AN EVALUATION OF VERMONT'S EDUCATION FINANCE SYSTEM

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Final Report

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Stephen Klein
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Dear Steve:

Please find attached our final report for the evaluation of Vermont's education finance system. We have revised our January 4, 2012 draft based on the comments we received from your office, the Vermont Department of Taxes and the Vermont Department of Education as well as the public testimony we received on January 9 and the discussions we had on January 10 with several Legislative Committees.

Our overall finding from this study is that the Vermont school funding system is working well and meeting the goals established in Acts 60 and 68. Using a series of objective measures, we find:

- Vermont's schools have among the highest levels of per pupil revenue in the United States. During the meetings with the Legislature on January 9 there was considerable discussion regarding the actual level of spending per ADM. We have revised the estimates from our draft report, and following a number of conversations with officials of the Vermont Department of Education we estimate fiscal year (FY) 2012 total revenue per ADM to be $16,788. While this figure is $657 lower than the number we used while in Vermont on January 9 and 10, which was based on estimates compiled by another organization, this number is developed on the basis of Vermont estimates of FY2012 revenues and more accurately reflects resources available to education Vermont's K-12 students. Moreover, this change has no substantive difference on Vermont's national ranking, nor on the overall conclusions we draw from our research.

- The state has designed an equitable system. We found virtually no relationship between district fiscal capacity (measured by either by district property wealth or personal income) and spending levels

- Disparities in per pupil spending across districts meet or nearly meet well established benchmark standards for school finance equity

- The "tax price" or cost per additional dollar of education spending drives a relatively small amount of the differences in per pupil spending suggesting that the income adjustments to homestead property taxes have not led to large resource disparities

- Spending levels continue to be determined annually by each town's voters

- Vermont's student performance ranks among the highest in the country, although compared to other New England states, student performance is about average

- An in depth study of five schools that have shown substantial improvements in student performance over the last five years shows that Vermont schools, even those with high proportions of low income children, can produce large gains in student learning. The case studies also identified a number of promising practices for improving student performance

In the course of our work, including a series of public hearings, a number of concerns with the way schools are funded were identified. These represent genuine issues that impact the resources available to schools and the ability of Vermont citizens to pay for those schools. However, it is our strong view that none of those issues are so serious that the state needs to completely replace its approach to funding schools – rather each needs serious and careful consideration by the Legislature, which should consider modifications to those components of the system that create these issues. It is our sense that most of the individuals who shared their views and concerns with us at the public hearings concur that the overall system is working well and the needed changes can be made within the existing framework.

The need to make minor modifications to the system should not be seen as surprising, it is impossible to develop something as complex as a school finance system that raises nearly $1.5 billion to meet the needs of 89,115 children and meets the concerns of everyone. Moreover, school finance systems need to be flexible enough to accommodate changes in local economic conditions that cannot be predicted when the systems are initially designed. Our view is that Vermont's system can accommodate the needs of today's economy and continue to meet the standards established in Acts 60 and 68 provided the Legislature continues to monitor its many components and makes adjustments as circumstances warrant.

We have not made recommendations regarding tax rates, spending levels, or the distribution of tax efforts across individuals and classes of property. Those are, in our

view, policy decisions that rest with the Vermont Legislature and the citizens of your state.

During the course of our discussions with the Legislature in January, we found considerable concern with, and interest in, identification of approaches to help Vermont's schools use their resources to make further improvements in student learning. Our recommendations and conclusions identify a number of potential issues the state might consider for study in the future.

We want to thank you, your staff, and the staffs of the Vermont Department of Education and the Vermont Department of Taxes for their help in collecting and helping us to understand the tremendous amount of data available and necessary for our study. While we have vast experience in working with state agencies across the United States, it is unusual to find such a consistently high level of staff capability uniformly across so many state agencies and at so many different levels. All of the members of our team have enjoyed the opportunity to work with Vermont state agency staffers. Moreover, we appreciate the time and energy representatives of individual school districts and supervisory unions as well as education support groups have provided us throughout this work.

We hope our findings will be useful to the Legislature in its future deliberations on the important issue of education finance, and look forward to the opportunity to work with you again in the future.

Sincerely,

Lawrence O. Picus
Lawrence O. Picus and Associates

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AN EVALUATION OF VERMONT'S EDUCATION FINANCING SYSTEM

EXECUTIVE SUMMARY

This report, submitted to the Vermont Legislature, provides a comprehensive evaluation of Vermont's education funding system. The study was conducted pursuant to House Bill No. 436 of the 2011 session of the Vermont Legislature, and was conducted by Lawrence O. Picus and Associates, LLC. The findings described in this report are based on work conducted by our team between August and December 2011 and provide a comprehensive analysis of the financing of Vermont's public PK-12 schools, describing the extent to which the funding system meets the goals established by Acts 60 and 68 – the two major pieces of legislation that establish the current funding model.

Our overall finding is that the current funding system meets the goals established by the Court and Acts 60 and 68 – to provide equal access to all towns for raising revenues for PreK-12 education. The system established through that legislation provides that each town determines the budget for its schools on an annual basis and, through a combination of residential and non-residential property taxes and other state sources of revenue, funds those schools so that each town has access to the same level of funding for a given tax rate. Moreover, the design and operation of the system has resulted in relatively little disparity in per pupil education spending related to property wealth and household income, created substantial equality in the level of per pupil spending across the state's 277 school districts, and has reduced the variation in student achievement in reading and mathematics across schools, as measured by NECAP tests. One result of these reforms is that today, Vermont's school children have one of the highest levels of per pupil funding in the United States, as well as one of the lowest ratios of pupils to teachers among the 50 states.

This analysis was conducted by a team of five school finance experts under the auspices of Lawrence O. Picus and Associates. As part of this study, we communicated extensively with Vermont education officials at the state and local level, as well as with other state officials responsible for administration of parts of what is a very complex funding system. We used traditional school finance and economic analytic techniques to develop our findings, and frequently interacted with state officials to ensure the accuracy of our data. We conducted extensive case studies of five improving schools across the state and developed a comprehensive comparison of Vermont's current education system with the education systems in the five other New England states as well as with all 50 states more generally. We held three public hearings in Vermont where representatives of local school districts and the general public had the opportunity to share their thoughts and concerns about Vermont schools. Finally, we met with a number of Legislative

Committees throughout the study, including a daylong series of meetings on January 10, 2012, to share our progress and to understand their concerns about the funding system.

Our report contains detailed sections that describe the state's school funding system; offers a series of interstate comparisons with all 50 states in general and with New England states more specifically; describes the findings from a traditional school finance equity analysis within the unique funding system in Vermont; conducts an economic analysis of the impact of the current system on town education spending decisions; identifies common themes in Vermont's significantly improving schools; summarizes the testimony received at the three public hearings, responds to concerns expressed by members of the Legislature, and offers conclusions and a list of issues the state may want to consider as it reviews the education funding system and its ability to improve student outcomes in the future. Our overall findings for each of these sections are summarized below.

VERMONT'S SCHOOL FUNDING SYSTEM

In fiscal year 2012 (FY 2012) Vermont will raise an estimated $1.4961 billion to educate approximately 89,115 students in 307 schools operated by 277 districts through 46 supervisory unions, 12 supervisory districts, and 2 interstate districts. This amounts to approximately $16,788 per ADM.[1] Vermont's system for allocating revenue to school districts is unique among the 50 states in that local towns and districts annually determine the spending level for their schools, and the state – through a complex system of property and income taxes and other state sources of revenue – funds the schools in a manner designed to treat taxpayers choosing the same level of spending for the students in their schools equally regardless of their location across the state.

It is important to point out at this juncture that many Vermont policy makers, stakeholders and citizens view the State's funding system under Acts 60 and 68 as an income tax based system that raises money through income sensitive adjustments to property taxes. However, documents and legislation describing the system describe it more in terms of a property tax based system with adjustments for income. Moreover, all other states – with the exception of Hawaii, which is a state, funded system – view their education finance systems through a property tax lens. Consequently, the substantial school finance literature upon which we rely in this evaluation, combined with the property tax based description of Vermont's system have led us to describe the system from the perspective of the property tax and income based adjustments to that tax. While this may run counter common views of Vermont's system, this approach is, in our view, the only way to comprehensively evaluate the performance of the system within the context of the goals of Acts 60 and 68.

The funding system in use today emerged in response to the 1997 Vermont Supreme Court ruling in *Brigham v. State* and was implemented through Act 60 in 1997

[1] This figure includes all revenue for K-12 public education including state appropriations for school employee retirement programs and estimated Federal funding. Details as to how this figure was derived can be found in the second section of the full report.

and Act 68 in 2004. The funding system in Vermont is a unique blend of local control and equalized state funding. While each town chooses the level of education spending for its schools annually, the revenue for education comes from a number of state sources. Primary among them is over $900 million in residential (with adjustments) and non-residential property taxes, all of which are treated as state revenues. In addition, state funds for education come from the state's general fund, one-third of the sales and use tax receipts, one third of the state's purchase and use tax, the state lottery, Medicaid reimbursements and the Vermont Yankee power plant. This is supplemented by funding for school employee pensions appropriated by the Legislature and by Federal funding programs.

The non-residential property tax rate is set by the Legislature annually. In addition, the Legislature establishes a base per pupil spending level and a residential property tax rate to fund that level of spending. The property tax rate for towns choosing to spend above that level increases proportionally with the increase in per-pupil spending above the base level. However, individual property taxes are limited to a legislatively determined percentage of household income for taxpayers with incomes below $97,000. The income percentage is similarly increased proportionally for per-pupil spending above the base amount. Finally, for towns that elect to spend a per-pupil amount that exceeds 125% of the state average per pupil expenditure from the previous year, the property tax rates and income adjustment tax percentages double for the portion above that level. Property tax rates (residential and non-residential) are also adjusted by the common level of appraisal (CLA), which is designed to equalize assessment practices across the state and ensure properties with the same market value are treated equally regardless of their location. For FY 2012 the rate is $1.36 per $100 of fair market value, and the base homestead tax rate is $0.87 per $100 for districts spending at or below the base level.

INTERSTATE COMPARISONS

An analysis of education finance systems in the United States and New England identified the following comparisons with Vermont:

Educational Expenditures

- State and local revenues for K-12 education increased by almost 83.7% between FY 2001 and FY 2012 (NEA Rankings and Estimates, 2011)[2]
- This increase is due in part to declining enrollments, and in part to substantial increases in state education revenues
- Vermont maintained a continued commitment to education funding as measured through both the state's relative tax effort (highest in the nation) and the percentage of state resources devoted to K-12 schools (6th highest)

[2] We needed to use a national source for interstate comparisons but it is important to note that NEA estimates have not relied on data provided by the State of Vermont since 2006. The NEA has projected revenues and expenditures based on data provided prior to 2006 and we believe their estimates overstate total revenue. Our analysis of FY 2012 budgeted revenues for education identified total revenues of $1.1.496 billion or $16,788 per ADM.

Student Population

- Vermont has experienced the second greatest percentage decrease in student population (18.1%) over the time frame of the study. Only North Dakota has had a greater decline
- Average school district size has dwindled to 299 students – making the state's school districts the smallest in the nation with an average enrollment that is less than 10% of the size of the average school district in the United States.

- **Staffing**
  - Vermont has seen an increase in the number of new teachers, administrators and support staff
  - When combined with the decline in student enrollments the result is that Vermont has the lowest teacher to student and staff to student ratios in the country
    - In Vermont from 1999-2000 to 2009-10 the number of full-time equivalent (FTE) teaching positions increased by 250, or 3.1%.
    - Nationally the number of teachers increased by 10.3% and in the New England states they increased by 12.7%.
    - Vermont's increase in teaching positions (3.1%) combined with the decrease in the state's K-12 population (18.1%) led to a reduction in the student to teacher ratio from 12.3 to 1 to 10.6 to 1 in 2009-10 (NEA, 2011).
  - The reduced teacher and staff to student ratios are a major cause of the state's increases in per pupil expenditures

- **Student Achievement**
  - Vermont's scores on the National Assessment of Educational Progress (NAEP) continually rank among the top ten in the nation
  - While there have been slight increases in NAEP math and reading scores for 4th and 8th grade students, the increases are less than the national average increase in these scores, and also lower than improvements observed in other New England states over this time period
  - Student performance on most aspects of the New England Common Assessment Program (NECAP) has only modestly increased.
  - The state has observed a steady increase in high school graduation rates

EQUITY ANALYSIS

We conducted a traditional school finance equity analysis over the time frame in which Acts 60 and 68 were in effect. We found that the Vermont school funding system has achieved a high degree of equity, even though it did not meet every standard equity benchmark established in the school finance literature, all of which are quite rigorous and rarely met by any of the 50 states. Acts 60 and 68 focused on achieving a high degree of fiscal neutrality – reducing the linkage between disparities in per pupil spending and local fiscal capacity – and have met that goal.

Our analysis focused on four main issues: the extent to which education spending is related to property and/or income wealth, the equality of education spending across districts and towns, the changes in education spending over time, and the disparity in education outcomes. We found that spending in Vermont has tended to be weakly related to wealth (at an acceptable degree under standard school finance equity benchmarks) and that there is virtually no relationship between property wealth and spending in the earliest years covered in this study. In technical language, we find that the Vermont school funding system is fiscally neutral.

Measures of the equality of spending in Vermont remained consistent over the years covered in the study. The funding system did not meet the accepted benchmarks of equality, but came very close throughout the period of study. We also found that the state spends 140% more per pupil today for PK-12 education than it did in the year 2000, with the greatest increases coming in support services for students.

Using a combined NECAP measure of both reading and math performance across grades 3-8, we found that the disparity in student outcomes also declined over the time period the NECAP test has been used.

ECONOMIC ANALYSIS

An important consequence of Act 60 and Act 68 has been its impact on educational spending. These Acts revamped the educational finance system in Vermont, and changed the incentives facing taxpayers. We conducted an economic analysis of these factors and found:

- Act 60 and Act 68 altered the linkage between taxpayer benefits and costs of education by shifting from a shared state and locally funded system to a state centered system.

- Prior to Act 60 local jurisdictions were largely responsible for raising education funds above the state determined foundation level. Subsequently, local responsibility was diluted by the shift of non-residential property tax collections to the state level – along with establishment of the non-residential property tax rate – and by the separation of local budget setting and state revenue collection.

- Vermont has moved increasingly to an income-based system, with over 2/3 of residential taxpayer liability at least partially determined through income adjustments and the circuit breaker program. In FY 2011 it is estimated that over $165 million in residential property tax collections will be replaced by income related tax adjustments.[3]

[3] As noted above, many Vermont stakeholders view the system as an income tax based system, not a property tax based system.

- The consequence of these policy shifts has been to reduce the average marginal price of an additional dollar of per pupil educational services by approximately 70% since prior to Act 60. In other words, on average, towns that want to increase education spending must raise only 30 cents locally, with the remainder covered by other revenue sources.

- In the most recent time period we have data for, FY 2008 – 2010, changes in the marginal price of an additional dollar of per pupil educational services has been more modest, averaging approximately 3% statewide. However, the statewide average masks the experience of individual towns, some of which faced much different price changes.

- In line with economic theory, we would expect changes in price to have an impact on the level of demand for educational services. In fact, towns that experienced price declines increased their educational spending by $550 more per ADM than towns that experienced price increases. The differences were even greater for those towns that experienced the 10% largest and 10% smallest price changes, a difference of $1,248 per ADM.

- The change in tax price[4] has an independent effect on school spending, even after we have controlled for other determinants of school spending.

- We find that the price elasticity of demand for educational services is -0.072 in small towns and -0.028 in large towns. This implies that school spending is 2-5% higher than it otherwise would be in the absence of the 70% change in tax price.

- School enrollments have a powerful effect on per pupil spending. The historical decline in Vermont enrollments have driven up the cost of education. A 10% decline in student enrollments is estimated to have a $1,500 increase in spending per ADM.

COMMON THEMES IN VERMONT'S SIGNIFICANTLY IMPROVING SCHOOLS

We conducted case studies of five schools that had significantly improved student performance over the past several years. These were not necessarily the highest scoring schools, but rather schools that had made large gains in the NECAP reading and math tests between 2005 and 2010. The goal of these cases was to understand strategies schools used to boost student learning, and over time, the resource needs of those strategies. This information can serve as a beginning step toward addressing the next big education finance issue for the state – forging a closer connection between the state funding formula, school use of resources and student performance. Among the key themes that emerged from this study are:

[4] As used in this document, tax price refers to the town's average marginal cost of each additional dollar spent for schools. We compare the increased tax liability of local residential taxpayers to the cost of raising school spending $1 per pupil to arrive at the "tax price."

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- Our findings align with recent other studies of effective schools in Vermont, including *Roots of Success* (2009) and *Vermont Schools Closing Achievement Gap* (2011)

- The strategies we identified in our five case studies align with national studies of schools that have significantly improved student learning, including studies we have conducted in other states (Odden, 2009; Odden & Archibald, 2009).

- We identified 11 common themes that were in place across the five schools, and note that several of the 11 elements represent significant augmentations of the findings from recent Vermont studies of improving schools (*Roots of Success* and *Vermont Schools Closing the Achievement Gap*). The 11 themes are:

    1. Talent
    2. High expectations
    3. Ambitious goals
    4. Curriculum
    5. Instruction
    6. Use of data
    7. Multiple interventions
    8. School schedule
    9. Professional culture
    10. Leadership
    11. Small class sizes.

- A key in the five schools we studied was the knowledge and skill of the staff to implement the various strategies effectively.

- Not every school was strong on all of the eleven elements, but all were strong on most of them.

In addition, an appendix to our report provides detailed case studies describing how each of the five schools achieved their significant improvements in student achievement.

PUBLIC HEARINGS

We conducted a series of public hearings to identify concerns and suggestions from the public regarding the State's school finance system. A number of concerns and issues were identified, some pertaining to the school funding and taxation system and others to the performance of the state's schools. However, it is our sense that the problems identified are not of a magnitude that would require establishing a new or alternative funding system, but rather are the kinds of issues that develop overtime in any

school funding system and require thoughtful research and development of policy options that can resolve specific issues in the framework of a generally successful system.

The need to make minor modifications to the system should not be seen as surprising. It is impossible to develop something a complex as a school finance system that raises nearly $1.5 billion to meet the needs of 89,115 children and that meets the concerns of everyone. Moreover, school finance systems need to be flexible enough to accommodate changes in local economic conditions that could not be predicted when initially designed. Our view is that Vermont's system can accommodate the needs of today's economy and continue to meet the standards established in Acts 60 and 68 provided the Legislature continues to monitor its many components and makes adjustments as circumstances warrant.

CONCLUSIONS AND ISSUES FOR FURTHER CONSIDERATION

Our overall finding from this study is that the Vermont school funding system meets the goals established in Acts 60 and 68. Specifically in the past 12 years the funding system has reduced disparities in education spending that are linked to local fiscal capacity (property wealth and income), moderated disparities in student outcomes, and allowed all towns to set their own tax rates for schools under a system that ensures towns with equal tax rates generate virtually equal education spending per pupil. Using a series of objective measures, we find that Vermont's schools have among the highest levels of per pupil spending in the United States. We also found that the state has designed an equitable system with limited disparities in per pupil spending, and virtually no relationship between wealth (measured by either district property wealth or personal income) even though spending levels are determined annually by each town.

Further, Vermont's student performance compares favorably with the nation overall, although compared to other New England states, student performance is about average. Because of concerns about how well Vermont students do compared not only to others in New England and the United States, but also to the performance of students in other countries, we also conducted in depth studies of five schools that have shown substantial improvements in student outcomes in the last five years. Our findings from these schools identified a number of promising practices for improving student performance and found that they can be implemented within the bounds of the current Vermont school finance system.

Through a series of public hearings, a number of concerns with the way schools are funded were identified. These represent genuine issues that impact the resources available to schools and the ability of Vermont citizens to pay for those schools. However, it is our strong view that none of those issues are so serious that the state needs to completely replace its approach to funding schools – rather each needs serious and careful consideration by the Legislature who should consider modifications to those components of the system that create these issues. It is our sense that most of the individuals who shared their views and concerns with us at the public hearings concur

that the overall system is working well and the needed changes can be made within the existing framework. The issues we identified include:

- There was concern that despite Vermont's highest in the region per pupil expenditures, student performance was only average in New England. Research on the linkage between spending and student outcomes has not found direct and consistent relationships between the two. We note that Wyoming, with the 4th highest per pupil spending in the United States (Vermont is 3rd) has even lower student performance. On the other hand we did find schools that had dramatically improved student outcomes during the past five years. These schools deployed strategies that other Vermont schools also could deploy.

- Consideration of the income adjustment cut off $90,000 for full adjustments and the "slide" to $97,000 for partial income adjustments. We heard a great deal of discussion over the appropriate level for the income adjustment as well as concern over the limited differential between the level for a full adjustment and the complete cutoff of adjustment support. Our sense is there are substantial income distribution implications for various decisions about the level of household income qualifying for the adjustment and the differential between the full level of adjustment and the elimination of adjustment.

- There was concern expressed about the $500,000 cap on homesite property value to qualify for the income adjustment. A number of individuals felt that an increasing share of Vermonters with fixed incomes were suddenly faced with dramatic (and potentially unaffordable) increases in property taxes as a result of where they live. Before taking action on this, our view is a clear understanding of how many individuals are impacted by this is needed, and a careful analysis should be conducted about the range of solutions available before the system is changed.

- One of the potential sources of high per pupil spending in Vermont is the limited "price" of increased spending to the average town voter. While our estimates of the price elasticity are low, it seems likely that over time, local voting on school budgets has been one of the reasons for Vermont's rapid increase in per-pupil spending. Efforts to reduce the growth in future spending need to consider the tradeoffs between local control over annual budgets and more state control over how much towns can spend for education.

- One potential source of Vermont's high spending is the large number of very small schools – average school district size is the lowest in the nation by a substantial amount. Tradeoffs between local and state control over school district size are also an issue. Strong consideration should be given to the role of supervisory unions (either through state mandates or more market based solutions) as part of the discussion on these dis-economies of scale.

- Finally, to facilitate future studies of this nature, we recommend that state

databases contain a common identity variable for each district to facilitate merging data from different state agencies. Additionally, education data bases should be designed so that it is feasible to cross link between the three main levels of local school funding, supervisory union, district, and town. There are some straightforward analyses that we could not do because the three levels could not be linked.

From these public comments and the conclusions of our evaluation, Lawrence O. Picus and Associates also make the following recommendations for further study and analysis, and offer the following suggestions for next steps for education finance policy in Vermont:

- Vermont policy makers noted that although the Vermont school finance system has implemented the intent of Acts 60 and 68, it has also led to one of the highest levels of per pupil expenditures in the country. They argued that the state needs begin identifying ways this substantial spending can be translated into further improvements in student learning. We offer suggestions for five interrelated issues that the state could address as it strives to focus education resources to improve student outcomes in all schools:

    - Establish a system of more state accountability for student performance. Develop an incentive system that provides rewards for schools that meet or exceed state-set targets for improved student performance – beyond historical trends.

    - Expand the case studies of schools to include a larger sample so that Vermont specific conclusions can be made regarding those factors that lead to substantial improvements in student learning. Though the five cases conducted for the report provide promising insight into how schools can transform dollars into instructional practices that boost student achievement, more analysis is needed to ensure that the eleven practices identified are those that are the most effective in the unique circumstances found in Vermont.

    - Related to the case study approach, Vermont might consider sponsoring a "production function" study that encompassed all schools to determine the degree to which higher spending is linked to higher achievement in Vermont.

    - Assess the degree to which Vermont has the teacher and principal talent to execute effective school improvement strategies that dramatically boost student learning. Specifically conduct an analysis of the teacher and principal supply channels in Vermont. This would include analysis of the institutions from which teachers and principals are recruited, assessment the quality of the talent that is recruited for Vermont's schools, and development of an understanding of the degree to which Vermont recruits

teachers and principals from the top or bottom half of the talent pool. This information could be used to design policies to ensure that future educator talent is recruited from the top so that the best and the brightest teach in and administer Vermont schools.

- Join the action of nearly two-thirds of the other states in the country to develop new and comprehensive teacher and principal evaluation systems. These systems would use multiple measures to place teachers and principals into 4-5 different categories of effectiveness – effectiveness defined as producing student learning gains. Use these new metrics to design new systems to license, tenure and pay educators.

AN EVALUATION OF VERMONT'S EDUCATION FINANCING SYSTEM

1. INTRODUCTION

This report, submitted to the Vermont Legislature, provides a comprehensive evaluation of Vermont's education funding system. The study was conducted pursuant to House Bill No. 436 of the 2011 session of the Vermont Legislature, and was conducted by Lawrence O. Picus and Associates, LLC. The findings described in this report are based on work conducted by our team between August and December 2011 and provide a comprehensive analysis of the financing of Vermont's public PK-12 schools, describing the extent to which the funding system meets the goals established by Acts 60 and 68 – the two major pieces of legislation that establish the current funding model.

Vermont's current school finance system was developed in response to the state Supreme Court's ruling in the *Brigham* decision,[5] in 1997. As established through Acts 60 and 68, Vermont's school funding system was designed to meet several goals:

1. Reduce the wide disparity in per-pupil education spending that was closely related to property wealth
2. Reduce the disparity in academic achievement among Vermont's school children
3. Reduce the disparity in education tax burdens for equal amounts of spending per pupil among Vermont taxpayers
4. Allow school district voters to choose to spend as much as they wish on their children's education.
5. Ensure that higher spending per pupil in a district results in higher homestead taxes in that district.

Our overall finding is that the current funding system meets the goals established by the Court and Acts 60 and 68. The system established through that legislation provides that each town determines the budget for its schools on an annual basis and, through a combination of residential and non-residential property taxes and other state sources of revenue, funds those schools so that each town has access to the same level of funding for a given tax rate. Moreover, the design and operation of the system has resulted in relatively little disparity in per pupil education spending related to property wealth and household income, created substantial equality in the level of per pupil spending across the state's 277 school districts, and has reduced the variation in student achievement in reading and mathematics across schools, as measured by NECAP tests. One result of these reforms is that today, Vermont's school children enjoy one of the highest levels of per pupil funding in the United States, as well as one of the lowest ratios of pupils to teachers among the 50 states.

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[5] *Amanda Brigham v. State of Vermont* (96-502); 166 Vt. 246; 692 A.2d 384

This analysis was conducted by a team of five school finance experts under the auspices of Lawrence O. Picus and Associates. As part of this study, we communicated extensively with Vermont education officials at the state and local level, as well as with other state officials responsible for administration of parts of what is a very complex funding system. We used traditional school finance and economic analytic techniques to develop our findings, and frequently interacted with state officials to ensure the accuracy of our data. We conducted extensive case studies of five improving schools across the state and developed a comprehensive comparison of Vermont's current education system with the education systems in the five other New England states as well as with all 50 states more generally. We held three public hearings in Vermont where representatives of local school districts and the general public had the opportunity to share their thoughts and concerns about Vermont schools. Finally, we met with a number of Legislative Committees to share our progress and to understand their concerns about the funding system.

Our findings are contained in the pages that follow. Following this introduction, the document is divided into seven analytic sections and an extensive set of appendices. Section two of the report provides an overview of Vermont's school funding system, and offers a brief historical perspective describing how the state arrived at the current approach to funding its schools.

Following this descriptive chapter, Section three offers a detailed interstate comparison of finance and student performance, providing detailed comparisons of a range of school finance and student performance statistics with the other New England states. A detailed appendix contains further comparisons across all 50 states.

Section four of this report contains a traditional school finance equity analysis. One of the unique aspects of Vermont's system is the income adjustment that is available to reduce the property tax burden of homeowners with incomes below $90,000 a year. Consequently, our analysis looks at both the relationship between property wealth and school district spending, and the relationship between income and school district spending. The section, along with the related appendices, offers substantial evidence as to the equity of the current funding system.[6]

Because Vermont's education funding system considers both property values and household income and allows each town to annually determine the school funding level, Section five contains a more detailed economic analysis of the system. In that section we attempt to better understand the economic incentives or "tax price" faced by taxpayers in each town when they make their annual decisions about how much to spend on their schools.

