in trend between Benwood and non-Benwood teachers.

Results for Math

A total of 1591 teacher effectiveness t-values on 563 teachers were used in the analysis. Of these, 281 t-values on 132 teachers were from Benwood schools and 1310 t-values on 431 teachers were at non-Benwood school.

Mean teacher effectiveness for Benwood and non-Benwood teachers each year was estimated by the repeated measures ANOVA. Trends in teacher effectiveness over time were calculated from these estimated means and displayed in the form of slopes of straight lines. Figure 1, which is shown in the report, plots the trend during 2000–2002 (before intervention), and the trend during 2003–2006 (after intervention). The overall trend for Benwood schools is upward (increasing effectiveness), with both “pre” and “post” slopes positive. The “post” slope is numerically larger than the “pre” slope, but the difference (“Benwood, post-pre”) is not significant. For non-Benwood schools, the trend over all years is slightly negative (but not statistically significant). The “pre” slope is very nearly zero while the “post” slope is negative but not quite statistically significant at the .05 level. In comparing trends at Benwood schools versus non-Benwood schools, for both “pre” and “post,” the Benwood trends are more positive than the non-Benwood trends, significantly so for “post” but not for “pre.” Also, the change in trend from “pre” to “post” is larger for Benwood than non-Benwood schools but again the difference is not statistically significant.

Table 1. Trend Lines for Math Teachers

School Group	Year Group	Intercept	Slope
Benwood	0 All-Years	-0.24120	0.19910
Benwood	1 Pre	-0.15632	0.20279
Benwood	2 Post	-0.54126	0.36039
Non-Benwood	0 All-Years	-0.03906	-0.06589
Non-Benwood	1 Pre	0.15330	0.02682
Non-Benwood	2 Post	-0.01050	-0.08840

Appendix. Methodology

Results for Reading

A total of 1626 teacher effectiveness t-values on 570 teachers were used in the analysis. Of these, 285 t-values (132 teachers) were from Benwood schools and 1341 t-values (438 teachers) were at non-Benwood school. None of the trend estimates and comparison among trends is significantly different from zero. The variances for reading are noticeably smaller than for math.

The SAS output from the analyses for both math and reading are available upon request.

Table 2. Trend Lines for Reading Teachers

School Group	Year Group	Intercept	Slope
Benwood	0 All-Years	-0.25284	-0.000697
Benwood	1 Pre	-0.09735	0.085923
Benwood	2 Post	-0.13165	-0.072621
Non-Benwood	0 All-Years	0.03354	-0.017976
Non-Benwood	1 Pre	-0.03561	-0.049583
Non-Benwood	2 Post	0.03772	-0.017798