[6] A tension that exists throughout this report is determining whether Vermont's school funding system should be considered an income tax based system or a property tax based system. We address this issue in detail at the beginning of the next section, but this document treats the system as a property tax based system, both because that is how it is described in law, and because that is traditionally how school funding systems are established and evaluated. Please see section two for more details.

As demonstrated in Section three, per pupil spending for education in Vermont is among the highest in the nation and New England. At the same time, although the state does very well in national comparisons of student performance as measured by the National Assessment of Education Progress (NAEP), the state's performance in the New England region is about average. As part of this study, we identified several schools that have succeeded in making dramatic improvements in student performance on the New England Common Assessment Program (NECAP). To understand how these schools succeeded, we conducted in-depth case studies in five schools. Our findings, described in Section six of this document show how schools can make dramatic improvements in student learning and how they allocate resources – staff, time and dollars – to produce those results.

An important component of this study was the public hearings that we held in September, and November 2011 and January 2012. To maximize citizen and school district response, we relied on the Vermont Department of Education's Learning Network of Vermont (LNV) and the state's Vermont Interactive Television (VIT) networks to facilitate testimony from across the state. Section seven of this document summarizes the comments, suggestions and concerns identified through the public hearings.

Finally, Section eight of this document offers our conclusions and recommendations. Generally we find that the system is working well. However, through our discussions with state and local officials and through testimony provided at the public hearings, a number of concerns with specific components of the funding system emerged. These are identified in Section eight. It is our overall view is that these issues warrant consideration by the legislature, but none of them rise to the level of suggesting that the overall structure of the funding model in Vermont should be changed. In fact, all of them are the likely result of changes in the local, state and national economies in the time since Acts 60 and 68 were implemented and consideration of each, along with a careful analysis of the impact of any proposed changes to system parameters, is a worthy next step.

Our work also identified considerable concern among Vermont policy makers regarding the high level of expenditures compared to the overall performance of Vermont's school children. It is our view that with the knowledge that the funding system is sound, the focus of the policy and education community should be aimed at improving student learning. Our five case studies offer an initial set of approaches that have led to success in Vermont schools. Our report concludes with a set of recommended future analyses to help the state identify incentives for accountability and ways to identify, employ and retain talented educators in the future.

2. VERMONT'S SCHOOL FUNDING SYSTEM

In fiscal year 2012 (FY 2012)[7] Vermont will raise an estimated $1.4961 billion to educate 89,115 students in 307 schools operated by 277 districts through 46 supervisory unions, 12 supervisory districts, and 2 interstate districts.[8] This spending amounts to approximately $16,788 per pupil. Vermont's system for allocating revenue to school districts is unique among the 50 states in that local towns and districts annually determine the spending level for their schools, and the state – through a complex system of property and income taxes and other state sources of revenue – funds the schools in a manner designed to treat taxpayers choosing the same level of spending for the students in their schools equally regardless of their location across the state.

It is important to point out at this juncture that many Vermont policy makers, stakeholders and citizens view the State's funding system under Acts 60 and 68 as an income tax based system that raises money through income sensitive adjustments to property taxes. However, documents and legislation describing the system describe it more in terms of a property tax based system with adjustments for income. Moreover, all other states – with the exception of Hawaii, which is a state, funded system – view their education finance systems through a property tax lens. Consequently, the substantial school finance literature upon which we rely in this evaluation, combined with the property tax based description of Vermont's system have led us to describe the system from the perspective of the property tax and income based adjustments to that tax. While this may run counter common views of Vermont's system, this approach is, in our view, the only way to comprehensively evaluate the performance of the system within the context of the goals of Acts 60 and 68.

The funding system in use today emerged in response to the 1997 Vermont Supreme Court ruling in *Brigham v. State* and was implemented through Act 60 in 1997 and Act 68 in 2004. This section provides a brief historical description of Vermont's school funding system and offers a description of its current operation. As in other states, the actual operation of the school finance system is highly technical. This description is designed to provide the reader with an understanding of how it works, but does not include many of the technical details that can lead to confusion in understanding the overall operation of the system.

HISTORICAL CONTEXT

Prior to the *Brigham* decision, Vermont relied on a foundation program to fund its public schools. A foundation program is the most common approach to school finance

[7] Fiscal years run from July 1 of one year through June 30, of the following year. As used throughout this document when we use the term FY 2012 we are referring to the period of time from July 1, 2011 through June 30, 2012, thus the current fiscal year as of the date of this study is FY 2012.

[8] *2011 Report on Act 3 Section 56, An Act Relating to Fiscal Year 2011 Budget Adjustment*, Report/Recommendations to the House and Senate Committees on Appropriations, Submitted by: Vermont Department of Education, School of Finance Division. April 6, 2011. http://www.leg.state.vt.us/reports/2011ExternalReports/268662.pdf

today and relies on a base – or foundation – level of revenue for each school district. To ensure that all school districts have equal access to this level of resources, a fixed tax rate is established, and state aid is provided to districts that are not able to raise the full foundation amount from the fixed tax rate.

In Vermont, the foundation level was legislatively determined on an annual basis by the Legislature and expressed in terms of funding per weighted ADM (Average Daily Membership).[9] Weighted ADM was determined by assigning weights of 1.25 to secondary students and to students from families receiving food stamps. In addition a variable weight was assigned for pupil transportation (Mathis, 1995). Downes (2004) points out that fluctuations in the state's fiscal status led to Legislative adjustments to the foundation tax rate to reduce the state's liability and the share of education expenditures fluctuated between 20% and 37% of education expenditures. In the period immediately prior to the *Brigham* ruling and passage of Act 60, the state share had been declining.

In addition, prior to Act 60, property wealthy districts were able to increase spending above the foundation level with a lower incremental tax rate than property poor districts, and thus benefited from both lower property taxes and higher per pupil revenues. Despite efforts – to that time unsuccessful – by the legislature to modify the system, the combination of reduced state share plus property tax rate inequities led to the filing of the *Brigham* suit. The ruling by the state's highest court required that local tax efforts for equal levels of school spending be substantially equal, and that the wealth of the state, not of local school districts, be the determinant of how much was spent to educate Vermont's school children. As described below, the Legislature responded with a system designed to both equalize property tax burdens and individual taxpayer liability on the basis of their household income.

ACT 60

Passed just four and a half months after the *Brigham* ruling, Act 60 dramatically changed the way Vermont's schools were financed. Act 60 established a two tier funding system and added an income adjustment to limit the amount individual taxpayers would pay for schools. The first component of the new system was a basic level[10] of spending for all districts, financed in part by a statewide property tax. Districts choosing to spend more than the basic level participated in a power-equalized system that included a recapture provision. A unique aspect of this second tier of the funding system was that it was funded by an additional property tax rate assessed in proportion to the level of spending a town chose. The property wealth of all districts that wanted to spend above the base spending level was pooled, and a tax rate based on the district's desired spending

[9] It is important to note that Vermont has a number of different pupil counts. Throughout this document we have identified the measure or count we are using, and Appendix 5 provides definitions of the many pupil counts used in the State's education system.

[10] Students of school finance will want to call this a foundation amount. Vermont does not use that term and points out that since the passage of Act 60 and as part of Act 68, the basic amount is determined annually as part of the appropriation process for education. Generally in school finance, the foundation level is determined on the basis of some minimum amount needed for all schools; this is not part of the discussion in determining the annual basic amount in Vermont.

level set to produce the additional funds desired, with each district receiving from the "sharing pool" of revenue the amount it wanted to spend above the base spending level.

What made the second tier unique was that it did not rely on any revenue sources other than property taxes beyond the base level. Towns that chose to spend above the base level informed the state what their spending level would be. The total additional revenues for all towns that went above the base level would come from the "sharing pool" that was funded by additional property taxes on those towns that chose to raise additional funds. Town tax rates above the base rate were determined on the basis of how much their per-pupil funding proportionally exceeded the base level (that is if per pupil spending above the base level was twice as high as another district, the tax rate beyond the base rate was twice as high as well) and how much money was needed to be raised to fund fully the sharing pool from these revenues. Property tax revenues were then placed in the "sharing pool" by the state and redistributed to school districts.

Setting proportionate tax rates for the same spending levels meant that property rich districts would raise more money at the same tax rate than property poor districts. The effect of the sharing pool process was to fully recapture any property tax revenues generated by property wealthy districts as all districts making the same spending level choice paid the same tax rate. Therefore, property wealthy district funded a disproportionate percentage of the sharing pool even when taxed at the same rate as poorer districts. This feature of the sharing pool led a number of wealthy districts to limit their participation in the sharing pool to minimize the amount of property tax funding that was recaptured. While some districts were able to fund all expenditures above the basic amount through private donations, many relied on a combination of private funding and the sharing pool. At its height, wealthy districts raised about $13.9 million total privately out of a system with total spending in the range of $1 billion. As described below, Act 68 eliminated the sharing pool and the incentive to raise such large amounts of private funds.

In addition, an income adjustment was enacted to impact individual tax liability for schools. In districts that only spent the basic amount, school taxes for taxpayers with household incomes below $75,000 were limited to the lesser of the homestead property tax (the tax liability on their homestead which is their house and up to two surrounding acres) or two percent of their income. For spending above the base amount, the percent of income was increased proportionally along with the property tax rate. This income adjustment was the result of many legislators wanting to move the state to an income based tax system for schools, and represented a compromise between those who wanted to rely solely on income taxes and those who felt residential property taxes should be part of the funding scheme as well. Although Downes (2004) suggests the income adjustment was primarily developed to limit the tax liability of low-income families living in high wealth or "gold town" school districts, interviews with officials who participated in the development of the system suggest this was not the primary goal. Rather the primary goal was an income tax based school funding system.

Act 60 succeeded in eliminating the relationship between property wealth and school district spending. However it was widely unpopular in the gold towns, many of

which elected to limit participation in the sharing pool and instead raised funds through private donations as described above. The state also took on additional funding responsibility for schools – and began the process whereby all property tax collections for schools are considered state, not local, revenue sources. In response to the many concerns about Act 60 and the complexities of the "sharing pool," the state enacted Act 68 in 2004.

ACT 68[11]

Act 68 as it modified Act 60, remains the basis for Vermont's school funding system today. Act 68 eliminated the two tier funding system placing all education funds for schools in one large pot, not two. It also ended the "sharing pool" and split the property tax base between residential and non-residential property. The non-residential property tax rate is determined by the state and is uniform across all towns but adjusted for the common level of appraisal or CLA as described below. Changes since that time have increased the income level at which the income adjustment to homestead property taxes can be used and made other small alterations to the operation of the system. According to the Vermont Department of Education (2011), today, regardless of the level of per pupil spending approved by the voters of each town, taxpayers with homesteads of the same market value or the same household income, in districts with the same per pupil spending, should have the equal tax bills for education. As shown in Section four of this document, that is largely the case today. School funding under this system is outlined below.

Education Spending

Under Act 68, total funding for education has two components, categorical grants and education spending. Categorical grants are separate revenue sources provided by the state to school districts for specific purposes. In FY 2012 these grants amounted to $205.7 million as displayed in Table 2.1. Education spending is essentially all other expenditures for education and is determined by totaling all budgeted expenditures of all school districts (including any district carryover deficits if they exist) and subtracting the categorical grants. For FY 2012 education spending is estimated to be $1.125 billion, which amounts to 78% of total PK-12 resources.

In addition to these two components, an estimate of total estimated revenue for FY 2012 includes the state appropriation for school employee pensions ($57.3 million) as well as Federal funding (estimated at $108 million) for a total of $1.496 billion or $16,788 per ADM. There are several revenue sources for state funds. They include:

- Non-residential property tax
- General Fund transfer
- One-third sales and use tax
- One-third purchase and use tax

[11] This section draws heavily from the Vermont Department of Education's document, *Vermont's Education Funding System, June 2011*.

- State Lottery
- Medicaid reimbursement
- Vermont Yankee
- Homestead property tax (with adjustments)
- Estimated State Pension Contribution
- Estimated Federal Funds

Table 2.1: Vermont Categorical Grants, FY 2012

Categorical Grant	Amount ($)
Special Education Aid (about 60% of eligible special education)	148,587,443
Transportation Aid (about 44% of transportation expenditures)	16,313,885
Small School Grants	7,100,000
Aid for State-placed Students	15,000,000
Technical Education Aid	12,872,274
Essential Early Education Aid	5,782,900
Total	**205,656,502**

Source: Vermont Department of Education, 2011

Property taxes are split into two components, a non-residential component and the homestead property tax. The tax rate for non-residential property is set annually by the state as part of the process of determining how much revenue will be needed to fund schools. The residential component – which is subject to both the income adjustment and a circuit breaker relief program for households with incomes below $47,000 – is the most complex part of the formula. Act 68 establishes tax rates of $1.59 per $100 of fair market value for non-residential property taxes and a base rate of $1.10 for homestead property although both are adjusted annually by the Legislature upon recommendation by the Tax Commissioner based on projections of the amount of money in the education fund reserve and the stipulation that the non-residential property tax revenues must fund at least 34% of education spending (total minus categoricals). For FY 2012, the non-residential property tax rate is $1.36 and the base homestead rate is $0.87.

Determining the actual tax payments for individuals in local school districts is relatively complex and based on a number of factors. The state does not limit how much a local district can spend on education although as described below there is a disincentive to spend at very high levels .

To determine homestead tax rates, the first step occurs when the Legislature establishes the base homestead tax rate ($0.87 for FY 2012) and the base education spending amount per pupil ($8,544 in FY 2012). A district's education budget, which can be larger than the base spending, is then divided by its equalized pupil count.[12] This

[12] The equalized pupil count is determined by the Vermont Department of Education based on a specific formula and differs from enrollment, ADM and weighted ADM. See Appendix 4 for details.

yields an education spending per equalized pupil figure for each district in the state. That amount is compared to the base education spending amount per pupil to determine the percentage variance from that amount. If a district's equalized per pupil spending amount is less than or equal to the base education spending level ($8,544), its tax rate is the base homestead rate ($0.87). If the district's per pupil spending exceeds the basic education per pupil amount, the base education homestead tax rate is increased by the percentage by which its per pupil spending amount exceeds the base amount. In addition, there is a threshold beyond which increases are funded at rates double the proportional increase (see below). The following describes how the education homestead tax rate is first determined for each town and then for each individual resident's property in the town.

First, a district's base homestead tax rate cannot be lower than the state determined base rate ($0.87 in FY 2012). Districts spending less than the base spending level therefore pay the same homestead tax rate as districts spending at the base spending level.

Second, when a town decides to spend above the base spending level, the education homestead tax rate of $0.87 is increased proportionally, i.e., by the same percentage.

Third, there is a built in disincentive to spend above a certain point, called the High Spending Threshold. The High Spending Threshold is determined statutorily to be 25% above the state average education spending per pupil for the prior year. In FY 2012, this threshold is $14,733 per pupil. For districts choosing to spend above this level (after adjustments for approved capital construction debt services, certain special education costs, and deficit repayments in some cases) the marginal homestead tax rate increases at twice the rate it increases below the threshold. The marginal percentage of income paid under the income adjustment also doubles above this threshold.

Fourth, an individual taxpayer's tax payment is subject to an income-based adjustment if their household income is below $90,000 (with a smaller adjustment between $90,000 and $97,000). In 2012, for school districts with per pupil spending equal to the base spending level ($8,544), the homestead property tax is the lower of the property tax assessment or 1.8% of household income. As equalized spending per pupil exceeds the base spending level, the percentage of household income used to determine tax liability increases by the same percentage that spending exceeds the base amount. This too is subject to the High Spending Threshold so the additional proportion of income to be paid in school taxes doubles for amounts above the threshold. Above incomes of $90,000 this adjustment is reduced until household income reaches $97,000 at which point no adjustment is available.

Fifth, the income adjustment to property taxes only applies to the first $500,000 of housesite market value. Any value above $500,000 is subject to the homestead property tax rate of the school district.

Sixth, Vermont has a circuit breaker property tax relief program for households with incomes below $47,000. This provides further income based property tax relief for some households. The important consideration related to the circuit breaker is that once a taxpayer qualifies for circuit breaker assistance, they do not pay for additional homestead property taxes even if their school district's spending increases. This adjustment has been in place since the 1970s, but after Act 60's passage, the income adjustment reduced tax liabilities of many households and reduced the number of households that qualify for the circuit breaker, which is applied after the income adjustment is computed.[13]

Seventh, there is one more adjustment that has caused a great deal of confusion about the system. The common level of appraisal or CLA is designed to adjust property tax rates to accommodate differences in assessment practices across the state. The CLA is computed by the Vermont Tax Department based on actual sales data over the past three years and additional statistical analysis. The CLA compares the town's education grand list with what the grand list would be if all properties were listed at 100% of fair market value as determined through this analysis. The CLA is then expressed as a percentage such that a town that has under assessed its property would have a value less than 100% and a town that over assessed its property would have a value exceeding 100%. The CLA is then applied to the town's education tax rate by dividing the homestead and non-residential tax rates by the CLA. For example in a town with an education tax rate of $1.22 and a CLA of 80%, the tax rate would be divided by 0.8 and the actual tax rate shown on tax bills would be $1.53 ($1.22/0.8). Similarly, a town with a CLA of 120% would find a tax rate of $1.22 adjusted downward to $1.02 ($1.22/1.20). Again, this important adjustment, which is made in most other states as well, is to ensure that property tax rate calculations are made on the basis of comparable valuing of property.

Eighth, another confusing aspect of the system is the annual determination of the base amount as well as the non-residential property tax rate and the homestead base tax rate. Because these are determined by the Legislature and likely to be impacted by the level of other state revenue available for education, if a district's education spending were to remain constant from one year to the next, but the Legislature were to reduce the funding from other state sources, homestead and/or non-residential property tax rates could increase. Similarly, it is possible for a town to hold spending constant while others increase spending and similarly see tax rate increases.

While this system appears quite complex, the intent is to ensure that property tax payments, whether based on the value of the property or household income should be equal for individuals in school districts with the same per pupil spending level and equal property values or household incomes. In short, the property wealth of individual school districts and the income of district residents should not impact the amount of money a district spends for education. We address how well the Vermont system of school funding addresses this issue in Sections four and five below.

[13] It should also be noted that Vermont has a $15,000 homestead exemption for property taxes. Property worth less than $15,000 is not subject to taxation, and tax rates are applied to homestead property values minus the $15,000 exemption.

3. INTERSTATE COMPARISONS

As part of this study, a comparative assessment of state school finance systems was conducted. The interstate comparison reviewed data from all 50 states, with an emphasis on data from the New England states. The study focused on comparing school funding data from Vermont with that of other states with a focus on three areas:

1. Educational funding distribution systems
2. Expenditures and student achievement data since the passage of Act 60
3. A comparison of school finance equity compared to other states

To answer these questions, we reviewed data from national and state educational organization as well as various peer reviewed academic sources. In the description that follows, we provide information on Vermont's status compared to national averages as well as compared to the other states in New England. Data presented here focus on the comparison with New England. *Appendix 1 of this report contains related tables showing similar data for all 50 states.*

The findings from this interstate comparison can be summarized as follows:

- Educational Expenditures
  - State and local revenues for K-12 education increased by 83.7% between FY 2001 and FY 2011 (NEA Rankings and Estimates, 2011)[14]
  - This increase is due in part to declining enrollments, and in part to substantial increases in state education revenues
  - Vermont maintained a continued commitment to education funding as measured through both the state's relative tax effort (highest in the nation) and the percentage of state resources devoted to K-12 schools (6th highest)

- Student Population
  - Vermont has experienced the second greatest percentage decrease in student population (18.1%) over the time frame of the study. Only North Dakota has had a greater decline
  - Average school district size has dwindled to 299 students – making the state's school districts the smallest in the nation with an average enrollment that is less than 10% of the size of the average school district in the United States.

- Staffing
  - Vermont has seen an increase in the number of new teachers, administrators and support staff

[14] We needed to use a national source for interstate comparison data, and the NEA has the best and most recent data. However, NEA estimates have not relied on data provided by the State of Vermont since 2006. The NEA has projected revenues and expenditures based on data provided prior to 2006 and we believe their estimates overstate revenues. Our analysis of FY 2012 budgeted revenues for education identified total revenues of $1..496 billion or $16,788 per ADM. Nevertheless, we use the NEA figures in this section of the report.

- When combined with the decline in student enrollments the result is that Vermont has the lowest teacher to student and staff to student ratios in the country
- The reduced teacher and staff to student ratios are a major cause of the state's increases in per pupil expenditures

- Student Achievement
  - Vermont's scores on the National Assessment of Educational Progress (NAEP) continually rank among the top ten in the nation
  - While there have been slight increases in NAEP math and reading scores for 4th and 8th grade students, the increases are less than the national average increase in these scores, and also lower than improvements observed in other New England states over this time period
  - Student performance on most aspects of the New England Common Assessment Program (NECAP) has been relatively flat.
  - The state has observed a steady increase in high school graduation rates

In Vermont from 1999-2000 to 2009-10 the number of full-time equivalent (FTE) teaching positions increased by 250, or 3.1%. Nationally the number of teachers increased by 10.3% and in the New England states they increased by 12.7%. Vermont's increase in teaching positions (3.1%) combined with the decrease in the state's K-12 population (18.1%) led to a reduction in the student to teacher ratio from 12.3 to 1 to 10.6 to 1 in 2009-10 (NEA, 2011).

EDUCATIONAL FUNDING DISTRIBUTION SYSTEMS

Each of the 50 states employs a unique system for allocating funds to local education agencies. These systems are developed in various ways and take into account state specific political and historical factors. These factors include political decisions, fiscal constraints and judicial mandates. While each state's funding system is unique, it is possible to place these funding systems into general categories for comparative purposes. A recent study by Deborah Verstegen (2011) at the University of Nevada, Reno put each of the 50 states' systems into one of four general funding categories:

1. *Foundation formula* (38 states) – Foundation formulas establish a guaranteed per pupil or per teacher funding level that is theoretically designed to pay for a basic or minimum education program. Local education agencies are required to contribute to the foundation amount - usually through a uniform tax rate. The state makes up the difference between local funding and the total foundation amount (for more details see Odden & Picus, 2008). In some states this system is known as a base or guaranteed funding system.

2. *District power equalization* (3 States) – District power equalization, frequently also called a guaranteed tax base, is designed to provide state funding matches to local educational agencies based on their relative wealth. Theoretically this type of formula functions by guaranteeing an equal tax base to every local education

agency in the state. Verstegen (2011) assigns Vermont, Connecticut and Wisconsin to this category.

3. *Full state funding* (1 state) – The state of Hawaii operates as a single school district, and because of this 100% of school funding comes from state sources.

4. *Combination of formulas* (8 states) – Eight states make use a combination of a foundation formula, power equalization formula, flat grants and/or other types of funding methods. These systems are often referred to as two-tier or multi-tier systems. A common approach is a first tier foundation level followed by a second tier of optional funding supported through guaranteed tax base or percentage power equalization.

It should be noted that it can be difficult, bordering on impossible, to place each state's funding system into a single category - Vermont's funding system is an example of this. This study defines the Vermont system as using a district power equalization formula, but the state's program also contains elements of a foundation formula and by some it could even be defined as full state funding, particularly since the state considers all property taxes raised for education whether residential or non-residential to be a state revenue source.

Funding Special Student Populations

States often provide supplementary funding to local school districts for certain student populations that may require additional resources to meet their educational needs. This can include students enrolled in special education, students who are identified as at-risk or low income, and English language learners. Forty-nine states provide additional funding for special education students – Rhode Island is the only exception. Thirty-four states provide additional funding for at-risk student populations – usually defined as low income students who qualify for free/reduced priced lunch programs. Thirty-seven states provide additional funds for educating students who do not speak English as their first language. Vermont provides special education funding to districts through three mechanisms; a census based block grant, an extraordinary cost reimbursement program for high-cost students and a reimbursement program designed to cover 56.44% of any remaining special education costs not paid for by other federal or state programs. The state also provides additional funding for at-risk and English language learner (ELL) students through the states primary formula. Vermont's funding formula provides an additional weight for at-risk students of 0.25 while ELL students are provided a weight of 0.20.

Education Funding Systems in New England

Verstegen (2011) indicates that Vermont's education funding system relies on a variation of a power equalization formula that provides additional funding for special education, at-risk and ELL students. The approach used by each of the six New England States is summarized in Table 3.1. Important comparisons from this table include:

- Four of the five other New England states use a variation of a foundation formula to distribute funding to school districts - the exception is Connecticut which makes use of a power equalization formula.
- Four of the five other states provide additional funding for special education students (Rhode Island is the only exception)
- Three of the five other states in New England provide additional funding for at-risk students (New Hampshire and Rhode Island do not).
- All five other states provide some additional funding for the education of students in English language learner programs.
- New Hampshire provides additional funding for student transportation through their primary formula while Connecticut, Maine and Massachusetts provide transportation funding outside of the formula, and Rhode Island provides no additional funding for transportation.
- All five other states provide some form of capital funding to districts outside of their primary funding formula.

Table 3.1: Summary of education funding systems across the New England States

State	Funding Formula	Special Education	At-Risk	English Language Learners
Vermont	Power Equalization	Census and reimbursement based funding along with additional funding for high-cost students	An additional weight of 0.25 is supplied to each at-risk student	An additional weight of 0.20 is supplied to each ELL student
Connecticut	Power Equalization	Additional funding only for high need students	25% addition funding per student	Grants to districts with 20 or more ELL students
Maine	Foundation	Reimbursement based on costs	20% addition funding per student	30% to 60% additional funding per student
Massachusetts	Foundation	Based on census and also for high need students	An additional $2,285 to $2,831 per student	100% additional funding per full-time student
New Hampshire	Foundation	Additional funding only for high need students	No additional funding	$1,000 per ELL student
Rhode Island	Foundation	No additional funding	No additional funding	$31 mill in grants to districts

Source: Verstegen, D. A. (2011) "Public education finance systems in the United States and funding policies for populations with special educational needs". Education Policy Analysis Archives, 19 (21).

Transportation and Capital Costs

Two programs that tend to be funded by states outside of the primary funding formula are transportation costs and capital expenditures. While 10 states address transportation costs within the primary formula, and three states provide no funding at all, the remaining 37 states address this issue outside of the primary formula because transportation needs varies so greatly between districts. The various systems that states use to allocate transportation costs outside of the primary formula include.

- Allowable reimbursement (16 states) – The state reimburses districts for a percentage of allowable transportation expenses
- Density formulas (9 states) – The state funds districts based on the number of district students per square mile
- Per pupil (5 states) – The state provides funding to each district based on a set amount per pupil
- Full reimbursement (5 states) – The state reimburses each district the full cost of allowable transportation expenses
- Equalized reimbursements (3 states) – The state provides reimbursement that is equalized based on a districts relative wealth

Tennessee is the only state that funds transportation both in the primary formula and through funding outside the formula. Vermont provides transportation funding to its school districts through a system of allowable reimbursements.

States often address capital costs outside of the primary formula as well. Twelve states provide no funding for capital costs. Of the remaining 38 states – six states use their primary formula to fund capital costs, four states use a combination of funding from their primary formula and other funding sources outside of the formula and the remaining 28 states use one or more funding programs outside the primary formula. The various types of funding that exist outside the formula are:

- Approved project grants (14 states)
- Equalized project grants (10 states)
- Equalized debt service (6 states)
- State bond guarantees (5 states)
- Subsidized loans to school districts (4 states)
- Debt service grants to school districts (2 states)

Vermont has in the past used a combination of approved project grants, equalized debt service grants and subsidized loans to provide capital funds to school districts. However, there is currently a moratorium on capital funding except for emergencies. At the present time, Vermont school districts are expected to use operational funds to cover their capital expenses and operational expenses above base spending are on average 70 percent cost shared by the state.

Table 3.2 below summarizes the transportation and capital cost provisions of the school funding formulas in the six New England states.

Table 3.2: Funding Transportation and Capital Expenditures Outside of the Formula in New England States

State	Transportation	Capital Expenditures
Vermont	Allowable reimbursement	All non-emergency capital funding has been suspended
Connecticut	Equalized reimbursements	Equalized project grants
Maine	Density formula	Approved project grants
Massachusetts	Full cost reimbursement	Approved project grants, state bond guarantees and equalized debt service grants.
New Hampshire	Through the primary funding formula	Equalized project grants
Rhode Island	None	Equalized project grants

Source: Verstegen, 2011

STATE FUNDING COMPARISONS

As part of this study, we compared education funding and student performance in Vermont to all 50 states and conducted a more in-depth analysis of how Vermont compares to the other New England states. Educational expenditure, demographic and student achievement data were reviewed for all 50 states beginning with fiscal year 1999-2000 - the last year before Act 60 was fully implemented – through 2010-11.[15] Details are provided below.

Educational Expenditures

Total K-12 Expenditures

A review of data from the National Education Association's Rankings & Estimates publications[16] shows that from fiscal year 1999-2000 to 2010-11 state and local revenue for public K-12 education in Vermont grew from $850.3 million to $1.562 billion - an increase of just over $711.5 million or 83.7%. During this same time period state and local revenue for K-12 education in all 50 states increased by 62.6% ($205.5

[15] http://education.vermont.gov/new/pdfdoc/pubs/eeo_report_01.pdf
[16] Available at www.nea.org

billion). In the six New England states, local and state revenue for education increased at the rate of 62.6% ($12.3 billion). Table 3.3 shows these changes for all six states in New England. As noted in footnote 18 and the footnote to Table 3.3, the total revenue and growth figures in Table 3.3 for Vermont may be high. Regardless of which figure is used, Vermont still has the second fastest percentage growth rate in New England, exceeded only by New Hampshire.

Table 3.3: Growth in Local & State Revenue for K-12 Education

	Local & State Revenue		Growth in Revenue	
	1999-2000	2010-2011	In Dollars	In Percentages
National	**$328,174,961,000**	**$533,642,694,000**	**$205,467,733,000**	**62.6%**
New England	**$19,599,521,000**	**$31,859,817,000**	**$12,260,296,000**	**62.6%**
Vermont	$850,336,000	$1,561,826,000*	$711,490,000	83.7%
Connecticut	$5,822,073,000	$8,869,759,000	$3,047,686,000	52.3%
Maine	$1,561,385,000	$2,541,017,000	$979,632,000	62.7%
Massachusetts	$8,756,809,000	$14,355,655,000	$5,598,846,000	63.9%
New Hampshire	$1,430,655,000	$2,739,764,000	$1,309,109,000	91.5%
Rhode Island	$1,178,263,000	$1,791,797,000	$613,534,000	52.1%

Source: National Education Association. Rankings and Estimates, 2000 through 2011.
* Note: This figure exceeds many Vermont estimates of state and local revenues for Vermont. This is due in part to the fact that the NEA uses somewhat different definitions of revenue than do most Vermont revenue and spending estimates. Specifically, these figures include estimates for contributions to employee pension funds, which are funded separately by the Legislature in Vermont. Finally, we anticipate this figure is somewhat high because as noted in footnote 18, the NEA has estimated Vermont revenue and expenditure data since 2006 projecting these figures based on growth prior to 2006. This is likely an over-estimate of the total given that the recession of 2008-2010 slowed down the growth in spending in Vermont in recent years. We estimate FY2012 total revenue to be $1.496 billion, which represents an increase of 75.9% over FY 2000.

Per Student Expenditures

As shown in Table 3.4, in FY 2000 Vermont's average per pupil expenditure was $6,981, ranking it 16th highest in the nation – $354 or 4.3% above the national average of $6,627 per pupil. In 2010-11 the NEA's estimated average per pupil expenditure for Vermont grew to $17,447, which was $6,631 or 61.2% above the national average of $10,826. That year, Vermont's per pupil spending ranked third behind New York ($17,750) and New Jersey ($17,717). In the other five New England states, spending averaged $15,316 per student and ranged from $13,797 in New Hampshire to $15,803 in Rhode Island.

Our estimated per pupil revenues for FY 2012 identified in section two above amounted to $1.496 billion, or $16,788 per ADM, some $657 per ADM lower than the expenditure figure estimated by the NEA for FY 2011. However, even at this level of per pupil spending, we estimate that Vermont would still have the third highest per pupil expenditure and revenue in the country. In FY 2011 the NEA lists Wyoming as the fourth highest spending state at $16,066 per pupil, more than $700 below our Vermont estimate (see Appendix 1 Table A1.4). The Wyoming Legislature did not enact a cost of living adjustment to the state formula for FY 2012 so it seems highly unlikely that Wyoming spending would jump enough to overtake Vermont.

From fiscal year 1999-2000 to 2010-11 Vermont's per pupil expenditures for public primary and secondary schools as estimated by the NEA increased by $10,466 or almost 150%. Vermont's percentage spending growth was the highest in the nation. Nationally, average spending per pupil increased by $4,199 or 63.4%. If Vermont's per pupil spending had grown at the national average, current spending would be $11,407 per pupil – or $6,400 less than the current average spending level. In the other five New England states per student expenditures increased an average of 94.1% ranging from 53.1% in Connecticut to 122.5% in New Hampshire. Details of these changes are displayed in Table 3.4. Finally, if we use the $17,103 per pupil spending figure for Vermont, the growth rate from FY 2000 would be 145%, and Vermont would remain the fastest growing state in terms of revenues per pupil.

Table 3.4: Growth in Per-Pupil Spending

	Per Pupil Expenditures *(National Rank)*		Growth in Expenditures *(National Rank)*	
	1999-2000	2010-2011	In Dollars	In Percentages
National	**$6,627**	**$10,826**	**$4,199**	**63.4%**
New England	**$7,889**	**$15,316**	**$7,427**	**94.1%**
Vermont	$6,981 (16)	$17,447 (3)*	$10,466 (1)	149.9% (1)*
Connecticut	$9,792 (2)	$14,989 (8)	$5,197 (17)	53.1% (36)
Maine	$7,619 (11)	$15,032 (7)	$7,413 (8)	97.3% (7)
Massachusetts	$8,750 (5)	$14,828 (9)	$6,078 (11)	69.5% (25)
New Hampshire	$6,202 (24)	$13,797 (11)	$7,595 (7)	122.5% (3)
Rhode Island	$7,990 (9)	$15,803 (5)	$7,813 (6)	97.8% (6)

Source: National Education Association. Rankings and Estimates, 2000 through 2011.
*Note: Our estimated FY 2012 revenues per ADM amount to $16,788 per ADM, with growth amounting to $9,807 and a growth rate of 140.4%, so Vermont has the highest increase in dollars and percent if estimates for FY 2012 are used.

State Financial Commitment to Education

An important question to ask in comparing per pupil expenditures for education across states is to consider how "hard" a state works to reach it's spending level. One approach for estimating this level of effort is to analyze K-12 education expenditures per $1,000 of personal income. Vermont's spending for K-12 education in the 2007-08 school year (the most recent year for which data are available) was $56 per $1,000 of personal income. Vermont has the highest level of effort (tied with Wyoming) in supporting education when computed in this manner. The national average in 2007-08 was $41 per $1,000 of income, a figure that was unchanged from 1999-2000. In New England in 2007-08, the amount ranged from $40 in Connecticut to $47 in Maine and Rhode Island. See Table 3.5 for more detailed findings.

Another way to assess a state's fiscal commitment to education is to determine the percentage of the state's budget devoted to K-12 public schools. During the 2008-09 fiscal year (the most recent year for which data are available) General Fund K-12 expenditures accounted for 26.2%[17] of state general fund expenditures in Vermont while the national average was 21.7%. Only five states had amounts that exceeded Vermont – Texas (31%), Michigan (28.9%), Indiana (28.1%), Idaho (27.4%) and Kansas (26.4%). The percentage of Vermont's budget going to K-12 education has varied considerably since the passage of Act 60, from a low of 19% in 1999-2000 to a high of 38% in 2002-

[17] Note: Only 20.3% of Vermont's state funding for education flows through the states General Fund, the remaining 79.7% is derived from the non-residential property tax (40.5%), the homestead property tax (26.8%), a third of the sales & use tax (10.2%) and other state sources (2.2%).

03 (National Association of State Budget Officers, 2011). Table 3.6 summarizes the share of each New England state's budget devoted to K-12 education in 1999-2000 and 2008-09.

Table 3.5: K-12 Spending Per $1,000 of Income

	K-12 Spending Per $1,000 of Income *(National Rank)*		Change in Expenditures *(National Rank)*	
	1999-2000	2007-2008	In Dollars	In Percentages
National	**$41**	**$41**	**$0**	**0.0%**
Vermont	$53 (2)	$56 (1)	$3 (17)	5.7% (15)
Connecticut	$42 (21)	$40 (26)	-$2 (31)	-4.8% (33)
Maine	$46 (9)	$47 (8)	$1 (23)	2.2% (24)
Massachusetts	$36 (44)	$42 (22)	$6 (3)	16.7% (3)
New Hampshire	$37 (38)	$42 (22)	$5 (7)	13.5% (7)
Rhode Island	$41 (23)	$47 (8)	$6 (3)	14.6% (5)

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table 3.6: State K-12 Expenditures as a Percent of Total State Expenditures

	K-12 Expenditures as a % of total state expenditures *(National Rank)*		Change in Expenditures *(National Rank)*
	1999-2000	2008-2009	
National	**22.5%**	**21.7%**	**-0.8%**
Vermont	20.5% (25)	26.2% (6)	5.7% (3)
Connecticut	13.9% (48)	14.6% (45)	0.7% (19)
Maine	19.9% (26)	17.6% (35)	-2.3% (37)
Massachusetts	14.4% (47)	13.0% (47)	-1.4% (28)
New Hampshire	28.7% (4)	22.4% (20)	-6.3% (44)
Rhode Island	16.6% (46)	14.9% (44)	-1.7% (33)

Source: National Association of State Budget Officers, 2011

Factors That Drive Educational Expenditures

There are multiple factors that can influence the growth, or reduction, of education spending in a state. These can include: changes in the size of the state's

student population, increases in teacher/staff compensation, growth in the number of teachers/staff and increases in costs outside of the state/districts powers (i.e. fuel or energy costs). A number of these issues have impacted Vermont since the passage of Act 60 and are described below.

Student Population

Since the passage of Act 60 Vermont has experienced a substantial decrease in its K-12 student population. Between 1999-2000 and 2010-11, Vermont's K-12 public school population decreased 18.1% from 104,559 to 85,635 (NEA, 2011)– a decrease of 18,924 students. This was the second largest percentage population decrease in the nation (North Dakota experienced a 20.2% decrease). During this same period of time the national K-12 public school population increased by 5.6% and the student population in New England shrank by 3.4%. The change in individual New England state enrollments is shown in Table 3.7.

While the state's student population was decreasing, the number of school districts remained relatively stable. As a result, the average district size decreased by 52 students or 14.8%. For the 2010-11 fiscal year Vermont had the smallest average district size in the country at 299 students per district. Data on other New England States and the National Average school district size is displayed in Table 3.8.

Table 3.7: Student Population Changes

	Total Student Enrollment		Change in Enrollment *(National Rank)*	
	1999-2000	2010-2011	In Students	In Percentages
National	**46,540,114**	**49,162,463**	**2,622,349**	**5.6%**
New England	**2,198,182**	**2,124,456**	**-73,726**	**-3.4%**
Vermont	104,559	85,635	-18,924 (43)	-18.1% (49)
Connecticut	554,899	566,030	11,131 (25)	2.0% (26)
Maine	209,254	187,401	-21,853 (44)	-10.4% (46)
Massachusetts	967,336	953,223	-14,113 (40)	-1.5% (34)
New Hampshire	206,783	193,264	-13,519 (39)	-6.5% (44)
Rhode Island	155,351	138,803	-16,548 (41)	-10.7% (47)

Source: National Education Association. Rankings and Estimates, 2000 through 2011

Table 3.8: Average School District Sizes

	Average District Size *(National Rank)*	
	1999-2000	2010-2011
National	**3,169**	**3,213**
New England	**1,701**	**929**
Vermont	342 (50)	299 (50)
Connecticut	3,049 (27)	2,903 (25)
Maine	894 (45)	818 (46)
Massachusetts	2,607 (30)	2,432 (29)
New Hampshire	1,269 (43)	1,200 (44)
Rhode Island	4,315 (16)	2,833 (27)

Source: National Education Association. Rankings and Estimates, 2000 through 2011

Teacher Staffing

Data collected by the National Center for Education Statistics show that employee salaries and benefits account for just over 80% of all public school expenditures. The majority of these salary and benefit expenses can be traced to teaching positions. Consequently, increases in teacher pay and/or increases in the number of teachers employed in a state can drive up total educational expenditures. After the passage of Act 60 Vermont did not experience a dramatic increase in teacher pay but did witness an increase in the number of teachers – all at the same time student populations were dropping.

In 2010-11, the average teacher salary in Vermont was $49,084, which was 11.1% lower than the national average teacher salary of $55,202. Prior to the full implementation of Act 60 in 1999-2000 average teacher salaries in Vermont were $37,714 or 9.7% lower than the national average of $41,754. Between 1999-2000 and 2010-11 Vermont's teacher salaries grew by $11,370 or 30.1% while the national average teacher salary during that time grew by $13,448 for an increase of 32.1%. These data are displayed in Table 3.9.

Table 3.9: State Average Teacher Salaries

	Average Teacher Salaries *(National Rank)*		Salary Increases *(National Rank)*	
	1999-2000	2010-2011	In Dollars	In Percentages
National	**$41,754**	**$55,202**	**$13,448**	**32.2%**
Vermont	$37,714 (26)	$49,084 (28)	$11,370 (32)	30.1% (30)
Connecticut	$51,780 (2)	$64,350 (5)	$12,570 (26)	24.3% (46)
Maine	$35,561 (36)	$46,106 (43)	$10,545 (42)	29.7% (32)
Massachusetts	$46,580 (8)	$69,273 (2)	$22,693 (1)	48.7% (3)
New Hampshire	$37,734 (25)	$51,443 (21)	$13,709 (14)	36.3% (15)
Rhode Island	$47,041 (7)	$59,686 (8)	$12,645 (23)	26.9% (43)

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

In Vermont from 1999-2000 to 2009-10 the number of full-time equivalent (FTE) teaching positions increased by 250, or 3.1%. Nationally the number of teachers increased by 10.3% and in the New England states they increased by 12.7%. Vermont's increase in teaching positions (3.1%) combined with the decrease in the state's K-12 population (18.1%) led to a reduction in the student to teacher ratio from 12.3 to 1 to 10.6 to 1 in 2009-10 (NEA, 2011). Nationally, average student to teacher ratio in 2009-10 was 15.4 to 1 and the average in the New England states was 14.2 to 1 in that same year.

Between 2000-01 and 2009-10 Vermont also saw an increase of 327 administrators and other staff. This represented an increase of 22%. For the same period, the national average increase was 15.1% and the increase for the New England states was 19.4% (NCES, 2011). These data are displayed in Table 3.10.

Table 3.10: Teacher & Administrator to Student Ratios

	Pupils Per Teacher Based on Fall Enrollment *(National Rank)*		Pupils Per Administrator Ratios *(National Rank)*	
	1999-2000	2009-2010	1999-2000	2010-2011
National	**16.1**	**15.3**	**341.5**	291.9
New England			**293.5**	258.4
Vermont	12.3 (1)	9.8 (1)	256.9 (6)	184.1 (3)
Connecticut	13.7 (7)	13.2 (11)	282.8 (14)	257.9 (15)
Maine	13.5 (5)	11.1(2)	236.4 (3)	155.0 (2)
Massachusetts	14.2 (13)	13.6 (15)	332.3 (27)	221.1 (5)
New Hampshire	14.7 (16)	12.7 (8)	400.7 (43)	384.0 (46)
Rhode Island	12.9 (2)	13.0 (10)	405.3 (44)	321.1 (35)

Sources: Teacher data - National Education Association. Rankings and Estimates, 2000 through 2011. Administrator data – National Center for Education Statistics, 2000 through 2011.

Other Funding issues

There have been some questions as to whether the state of Vermont has disproportionally high transportation costs. The most recently available data from the National Center for Education Statistics (FY 2007-08) shows that transportation expenditures in Vermont were 3.1% of total educational expenditures, compared to a national average of 3.6% and a New England average that ranged from 3.5% (Rhode Island) to 4.2% (Connecticut and Maine). On a per pupil basis, Vermont spent $441 on transportation while the national average was $406 with expenditures in New England ranging from $469 in New Hampshire, to $664 in Connecticut. Expenditures in other New England States were Rhode Island -- $506, Maine - $516 and Massachusetts - $549.

At one of the public hearings conducted as part of this study, several individuals questioned Vermont's commitment to capital spending for schools compared to other states. In FY 2007-08 Vermont spent $741 per student on capital outlay compared to a national average of $1,276. The New England average ranged from a high of $2,002 per pupil in Connecticut to a low of $281 per pupil in Rhode Island. Other New England state capital expenditures per pupil were Maine - $483, Massachusetts - $638 and New Hampshire - $1,022. If Vermont's capital expenditures were at the national average of $1,276 per student it would provide an additional $45.8 million in facility funding for school districts each year.

EDUCATIONAL OUTCOMES

Overall, Vermont students do well in comparisons of standardized tests compared to students in the United States, and are at about the average in performance among the six states in New England. Below we show how Vermont compares on the National Assessment of Educational Progress (NAEP) and the New England Common Assessment Program (NECAP).

National Assessment of Educational Progress

The NAEP assessments have been administered periodically to students in reading, mathematics, science, writing, U.S. history, civics, geography, and other subjects since 1969.[18] Federal law now requires all states that receive Title I funds – which currently all states receive – to participate in NAEP reading and mathematics assessments at fourth and eighth grades (NAEP, 2011). Because of this we have comparable fourth and eighth grade math and reading NAEP results for all states for the 2003, 2005, 2007, 2009 and 2011 assessments.

NAEP - Scale Scores

Cross state comparisons using NAEP data can be made using average scale scores or student achievement levels. When reviewing Vermont's average scale scores on the NAEP Math and Reading exams for the 4th and 8th grade there are some positive conclusions and some areas where the results suggest more can be done. Overall, a review of NAEP scores from 2003-2011 show:

- In every year that was reviewed, Vermont's math and reading scores were above the national average
- Vermont's scores were never ranked lower than 7th nationally
- Vermont's test scores for both math and reading in the 4th and 8th grades improved from 2003 to 2011
- The average scores for students in Massachusetts are always higher than the average scores for students in Vermont
- Vermont's scores were more likely to be the 3rd or 4th highest in New England (13 times) than the 2nd highest (7 times)
- While Vermont's average scale scores did improve from 2003 to 2011 that improvement was often small

	2003	2011
Math 4th grade:	242	247
Math 8th grade:	286	294
Reading 4th grade:	226	227
Reading 8th grade:	271	274

[18] National Center for Education Statistics' National Assessment of Education Progress web site. Retrieved November 21, 2011 from http://nces.ed.gov/nationsreportcard/faq.asp#ques3a

NAEP – Student Achievement Levels

Student test results are divided into four different student achievement levels – advanced, proficient, basic and below basic. These performance standards are set by the National Assessment Governing Board and provide a context for interpreting student performance on NAEP, based on recommendations from panels of educators and members of the public (NAEP, 2011). For comparison purposes this study reviewed NAEP student test results that were at or above basic and at or above proficient. Table 3.11 shows that in Vermont, the number of students scoring at or above basic and proficient in reading or math increased between 2003 and 2011.

Table 3.11: Summary of Vermont Reading and Math NAEP results, 2003 to 2011

Percent of Students Who Scored At or Above Basic

	2003	2005	2007	2009	2011
Math – 4th grade	85%	87%	89%	89%	89%
Math – 8th grade	77%	78%	81%	81%	82%
Reading – 4th grade	73%	72%	74%	75%	73%
Reading - 8th grade	81%	79%	84%	84%	82%

Percent of Students Who Scored At or Above Proficient

	2003	2005	2007	2009	2011
Math – 4th grade	42%	44%	49%	51%	49%
Math – 8th grade	35%	38%	41%	43%	46%
Reading – 4th grade	37%	39%	41%	41%	41%
Reading - 8th grade	39%	37%	42%	41%	44%

Vermont has had a higher percentage of students score at or above basic and proficient in math and reading almost every year that the exam was administered. However, the percentage of students who scored at or above basic and proficient was consistently higher in Massachusetts, a state with a much higher at-risk population, than in Vermont. Table 3.12 provides more detail on how Vermont students did on the NAEP and compares Vermont's results to both other states in New England, and to national outcomes. This is also displayed graphically in Figure 3.1. It is important to point out that the percent of students at or above proficient on the NECAP in Vermont is higher than the percent at or above proficient on NAEP which suggests that the cut off point on NECAP is at a lower level of proficiency, or that NAEP has established a higher bar for proficient.

Table 3.12: Comparison of Vermont NAEP results with other New England States and with National Results, Math and Reading NAEP Scale Scores 2003 to 2011

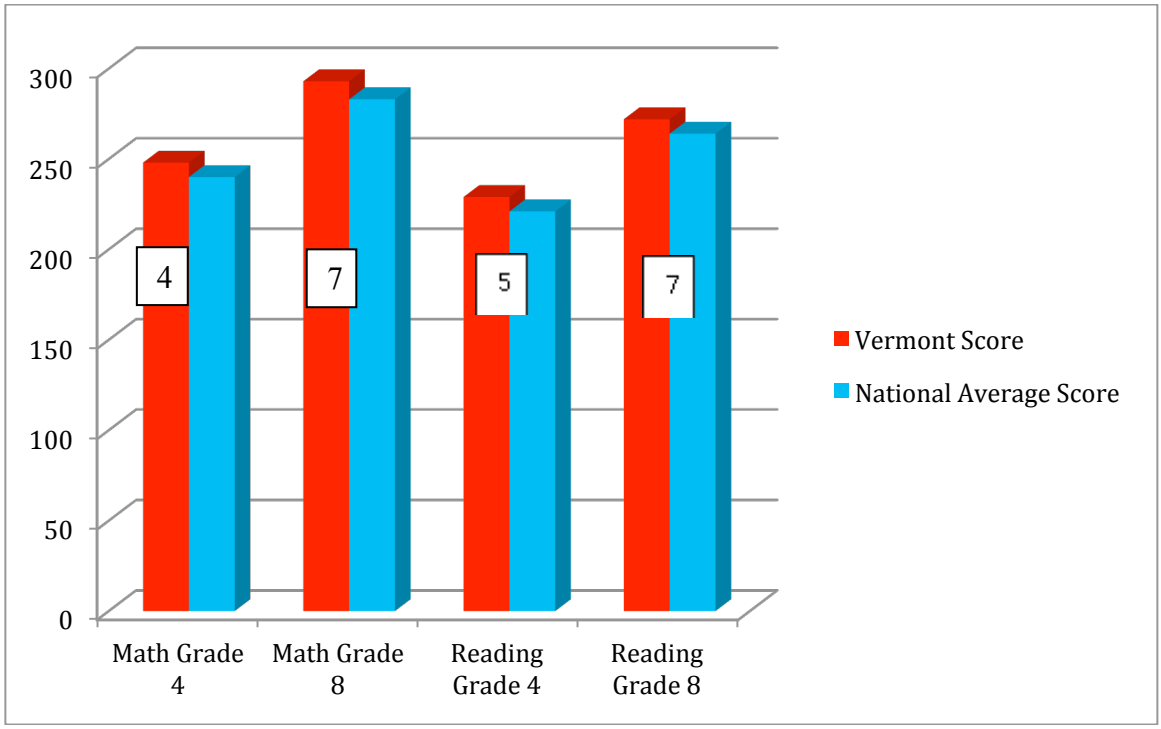
Math 4th Grade	Vermont Scores			National Scores
Year	Average	National Ranking	New England Ranking	Average
2003	242	3	2	235
2005	244	6	3	238
2007	246	6	3	240
2009	248	4	3	240
2011	247	6	3	240

Math 8th Grade	Vermont Scores			National Scores
Year	Average	National Ranking	New England Ranking	Average
2003	286	6	3	278
2005	287	3	2	279
2007	291	4	2	281
2009	293	3	2	283
2011	294	4	2	283

Reading 4th Grade	Vermont Scores			National Scores
Year	Average	National Ranking	New England Ranking	Average
2003	226	4	4	218
2005	227	3	3	219
2007	228	4	3	221
2009	229	5	4	221
2011	227	7	4	220

Reading 8th Grade	Vermont Scores			National Scores
Year	Average	National Ranking	New England Ranking	Average
2003	271	3	3	263
2005	269	7	4	262
2007	273	2	2	263
2009	272	3	2	264
2011	274	4	3	264

Figure 3.1: NAEP Scale Scores (with National Rankings), 2009



Source: NAEP, 2011

New England Common Assessment Program

Maine, New Hampshire, Rhode Island and Vermont have worked together to develop grade level expectations (GLE) for students in math, reading, writing and science. To test how well students are achieving these GLEs – and to fulfill the requirements of the federal 'No Child Left Behind' legislation - the states developed the New England Common Assessment Program (NECAP). There are currently NECAP exams for math (grades 3-8 & 11), reading (grades 3-8 & 11), writing (grades 5, 8 & 11) and science (grades 4, 8 & 11). Student test results are placed into four different categories: Proficient with distinction, proficient, partially proficient and substantially below proficient. Reviewing the test results over the past five years some patterns do emerge (See Table 3.13 and figures 3.2 and 3.3)

- Vermont's math and reading scores have consistently been higher than the scores for Maine and Rhode Island
- New Hampshire students have consistently scored better than Vermont students on the math and reading exams
- Vermont's results have been relatively flat, or exhibit only modest increases, over the past five years across all subjects

- Vermont students are losing ground compared to other New England states - both New Hampshire and Rhode Island have seen greater improvement in student test scores in the past five years

Table 3.13: New England Common Assessment Program Results for Vermont Students who scored at or above proficient

Year the Test was Administered	2005	2006	2007	2008	2009	2010
Math – 3rd grade	64%	66%	66%	64%	65%	66%
Math – 4th grade	64%	63%	61%	67%	67%	64%
Math – 5th grade	63%	64%	62%	66%	66%	64%
Math – 6th grade	64%	63%	64%	64%	65%	67%
Math – 7th grade	61%	62%	59%	62%	62%	60%
Math – 8th grade	59%	58%	58%	61%	64%	63%
Math – 11th grade			29%	34%	34%	37%
Reading – 3rd grade	69%	70%	71%	70%	72%	70%
Reading – 4th grade	68%	67%	67%	69%	68%	69%
Reading – 5th grade	65%	69%	66%	69%	71%	72%
Reading – 6th grade	66%	68%	70%	70%	71%	73%
Reading – 7th grade	65%	65%	70%	74%	72%	68%
Reading – 8th grade	64%	64%	68%	68%	74%	75%
Reading – 11th grade			66%	70%	69%	71%
Writing – 5th grade	49%	49%	48%	55%		
Writing – 8th grade	54%	46%	45%	52%		61%
Writing – 11th grade			37%	42%	49%	49%
Science – 4th grade					48%	52%
Science – 8th grade					26%	24%
Science – 11th grade					25%	26%

Source: Vermont Department of Education, Accessed on November 3, 2011: http://education.vermont.gov/new/html/pgm_assessment/data.html

Figure 3.2: NECAP Reading - Proficient Plus

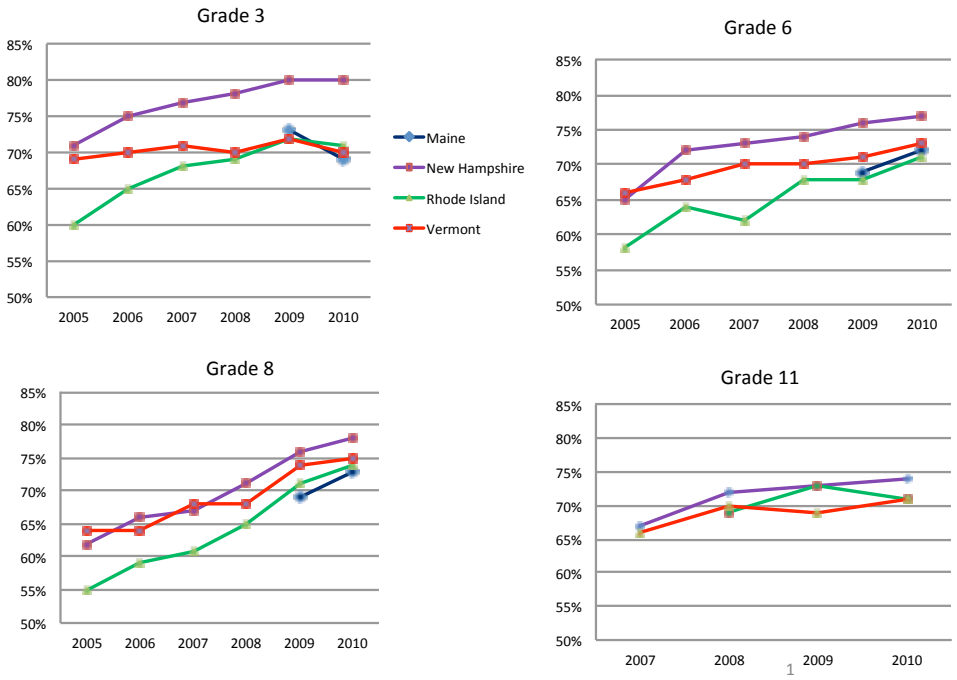


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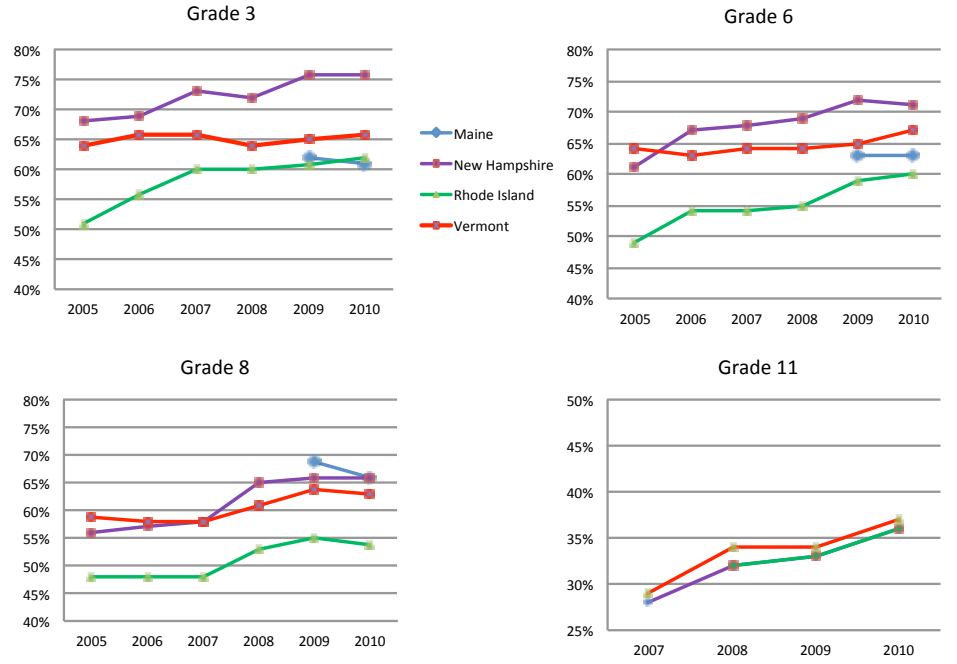
Figure 3.3: NECAP Math – Proficient Plus



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Other Educational Measures

There are other ways to measure student achievement beyond the use of student test scores. Comparisons of graduation rates for example show that the percentage students who graduated from Vermont high schools within four years in the 2008-09 school year was 89.6% (NCES, 2011). Vermont's graduation rate was 14 percentage points higher than the national average and second only to Wisconsin's graduation rate of 90.7%. Between 2001-02 and 2008-09 Vermont's high school graduation rate improved by 7.6 percentage points. Table 3.14 shows the high school graduation rates for New England states.