Endnotes

- ¹ Originally, there were nine schools targeted, but one of them was subsequently closed because of low enrollment, leaving eight schools as the focus of the Benwood Initiative.
- ² Noam Schieber, "Fixing America's Schools: 2 Schools, 1 Big Idea," *Reader's Digest*, May 2005, available online at <http://www.rd.com/national-interest/education-issues/fixing-americas-schools/P2/article.html>; Jay Mathews, "A Move to Invest in More Effective Teaching," *Washington Post*, February 10, 2004; Bess Keller, "Charging the Gap," *Education Week*, March 1, 2006.
- ³ Joshua Benton, "Good Teachers to Fix Bad Academics," *Dallas Morning News*, August 28, 2003.
- ⁴ Republican Policy Committee, "Teachers Are Key to Success of 'No Child Left Behind': Better Pay for Better Teaching." (Washington, DC: Republican Policy Committee, October 25, 2005), available online at http://rpc.senate.gov/_files/Oct2505TeacherPayDB.pdf.
- ⁵ The Education Commission of the States (ECS) features a database of state and local education reform strategies, including teacher compensation. See <http://mb2.ecs.org/reports/Report.aspx?id=1131> for a description of the Benwood Initiative. The Working Group report, "Creating a Successful Performance Compensation System for Educators," was issued in July of 2007 by the National Institute for Excellence in Teaching and can be viewed at www.talentedteachers.org.
- ⁶ Claire Handley and Robert A. Kronley, "Challenging Myths: The Benwood Initiative and Education Reform in Hamilton County" (Chattanooga, TN: Public Education Foundation, March 2006).
- ⁷ Chattanooga City Public Schools broke away from the county system in the 1940s when the city was prospering, but after decades of economic decline, the school board voted in 1994 to give up its own system and merge back into Hamilton County. In July 1997, the two systems formally merged, combining the predominantly African-American student population of Chattanooga with the suburban, rural, and mostly white student population in the surrounding suburbs.
- ⁸ Hillcrest Elementary received B's in these subjects. A grade of B indicates that student gains exceeded the state growth standard; a C indicates that student gains met the state growth standard; below that indicates negative growth.
- ⁹ Tennessee Department of Education, State Report Card 2007.
- ¹⁰ Public Education Network and U.S. Department of Education Office of Educational Research and Improvement (OERI), "Teacher Quality and Student Achievement: Linking Research to Practice," 2000.
- ¹¹ Jesse Register, personal interview, August 2006.
- ¹² Dan Challener, "The Benwood Initiative: Heat and Light for Our Future," *Chattanooga Times Free Press*, May 14, 2006.
- ¹³ This teacher had been working in Chattanooga for six years. She left and took a job in a neighboring county and says she "hasn't looked back." She asked not to have her name used for this publication.
- ¹⁴ John Merrow, "Chattanooga Elementary Schools Struggle to Improve Test Scores," PBS NewsHour, June 20, 2006.
- ¹⁵ Stephanie Spencer, personal interview, November 2006.
- ¹⁶ State law allows the superintendent to assign school staff. This was reinforced by the strategic plan and new teacher contract that were developed collaboratively by the union and district, which included an agreement to re-staff Benwood schools.
- ¹⁷ Rhonda Thurman, personal interview, December 2006.
- ¹⁸ Robert Hope, personal interview, October 2007.
- ¹⁹ This is the average wage for 2000–2001. By 2005–06, it had risen to \$43,469, according to the Tennessee Department of Education, State Report Card 2006. Average teacher salaries are now reported in the state's Annual Statistical Report. See 2006 report online at: http://state.tn.us/education/asr/05_06/doc/table5.pdf.
- ²⁰ Claire Handley and Robert A. Kronley, "Challenging Myths: The Benwood Initiative and Education Reform in Hamilton County."
- ²¹ The state of Tennessee has been using Sanders' model since 1992. The model is also used by Pennsylvania and Ohio, as well as by over 300 school districts nationwide. For more on TVAAS, see William L. Sanders and S. P. Horn, "The Tennessee Value-Added Assessment System (TVAAS) Mixed-Model Methodology in Educational Assessment," *Journal of Personnel Evaluation in Education*, 8 (1994): 299–311.
- ²² Most researchers agree that the value-added assessment system is a reliable statistical method, although it is controversial in its use as a single measure of effectiveness or as a tool for high-stakes accountability. Studies of value-added models by the RAND Corporation found reason to critique the method but concluded that the teacher effect is real and that in the evaluation of alternative models of accountability, it be given serious consideration. See Daniel McCaffrey, et al., *Evaluating Value-Added Models for Teaching Accountability* (Santa Monica, CA: RAND Corporation, 2004). Also see J.R. Lockwood and Daniel F. McCaffrey, "Controlling for individual heterogeneity in longitudinal models, with applications to student achievement," *Electronic Journal of Statistics* 1 (2007): 223–252.
- ²³ An average teacher value-added score of 100 means that a teacher's students have learned as much as they are expected to learn in one year, and earns no bonus. A score of 115 or better, suggesting growth beyond expected outcomes, makes Benwood teachers eligible for a \$5,000 bonus each year.
- ²⁴ Hamilton County TVAAS teacher estimates have been used for several larger studies on Tennessee teachers. Teacher value-added data, even for combined analyses, is restricted. While school-level TVAAS data are made public each year, state law requires that teacher TVAAS scores be passed through the district in sealed envelopes and viewed only by the individual teacher and his/her principal.
- ²⁵ The analyses were conducted in August and September 2007. Teacher effect estimates were also examined for reading teachers. As anticipated, there was a much smaller variance for reading than for math since the measurable effect of teachers on reading achievement has been found to be generally smaller than it is on student math achievement. See Appendix for full methodology.
- ²⁶ Zero on the chart represents the average performance for Hamilton County teachers.