Table 3.14: High School Graduation Rates
Average freshmen four-year graduation rates

	Graduation Rates *(National Rank)*		Change in Rates *(National Rank)*
	2001-2002	2008-2009	
National	**72.6%**	**75.5%**	**2.9%**
Vermont	82.0% (7)	89.6% (2)	7.6% (6)
Connecticut	79.7% (12)	75.4% (28)	-4.3% (49)
Maine	75.6% (24)	79.9% (17)	4.3% (16)
Massachusetts	77.6% (16)	83.3% (8)	5.7% (13)
New Hampshire	77.8% (15)	84.3% (7)	6.5% (10)
Rhode Island	75.7% (23)	75.3% (30)	-0.4% (41)

Source: National Center for Education Statistics, 2000 through 2011.

Another measure that is frequently used to gage student performance is the number of high school graduates who enroll in college – this is commonly known as the "college going rate." The college going rate is a measure of the number of students who graduate from high school and begin college in the fall of the next school year. Vermont's college going rate for 2007-08 was 48.3% which was the second lowest in the country.[19] The national college going rate for that year was 63.8%. Because of the way that this number is measured states that have a low high school graduation rate often have high college going rates – due to the fact that high school drop-outs are not part of the equation. For this reason Mississippi, which had the 3rd lowest high school graduation rate at 63.9%, had the highest college going rate in the country at 77.4%.

[19] Calculated by the CL Higher Education Center using data from the U.S. Department of Education.

4. EQUITY ANALYSIS

Our equity analysis focuses on four main issues: the extent to which education spending is related to property and/or income wealth, the equality of education spending across districts and towns, the changes in education spending over time, and the disparity in education outcomes. This section shows that spending in Vermont has tended to be weakly related to wealth (at an acceptable degree under standard school finance equity benchmarks) and that there is virtually no relationship between property wealth and spending in the earliest years covered in this study.[20] In technical language, we find that the Vermont school funding system is fiscally neutral.

The equality of spending in Vermont remained consistent over the years covered in the study. The funding system did not meet the accepted benchmarks of equality, but came very close throughout the new millennium. We also found that the state currently spends approximately 140% more per pupil on PK-12 education today than it did in FY 2000, with the greatest increases coming in support services for students.

Using a combined NECAP measure of both reading and math performance across grades 3-8, we also found that the disparity in student outcomes also declined over the time period the NECAP test has been used.

The Vermont school funding system has achieved a high degree of equity, even though it did not meet every equity benchmark all of which are quite rigorous and rarely met by any of the 50 states. Acts 60 and 68 focused on achieving a high degree of fiscal neutrality, and have met that goal.

INTRODUCTION

Reflecting the core requirements of the legislature's request for an evaluation of the equity of the Vermont school funding system, the cornerstone of our evaluation of Vermont's education finance system is an equity analysis of school district spending using traditional school finance equity statistics to ascertain how well the system meets the equity goals of Acts 60 and 68. Those two statutes established three goals that can be evaluated through this approach:

1. Reduce the wide disparity in per-pupil education spending that was closely related to property wealth
2. Reduce the disparity in academic achievement among Vermont's school children
3. Reduce the disparity in education tax burdens for equal amounts of spending per pupil among Vermont taxpayers

[20] We note that our finding of a lack of a relationship between property wealth and spending prior to Act 68 might be different if we possessed, and could incorporate into our analysis, data regarding private "fundraising" dollars raised by wealthy districts prior to Act 68.

The school finance literature identifies a number of statistics that are typically used to assess the equity of a state's school funding system. They can be divided into two categories – statistics that measure the fiscal neutrality of the system, and statistics that measure the equality of per pupil spending across school districts in the state. The most common approaches for measuring fiscal neutrality and equal spending are described in Odden and Picus (2008) and are used here to measure how well Vermont has met the three goals stated above. Appendix 2 of this document contains tables that display all of the equity statistics we have calculated for Vermont school districts for years included in this evaluation study.

CHOOSING THE BEST MEASURE OF PER PUPIL SPENDING

Before analyzing the equity of Vermont's school finance system, we first had to reach agreement on the best measure of per pupil expenditures to use in the equity analyses. Although this would seem to be a simple thing to do, those familiar with Vermont school finance realize it is a complex matter that potentially could impact the outcome of the study. The choice requires determination of what expenditures to include and what pupil count should be used in estimating per pupil expenditures.

Expenditures

The first step is to eliminate expenditures that are out of a district's control due to locational circumstances. For example most school finance equity studies do not include pupil transportation expenditures as part of total district spending because it is not used to educate students directly and varies by district due to conditions such as district size, terrain and population density. We excluded transportation spending from all our equity analyses presented here, and this exclusion could make our equity statistics differ from other studies that did not eliminate pupil transportation.

The second problem we encountered in establishing a per pupil expenditure figure relates specifically to Vermont and the way the state funds its schools. The problem arises because school budget decisions are approved annually by local towns – where the taxation base and authority reside – while the expenditure of funds is made by school districts and Supervisory Unions. Although districts spend funds, measures of fiscal capacity (property wealth and household income) are linked only to towns and not districts; thus any measure of fiscal neutrality can only be calculated for towns, for which only budgeted expenditures are known. In selecting the expenditure figures to analyze, we followed advice provided to us by both state officials and private citizens and elected officials to analyze a variety of expenditure categories, including:

1. Budgeted local education expenditures at the town level,[21]
2. Actual expenditures at the district level, and
3. Actual expenditures at the supervisory union level.[22]

[21] Local education expenditures (or spending) equals budgeted education expenditures minus offsetting revenues, such as federal aid, and state categorical funds as described in Section two above.

Pupil Count

Like expenditures, on the surface pupil count seems a straightforward concept. However, a number of factors need to be considered. At the town level – which we needed to consider in computing fiscal neutrality statistics – the data available to us were pupil counts. This provides one measure of students that can be used as the divisor in estimating per pupil expenditures.[23]

When conducting equal spending analyses two concepts need to be considered. The first is simply equal spending per pupil, or what is known as horizontal equity. The second considers differential student needs and attempts to asses the degree to which students with different needs receive equal funding based on their needs – although the per pupil expenditures can reasonably vary based on the educational needs of the students. In Vermont, district pupil counts are computed on the basis of unweighted ADM and weighted ADM. Weighted ADM counts students who are in compensatory programs and in high school with an extra weight. Chapter 133 of the Vermont Statutes (16 V.S.A. Section 4010) identifies the following weights:

Category	Weight
Pre-K	0.46
Elementary or Kindergarten	1.00
Secondary	1.13
Economically Deprived Backgrounds	1.25
English Language Learners	1.20

By assessing equal spending on the basis of weighted ADM, we can establish a measure of the vertical equity of the system. The Vermont Department of Education provided us both unweighted and weighted ADM at the town level. We express no opinion regarding whether the current weights are appropriate for the services required by the students. Nevertheless, in this report, we combined the general spending figures with the compensatory education budget figures and then used the Vermont weights for high school students, compensatory education and ELL in the analysis of town level local educational expenditures as part of the vertical equity analysis.

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[22] Supervisory unions were analyzed as a category because doing so provided us with a way of including certain expenditures provided at different levels by the various supervisory unions, but which cannot be attributed accurately back to any individual district. But again note, that we could not calculate any fiscal neutrality figures for either districts or Supervisory Unions.

[23] Vermont has a number of pupil counts that are used for various purposes. Appendix 5 lists all of the various counts used and their definitions. It should also be noted that NEA estimates of the number of pupils in Vermont subtract students attending independent schools with public dollars and consequently are often somewhat lower than enrollment or ADM figures generated in Vermont.

Per Pupil Expenditures

To compute per pupil expenditures at the district and supervisory union levels we used both ADM and weighted ADM and report equity statistics for both measures in an effort to measure both horizontal and vertical equity.

Measures of fiscal capacity were based on per pupil property wealth and both income per pupil and income per return at the town level (the only level for which these fiscal capacity statistics were available). The Vermont Department of Education provided data regarding the Equalized Education Grand List (EEGL) for both overall and residential/homestead[24] property. Income data were downloaded from the website of the Vermont Department of Taxes.

For both towns and districts, we computed student expenditure deciles[25] based on jurisdiction per pupil expenditures. We also created deciles for town level local educational expenditures based on property values. The decile analyses enabled us to track changes in spending by group over time. Equity and fiscal neutrality statistics were computed using Excel, SPSS and JMP. The expenditure deciles were computed using Excel spreadsheets.

FISCAL NEUTRALITY

Our reading of the Vermont Supreme Court's ruling in *Brigham* and our analysis of Acts 60 and 68 suggests that the major focus of the system is to create a fiscally neutral system, that is, one where disparities in per pupil spending are not related to district wealth or fiscal capacity. As a result, we first assess the fiscal neutrality of the finance system over time, and then consider measures of spending and student outcome equality. We offer a number of analyses to ensure a complete assessment of the funding system as it is currently implemented.

Assessing the degree of fiscal neutrality entails analyzing the relationship between measure(s) of per pupil revenues and/or expenditures and measure(s) of fiscal capacity. Property wealth per-pupil is typically used to measure fiscal capacity,[26] but given the extensive income adjustment that is part of the Vermont funding system (see section 2

[24] Act 68 divided property into two categories – homestead and non-residential. Prior to that time, data are available for residential and non-residential properties. In longitudinal comparisons, the term "homestead" includes residential property in years prior to Act 68. Since residential and homestead are not identical terms, we focused our analysis on overall EEGL.

[25] Student deciles are computed so that approximately 10% of the students in the state are in each decile. As a result the number of districts in each decile can vary substantially.

[26] See the discussion in Section two regarding whether Vermont's system is an income based or property tax based system. In assessing fiscal neutrality, we have considered both property wealth (which is traditionally used in school finance analyses) and income because of its importance in Vermont.

above) we also consider the relationship of income to district per pupil spending. In conducting this analysis, the greater the relationship between measures of fiscal capacity and levels of revenue, the less fiscal neutrality and, therefore the more inequity present in the system.

Fiscal neutrality is measured using the correlation coefficient and the elasticity computed from a simple one-variable regression. The simple correlation indicates the degree to which there is a linear relationship between two variables, i.e., whether as one variable increases the other increases (or decreases). It ranges in value between -1.0 and +1.0. A value of +1.0 or close to +1.0 indicates a strong positive relationship, i.e., for example, as property wealth increases so do expenditures per-pupil. A correlation coefficient close to zero indicates that there is little or no linear relationship between the two variables. Under fiscal neutrality, the ideal value of the correlation coefficient is zero, but the generally accepted standard for this statistic is +0.50 or less (Odden & Picus, 2008).[27]

While a correlation coefficient indicates whether a linear relationship exists between two variables, the elasticity indicates the magnitude (slope) or policy importance of that relationship. For example, expenditures and wealth could be strongly related, but if a ten-fold increase in property wealth only resulted in a small increase in expenditures, one could argue that the magnitude of the relationship was not significant and of little policy significance.

Technically, the elasticity indicates the percent change in the object variable, expenditures per-pupil, relative to the same percent change in the measure of fiscal capacity, e.g., property value per-pupil. The elasticity of a school funding system usually ranges in value from zero to any positive number, although it also can be negative. In school finance, an elasticity that equals 1.0 or higher indicates that spending increases in percentage terms at the same or higher rate as property wealth. Elasticities below 1.0 indicate that spending does not increase at the same percentage rate as local property wealth local property wealth.

The elasticity between a dollar object, such as expenditures per-pupil, and property wealth per-pupil, can be calculated using the slope of the linear regression of expenditures on wealth; the elasticity equals the slope (the regression coefficient for wealth) times the ratio of the mean value of property wealth per-pupil and the mean value of expenditures per-pupil. The equity standard for the wealth elasticity is for it to be equal to or less than 0.1 (Odden & Picus, 2008).[28]

[27] This implies that a negative correlation would be acceptable at any value. In fact negative correlations between wealth and per pupil spending are rare in school finance (although it did happen a few years under Act 60 as shown below), so a more appropriate standard is, in reality an absolute value of 0.5 or less as large negative correlations could also be considered inequitable.

[28] In theory the elasticity could be negative. In that case, the fiscal neutrality standard would be for elasticity to be greater than -0.1, but less than 0.1.

It is important to assess the correlation coefficient and elasticity jointly. If the correlation is high and the elasticity is low, there is a relationship between the two variables but the relationship is not of policy importance. On the other hand, if the correlation is low and the elasticity is high, even the tenuous link might have policy significance. If both the correlation coefficient and elasticity are high, then fiscal neutrality does not exist -- the two variables are linked and the magnitude of the link is strong. Finally, fiscal neutrality is achieved if the value of each variable is below the benchmark (an absolute value of less than 0.5 for correlation and an absolute value of less than 0.1 for elasticity).

Finally, the benchmark standards established for this analysis are very strict measures and ones that few states meet. An important thing to keep in mind as reviewing the fiscal neutrality – and spending equity – statistics is to consider how close the measures are to the state standard and how they have changed over time. Also important to consider is the fact that finance formulas designed to create fiscal neutrality (the major goal in Vermont) allow differences in district per pupil spending levels if local choices are not constrained in some way. As a result it is important not only to look at the magnitude of the equity statistics, but also to consider trends over time and understand whether or not the state is making progress toward its goals. It is our understanding that in Vermont, the goal is to achieve fiscal neutrality and that some differences in per pupil expenditures are acceptable provided they are not a function of local wealth.

Elasticity Between Expenditures and Property Wealth

Figure 4.1 displays our fiscal neutrality analysis by showing the property wealth elasticity of the Vermont school finance system between FY 2000 and FY 2010. Annual data for this figure are displayed in Table A2.1 in Appendix 2. Figure 4.1 shows the elasticity on a weighted and unweighted ADM basis, and for two different measures of property wealth – the Equalized Education Grand List (EEGL), which is all property in a jurisdiction and the EEGL-Homestead property (which included residential property in the era before Act 68).

It also is worth noting that the elasticity was greater when we based property wealth on Homestead values than on the total Equalized Education Grand List. [29] It appears that the connection between property wealth and expenditures was stronger for the types of property over which voters possess a more direct influence over tax rates. However, the elasticity results generally remained low even when using Homestead values.

Using the elasticity benchmark standard of 0.1, Figure 4.1 shows that, Vermont school funding had an extremely low elasticity when the EEGL was used as the measure of property wealth, consistently below the standard of 0.1 across all years. The values were somewhat higher when the EEGL-Residential/Homestead was used to measure property wealth, with the values edging above 0.1 in recent years. These results suggest

[29] We used homestead property values in addition to total property values because homestead property taxes vary with the chosen spending level in each town.

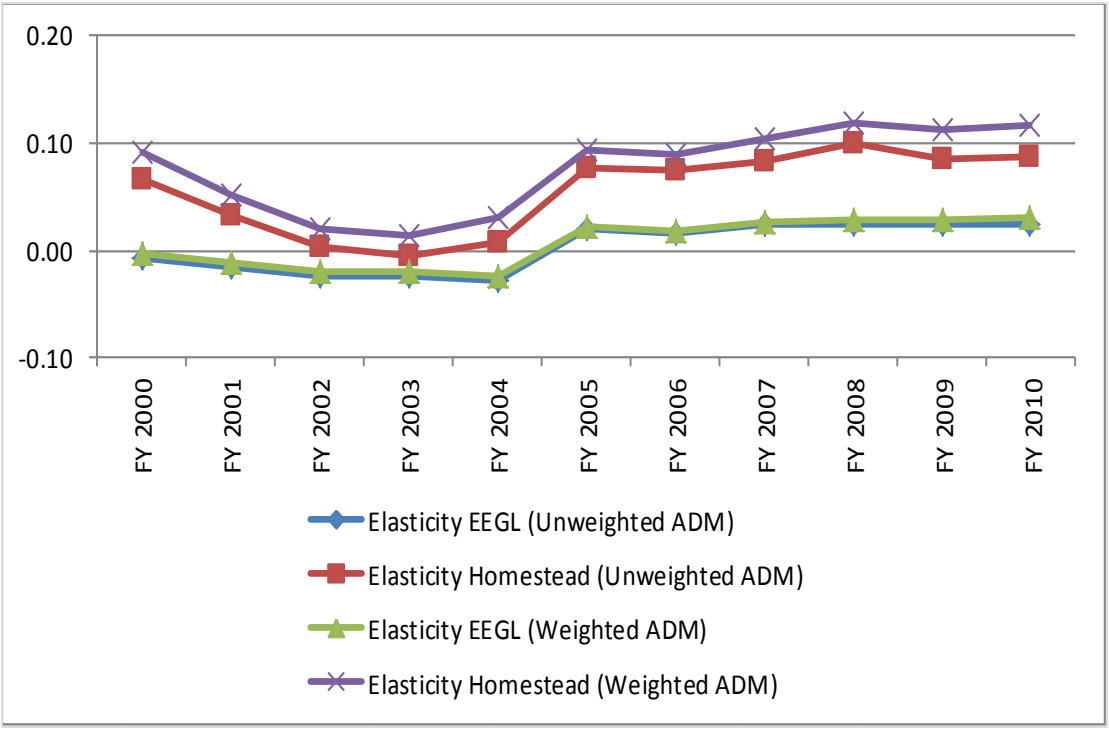
that the Vermont school finance system is fiscally neutral with respect to property wealth when considering total property value. Moreover, the pattern over time is essentially the same for total EEGL, suggesting that this conclusion is stable and the relationship between property wealth and per pupil spending is very small – one of the goals of Acts 60 and 68.

The system as measured by Residential values was strongly fiscally neutral prior to Act 68, but less so since Homestead values have been the measure of property wealth since the passing of that Act. In fact, prior to Act 68, in some instances the elasticity was negative, which implies that as property wealth increased, expenditures per-pupil declined slightly.[30] This ended with the implementation of Act 68 and the elimination of the sharing pool. Under Act 68, the elasticity measure for Homestead property wealth has been close to the 0.1 standard and rose above it in a few instances.

The Vermont system achieved essentially ideal levels of fiscal neutrality under Act 60. The system remains strongly fiscally neutral with respect to total EEGL, but the category of Homestead wealth introduced by Act 68 has been less fiscally neutral than prior measures of property wealth. Even under Act 68 the elasticity has remained generally close to zero thus achieving the goal that taxpayers have equal tax burdens for equal levels of spending.

[30] Although data on district private fundraising are not available in a form that would allow us to test this hypothesis, it is possible that the negative elasticities are due, at least in part to private funding.

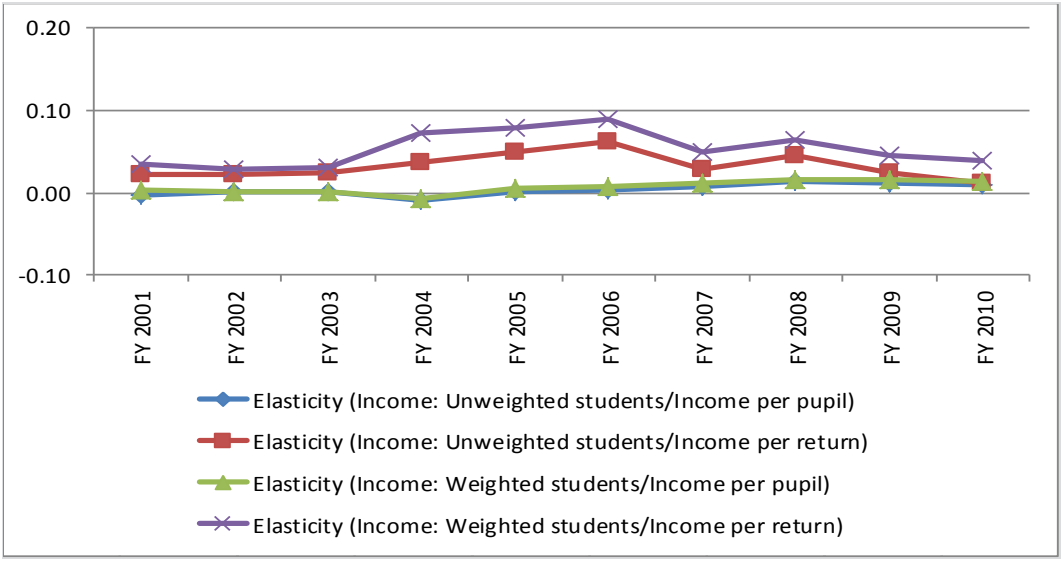
Figure 4.1: Elasticity Between Local Education Spending Per ADM (Weighted and Unweighted) and Property Wealth: FY 2000 – FY 2010



Elasticity Between Expenditures and Income

Figure 4.2 (and Table A2.1 in Appendix 2) provides the corresponding data for assessing the fiscal neutrality of the system by measuring elasticity using income as the measure of wealth. As can be seen in the figure, the elasticity of the system remained below the benchmark value of 0.1 each year. The elasticity was very close to the goal value of 0.00 when the fiscal capacity measure was income per pupil (weighted or unweighted), and only slightly higher, but still far below the benchmark, when the wealth measure was income per tax return.

Figure 4.2: Elasticity Between Local Education Spending Per ADM (Weighted and Unweighted) and Income: FY 2001 – FY 2010



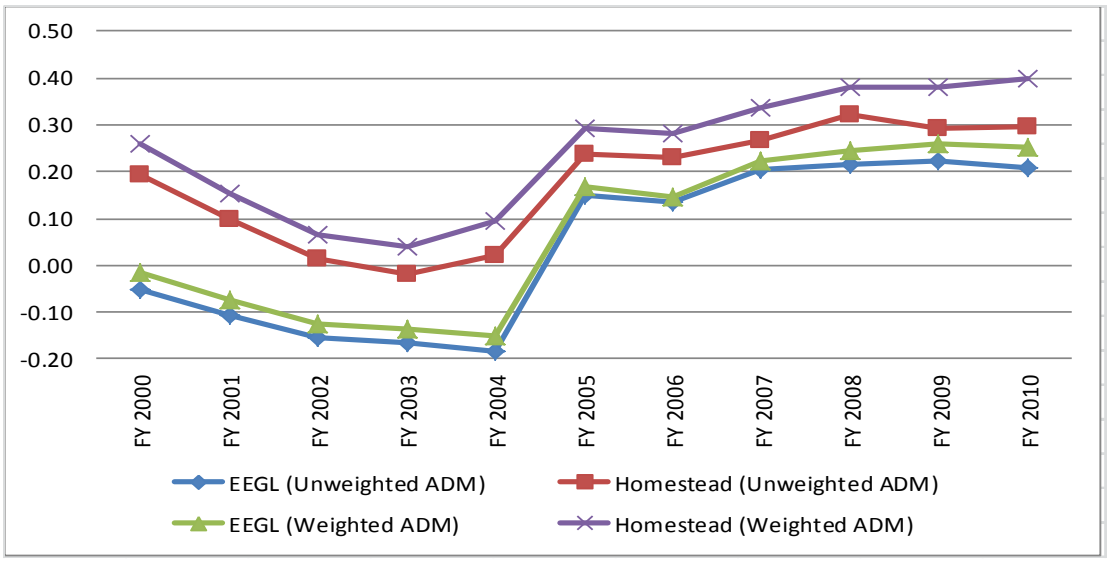
Correlation Between Expenditures and Property Wealth

Figure 4.3 (and Table A2.1 in Appendix 2) display the correlation between per pupil town level education spending and two measures of property wealth: per pupil Equalized Education Grand List and per pupil Residential or Homestead property value. We included both measures of property value because Homestead property taxes are the component that varies with the chosen spending level in each town. Both unweighted and weighted pupil counts were used in the analysis.

All of the correlation coefficients computed for this analysis were below the correlation standard of 0.5, which suggests that expenditures were not highly correlated with property wealth. Three important relationships can be seen in Figure 4.3. First, the correlation between expenditures and total property value was consistently lower than that between expenditures and residential or homestead property value. This difference has narrowed substantially since FY 2004 when Act 68 was implemented. Second, the correlation by property type was slightly higher for weighted pupils than for unweighted pupils.

Third, fiscal neutrality as measured by the correlation between property wealth and per pupil spending improved during the first several years of the analysis during the time Act 60 governed school funding. The correlation between expenditures and total property value was negative for most of the years through FY 2004, indicating that districts with lower property wealth tended to spend more per pupil. The enactment of Act 68 appears to have changed these relationships and led to higher correlation values. The values of the correlation coefficient remained well below the benchmark of 0.50.