- ²⁷ The improvement trend is also likely due to the retention of effective teachers in Benwood schools.
- ²⁸ The apparent difference in the before and after slopes is not statistically significant.
- ²⁹ Researchers with Mathematica, Inc. and Chesapeake Research Associates, both nonprofit policy research institutes, eliminated the Benwood Initiative from a recent study of teacher pay reform programs, concluding that the initiative “included so many different intervention components beyond teacher bonuses” that it was “infeasible to isolate the effects of just the offer of teacher incentives.” See Steven Glazerman, Tim Silva, Nii Addy, et al., *Options for Studying Teacher Pay Reform Using Natural Experiments* (Washington, DC: Mathematica Policy Research, Inc., March 30, 2006).
- ³⁰ The report, funded by the NEA, chronicles the success of Hamilton County and Clark County, NV. Available at http://nctaf.org.zeus.silvertech.net/resources/research_and_reports/nctaf_research_reports/documents/ReducingtheAchievementGapFullReportFinal.pdf
- ³¹ Gerry Dowler, personal interview, December 2006.
- ³² Disclosure: Education Sector receives financial support from the Carnegie Corporation of New York (which provided funding for this report), as well as from the Bill & Melinda Gates Foundation.
- ³³ Pamala J. Carter, *Review of Highly Effective Teachers in Hamilton County: An Analysis of Current Trends and Implications for Improvement* (Chattanooga, TN: Public Education Foundation, May 2003). These teachers, identified as highly effective, received TVAAS scores in the top 25 percent of all teachers in the county or were deemed highly effective based on principal nominations. These included teachers who moved from grade to grade, as well as kindergarten through third-grade teachers, and therefore did not have the requisite three-year TVAAS average.
- ³⁴ The district is now experimenting with a modified version of the consulting teacher model, which splits teacher’s time between classroom and consulting. The rationale for this, in part, is that consulting teachers and their support will be better received by classroom teachers if they too are teaching at the school.
- ³⁵ The PEF also played an active role in collecting, analyzing, and sharing district data.
- ³⁶ This includes learning how to understand and read value-added data, although teachers interviewed expressed confusion about school and teacher TVAAS scores.
- ³⁷ Claire Handley and Robert A. Kronley, “Challenging Myths: The Benwood Initiative and Education Reform in Hamilton County.”
- ³⁸ Personal interview with Benwood teacher, September 2006.
- ³⁹ Richard Ingersoll, “Why Do High-Poverty Schools Have Difficulty Staffing Their Classrooms With Qualified Teachers?” (Washington, DC: Center for American Progress and the Institute for America’s Future, November 2004).
- ⁴⁰ H. Dickson Corbett and Bruce Wilson, “Report on Benwood Initiative to Chattanooga/Hamilton County Public Education Foundation,” (unpublished report, October 2007).
- ⁴¹ The 2006 survey was administered to teachers in the Benwood schools and in a sample of non-Benwood elementary schools in Hamilton County.
- ⁴² The higher ratings were statistically significant.
- ⁴³ Mike O’Neal, “Benwood Initiative Expands Education Goals,” *Chattanooga Times Free Press*, September 14, 2007, available online at <http://www.pefchattanooga.org/LinkClick.aspx?link=Benwood%2f9.14.07+Benwood+Initiative+expands+education+goals.doc&tabid=57>.