Figure 4.3: Correlation Between Local Education Spending Per ADM (Weighted and Unweighted) and Property Value: FY 2000 – FY 2010

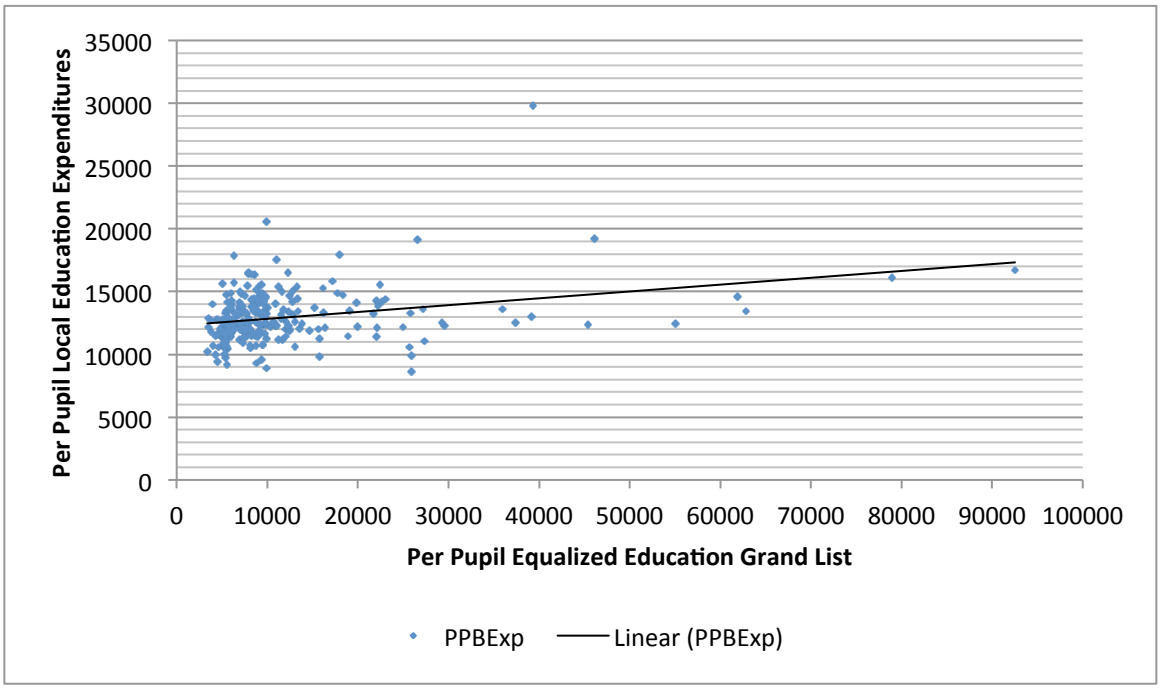


The use of a scatterplot offers another way to look at the elasticity and correlation data. Figure 4.4 shows a scatterplot of the FY 2010 Per Pupil Equalized Education Grand List and Per Pupil (ADM) Local Education Expenditures.[31] As can be seen, only a very small relationship exists between property wealth and expenditures in Vermont in FY 2011. In addition, the elasticity is almost zero, as an $80,000 change in the Equalized Education Grand List (a $8 million change in per pupil property value) corresponds to a $4,000 change in budgeted Local Education Expenditures.[32]

[31] Stratton has been removed from the figure. Its property value is more than 2.5 times as much as the next highest town. Including that value in the figure makes it difficult to show the relationship between the variables for the other towns because of scaling issues.

[32] The Equalized Education Grand List is defined as 1% of the Equalized Education Property Value (Vermont Department of Taxes, 2011), so the $80,000 change in the Equalized Education Grand List equates to a $8,000,000 change in Equalized Education Property Value.

Figure 4.4: Scatterplot of FY 2010 Per Pupil Equalized Education Grand List and Per Pupil Local Education Expenditures



In order to better understand the change in correlation, for each year we divided the state's students into deciles ranked by the per pupil Equalized Education Grand List. The mean per pupil local education expenditures for each year were calculated for each decile. Due to the complexity of the information, Figure 4.5 only displays the results for Decile 1 (lowest property wealth) and Decile 10 (highest property wealth) in comparison with the mean value for the state.

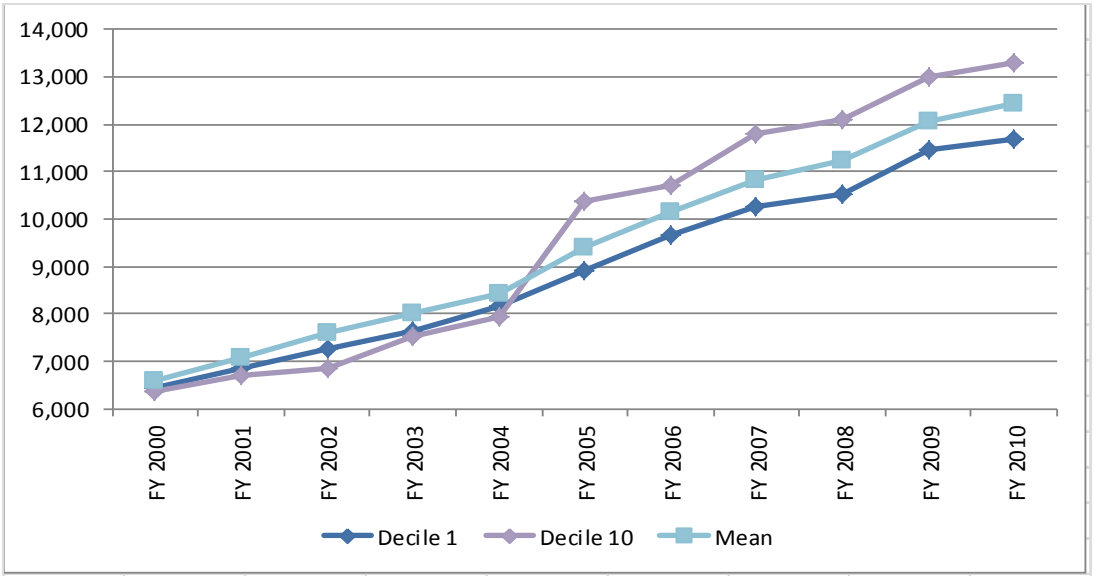
As Figure 4.5 shows, the mean level of expenditures rose steadily over the time period. The mean per pupil expenditures in Wealth Decile 1 also rose, but stayed below the mean for the entire time period. On the other hand, the mean per pupil expenditures in Wealth Decile 10 was below the mean during the Act 60 era (and was the lowest value in the state most years), but rose rapidly in FY 2005 when Act 68 was implemented and has been the highest value in Vermont every year except one since FY 2005. It is important to note, however, that the difference in per pupil spending between the decile with the most property wealth and the decile with the least property wealth was just over $1,500, compared to a mean value of about $12,500 (12%). That small difference helps to explain why the elasticity was so low.

This phenomenon also can be seen by looking at the spending increases from FY 2004 to FY 2005 (when Act 68 was fully implemented) of the five towns that had the highest values on the per pupil Equalized Education Grand List. For comparison purposes, mean spending for the state increased those two years from $8,434 to $9,400

(an increase of about $1,000). The figures for the five towns were: Stratton ($4,733 - $7,596), Sherburne ($6,498 – 11,234), Winhall ($5,382 - $9,825), Ludlow ($6,057 - $10,847), and Dover ($6,438 - $8,935), with the smallest increase being the roughly $2,500 increase in Dover. Interestingly, each of these towns had a ratio of homestead to non-homestead property of 0.30 or less[33], which may have influenced their decision-making. A similar, though less extreme, increase in high end spending occurs if one considers homestead property value. The decline in the fiscal neutrality of the Vermont finance system appears to have resulted from the incentives of Act 68 leading the wealthiest towns to change from being relatively low spending to returning to being high spending districts on average.

To better understand this analysis, Appendix 2 includes 12 figures (Tables A2.1-A2.12) – one for each year FY 2000 through FY 2011 – that display graphically average per pupil expenditures by wealth decile. We used the same vertical scale for all 12 figures so the overall increase in per pupil spending over time is also clear. The series of graphs clearly shows low spending among the highest wealth districts prior to implementation of Act 68 in FY 2005. The graphs also display the state-wide average per pupil expenditure. As analysis of all 12 shows, regardless of the wealth decile, per pupil expenditures are consistently very close to the mean, confirming our finding that there is little relationship between property wealth and per pupil expenditures.

Figure 4.5: Decile 1, Decile 10, and Mean Local Education Spending: FY 2000 – FY 2010



In summary, the correlation between wealth and spending remained within the established guidelines throughout the course of the study. The correlation values were

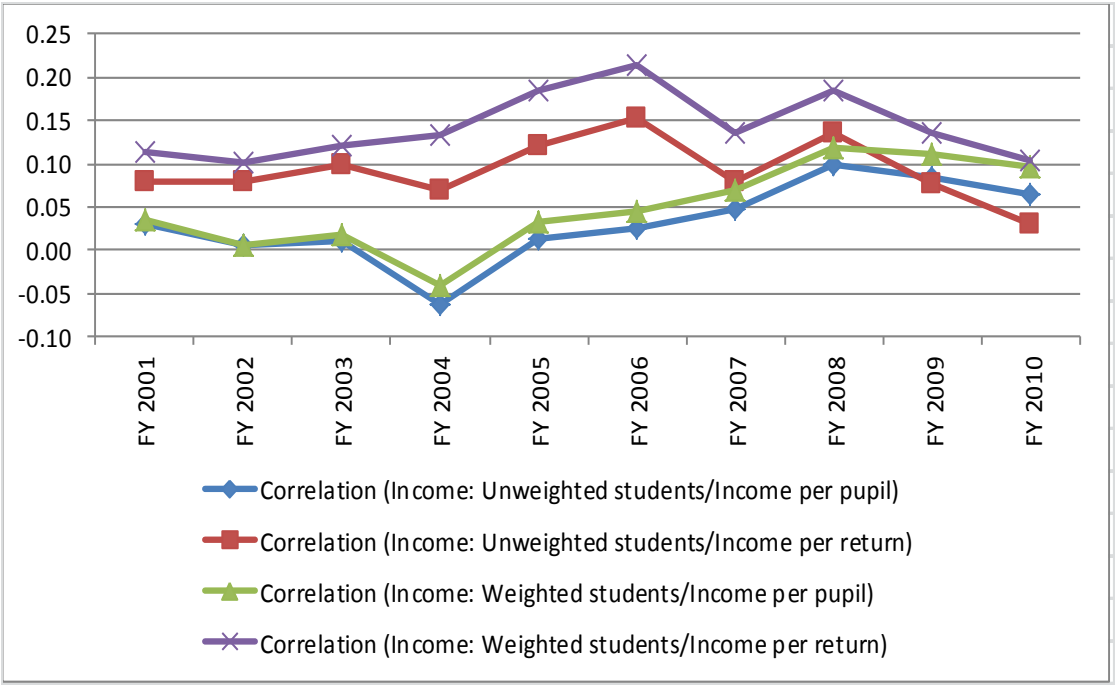
[33] Compared to the state average of roughly 50%.

near or even less than zero during the Act 60 era. The correlation values increased after the passage of Act 68, primarily due to the rapid increase in spending of very high wealth districts. However, it should be emphasized that the correlations remained low over the course of the study.

Correlation Between Expenditures and Income

Figure 4.6 and Table A2.1 in Appendix 2 displays the results for the correlation between per pupil (ADM) town level local education expenditures and two measures of income: AGI per ADM and AGI per return. Again, the analysis was conducted both for unweighted and weighted ADM counts. The figure shows that the values of the correlation coefficients remained well below the benchmark value of 0.50 throughout the period of this analysis. There were slight fluctuations in the values of the correlation coefficients over time, but the values remained in a relatively narrow range over the course of the study, though dropped below zero shortly before the passage of Act 68. Throughout most of the analysis, the correlation values tended to be higher when AGI was considered on a per return basis, but that relationship seems to have dissipated in recent years. The essential point is the correlation between expenditures and income stayed very low and rather consistent over the course of the study.

Figure 4.6: Correlation Between Local Education Spending and Income: FY 2001 – FY 2010



Summary of Fiscal Neutrality Estimates

The Vermont school funding system overall has succeeded in providing a fiscally neutral distribution of spending. The system remained within the established standards for both correlation and elasticity statistics, and for multiple measures of fiscal capacity, over the course of the study, with the exception of the elasticity between local education expenditures and EEGL-Homestead in recent years. The correlation, in particular, stayed remarkably low during the entire study. The data show that the reforms of Act 60 brought the state to a nearly perfect level of fiscal neutrality, while Act 68 and the subsequent reforms moved the state into the position of being slightly less fiscally neutral. Nevertheless, the essential finding is the Vermont school funding system achieved fiscal neutrality nearly every year of the study.

SPENDING EQUALITY

A second important equity concept is measuring the equality of per pupil spending across the state's school districts. Tables A2.1 and A2.2 in Appendix 2 display the annual equity statistics on a horizontal equity basis (Table A2.1) and a vertical equity basis (Table A2.2). In this section we describe our findings on the equality of spending across Vermont school districts based on an analysis of horizontal and vertical equity as described above. Review of the table shows that the equity statistics for spending equality have stayed remarkably consistent over time even though all of the spending measures themselves increased substantially.

Vertical equity was assessed through the use of weighted ADM. A comparison of Tables A2.1 and A2.2 shows that per weighted ADM spending figures were lower than per ADM spending. This results from the fact that pupil weights essentially increase the student count and the same expenditure figures are then divided by that higher pupil count. Despite this difference, review of the two tables shows that the equal spending estimates are similar over time and slightly worse when vertical equity is measured. This slight difference in the values of the equity statistics suggests that differences in funding across districts were based primarily on factors other than the differing educational needs of the students.

To facilitate the analysis of the equality of spending in of the Vermont funding system, three of the statistics presented in Appendix Tables A2.1 and A2.2 are displayed below in graphic form. The three statistics reviewed here are the coefficient of variation (CV), the McCone Index, and Verstegen Index.

Coefficient of Variation

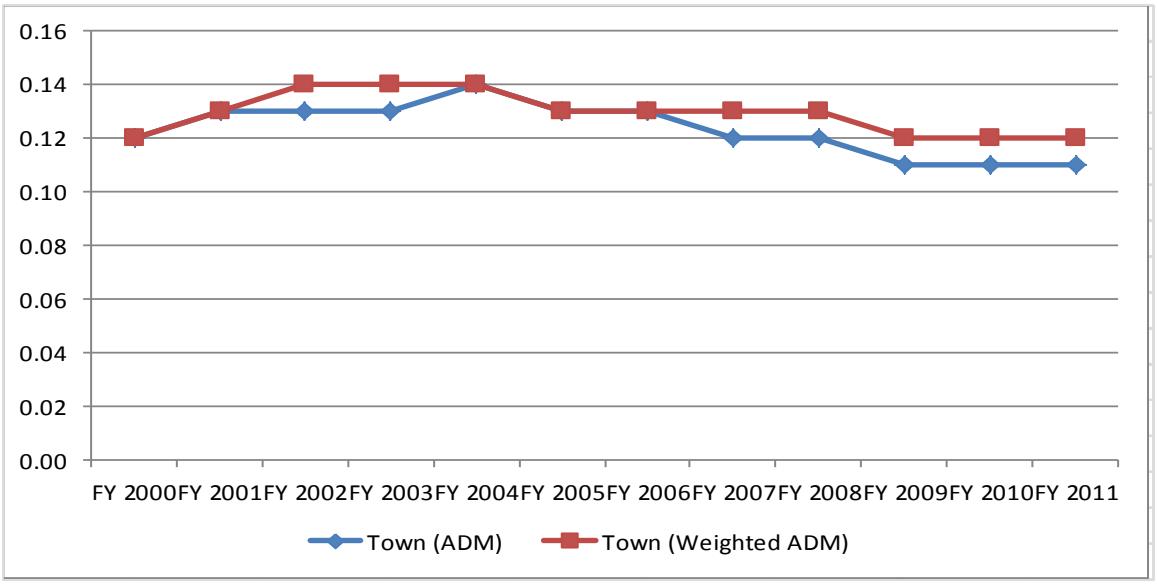
Figure 4.7 summarizes the CV for unweighted and weighted student counts from FY 2000 to FY 2011. Odden and Picus (2008) suggest using a value of 0.10 as the benchmark for assessing the expenditure equality of a state's school finance system, with values of 0.1 or below indicating a high level of equity. Figure 4.7 shows that the CV in

Vermont remained just short of that very high standard at the town level in every instance, even though expenditure equality was not the primary goal of the funding system. The values of the CV declined slightly following the passage of Act 68, which suggests that one result of Act 68 was some loss of fiscal neutrality and more equal per pupil spending across districts.

The values of the CV vary only slightly whether unweighted or weighted ADM were used. This suggests that when towns make decisions regarding school budgets, student needs may not be the primary consideration. This finding is not surprising given the relationship between taxation and funding in Vermont.

Because the CV is a commonly used measure of school finance equity it is possible to compare our computations of the CV with estimates made by others prior to enactment of Act 60. Downes (2004) using current expenditures per weighted pupil at the town level computed a CV of 0.151 in FY 1998-99 and showed that it improved to 0.136 by FY 2001-02. While definitions of expenditures have changed slightly over time, Downes figures suggest that Acts 60 and 68 have resulted in slight reductions in the variation of per pupil expenditures – and it should be pointed out that the computations of CV across time suggest overall a high level of spending equity in the state.

Figure 4.7: Coefficient of Variation for Town Level Per Pupil Education Expenditures (weighted and unweighted ADM): FY 2000 – FY 2011



McLoone Index

Figure 4.8 displays the computed values of the McLoone Index for FY 2000 through FY 2011. Odden and Picus (2008) suggest a benchmark of 0.95 (1.00 being ideal) for the McLoone Index; that value would indicate that substantial equity exists across districts in the bottom half of the expenditure distribution. Figure 4.8 shows that

the Vermont school finance system came close to the very high McLoone benchmark of 0.95 in all years. As with the CV, the McLoone figures showed increased expenditure equality after the passage of Act 68. Again, the town level data show little difference whether unweighted or weighted pupil counts were used.

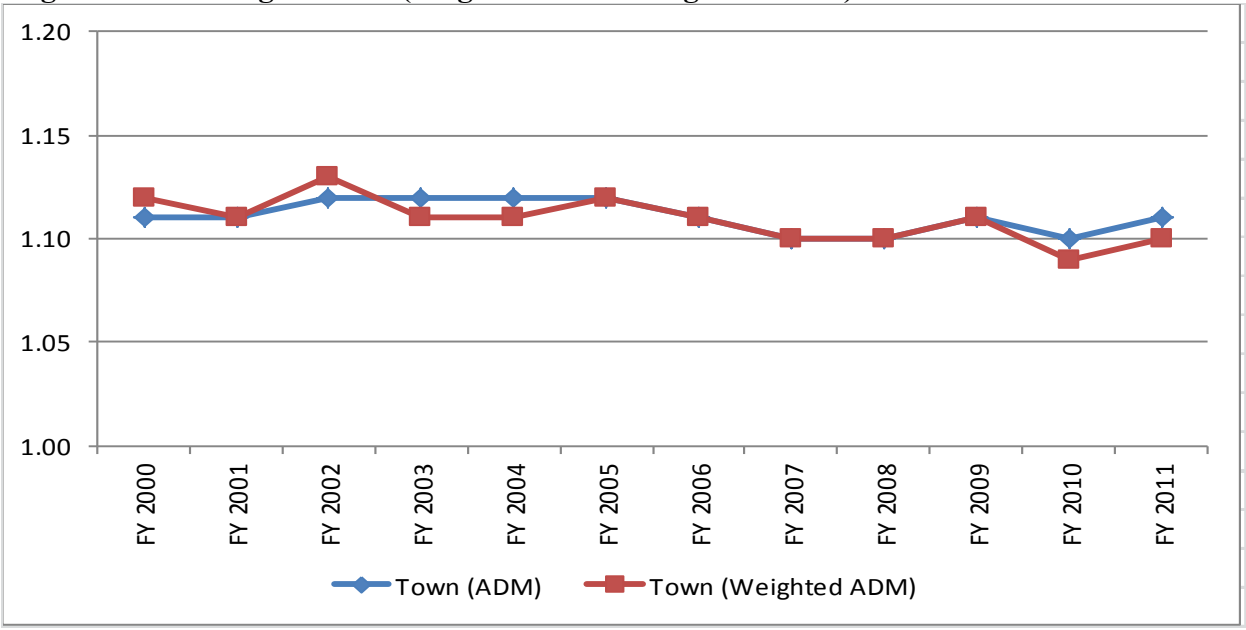
Figure 4.8: McLoone Index (weighted and unweighted ADM): FY 2000 – FY 2011

Verstegen Index

Figure 4.9 displays the computed values of the Verstegen Index for each year of the analysis. Odden and Picus (2008) suggest a benchmark of 1.05 (1.00 being ideal) for the Verstegen Index; this value would indicate that there is substantial equity across districts in the top half of the expenditure distribution. Figure 4.9 and Tables A2.1 and A2.2 in Appendix 2show that the Vermont school finance system came close to this very high benchmark standard each year although it never quite achieved the value of 1.05.

A comparison of Figure 4.8 with Figure 4.9 shows that the small inequities that exist in per pupil spending are similar for the bottom and top halves of the distribution, although the top half of the distribution is slightly less equitable than the bottom half.

Figure 4.9: Verstegen Index (weighted and unweighted ADM): FY 2000 – FY 2011



Overall, Figures 4.7 to 4.9 suggest that the Vermont school funding system came quite close to meeting the spending equality benchmarks suggested by Odden and Picus (2008), even though expenditure equality was not the primary goal of the Vermont funding system. Moreover, implementation of Act 68 appears to have marginally improved the spending equity statistics across towns. The data also suggest only very small differences in values were detected, regardless of whether weighted or unweighted ADM was used.

OUTCOME EQUALITY

We also assessed the degree to which there have been reductions in the disparities in student outcomes. Though this is a complex issue as there are many factors that impact student performance, we compiled a few statistics that can be used as a starting place to assess this issue. We compiled a measure for each district that indicates the percentage of students that performed at or above the proficiency level on NECAP tests from Grade 3 to Grade 8. We computed this score for both reading and mathematics, and then calculated the coefficient of variation for the results; in computing the CV we weighted the results by the number of students taking the test in each school so the statistic indicates the disparity of outcomes across students in Vermont. . The findings are presented in Tables 4.1 and 4.2 for math and reading respectively.

The numbers show that the average percent of students performing at or above proficiency increased modestly in math over these five years, and that the Coefficient of Variation dropped from 0.21 in 2005 to 0.18 in 2010, showing a reduction in the disparity in math performance since 2010. Likewise the numbers show that the average percent of students performing at or above proficiency increased by six percentile points in reading

over these five years and the CV for reading dropped from 0.17 to 0.12 over this time period, showing a reduction in the disparity reading performance.

Table 4.1: Statistics for Percent Performing At or Above Proficiency in Math, 2005-2010 Across Schools (unweighted across schools)

	Percent at Proficient or Proficient With Distinction					
	2005	2006	2007	2008	2009	2010
Mean	0.62	0.63	0.62	0.65	0.65	0.64
SD	0.13	0.12	0.13	0.12	0.12	0.11
CV	0.21	0.20	0.21	0.18	0.18	0.18

Table 4.2: Statistics for Percent Performing At or Above Proficiency in Reading, 2005-2010 Across Schools (unweighted across schools)

	Percent at Proficient or Proficient With Distinction					
	2005	2006	2007	2008	2009	2010
Mean	0.66	0.67	0.69	0.70	0.71	0.72
SD	0.11	0.11	0.11	0.10	0.10	0.09
CV	0.17	0.16	0.15	0.15	0.14	0.12

EXPENDITURE INCREASES

In addition to assessing the equity of Vermont's funding system, it is important to note the extent to which per pupil spending has increased over time in Vermont. In Section 3 we showed that the increase in per pupil expenditures in Vermont over time was the highest among the 50 states. Appendix Tables A2.1 and A2.2 show that state total educational spending increased rapidly from FY 2000 to FY 2011.

Unfortunately, town level expenditure data cannot be broken down into functional spending categories (instruction, pupil support, administration, etc.). Therefore Table A2.3 in the appendix shows the changes in per pupil expenditures by function from FY 1996 to FY 2009. Every expenditure category more than doubled during this time except the very small category of Other Enterprise. The fastest growing categories, on a percentage basis, were Instructional Support Services, Pupil Support Services, and Other Support Services, while the slowest growing category (other than Other Enterprise), were Instruction, Administration, and Food Services. These data suggest support services grew more rapidly than the foundational categories of instruction and administration during this time frame.

Although expenditures increased substantially over the time period of this study, relative spending changed very little. Table 4.3 illustrates this point by showing the town level Local Education Expenditures by decile in FY 2000 and FY 2011. The table also

displays the average expenditure for each decile as a percentage of average expenditures in Decile 10 (the highest spending towns) in each of those years. A comparison of the two per pupil expenditure columns shows that spending in each decile fell just short of doubling since FY 2000. Examining the columns that show each decile's expenditures as a percentage of expenditures in Decile 10 towns shows that the percentage was exactly the same in FY 2000 and FY 2011 for 8 of the 10 deciles,[34] with Decile 1 and Decile 8 changing by 1 percentage point each. It is important to note that the composition of the deciles (district membership in each decile) changed over the years, so some towns experienced a relative gain or loss relative to the state average, but across the state, on average, the increases were constant on a percentage basis.

Table 4.3: Town Level Local Education Expenditures: Decile Analysis

	FY 2000		FY 2011	
Decile	Per Pupil Expenditures	Percentage of Decile 10	Per Pupil Expenditures	Percentage of Decile 10
Decile 1	$5,376	66%	$10,360	67%
Decile 2	$5,854	72%	$11,119	72%
Decile 3	$6,062	75%	$11,535	75%
Decile 4	$6,236	77%	$11,917	77%
Decile 5	$6,366	79%	$12,233	79%
Decile 6	$6,583	81%	$12,524	81%
Decile 7	$6,818	84%	$12,993	84%
Decile 8	$7,013	87%	$13,302	86%
Decile 9	$7,385	91%	$14,043	91%
Decile 10	$8,093	100%	$15,465	100%

CONCLUSIONS

Overall, three patterns emerge from our equity analysis of the Vermont school funding system over time. First, we found that the system met or very nearly met all of the strict benchmarks established by Odden and Picus (2008) for fiscal neutrality, using multiple measures of both property wealth per pupil and household income, and using expenditures on both a weighted and unweighted ADM basis. In other words, the Vermont school finance system reduced the wide disparity in per-pupil education spending that was closely related to property wealth – the prime goal of both Acts 60 and 68.

The best fiscal neutrality measures were observed during the Act 60 era. This result is likely due to the approach taken by the state to link tax rates to per pupil spending, and the use of a sharing pool based on property tax collections to raise the

[34] Decile 10 by definition had to be 100% both years, so nine deciles had the potential to change values.

funds approved by individual towns to spend above the state minimum level. However, this finding may mask the effect of private fundraising on school district expenditures. As has been well documented, many wealthy, or gold town, districts elected to minimize their participation in the sharing pool by raising funds for schools privately. Since we do not have data on the level of private funding by district in those years, it is impossible to ascertain the impact it had on the equity statistics we have computed during that time frame. We do note that at its extreme, private fund raising represented only $13.9 million out of a total of $1 billion in education expenditures, or one tenth of one percent of the total. A more likely explanation is that wealthy towns elected lower spending levels than they otherwise would have chosen absent the recapture impact of the sharing pool. As we show in the next chapter, our economic analysis offers evidence that the high price implicit in the sharing pool for wealthy towns would have resulted in a lower level of public spending – particularly if they were able to replace public funds with privately raised funds.

The decision to create separate Grand Lists for homestead and non-homestead property under Act 68 reduced the system's fiscal neutrality to some degree, though it still meets all the equity benchmarks. This result could be regarded as exchanging a small amount of fiscal neutrality for a small amount of equality of spending.

Second, we also found an improvement in expenditure equality across towns, school districts and supervisory unions, even though this was not a goal of either Act 60 or Act 68. Nevertheless, the expenditure equality statistics indicate that spending disparities in Vermont have been reduced and come very close to meeting the strict expenditure equality equity statistical benchmarks established by Odden and Picus (2008). Even though Vermont towns are able to determine their education spending level annually, and despite the fact that our analysis suggests the decisions they make on spending levels are not closely related to property wealth or income, statistical measures of the disparities in per pupil spending have been getting smaller over the past ten years.

In our analysis of expenditure equality, we also compared how the districts in the bottom half of the expenditure spectrum fare when compared to those at the median. Analysis of the McLoone Index values we computed shows they generally fell between 0.90 and our strict benchmark of 0.95. We also assessed spending differences for the top half of the distribution using the Verstegen Index and found that it generally fell between 1.10 and 1.15, somewhat above our strict benchmark of 1.05. Taken together, these results suggest that minor expenditure inequalities exist on both ends of the spectrum in Vermont, with slightly greater inequity at the top than at the bottom of the funding distribution. In our view, these are of minor policy importance.

Third, using a combined measure of student proficiency performance on the NECAP test in reading and math across grades 3-8, we found that there has been a reduction in the disparity in student outcomes in both reading and mathematics over the time period the state has used the NECAP test. Though many factors impact student learning, this finding indicates the investment in education the state has made is beginning to positively impact the disparity in student performance.

However, we also found that student performance has increased only modestly over the past ten years on multiple measures of student performance, including both NECAP and NAEP scores. Though Vermont consistently ranks in the top ten of student performance across the fifty states, it does not rank at the top of New England state performance, and has shown less improvement over the past years than several other New England states.

Fourth, we found that spending per pupil has dramatically increased over the past several years. Vermont has increased per pupil spending at rates that surpass both the national and New England averages, and now ranks as the third highest K12 spending state in the country. Further, the passage of Act 68 appears to have had the effect of accelerating the increase in spending in the state. Appendix Tables A2.1 – A2.3 show that the largest increase in spending occurred in the first year of Act 68 (FY 2005). This is likely the result of several "gold town" districts electing to return to high spending levels following decisions to not participate in the sharing pool under Act 60.

In summary, Vermont created a school funding system that provides towns and districts with an equal opportunity to raise fund for their schools, regardless of the relative fiscal capacity of each community. It appears that as a result, spending disparities as well as outcome disparities have decreased, while spending has increased. The system has given Vermont communities' options to choose expenditure levels and the different choices have led to some funding differences across the state – but differences that are not strongly related either to property wealth or income.

5. ECONOMIC ANALYSIS

An important consequence of Act 60 and Act 68 has been its impact on educational spending. These Acts revamped the educational finance system in Vermont, changing the incentives facing taxpayers. The findings from the analysis described in this chapter include:

- Act 60 and Act 68 altered the linkage between taxpayer benefits and costs of education by shifting from a shared state and locally funded system to a state centered system.

- Prior to Act 60 local jurisdictions were largely responsible for raising education funds above the state determined foundation level. Subsequently, local responsibility was diluted by the shift of non-residential property tax collections to the state level – along with establishment of the non-residential property tax rate – and by the separation of local budget setting and state revenue collection.

- Vermont has moved increasingly to an income-based system, with over 2/3 of residential taxpayer liability at least partially determined through income adjustments and the circuit breaker program. In FY 2011 it is estimated that over $165 million in residential property tax collections will be replaced by income related tax adjustments.[35]

- The consequence of these policy shifts has been to reduce the average marginal price of an additional dollar of per pupil educational services by approximately 70% since prior to Act 60.

- In the most recent time period we have data for, FY 2008 – 2010, changes in the marginal price of an additional dollar of per pupil educational services has been more modest, averaging approximately 3% statewide. However, the statewide average masks the experience of individual towns, some of which faced much different price changes.

- In line with economic theory, we would expect changes in price to have an impact on the level of demand for educational services. In fact, towns that experienced price declines increased their educational spending by $550 more per ADM than towns that experienced price increases. The differences were even greater for those towns that experienced the 10% largest and 10% smallest price changes, a difference of $1,248 per ADM.

[35] As noted in Section two, many Vermont stakeholders view the system as an income tax based system, not a property tax based system.

- The change in tax price[36] has an independent effect on school spending, even after we have controlled for other determinants of school spending.

- We find that the price elasticity of demand for educational services is -0.072 in small towns and -0.028 in large towns. This implies that school spending is 2-5% higher than it otherwise would be in the absence of the 70% change in tax price.

- School enrollments have a powerful effect on per pupil spending. The historical decline in Vermont enrollments have driven up the cost of education, A 10% decline in student enrollments is estimated to have a $1,500 increase in spending per ADM.

ESTABLISHING THE CONTEXT

Fully understanding the impact of Act 60 and Act 68 on the level of school spending requires a more complete understanding of the factors that determine spending choices. This is particularly important in the context of Vermont's educational funding system because voters in each town decide how much to spend for their schools on an annual basis.

The willingness of each town's taxpayers to support school funding depends on a myriad of factors. School finance researchers have found that support for schools varies with the income, family structure, education level, and tastes of local voters, along with their tax price, source of funds, and effectiveness of the educational program. Furthermore, the cost of providing school services varies with a variety of factors characterizing the students served, including pupil counts, pupil demographics, and labor market conditions. Each of these factors has the potential to influence the level of educational spending chosen by a community. Additionally, the funding laws in place also influence school spending decisions. For example, state minimum program requirements, mandated services, and funding arrangements can all influence budget choices.

From a school finance perspective, perhaps one of the most important unanticipated impacts of the post-*Brigham* school reform effort was the change in the connection between local budget choice and local financing responsibility. Prior to Act 60, spending increases above the State base spending level were funded almost exclusively by taxpayers within the jurisdiction and thus, each dollar spent above the base spending level was raised by the community. As a result of differential taxpaying capabilities across the state's school districts, there were substantial inequities in the level of spending and the educational programs provided to children. Acts 60 and 68 altered the linkage between taxpayer benefits and costs and treated all revenue sources as being state sources, even if the check was written by a local property taxpayer. Moreover, as described in Chapter 2 above, only a portion of total district revenue is paid for by

[36] As used in this document, tax price refers to the town's average marginal cost of each additional dollar spent for schools. We compare the increased tax liability of local residential taxpayers to the cost of raising school spending $1 per pupil to arrive at the "tax price."

residential (and thus likely voter) property taxes – the balance coming from non-resident property taxes and state revenue sources.

Acts 60 and 68 changed the practice that districts would pay fully for the educational program received in a variety of ways. The guaranteed tax base established by Act 60 made local responsibility an inverse function of local property wealth. Jurisdictions whose per pupil property tax valuation was close to the state guarantee level experienced little change in the "price" they paid to provide additional per pupil funding, as their tax base generated revenues close to the guarantee level. Jurisdictions that were relatively property wealthy experienced an increase in their tax price, stemming from the excess revenue they generated being placed in the state sharing pool. Jurisdictions with per pupil property valuations below the guarantee level raised revenue as if their tax base was at the guarantee level – this implicit subsidy effectively enabled these school districts to raise additional school funding at a cost less than dollar for dollar.

Act 60 and Act 68 also lowered the price of relatively lower income Vermont property owners by establishing a funding mechanism unique to Vermont – conditioning homestead property tax liability for education upon the income of the property owner. Homeowners with household income below approximately $97,000 (today) face lower tax liability than neighbors with similarly valued properties but with incomes above $97,000. To the extent that these income sensitivity adjustments reduced residential tax payer liability, tax prices were further reduced.

Conditioning property tax payments on ability to pay based on income was not entirely new. Vermont was an early innovator and established a circuit breaker property tax relief program that limited all property tax liability to a certain percentage of income for taxpayers with incomes below a certain threshold that today is $47,000. This on-going property tax relief program continued to contribute to the divergence between educational program cost and local taxpayer responsibility in Vermont.

The decoupling of budget setting and funding responsibility was further widened by Act 68, which removed non-residential property owners from the local property tax base. Under Act 68, all non-residential property owners face the same CLA adjusted tax rate, and tax revenues are shared statewide, thus removing a key local connection. Non-residential tax liability is no longer set by local spending decisions. Instead the tax rate for this property is set by the State. If in the past non-residential interests had provided a brake on local funding decisions, this might no longer be the case. Act 68 further attenuated the connection between local tax bases and local revenue generation by replacing the sharing pool and guaranteed tax base provisions with a system where local tax rates were increased proportionately with any proportionate increase in local school spending, relative to the base level. Finally, the new system imposed higher taxes on those high spending districts that exceeded a spending threshold. The local net effect of these various factors differed by the specific characteristics of each jurisdiction. Whether locally raised funds would now cover the local cost of education was cloaked, as the system became a State system. Nevertheless, school spending levels were still set by local taxpayers.

The net result of the various changes introduced by Act 60 and Act 68 was to reduce the typical educational "price" that local residents otherwise would have faced. We define the "price" of educational services to be equal to the communities' marginal cost in tax dollars paid in generating an additional dollar of per pupil educational spending. Prior to Act 60, there was a direct linkage between budget and tax paying responsibility, and the price of educational services was undoubtedly close to 1.[37] When voters decided to increase per pupil spending above the state determined foundation level, they correctly anticipated that such revenue would come from the community's resources. For some communities that required a considerably higher tax burden than others, as local tax bases and millage rates differed significantly. Nevertheless, for the most part, what a community spent above the foundation level was raised locally. Act 60 changed this relationship, setting the price to be proportionate to the ratio of local property wealth relative to the guaranteed tax base. Today, under Act 68, a community's price depends on the number of students in a district, the property wealth of the district, whether residential property owners qualify for the circuit breaker or income sensitivity adjustment, the value of the property taxed and subject to income conditioning, and whether the excess spending provisions are in place.

As an example, consider a community where every residential property owner is protected from property tax increases by the circuit breaker. In such a community the cost of additional per pupil spending would be zero. Circuit breaker qualified households could elect higher per pupil spending with no concomitant increase in their property tax burdens. In contrast, in a community with high income, few students, and great property tax wealth, the tax dollars raised by a proportionate increase in the rate is likely to exceed the cost of the new services delivered. This community would face a tax "price" greater than unity.

Tax prices are also influenced by enrollment changes. Vermont has experienced enrollment declines, which tend to drive up the average cost of per pupil services. Which countervailing force dominates is an empirical question. While these examples are not meant to be illustrative of any specific Vermont community, there exists a continuum of community types in Vermont, generating a range of prices calculated in this manner.

TAX ADJUSTMENTS IN THE VERMONT SCHOOL FUNDING SYSTEM

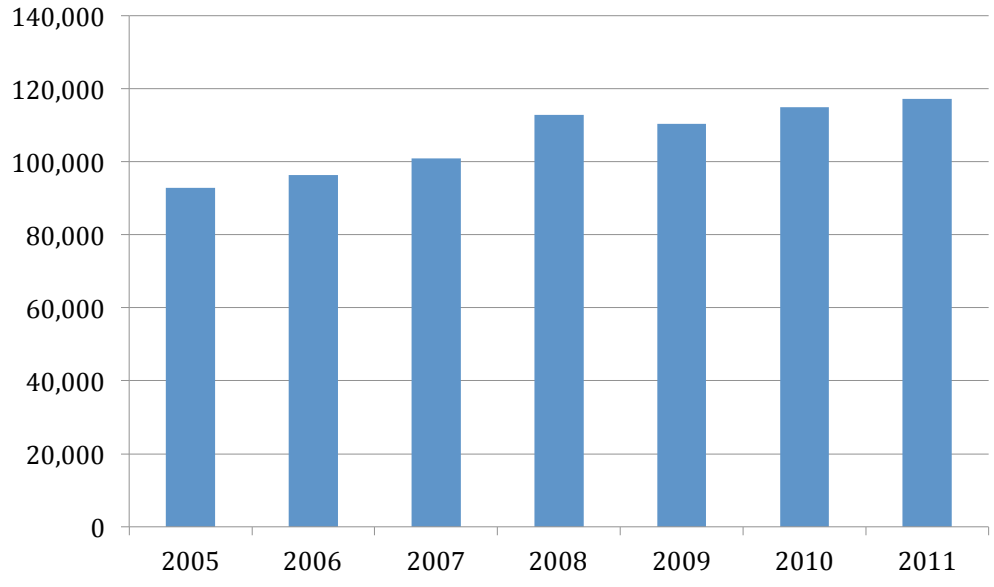
An examination of the tax adjustment provisions in Vermont provides some insight as to the extent and variation in prices communities might experience. Over time, the income sensitivity adjustment in Vermont has increased the state's commitment to reducing lower-income, property owner tax liability, and in doing so has also reduced the marginal tax price those individuals face. The number of households eligible for the educational tax adjustment (that is who pay homestead property taxes on the basis of their

[37] As we noted above, the circuit breaker program existed prior to Act 60 and had the effect of shifting some of the price to the state level, resulting in an average price less than unity. However, the circuit breaker program was rather modest in size relatively to school spending and consequently had rather small price effects.

income and not the assessed value of their homestead property) has climbed approximately 26%, growing from 92,801 households in FY 2005 to 117,159 households in FY 2011.

In dollar terms, the increase in property tax adjustments was even greater. Unfortunately, we only have reliable data for non circuit-breaker educational adjustments for the FY 2005 – 2011 period. These income sensitive adjustments increased from just over $76.5 million in FY 2005, to over $145 million in 2011 an increase of approximately 90% (See Figures 5.1 and 5.2). For FY 2008 – FY 2011 we can add in the value of educational tax adjustments attached to circuit breakers. Figure 5.3 adds the education, income sensitivity adjustment for those who receive circuit breakers to the income sensitivity adjustment enjoyed by those who don't qualify for circuit breakers. We find that the total educational adjustment increases nearly 28%, from almost $120,000,000 to over $152,000,000 in just 3 years.[38]

Figure 5.1: Number of Income Sensitivity Education Tax Adjustments FY 2005 - FY 2011



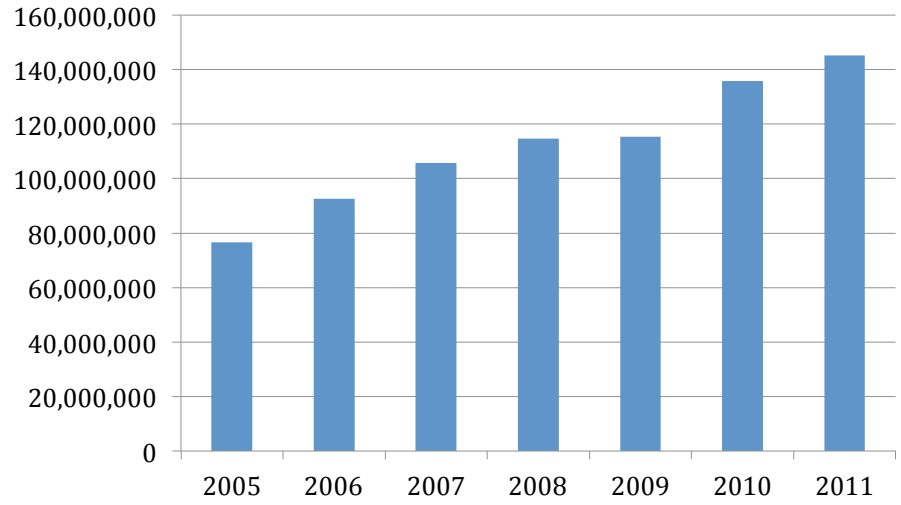
Computed from Vermont Department of Taxation data

Currently, income sensitivity adjustments impact over 2/3 of property tax paying households. Available data are only available from FY 2007 forward. In 2007

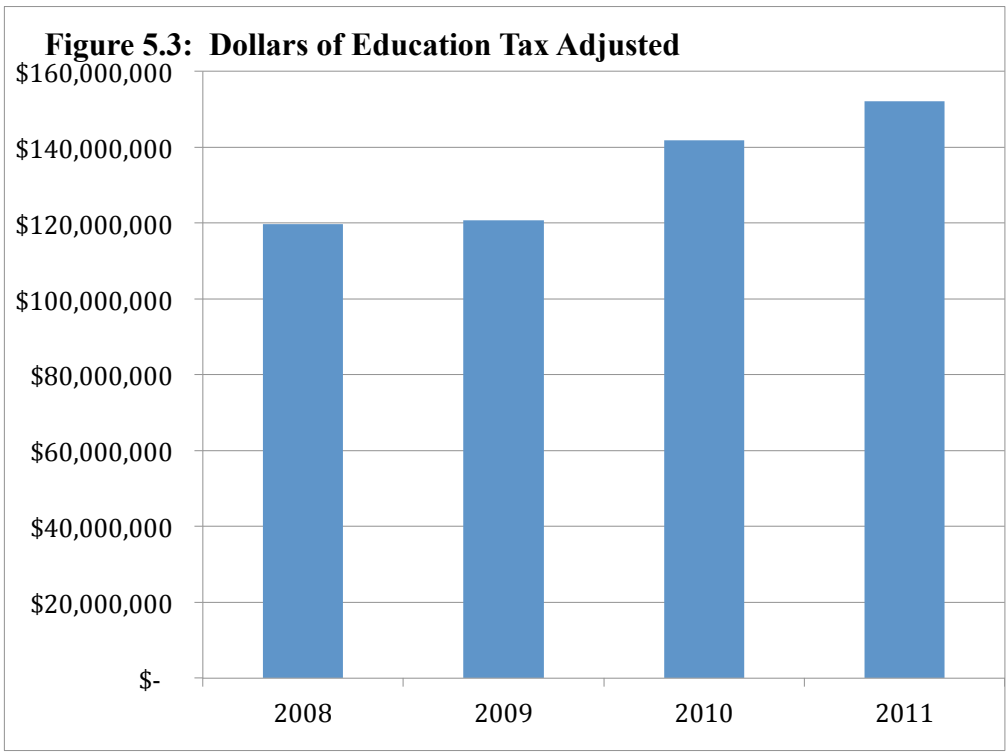
[38] To construct the educational income sensitivity adjustments for circuit breaker recipients we make use of both Tax Department and Department of Education data. Such data are collected at two different points in time, so my findings are not precise calculations.

approximately 60% of Vermont residential property tax payers received an income adjustment. By FY 2011 that proportion had increased to over 67% (See Figure 5.4). Importantly, because of the non-random distribution of household income across the state, the degree to which property tax adjustments affect different towns varies considerably. In some towns, 80% of homestead property taxpayers receive the adjustment. In other communities, less than 40% are eligible for the adjustment. One would anticipate this heterogeneity to introduce considerable variation in "prices."

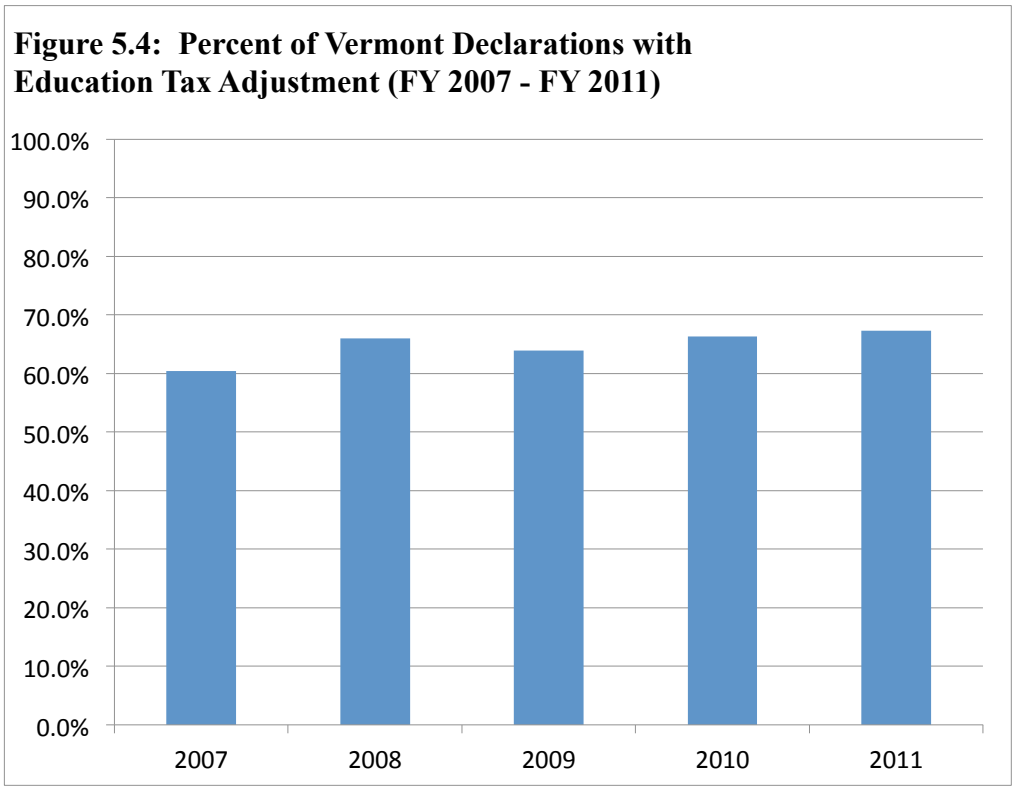
Figure 5.2: Dollars of Education Tax Income Sensitivity Adjusted, FY 2005 - FY 2011 (excludes circuit breaker)



Computed from Vermont Department of Taxation data



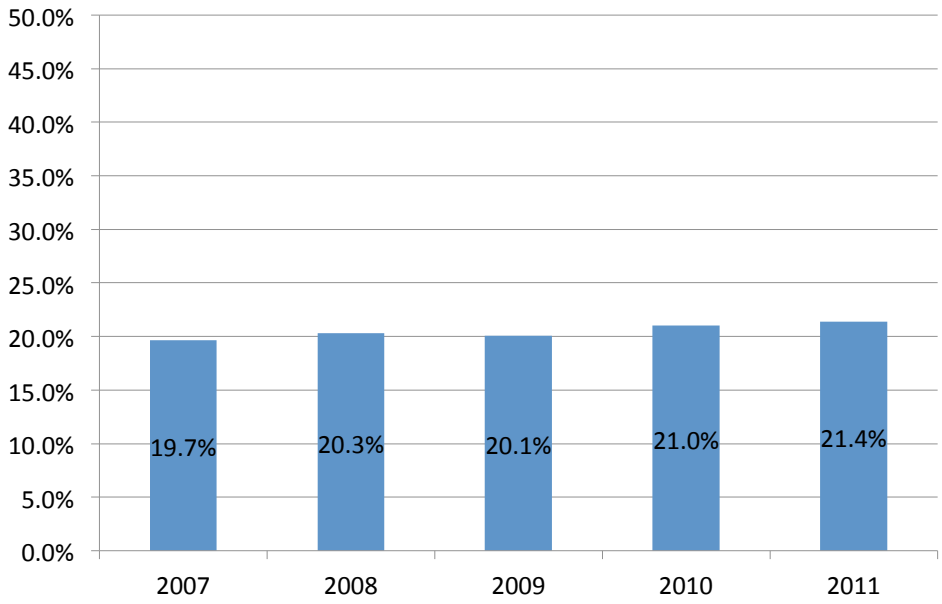
Computed from Vermont Department of Taxation and Vermont Department of Education data



Computed from Vermont Department of Taxation data

As mentioned above, some of those receiving income sensitivity adjustments participate in the circuit breaker program. An examination of Vermont state data reveals that the percentage of property tax declarations qualifying for the circuit breaker has increased from approximately 19.7% in 2007 to 21.4% in 2011 (See Figure 5.5). The circuit breaker caps property tax payments as a percentage of income, so these taxpaying households are shielded from tax increases resulting from voter-approved increases in local school budgets.. From the perspective of our marginal price analysis, circuit breaker households face a zero price.

Figure 5.5: Percent of Vermont Declarations with Circuit Breakers, FY 2007 - FY 2011



Computed from Vermont Department of Taxation data

Income sensitivity adjustments reduce the educational property tax burden facing taxpayers. We found that approximately 2/3 of Vermont's property tax paying homesteads enjoy some income sensitivity adjustment and that over 21% are sheltered from any additional property tax liability through the circuit breaker.[39] The percentage of households impacted by these provisions provides one measure of the degree to which tax prices are reduced by state policies. An additional measure of the degree to which these adjustments impact "price" is to compare the dollars that would have been collected absent the adjustments to the adjusted revenue total. Available data only make it possible to develop these comparisons for FY 2008 through FY2011, and over that time frame the data indicate the annual level of "subsidy" (the amount not collected due to the

[39] To be clear, the 21% covered by the circuit breaker are a subset of the 67% receiving income sensitivity payments.

adjustment) is high and increasing. On average, 27.2% of the total residential education tax liability was reduced by income sensitivity adjustments in 2008. This increased to 30.4% in 2011. The degree to which residential educational tax liability was reduced by these income adjustments differed considerably across Vermont towns.[40] For example, in FY 2010, the town of Winooski enjoyed a 40% reduction in what would have been its residential liability without these adjustments. In contrast, Charlotte had only a 18.2% reduction in liability. In FY 2008 the range was similar. Burlington enjoyed a reduction of 31.2%, while Shelburne had only a 18.2% reduction.

Prior to Act 68 we are unable to measure the percentage reduction in residential property tax liability, as the grand list was not split between residential and non-residential property. As an alternative measure we can compare the dollars adjusted through the income sensitivity provisions[41] to the size of each town's school budget – a figure that is substantially larger than the property tax liability from homesteads. From 2005 to 2011, income sensitivity adjustments grew from 7.0% of school budgeted expenditures to 10%. This measure also differs considerably across towns, ranging from 3% to 36% of budget expenditures. Although the measure is different, the pattern is the same – the burden of funding schools has been shifted away from homeowners over time.

Although Vermont has provided appreciable incentives that reduce the price of educational services to local taxpayers, a more complicated picture emerges for high spending districts. Act 68 doubles the marginal impact on price for dollars spent above the excess spending threshold, $14,548 in 2010. However, only about 3% of the towns in Vermont face the disincentive created by that provision, and reduction in price incentives still hold, even in these towns, up to the excess spending threshold.

IMPACT OF TAX PRICE ON LOCAL EDUCATION SPENDING

As argued above, multiple changes in the school funding laws reduced the "price" of purchasing school services for many Vermonters, while at the same time, enrollment declines in small districts led to an upward drift in the per pupil price of school services. But, how large were these changes and what impact did these price changes have on the actual level of school spending chosen? Ideally, to understand the full impact of the legislative changes, we would want to calculate the marginal tax price prior to Act 60, after Act 60 was enacted until Act 68 was passed, after Act 68 was enacted, and today. Unfortunately, we were unable to obtain the data required to make all of those computations. With the cooperation of the State of Vermont Tax Department, we have been able to obtain data that allow us to calculate prices for two recent fiscal years, 2008 and 2010. Just as we observe prices influencing the demand for private goods and services we would expect the level of school spending chosen to reflect the price a community pays. These two recent years provide us with the opportunity to analyze the impact of price changes on the willingness to pay for educational services.

[40] The calculation of town percentage reduction in residential tax liability is based solely on Department of Education data.

[41] Because FY 2005 predates reliable data for this purpose, we restrict our comparison to income sensitivity adjustments for non-circuit breaker recipients.

Using Vermont Tax Department data we find that the town average marginal "price" for additional educational spending was 32.4% in 2010 and 33.3% in 2008 (for towns having complete data in both years).[42] In other words, for every additional dollar of per pupil spending, on average, towns raised only $0.324 in 2010 and $0.333 in 2008. If we restrict our analysis to the 246 towns with ADM enrollment greater than 20, the 2008 range in "price" was 0 to 1.8. In 2008 the minimum price town was Readsboro,[43] and the town facing the highest price was Landgrove.[44] In 2010 the "price" ranged from .078 (Mount Tabor) to 1.05 (Weston)[45]. On average, there was a 3% decline in prices over this two-year period (0.9 percentage points), although this average decline masks considerable variation in town-by-town price changes. When we look at the 90th percentile and tenth percentile of the price change distribution, we find that ten percent of the towns had price increases greater than 12% and ten percent of towns had prices declines greater than one third over this time period. Although we cannot calculate prices for earlier time periods, we have reasoned that prior to Act 60 towns were responsible for the monies they spent, implying prices of unity.[46]

The change in the "price" of providing additional spending provides an opportunity to analyze the impact of these policies. As we indicated above, the price of educational services is a potentially important determinant of the level of services chosen. We find for the 183 districts that experienced price increases from 2008 to 2010, the average change in school spending was $1,450 per pupil. For the 76 districts experiencing price declines, the average increase in spending was over $550 more - $2,008 per pupil. If we look at the 90th and 10th percentile experiences, where the price changes are greater, we find that the 10% of towns with the largest price declines raised spending $2,479 per ADM, while the 10% of districts with the largest price increases only increased spending by less than half as much - $1,231 per ADM. While spending increases are not monotonic with tax price declines, on average, communities that experienced the strongest price changes exhibited appreciably different behavior in their spending choices.[47]

This lack of monotonicity is not surprising. After all, other factors should also impact the level of school spending. Among the factors that might impact the level of spending in a school district are:

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[42] See Appendix 3. Table A3.1 for a town-by-town analysis of these marginal prices.

[43] In 2008 Readsboro funded schools below the state base level, meaning that additional per pupil spending could be chosen without any additional cost to local residential property tax owners. Remarkably, the town chose to spend no more.

[44] Only 5 towns had 2008 prices greater than unity.

[45] Only 1 other town (Barnard) had a price greater than unity in 2010.

[46] See footnote 39 where we discuss the impact of the existing circuit breaker.

[47] We focus on the change in prices because there are multiple determinants of service demand at any point in time. As an example, it is likely that some communities will have a stronger taste for education than others. These communities may choose higher levels of school spending than lower taste for education communities, irrespective of the price. Unfortunately, we cannot measure tastes directly. However, we can see the impact of price in both high taste and low taste communities by observing their behavior if the price should change. By focusing on price changes we effectively hold constant the taste parameter in the community.

- In small school districts, changes in school enrollment can have significant effects on reported spending levels per ADM.
- Changes in the income or wealth of town residences might have separate, non-price effects.
- Recent declines in Vermont property values have had significant impacts upon the ability of taxpayers to fund public services.
- Secular trends in the willingness to support school funding can contribute to the upward drift of spending.
- Price escalations built into personnel contracts can have similar effects on the level of school spending.

Nevertheless, the data indicate price effects appear to have their own power. But, whether we can truly attribute these differential changes in the level of spending among school districts to changes in prices or whether these are consequences of other explanatory variables requires a more sophisticated multivariate analysis.

Our multivariate analysis is informed by theory but limited by the data available. There is a substantial literature on the determinants of school spending, generally finding that wealth and price effects, economies of scale, and taste differences, are important.[48] We explore a set of possible explanations for changes in town level school spending by making use of U.S. Census data, Vermont State Income Tax returns, Vermont school finance data, and Vermont Tax Department data. To investigate these relationships we constructed a multivariate regression model. The final regression models utilized in our analyses are quite successful in explaining differences in changes in school spending, generating results with a high degree of statistical confidence. The F statistics exceed a value of 50, indicating statistical significance at the highest level. The coefficient estimates are generally statistically significant, correctly signed, and reasonably sized. The proportion of variation explained by the model, an R^2 of .72 and .68 in small town and large town samples, indicate excellent predictive power for a regression that is estimating changes. We discuss each of the variables included in the model and our statistical results below. The variables' means and variances are summarized in Appendix Table A3.2, and our regression results presented in Tables 5.1 and 5.2.

Our analytic approach is to explain the changes in town level school spending per ADM from 2008 to 2010 as a function of a number of independent variables. The dependent variable is the town's change in school spending per ADM from 2008 to 2010 (admfy0810). The explanatory variables are the percentage change in ADM (admpct0810), the change in "price" (pricech), the percentage change in town AGI (pctagich), the 2008 per ADM level of spending (admfy2008), and the percent renter occupied housing units (percentren~d).

[48] See Bergstrom and Goodman, *American Economic Review*, "Private Demand for Public Goods," (June 1973) for the seminal paper on this approach.

Table 5.1 – Small Town ADM Regression

```
. reg admfy0810 admpctch08 pricech pctagich admfy2008 percentrent if adm08<200
> & adm08>20

      Source |       SS       df       MS              Number of obs =     110
-------------+------------------------------           F(  5,   104) =   55.17
       Model |   330950029     5  66190005.8           Prob > F      =  0.0000
    Residual |   124768768   104  1199699.69           R-squared     =  0.7262
-------------+------------------------------           Adj R-squared =  0.7131
       Total |   455718797   109   4180906.4           Root MSE      =  1095.3

------------------------------------------------------------------------------
admfy0810_ch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
admpctch0810 |  -15034.01   1030.666   -14.59   0.000    -17077.86   -12990.16
     pricech |  -2967.721   914.0482    -3.25   0.002    -4780.313    -1155.13
    pctagich |  -887.5657   811.4933    -1.09   0.277    -2496.787     721.656
   admfy2008 |  -.1027669   .0394395    -2.61   0.011    -.1809769   -.0245568
percentren~d |  -3.038806   20.65536    -0.15   0.883    -43.99916    37.92154
       _cons |   2630.268    667.286     3.94   0.000     1307.015    3953.521
------------------------------------------------------------------------------
```

Table 5.2 – Large Town ADM Regression

```
. reg admfy0810 admpctch08 pricech pctagich admfy2008 percentrent if adm08>200

      Source |       SS       df       MS              Number of obs =     130
-------------+------------------------------           F(  5,   124) =   54.58
       Model |  99835394.3     5  19967078.9           Prob > F      =  0.0000
    Residual |  45360091.3   124  365807.188           R-squared     =  0.6876
-------------+------------------------------           Adj R-squared =  0.6750
       Total |   145195486   129   1125546.4           Root MSE      =  604.82

------------------------------------------------------------------------------
admfy0810_ch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
admpctch0810 |  -15363.15   981.2032   -15.66   0.000    -17305.23   -13421.08
     pricech |  -1309.578   661.3254    -1.98   0.050    -2618.527   -.6302611
    pctagich |   515.1177   1006.629     0.51   0.610    -1477.283    2507.518
   admfy2008 |  -.1274443   .0293326    -4.34   0.000    -.1855018   -.0693868
percentren~d |   10.83914   5.294582     2.05   0.043     .3596767    21.3186
       _cons |   2496.687   405.3166     6.16   0.000     1694.452    3298.922
------------------------------------------------------------------------------
```

A basic finding that has emerged from the school finance literature is that small school districts will experience much higher per pupil costs because they are unable to take account of economies of scale of service provision. A related sentiment is expressed by Vermont school administrators who contend that they are unable to change their scale of service provision when confronted with small student enrollment changes. Vermont, as a primarily rural state, is characterized by two features that make economy of scale issues particularly germane. First, Vermont school districts are small. Nearly half of the districts in the state have enrollments under 200. Second, enrollments are declining. Over 70% of the towns experienced declines in ADM between the 2008 and 2010 school years.

These features suggest that school enrollment changes will have an important impact on spending per pupil. Because of the importance of the impact of enrollment changes on per pupil spending we made two adjustments to our analytic model. First, we

separately analyzed towns with enrollments exceeding 200 ADM from those with enrollments with 200 or fewer ADM. In the low enrollment sample we eliminated districts with fewer than 20 ADM, to remove potentially peculiar cases.[49] Our choice splits our sample at approximately the state ADM midpoint[50]. While the choice of 200 ADM could be altered, we find that the results would vary little with some other size cut point.[51] Second, since student enrollment changes will impact program costs differently depending upon the size of the district, we analyze the percentage enrollment change rather than the unit enrollment change. For example, a decline of 10 ADM's is a 10% enrollment change in a district of 100, but only a 1% change in a district of 1,000. Clearly, the change in the smaller district will have a much greater impact on per pupil spending levels.

Referring to the regression results in Table 5.1 and Table 5.2, we find that the percentage change in enrollments (admpctch0810) has a statistically negative impact on per pupil spending levels, all else equal. Evaluated at the mean, the findings suggest that a 10% decline in student enrollments in larger districts (representing a decline of 60 students) would cause a $1,503 increase in the per pupil spending level in that town. It would only take an enrollment decline of 12 students to have a comparable effect in smaller districts. Given the size of this effect and its statistical strength ($p < 0.001$ in both regressions), we note that enrollment movements, and policies that affect them, can have major implications for per pupil spending levels.

Next we consider the independent impact of the "price" changes. This is the key variable of interest and the novel feature of this analysis. The Vermont system, at the same time that it promoted greater equity in taxpayer tax rates across jurisdictions, created differential incentives for taxpayers within districts to support schools. As noted above, marginal school prices average just over 30% with a sizable range of differences by town. Potentially, these policy induced changes in tax price will impact the level of educational spending chosen. Our hypothesis is that those districts that enjoyed larger price declines from 2008 to 2010 were more likely to choose higher levels of school spending in 2010.

As pointed out above, on average, those towns characterized with high price declines increased their spending considerably more that towns with price increases. But, this finding did not account for the possibly confounding influences of other factors. Perhaps the spending differentials were due to other factors correlated with price changes. Our regression model allows us to investigate the independent source of these spending changes. The model confirms that tax price has statistically significant negative effect on the level of educational spending chosen, holding the other explanatory variables constant. The splitting of the sample reveals that the price effects (pricech) are statistically significant in both the larger (pvalue=0.05) and smaller (pvalue=0.01) ADM samples. The impact is bigger in smaller enrollment communities, where a 10% price

[49] By discarding towns with less than 20 ADM, we remove 6 towns from the regression
[50] Town median ADM is 214 in 2008, and 200 in 2010.
[51] We also conducted the analysis using the entire sample, and found substantively similar findings although it is not reported here

change evaluated at the mean, increases per pupil spending by nearly $300. The impact in larger ADM communities is a bit less than half that size.

It is useful to express these relationships as elasticities so that we can compare these finding to others in the literature. Previous research has found the demand for educational services to be price inelastic. This means that changes in spending are relatively insensitive to changes in price. Our findings confirm this result, although we find smaller elasticities than those generally reported in the literature.

The calculated price elasticity of demand for schooling is -0.072 for towns in the small enrollment sample and -0.028 for towns in the large enrollment sample. This implies that a 10% decrease in a town's price would result in a 0.72% increase in per pupil school spending in small enrollment towns, or 0.28% in large enrollment towns. While these are rather modest behavioral effects, they do have the consequence of increasing school spending. If the effective decline in price from the pre-Act 60 time period is in the range of 70%, representing a price decline from approximately unity to, on average, approximately 0.30 today, our findings imply that this price change has resulted in an average 2% to 5% increase in per pupil spending above the level that otherwise would have been chosen. This change would be on top of the changes resulting from declines in school enrollments, changes in the base funding level, and other changes in the school budget setting process.

Income or wealth have consistently been found to be a powerful explanation for the demand of private goods and services and also has been shown to be important in the demand for public goods. Data limitations – we have no true income or wealth measure in the data – limited our ability to explore this effect. The best we can do is use State income tax return data to construct an imperfect measure of community Adjusted Gross Income (pctagich). Unfortunately, these data cover the change in community AGI from 2008 to 2009, so they do not match up precisely with the 2008-2010 spending changes we are investigating. The standard hypothesis for studies of this nature is that communities that have shown income gains will be more likely to support higher school spending. Our results indicate no statistically significant impact of income on per pupil spending. Given that we are unable to measure income with precision, and the complex way income affects price through the income sensitivity adjustment, this is not surprising.[52] We include the variable in the analysis as a control, although it does not have a statistically significant effect.

The next variable in our analysis (admfy2008) is the town per pupil expenditure level in 2008. We hypothesize that relatively high spending towns are likely to increase their spending less than low spending towns, as they will be more likely to face the high spending threshold disincentive and because they are more likely to view their current spending as adequate, particularly compared to their neighbors. In contrast, relatively low spending towns will be seeking to catch-up to their higher spending neighbors and thus more likely to increase spending. We find similar results in both samples. The

[52] Higher income can disqualify a taxpayer from income sensitivity adjustments, thus effectively increasing their tax price.

independent effect of a $1 higher per pupil spending level in 2008 is to reduce 2010 per pupil spending by 10 cents to 13 cents below what we otherwise would have predicted. Thus, higher 2008 per pupil spending levels have a depressing effect on the level of per pupil spending increase a town chooses for the 2010 budget year.

Unfortunately, due to data limitations, we could only conduct this analysis for the FY 2008-2010 time period – a time dominated by the most severe recession since the depression. Table 5.3 shows the annual percentage increase in per pupil spending from FY 2001 to FY 2011. It is clear from the table that expenditure growth from 2008-2010 was slower than the average over the past decade. As a result, the behavioral effect we estimate may look different in a less fiscally constrained, and economically uncertain, time period.

Table 5.3: Annual Percentage Increase in Per Pupil Spending in Vermont, FY 2001 to FY 2011

Percent Change from Previous Fiscal Year	
Year	**Percent Increase**
2001	7.02%
2002	7.57%
2003	5.61%
2004	5.24%
2005	11.45%
2006	7.82%
2007	6.91%
2008	3.61%
2009	7.37%
2010	3.24%
2011	0.85%

Finally, we include a variable to capture the housing tenure choice of households - the percentage of households that are renter occupied. Renters are more likely to be childless and have a less permanent connection to the communities they live in, both features making them less likely to support school spending. Renters also tend to be lower income, and this too would drive them to lower school support. On the other hand, some analysts have argued that renter's misperceive the burden of the property tax, believing, since they see no tax bill, that they bear none of its burden, thus viewing school services as costless. Theoretically, this perspective is flawed. Although renters do not explicitly see property taxes in their rental bills, the imposition of property taxes on property owners increases their costs of providing rental properties and leads to a shifting of the burden from rental owners to renters. To what extent renters recognize this shifting is a matter of some controversy, although ultimately whether they do or don't is an empirical question upon which our analysis may shed some light. There is sufficient variation across towns in the percentage of rental occupied housing stock to analyze this

variable. On average, 18.4% of town households rent[53], although the town quartile range is 14-24%. We find the percent of renters does not influence school spending decisions in low ADM towns, perhaps because there are so few renters in these communities, but we do include the percentage of renter variable as a control. In the larger ADM sample we find the percentage of renters has a modest positive impact on school spending, in weak support of the burden ignorance hypothesis.

Concluding Remarks

Acts 60 and 68 have transformed the Vermont school finance system from one that was locally based to a hybrid system with extensive degrees of state involvement. In doing so, taxpayer equity and wealth neutrality goals have been for the most part achieved (see Section 4). However, the hybrid structure has resulted in a dilution of the connection between the decision to spend money on schools and the cost of that decision. We find that these policy changes have resulted in the average marginal price facing Vermont towns to now be on the order of 30 cents per dollar of pupil spending. Based on analysis of the 2008 and 2010 fiscal years we estimate a relatively small price elasticity of demand of -0.07 in Vermont's smaller towns and nearly -0.03 in larger towns, implying that the decrease in taxpayer price accompanying the legislative reforms is responsible for approximately a 2-5% increase in education spending in Vermont. Perhaps of greater import, and worthy of further investigation, are the cost increasing impacts of student enrollment declines.

[53] This is the simple town average of percent renters, weighting large and small towns equally. Statewide, 29% of households are renters.

6. COMMON THEMES IN VERMONT'S SIGNIFICANTLY IMPROVING SCHOOLS

As part of its study of the Vermont school finance system, specifically the requirement to assess the degree of equity of student outcomes, Lawrence O. Picus Associates conducted case studies of five schools that had significantly improved student performance over the past several years. The prime goal of these cases was to understand strategies schools used to boost student learning, and over time, the resource needs of those strategies. This information can serve as a beginning step towards forming a closer connection between the state funding formula, school use of resources and student performance. Among the key themes that emerged from this study are:

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- Our findings align with recent other studies of effective schools in Vermont, including *Roots of Success* (2009) and *Vermont Schools Closing Achievement Gap* (2011)

- The strategies we identified in our five case studies align with national studies of schools that have significantly improved student learning, including studies we have conducted in other states (Odden, 2009; Odden & Archibald, 2009).

- We identified 11 common themes that were in place across the five schools, and note that several of the 11 elements represent significant augmentations of the findings from recent Vermont studies of improving schools (*Roots of Success* and *Vermont Schools Closing the Achievement Gap*). The 11 themes are:

    1. talent
    2. high expectations
    3. ambitious goals
    4. curriculum
    5. instruction
    6. use of data
    7. multiple interventions
    8. school schedule
    9. professional culture
    10. leadership
    11. small class sizes.

- A key in the five schools we studied was the knowledge and skill of the staff to implement the various strategies effectively.

- Not every school was strong on all of the eleven elements discussed below, but all were strong on most of them.

We used NECAP scores to identify schools to study. NECAP provides the only common measure of student achievement across Vermont's schools and is generally viewed across the country as one of the best state accountability tests. We did not look for schools performing at a high level. Rather, since the policy goal in Vermont as well as across the country is to *improve* student performance, we looked for schools that had produced significant *gains* in student performance from 2005 to 2010 for elementary schools, and from 2007 to 2010 for high schools. We looked for schools that produced gains not only for the percent of students performing at or above the Proficient level, but also at or above the Proficient with Distinction level.

After reviewing data from all schools in Vermont, we identified the five schools identified in Table 6.1 which includes the school names and shows their enrollment and the proportion of students eligible for free and reduced price lunch. Enrollments ranged from a low of 112 students at Montgomery Elementary School, to a high of 770 for Colchester High School. All five schools had at least 25 percent of students eligible for free and reduced price lunch and three had approximately 50 percent of students from families with low incomes. The schools were in rural and urban locations. The appendix to this report includes individual case studies with specific findings for each of these five schools. This document identifies the common themes we found across the five cases.

Table 6.1
Characteristics of Five Vermont Improving Schools

Name of School	Enrollment	Students Eligible for Free and Reduced Price Lunch
Brewster Pierce Elementary	120	~25 percent
Colchester High School	770	~25 percent
Montgomery Elementary	112	~55-60 percent
Whitcomb Senior High School	140	~50 percent
White River School	232	~50 percent

This cross case analysis should not be considered a definitive statement about what Vermont schools can do to produce gains in student achievement; this report is simply a beginning step in that process. More schools would need to be studied and over a longer time period to make definitive statements. Although the cases show that these schools have produced impressive improvements, they have not done so in all subjects or at all grade levels, so more work still needs to be done – even in these impressive sites.

We have organized the results into eleven common themes: talent, high expectations, ambitious goals, curriculum, instruction, use of data, multiple interventions, school schedule, professional culture, leadership and small class sizes.

1. TALENT

The country is finding that educator talent matters. Teachers and principals need the knowledge, skills, instructional expertise and dispositions to produce high levels of student learning. Talent is not evenly distributed across states, districts or schools. As a result, those education organizations with better talent produce higher levels of student performance (Odden, 2011).

Talent was a key element in these five schools. Teachers and principals were highly knowledgeable about how to teach reading, personalize instruction, provide effective interventions, learn and use effective instructional practices and exert effort until the job was accomplished. It would be safe to say teacher talent in these schools was far above average. Some schools, even in rural areas, were able to select teachers from large application pools. All teachers were expected to be reading "experts." A teacher in one elementary school stated that, "Starting to work in this school was like joining an Ivy League faculty; teachers are highly skilled and expand their professional knowledge and skills every year." At both high schools, teachers were expected to personalize instruction for every child, which required sophisticated diagnostic skills and then effective instructional practices. At all schools, teachers and principals were expected to work hard, put in extra hours if needed, and take whatever steps were needed to make sure no child fell through the cracks. Principals were also smart, knowledgeable, instructional leaders, able to collaborate, good managers, and effective site leaders.

Teacher and principal talent was important to the success of these schools. Without that talent, these schools would have been unable to effectively and fully implement their comprehensive and sophisticated approaches to curriculum, instruction, interventions, and the organization of teacher work.

2. HIGH EXPECTATIONS

All schools had high expectations for student learning and believed that all students could learn to at least the proficiency standards on the NECAP test. Meeting standards was the bottom line, minimum expectation for all schools. Indeed, except for one school, neither teachers nor the principal mentioned school demographics when explaining expectations, goals, and the instructional program – they saw their job as getting the students they had, irrespective of family context or economic background, up to the Vermont standards. Teachers did not believe socio-economic status (SES) determined performance.

3. AMBITIOUS GOALS

In general, these schools had ambitious goals that were usually focused on student performance. The school that showed the most improvement among the five schools had specific numeric goals for both academic and behavioral performance for every subject and at every grade level. Further, this school had goals both to reduce the percentage of students at low performance levels and to increase the percentage of students at higher

performance levels. Another school with a 50 percent poverty concentration had a requirement that all schoolwork had to be 80% or more correct, or had to be redone. One high school had as a prime goal creating of a systemic approach to instructional practice that required all high school teachers to differentiate instruction according to student learning styles, to stress higher order thinking skills, and apply knowledge of content to real situations. The school staff believed that such instruction would produce authentic student achievement that would be reflected in higher NECAP scores. Though one school argued that effective instruction was THE key to improved student learning, its goals were on student academic achievement – the results of good teaching.

4. CURRICULUM

We found that the curriculum program was an important element of these schools' successes. This element was not identified in either of the recent Vermont studies of effective schools, and often is not mentioned in other national studies. But every one of the schools studied had made significant changes in their curriculum program over the time period of the documented improvements in student achievement. They adopted research-based programs in reading and mathematics in elementary schools, structured approaches to writing in all schools, and aligned the content taught to make sure all students were exposed to NECAP content before it was tested.

The three elementary schools took different approaches to reading, but all sought to implement – with fidelity – an approach to reading that emphasized the core research-based elements of an effective reading program: phonemic awareness and phonics, decoding, vocabulary, spelling, writing, reading comprehension and reading fluency. Two of the three schools added Wilson *Fundations* as a supplementary program for additional phonics practice in grades K-3; one school adopted the Fountas and Pinnell *Phonics* program; and another the *MySidewalk*s program for kindergarten phonics emphasis. They all stressed reading comprehension in the content areas of science and social studies, even beginning in Grade 3.

Two of the three tracked student performance in reading through multiple assessments of either AIMSWEB or Fountas and Pinnell assessment programs, even going beyond those benchmark assessments with more diagnostic assessments such as DRA2, Orton Gillingham, and other ways to track reading progress. The three elementary schools also had early interventions for reading including one-to-one tutoring. In all three schools, although staff were trained and knowledgeable about Reading Recovery, tutoring was expanded to include some struggling kindergartners as well as tutoring for students still struggling in Grades 2 and 3.

All schools also had a comprehensive and ambitious approach to writing, at all grade levels, including the various forms of writing – report, persuasive essay, narrative, personal essay, and response to literature – and emphasized the writing process of prewriting, drafts, feedback, editing, and then a final product.

Each high school had cross subject emphases in reading that stressed reading and writing in the content areas. One high school designed Grade 9 and 10 English/language

art classes for struggling readers to improve students' reading strategies, vocabulary, reading comprehension, interpretation of texts, composition, grammar skills, and basic writing abilities. The other high school had a ninth grade course called Strategic Reading for students who needed support in strengthening their reading skills. Both high schools required multiple forms of writing in virtually all classes and at all grade levels.

For mathematics, the elementary schools adopted a conceptual and problem solving approach to math, with two schools adopting the *Bridges* program and one school adopting *Math Investigations*. Both of these programs stress students' developing a conceptual understanding of mathematics and provide teachers with materials to understand the sophisticated ways elementary students engage in mathematical thinking. This includes but goes far beyond the algorithms usually taught. However, every school also augmented these texts with programs designed to emphasize automaticity of arithmetic skills, including *Rocket Math*, *Fasst Math* and *Math Corner*. One high school added a "math concepts" assessment, given as students took Algebra 1 and 2, and then provided extra help if students failed to score above a 7 (on a 10 point scale) for any concept.

Further, both the high schools made efforts to align their content so that all students were exposed to the appropriate content before taking the NECAP. This took considerable effort in science, as both chemistry and physics area covered in the Spring science test taken during the junior year because most students took either chemistry or physics in their senior year. Both high schools felt that their emphases on reading and writing, irrespective of NECAP, prepared students to be good and critical readers and writers, and thus prepared them for NECAP.

The key finding here is that the curriculum program mattered in all five schools. There were specific emphases on a research-based approach to reading, writing and mathematics, along with augmentations of commercially adopted programs to insure that all aspects of curriculum were appropriately covered. This occurred particularly in the phonics portion of reading and in the arithmetic skills portion of mathematics, and was an important part of making sure the curriculum content was aligned to NECAP tests.

5. POINT OF VIEW TOWARD INSTRUCTION

Every school had a particular "point of view" about instruction and teaching. For example, one high school wanted every teacher to "personalize" instruction for every student, by having teachers understand and address both the academic and social side of students. The other high school stressed "differentiating instruction" and had multiple ways that could be accomplished, including linking student assignments to students' personal learning styles. Having a point of view about teaching and instructional practice in high school is rare but there was a strong and persuasive point of view in each of these high schools – and teachers expected every other teacher to reflect their school's perspective.

The elementary schools also had school specific points of view about instruction. All expected teachers to personalize instruction. All had a very specific approach to reading, which included an emphasis on phonics in the early grades, with one school expecting each grade level teacher have advanced training, and to be expert in reading beyond what a commercial text would provide. Each school expected teachers to implement a school approach to teaching writing, and each school expected teachers to implement their math programs with fidelity.

The schools wanted students to experience a "consistency" of curriculum and instruction. All courses were collaboratively developed in one high school. As math teachers in one high school said, "Math teachers no longer work by themselves; everything is coordinated and developed with other teachers ….. there is no single math class taught individualistically."

In sum, instruction was public in these schools, there was a school wide view about effective teaching practice and all teachers were expected to reflect the school's views about instruction. Further, all teachers were expected to implement the school's curriculum program with fidelity. And principals reinforced these faculty perspectives.

6. USE OF DATA

All schools were data driven. They used and analyzed the state accountability test, NECAP; adopted and used benchmark assessments (Fountas and Pinnell Benchmark, AIMSWEB, MAP); used other formative assessments sometimes commercial, sometimes in the commercial programs (e.g., each curriculum unit in Bridges math included formative assessments) and sometimes from the state (e.g., the Vermont Primary Number Observation Assessment, OGAP and the VCAT system), and a battery of more informal formative assessments. In general, teachers analyzed these student performance data in teams and used them: 1) to assess the impact of their curriculum and instructional programs, 2) to place students into reading groups and various interventions, and 3) to continuously monitor student progress and take appropriate additional steps to make sure "no student fell between the cracks."

One elementary school had a "data wall" showing where all students (without names) stood vis-a-vis a four point performance scale at the beginning of the year, and then periodically during the year rescored all students, showing performance gains over the school year. The goal was to move more students into the top performance category, move students in Level 2 performance forward with many moving into the performance 3 category. The point of the wall was to make student performance public over the course of the year.

All schools took NECAP seriously, some teachers more than others, but there was virtually no complaining about NECAP. Schools used NECAP scores to track macro student performance changes. And most teachers were comfortable with the NECAP tests themselves, believing that if they implemented their curriculum and instructional programs with fidelity, students would learn more and NECAP scores would rise. Both

high schools implemented policies to incent high school students to do well on the NECAP tests, linking NECAP scores to course finals and/or graduation requirements.

No school wanted less data; most schools sought even more micro, diagnostic data in addition to the Benchmark, short cycle, NECAP release items and formative assessments they already were using.

7. MULTIPLE INTERVENTIONS

All schools had multiple extra help strategies for students struggling to learn to state performance standards. Most schools called these programs "interventions." As noted above, the elementary schools first augmented the core reading program with programs that provided even more instruction in phonemic awareness and phonics for the early elementary grades, believing that these were foundational skills for all students and that they had to be taught systematically to all students, particularly those from poverty backgrounds, in order form them to have the foundational skills to become expert readers and writers.

The elementary schools provided one-to-one as well as small group (no more than 5 students) tutoring in both reading and math; interestingly, and a practice to be noted, the elementary schools did not limit tutoring for reading to first graders, like Reading Recovery, but started tutoring in kindergarten if a student was struggling, and extended tutoring through Grade 3 if a student continued to need intensive assistance.

The elementary schools also added a 30-45 minute time block during the day during which additional extra help or interventions could be provided. Sometimes the assistance was a particular program, such as the Fountas and Pinnell *Leveled Literacy Intervention*, *Math Recovery* (a K-2 mathematics tutoring program), and Marilyn Burns *Do the Math, VMath* (another math tutoring program), and sometimes teacher provided extra helps on their own.

Sometimes, instructional aides provided these interventions, but in nearly all cases, the "aides" were former teachers now providing this service on a part time basis, or individuals who had earned a Bachelor's Degree and/or were close to earning a full teacher certification. In all case, the paraprofessionals were trained in the program they were implementing. So the aides providing these focused interventions generally were highly educated, trained in the program and had the professional skills to deliver the service effectively.

The high schools also provided multiple extra help interventions. As noted above, one high school had a strategic reading class for freshmen who needed to strengthen their reading skills (faculty were hoping to have a class for sophomores as well), and the other high school had tailored an English/language arts sequence of Grade 9 and 10 courses to emphasize reading, reading comprehension, grammar, vocabulary and writing skills. One high school had a Writing Workshop and Math Center that were available all day long for

students to get extra help in writing, reading and math. in HS (desired in Whitcomb but not yet implemented).

All schools had Homework Clubs that met either before or after school, or even on the weekends. In most cases, teachers who met with the homework clubs provided this extra help on a volunteer and unpaid basis.

All schools had some version of an Intervention Team which reviewed student progress, identified struggling students, and ultimately referred students to an evaluation for identifying a specific disability. And all school based interventions for struggling students were provided before identification of a specific disability was made and an IEP requiring more intensive extra services was developed for that student.

8. ATTENTION TO THE SCHOOL SCHEDULE

Four of the five schools had redesigned their school schedules to provide for common pupil free time to enable appropriate groups of teachers to collaborate on curriculum and instructional issues. One high school with a block schedule provided close to 90 minutes every day for some combination of individual planning and collaborative planning work, and in this school, virtually everything was done in a collaborative way, including the design and implementation of all core courses. Time for collaboration was viewed as strategic and the schools believed that a collaborative school culture was key to implementing a consistent approach to curriculum and instruction. Both of the small elementary schools figured out ways to carve out common planning time during the regular school day, even though they had limited degrees of freedom to do so.

The elementary schools also scheduled time for an intervention block during the regular school day, thus placing a high value on the need to provide extra help for students that required it in order to achieve to standards.

In short, the schools viewed time as a resource and designed schedules so that there was sufficient time for collaboration and interventions, both factors key to their overall plan's of action.

9. PROFESSIONAL SCHOOL CULTURE

As should be clear, there were professional cultures in these schools that had several features:

- High expectations for student learning
- Collaboration both within and across content areas
- A "public approach" to curriculum and instruction – teachers created and taught the same curriculum units, used the same end of curriculum assessments, and created common professional development activities.

- Relentless pursuit of high performance; teachers in these schools worked very hard – sometimes after school and sometimes on the weekends, to get the job done.
- Teacher responsibility for all students in the school (with all students accountable to any teacher) for both academic and behavioral performance. Teachers worked to make sure that no student fell through the cracks, regardless of family context and background
- Commitment to continuous learning. Teachers enhanced their content and instruction through professional development, course taking and similar activities. Teachers were never satisfied with the status quo – they always wanted to become more effective. Professional development was real, intensive, systemic, ongoing, and fully integrated into the curriculum and instructional program.
- Accountability for results. Teachers believed that student performance was a product of their curriculum and instruction work; if performance did not improve, then it was "back to the drawing boards," not, "This cohort of students doesn't do well."

10. STRONG LEADERSHIP

Leadership was strong at all levels in these schools. Principals were strong but collaborative leaders, on both managerial and instructional issues. Teachers executed several leadership functions as well, both as Professional Learning Community (PLC) coordinators, as instructional coaches, and in many different areas, including student behavior., At these schools all teachers were expected to take leadership roles as part of the operation of the school. Moreover, because of the collaborative and professional culture, the groups, activities and initiatives that teachers led were closely linked to, and part of, the systemic approach each school took toward learning and instruction.

11. SMALL CLASS SIZES

Finally, all schools had very small class sizes, ranging from the low single digits to a maximum of 20, with averages generally in the 12-14 range. Small classes were clearly a part of each school's strategy for boosting student performance. Small class sizes helped teachers get to know students personally and facilitated differentiating and personalizing instruction and helped insure that "no student fell between the cracks." Most teachers said that small class sizes helped them execute their overall school improvement strategies.

SUMMARY

The eleven key themes identified above were the strongest, and those most directly related to student achievement. In addition to our findings pertaining to those eleven key themes, we also note that all five schools had significant outreach to parents and the community, and sought as much parent involvement in the school as possible. Moreover, most schools had a specific focus on student behavior, and a curriculum and set of actions to insure that there was a safe and orderly environment in the school.

The eleven themes are totally within the control of schools and reflect the common notion, backed by research conducted by several others across the country, that the following are the pathway for producing increases in learning for all students, regardless of their family background or SES context. :

- High expectations and ambitious goals for student learning
- A rigorous curriculum delivered through effective instructional practice
- Multiple extra help strategies for students struggling to achieve to standards, and
- Relentless effort by highly talented educators, working collaboratively with student data and taking responsibility for results

That is exactly what these five schools did. Nevertheless, all of these schools along with their teachers and principals said that more can be done. While they are proud of what they have accomplished so far, they are not fully satisfied, and they want to produce even higher student performance. We have found this in other studies of schools and districts that have improved performance. After reaching ambitious targets in the first 4-6 years of improvement, they then set even more ambitious targets for continued improvement in student performance. For example, after improving student performance to state proficiency levels, Long Beach (CA) now has targets to improve the number of students who take Advanced Placement courses in high school and to continue to improve the percent of those who score a three or higher (Odden, 2009; Odden, 2011; Odden & Archibald, 2009).

7. PUBLIC TESTIMONY

An important component of our evaluation of Vermont's school funding system was a series of public hearings held to solicit input from the education community in Vermont and from the general public. To facilitate broad participation, we relied on the Vermont Department of Education's Learning Network of Vermont (LNV) and the state's Vermont Interactive Television (VIT) networks to facilitate testimony from across the state. We also received written comments and testimony before and after each of the hearings.

Hearings were held on September 9, 2011, November 15, 2011 and January 9, 2012. On each day two 90 minute hearings were conducted, one using the LNV and a second relying on the VIT. Lawrence Picus and Mike Griffith of Lawrence O. Picus and Associates attended the hearings in September and November, Picus and Allan Odden attended the hearings in January, and Picus served as the hearing moderator on all three dates.

A total of 44 individuals testified at the six public hearings and another 21 provided us with written testimony. The comments represented what appeared to be a broad cross-section of Vermont citizens and educators and provided us with important perspectives into the concerns of both groups regarding the Vermont Education funding system.

Prior to hear hearing, we sent out a press release posing a series of questions to guide individual testimony. While those electing to speak with us were free to discuss any and all topics related to our study, our hope was these questions would generate helpful commentary. The questions we posed prior to the first (September 9) hearing were:

- What do you think are the two or three major advantages or strengths of the current Vermont funding system?
- What do you think are the two or three major shortcomings of the Vermont school funding system? For each, what recommendations do you have for improving the system?
- What can the state do to create incentives for all schools to boost student achievement to higher levels? What three or four recommendations do you have that will improve student performance (at all levels and starting points)? What are the funding implications of those suggestions?

For the second hearing we asked participants to respond to these questions:

- Vermont education spending is high:
    - Does student performance match the level of effort to provide funding?

    - Are there strategies for improving student performance – and what costs, if any, would be associated with them?
    - Teacher salaries are relatively low – can salaries be increased without accelerating increases in education spending?
- Is Vermont getting its money's worth?
- Can we find ways to improve performance at a lower cost?
    - Is trading larger classes for higher teacher salaries an acceptable option?
    - Would school reorganization help?
- Are Vermont students well educated and prepared for the workforce?

For the third hearing, individuals were asked to respond to the January 4, draft of this report.

Comments received both in person and via written testimony seemed to fall into three general categories: Comments about the Vermont school funding formula; comments related to school performance; and comments related taxpayer fairness or equity. There were a number of individuals who expressed support for the operation of the system and argued that it seemed to work well. Others had suggestions for improving the funding system in a variety of ways. Many thoughtful and valuable ideas were brought forward through this process although none suggested a complete overhaul of the system.

Below we summarize the comments in the three categories identified above. The comments are presented objectively and individual responses or suggestion related to each comment are not provided. Our overall sense of the comments is that they support our conclusion that the overall system is working well. There are some areas where there are concerns that may require minor modification to the current system, but they are policy decisions that need to be made by the Legislature and the voters of Vermont.

COMMENTS ON THE FUNDING FORMULA

Not surprisingly, the largest number of comments related to the operation of the school funding formula. Some expressed the view that the system worked well, while others had more serious concerns. We summarize both sets of comments below.

Comments Supportive of the Current System

A number of individuals expressed satisfaction with the operation of the school funding formula. In general they felt it worked well, it build "rigorous equity" into the system and that it gave local districts adequate flexibility regarding the level of education spending in each community. Two people essentially said that they supported the

formula as it is, an done indicated specifically that the income sensitivity component of the model was one of its strong points.

Comments Calling for Change to the Current System

There was a range of comments critical of the current funding formula. Among the most common were the following:

- Many felt the formula is too complex and average voters are unable to understand it or how votes on school spending will impact their local property tax payments
- Some felt that there is too much emphasis on property taxes; one argued for a move to the income tax, others were silent on how to replace property taxes.
- One respondent felt the role of the state in the funding system had grown and that was problematic in terms of letting local towns spend at desired levels from their own wealth base and suggested that the effective recapture in the system was inappropriate.
- Another felt that incentives to constrain spending were needed and recommended state mandated minimum class sizes and argued that the 25% threshold for doubling the tax cost of per pupil spending was too high.
- Others felt more choice needs to be built into the system
- And one individual suggested that school district consolidation would yield cost saving efficiencies for the state.

There were a number of more technical recommendations as well. These included:

- An argument that using pupil counts to fund schools was not appropriate and that instead schools should receive set funding levels based on school size with the funding level cognizant of dis-economies for small schools.
- Someone else indicated that using the prior year pupil count to determine tax rates made it hard to balance budgets and created unfair property tax burdens.
- One person argued that the small school grants are too small and need to be increased
- There was an argument made that it is unfair for some small districts to tuition students to private schools when individuals living in districts that offer a full range of grades must pay private school tuition if they elect to send their children to private schools.
- And one individual argued about the importance of funding school facilities.

COMMENTS RELATED TO SCHOOL PERFORMANCE

We received a number of comments about school resources and performance and how it might be improved. Many of the people testifying on this issue offered similar suggestions for school improvement. These suggestions included:

- Using the DOE to provide information about successful school strategies without taking away local control of schools
- Establishing incentives for implementation of best practices – this would include waivers from regulations and dissemination of information on successful practices
- Strong professional development programs
- Better collection and use of data
- Technology to both support and enhance teaching and provide on-line classes, particularly in remote parts of the state
- Incentives for class size reduction
- Finding ways to provide more time for instruction
- More explicitly tying dollars to student performance
- Smaller class sizes
- Longer school years
- Better and stronger evaluation of teachers and principals

In addition to these recommendations, a number of individuals argued for more parental participation in their children's education, one going so far as to suggest the state find ways to help families so both parents did not have to work and one could support their children's schoolwork.

One participant expressed concern that establishing incentives to improve student performance were really a cover for departing from funding equity and urged caution in implementation of such incentive systems.

There were a number of individuals who took issue with the use of standardized test scores to measure school performance, and some questioned the sources of and presentation of the cost and student performance data we presented at the second hearing. There were members of the education community who felt very strongly that more funds and smaller classes were needed to help Vermont school children succeed, while others seemed to feel that current spending levels were adequate and the issue was using available resources well.

COMMENTS ON TAXPAYER ISSUES

Vermont's funding system is highly complex, and at the same time relies on annual approval of school district budgets by the citizens of each town. It was clear from the discussion that many lack a complete understanding of the complexities of the state's tax system and many others find it confusing. Moreover, a number of concerns were raised about issues that have emerged over time from the implementation of Acts 60 and 68. Among them are:

- There was considerable disagreement over the income sensitivity adjustment, with some arguing that the $90,000 cut-off was too high and others suggesting it was too low. We did receive testimony about individuals who found salary increases that increased their income to over $90,000 lost the benefit of the increase because their homestead property taxes increased as well. Some argued therefore

that the "soft landing" between $90,000 and $97,000 for exit from the program represented too small of a difference and that either the $90,000 be lower or the $97,000 be higher.

- There was concern that some retired homeowners who have fixed incomes and own homes on Lake Champlain are having trouble paying their property taxes as the assessed value of many of those properties exceeds the $500,000 cap for qualification for the income adjustment.
- A number of individuals expressed concern with the Common Level of Appraisal CLA arguing that it was unfair for them to vote for a tax rate at one level and then have the state raise that tax rate through the CLA adjustment. However, one individual did indicate that they thought the CLA was a necessary and important part of making the system fair.

SUMMARY

Throughout the public hearings, it was our sense that the public in general is supportive of, and generally happy with the schools in Vermont. They seem to share a general commitment to high levels of equity in the system, and recognize and are proud of the high levels of support for public education in Vermont.

Where a number of concerns and issues were identified, some pertaining to the school funding and taxation system and others to the performance of the state's schools, it is our sense that the problems identified are not of a magnitude that would require establishing a new or alternative funding system, but rather are the kinds of issues that develop overtime in any school funding system and require thoughtful research and development of policy options that can resolve specific issues in the framework of a generally successful system.

8. CONCLUSIONS AND ISSUES FOR FURTHER CONSIDERATION

This document describes the findings of a comprehensive evaluation of Vermont's education funding system. Over a period of several months at the end of 2011, Lawrence O. Picus and Associates conducted a number of studies designed to measure the extent to which Vermont's funding system has achieved the goals of Acts 60 and 68, the school finance legislation implemented in 1999 and 2004 in response to the State's Supreme Court ruling in *Brigham v. State*. The system that has emerged over time was designed to reduce the impact of local district wealth on the level of per pupil spending in school districts, to limit tax payments for schools on the basis of household income – a component of the system that is unique to Vermont, and at the same time continue Vermont's strong local control tradition of allowing each town to determine the level of spending for its schools each year.

Our overall finding from this study is that the Vermont school funding system is working well and meeting the goals established in Acts 60 and 68. Using a series of objective measures, we find that Vermont's schools benefit from among the highest levels of per pupil spending in the United States. We also found that the state has designed an equitable system with limited disparities in per pupil spending, and virtually no relationship between wealth (measured by both district property wealth and personal income) even though spending levels are determined annually by each town.

Further, Vermont's student performance compares favorably with the nation overall, although compared to other New England states, student performance is about average. Because of concerns about how well Vermont students do compared not only to others in New England and the United States, but to the performance of students in other countries, we also conducted in depth studies of five schools that have shown substantial improvements in student outcomes in the last five years. Our findings from these schools identified a number of promising practices for improving student performance and found that they can be implemented with the level of funding available to school districts today.

Through a series of public hearings, a number of concerns with the way schools are funded were identified. These represent genuine issues that impact the resources available to schools and the ability of Vermont citizens to pay for those schools. However, it is our strong view that none of those issues are so serious that the state needs to completely replace its approach to funding schools – rather each needs serious and careful consideration by the Legislature who should consider modifications to those components of the system that create these issues. It is our sense that most of the individuals who shared their views and concerns with us at the public hearings concur that the overall system is working well and the needed changes can be made within the existing framework.

Below we summarize the most important findings from our study.

STUDY GOALS AND DESIGN

This study was designed to evaluate the Vermont school funding system – to determine whether it has attained the education goals embodied in Acts 60 and 68. Specifically as outlined in our proposal we see the goals of these two laws as follows:

1. Reduce the wide disparity in per-pupil education spending that was closely related to property wealth
2. Reduce the disparity in academic achievement among Vermont's school children
3. Reduce the disparity in education tax burdens for equal amounts of spending per pupil among Vermont taxpayers
4. Allow school district voters to choose to spend as much as they wish on their children's education.
5. Ensure that higher spending per pupil in a district results in higher homestead taxes in that district.

To ascertain how well those goals have been met we designed a study with the following components:

- An assessment of how Vermont compares to the rest of the United States, with particular emphasis on how Vermont compares to its five New England neighbor states

- A traditional school finance equity analysis that measured the equity of the system on the basis of equal per pupil expenditures across districts and the relationship between district spending levels and local wealth as measured by both property wealth and income

- An economic analysis of the "tax price" each town faces when choosing how much to spend on schools, and how differences in tax price can effect the spending choice made – which effectively lowers the price low income individuals pay for an additional dollar of per pupil school spending – impacts spending levels

- An in-depth analysis of how five improving schools are succeeding in improving student performance with the resources available to them through the funding system

- A series of public hearings to understand the concerns of the state's citizens and educators about how well the school funding system is operating

Our overall conclusions are summarized below.

FINDINGS

How Vermont Compares

Section three of this report provides a comparison of Vermont's funding system with the rest of the United States and New England. We find that Vermont increased PK-12 revenues by approximately 76% percent over the past decade, which when combined with enrollment declines, boosted Vermont's per pupil spending to the third highest in the United States and the highest in New England. K-12 education revenue today is $16,788 per ADM and has grown faster than the level of spending in any other state. The citizens of Vermont devote $56 of every $1,000 of personal income to K-12 – tied for the highest level of effort among the 50 states.

Vermont's school children score relatively high on the National Assessment of Education Progress (NAEP), and about average among New England states on the New England Common Assessment Program (NECAP), but the growth in student performance has lagged Nation and New England states on NAEP and lagged the other states using NECAP. The high school graduation rate is among the highest in the country, ranking second in 2008-09.

Teacher salaries in Vermont are below the national average, and the state enjoys the lowest or second lowest pupil to teacher ratio of the 50 states. The student to administrator ratio is the third smallest in the United States, and the second lowest in New England.

The state has experienced a substantial drop in total student enrollment, declining over 18% between 1999-2000 and 2010-11. Combined with the large number of school districts across the state, Vermont has the smallest average school district size in the nation with an average of 299 students per district. This compares to a national average district size of over 3,000 students and a New England average of 929 students per district.

School Finance Equity

Section four of this study provides a detailed analysis of the Vermont school funding system over time under Acts 60 and 68. We find that using standard school finance equity statistics of fiscal neutrality and per pupil expenditure equality Vermont fares very well. Analyses of the wealth elasticity of the system – the relationship between measures of wealth and levels of per pupil spending – show that whether measured by property wealth or income, there is little relationship between wealth and the level of per pupil spending across Vermont school districts.

We also found that education spending per pupil has increased significantly over the past decade, but that statistical measures of spending disparities have actually improved. This finding suggests that the states' choice to not limit the level of spending any town can choose has not led either to wide disparities in spending or to inordinately

large increases in spending either by previously low spending or low fiscal capacity districts.

We also attempted to assess the degree to which there are differences in student performance across school districts and how performance has changed over time. We found that there has been a reduction in the disparity in student outcomes in both reading and mathematics over time. These improvements were relatively modest and showed that the schools performed more equitably in terms of reading than math results.

Economic Analysis

We looked closely at the operation of the school funding system and its interaction with the taxation system in Vermont. We found that the income sensitivity adjustments in the finance formula impact over two-thirds of the property tax paying households in the state, and that among the 21.4% of households that qualify for the circuit breaker property tax relief program, there is no increase in their property taxes when school spending is increased.

We also assessed the "tax price" of an additional dollar of per pupil spending for education across school districts. We found that the finance structure has resulted in a dilution of the connection between the decision to spend money on schools and the cost of that decision. Specifically it appears that the average marginal price facing Vermont towns is approximately 30 cents per dollar of pupil spending. Based on analysis of the 2008 and 2010 fiscal years we estimate a relatively small price elasticity of demand of -.07 in Vermont's smaller towns and nearly -.03 in larger towns, implying that the decrease in taxpayer price accompanying the legislative reforms has increased spending on schools by about 2-5% higher than it otherwise would have been.

Improving Schools

An important component of this study was an in-depth case study of five improving schools across Vermont. These were not necessarily the highest performing schools, but rather schools that over the past five years have seen dramatic improvements in student test scores. The analysis identified eleven key elements related to improvements in student performance and found that each of the schools shared a number of common characteristics for producing increases in learning for all students, regardless of their family background or SES context including:

- High expectations and ambitious goals for student learning
- A rigorous curriculum delivered through effective instructional practice, with an emphasis on phonics in the early elementary grades
- Multiple extra help strategies for students struggling to achieve to standards
- Relentless effort by highly talented educators
- Collaborative work with student data
- Shared responsibility for results.

Public Hearings

We conducted a series of public hearings to identify concerns and suggestions from the public regarding the State's school finance system. A number of concerns and issues were identified, some pertaining to the school funding and taxation system and others to the performance of the state's schools. However, it is our sense that the problems identified are not of a magnitude that would require establishing a new or alternative funding system, but rather are the kinds of issues that develop overtime in any school funding system and require thoughtful research and development of policy options that can resolve specific issues in the framework of a generally successful system.

The need to make minor modifications to the system should not be seen as surprising, it is impossible to develop something a complex as a school finance system that spends over $1.3 billion to meet the needs of some 87,000 children that meets the concerns of everyone. Moreover, school finance systems need to be flexible enough to accommodate changes in local economic conditions that could not be predicted when initially designed. Our view is that Vermont's system can accommodate the needs of today's economy and continue to meet the standards established in Acts 60 and 68 provided the Legislature continues to monitor its many components and makes adjustments as circumstances warrant.

The hearings, along with our discussions with Vermont officials over the period of the study identified a number of issues that the Legislature may want to consider as it debates school funding in the future. These include:

- There was concern that despite Vermont's highest in the region per pupil expenditures, student performance was only average in New England. Research on the linkage between spending and student outcomes has not found direct and consistent relationships between the two. We note that Wyoming, with the 4th highest per pupil spending in the United States (Vermont is 3rd) has even lower student performance. On the other hand we did find schools that had dramatically improved student outcomes during the past five years, and they deployed strategies that other Vermont schools also could deploy.

- Consideration of the income adjustment cut off $90,000 for full adjustments and the "slide" to $97,000 for partial income adjustments. We heard a great deal of discussion over the appropriate level for the income adjustment as well as concern over the limited differential between the level for a full adjustment and the complete cutoff of adjustment support. Our sense is there are substantial income distribution implications for various decisions about the level of household income qualifying for the adjustment and the differential between the full level of adjustment and the elimination of adjustment.

- There was concern expressed about the $500,000 cap on homesite property value to qualify for the income adjustment. A number of individuals felt that an

increasing share of Vermonters with fixed incomes were suddenly faced with dramatic (and potentially unaffordable) increases in property taxes as a result of where they live. Before taking action on this, our view is a clear understanding is needed of how many individuals are impacted by this factor. A careful analysis should be conducted about the range of solutions available before the system is changed.

- One of the potential sources of high per pupil spending in Vermont is the limited "price" of increased spending to the average town voter. While our estimates of the price elasticity are low, it seems likely that over time, local voting on school budgets has been one of the reasons for Vermont's rapid increase in per-pupil spending. Efforts to reduce the growth in future spending need to consider the tradeoffs between local control over annual budgets and more state control over how much towns can spend for education.

- One potential source of Vermont's high spending is the large number of very small schools – average school district size is the lowest in the nation by a substantial amount. Tradeoffs between local and state control over school district size are also an issue. Strong consideration should be given to the role of supervisory unions (either through state mandates or more market based solutions) as part of the discussion on these dis-economies of scale.

- Finally, to facilitate future studies of this nature, we recommend that state databases contain a common identity variable for each district to facilitate merging data from different state agencies. Additionally, education data bases should be designed so that it is feasible to cross link between the three main levels of local school funding, supervisory union, district, and town. There are some straightforward analyses that we could not do because the three levels could not be linked.

From the public comments and the conclusions of our evaluation, Lawrence O. Picus and Associates also make the following recommendations for further study and analysis, and offer the following suggestions for next steps for education finance policy in Vermont:

- Vermont policy makers noted that although the Vermont school finance system has implemented the intent of Acts 60 and 68, it has also led to one of the highest levels of per pupil expenditures in the country. They argued that the state needs to begin identifying ways this substantial spending can be translated into further improvements in student learning. We offer suggestions for five interrelated issues that the state could address as it strives to focus education resources to improve student outcomes in all schools:

    - Establish a system of more state accountability for student performance. Develop an incentive system that provides rewards for schools that meet or exceed state-set targets for improved student performance – beyond historical trends.

- Expand the case studies of schools to include a larger sample so that Vermont specific conclusions can be made regarding those factors that lead to substantial improvements in student learning. Though the five cases conducted for the report provide promising insight into how schools can transform dollars into instructional practices that boost student achievement, more analysis is needed to ensure that the eleven practices identified are those that are the most effective in the unique circumstances found in Vermont.

- Related to the case study approach, Vermont might consider a "production function" study that encompassed all schools to determine the degree to which higher spending is linked to higher achievement in Vermont.

- Assess the degree to which Vermont has the teacher and principal talent to execute effective school improvement strategies that dramatically boost student learning. Specifically conduct an analysis of the teacher and principal supply channels in Vermont. This would include analysis of the institutions from which teachers and principals recruited, assessment the quality of the talent that is recruited for Vermont's schools, and develop an understanding the degree to which Vermont recruits teachers and principals from the top or bottom half of the talent pool. This information could be used to design policies to ensure that future educator talent is recruited from the top so that the best and the brightest teach in and administer Vermont schools.

- Join the action of nearly two-thirds of the other states in the country to develop new and comprehensive teacher and principal evaluation systems. These systems would use multiple measures to put teachers and principals into 4-5 different categories of effectiveness – effectiveness defined as producing student learning gains. Use these new metrics to design new systems to license, tenure and pay educators.

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APPENDIX 1
50 STATE DATA TABLES TO ACCOMPANY SECTION 3
(INTERSTATE COMPARISONS)

Table A1.4:
K-12 Expenditures Per Pupil - Fiscal Year 1999-2000 to 2010-2011

State	1999-2000	2003-04	2005-06	2010-11	Growth From 1999-2000 to 2010-11 In Percentages	Growth From 1999-2000 to 2010-11 In Dollars
National Average	$6,627	$8,248	$9,100	$10,826	63.4%	$4,199
New England	$7,889	$10,461	$11,681	$15,316	94.1%	$7,427
Alabama	$4,946	$6,701	$7,706	$9,483	91.7%	$4,537
Alaska	$8,834	$9,808	$10,171	$11,147	26.2%	$2,313
Arizona	$4,505	$5,347	$5,585	$6,448	43.1%	$1,943
Arkansas	$5,540	$6,005	$8,402	$11,999	116.6%	$6,459
California	$5,967	$7,584	$8,496	$8,689	45.6%	$2,722
Colorado	$5,282	$8,023	$8,861	$9,588	81.5%	$4,306
Connecticut	$9,792	$11,774	$12,436	$14,989	53.1%	$5,197
Delaware	$8,022	$9,860	$12,036	$13,960	74.0%	$5,938
Florida	$5,872	$6,708	$7,762	$9,124	55.4%	$3,252
Georgia	$5,953	$8,109	$8,534	$10,971	84.3%	$5,018
Hawaii	$6,257	$8,221	$9,879	$11,819	88.9%	$5,562
Idaho	$5,411	$6,372	$7,042	$8,101	49.7%	$2,690
Illinois	$6,149	$9,854	$9,456	$11,896	93.5%	$5,747
Indiana	$6,674	$8,414	$8,935	$10,390	55.7%	$3,716
Iowa	$6,008	$7,279	$7,807	$9,856	64.0%	$3,848
Kansas	$6,386	$7,311	$8,373	$9,254	44.9%	$2,868
Kentucky	$6,425	$7,496	$8,300	$9,612	49.6%	$3,187
Louisiana	$5,701	$7,263	$8,519	$10,578	85.5%	$4,877
Maine	$7,619	$10,145	$11,285	$15,032	97.3%	$7,413
Maryland	$7,174	$9,186	$9,771	$15,268	112.8%	$8,094
Massachusetts	$8,750	$10,772	$12,596	$14,828	69.5%	$6,078
Michigan	$7,451	$8,671	$9,880	$12,015	61.3%	$4,564
Minnesota	$7,435	$8,821	$9,675	$11,905	60.1%	$4,470
Mississippi	$4,605	$6,137	$7,215	$8,003	73.8%	$3,398
Missouri	$5,846	$6,947	$7,840	$9,422	61.2%	$3,576
Montana	$6,131	$7,688	$8,361	$9,973	62.7%	$3,842
Nebraska	$6,000	$7,352	$7,900	$10,452	74.2%	$4,452
Nevada	$5,568	$6,622	$6,755	$8,089	45.3%	$2,521
New Hampshire	$6,202	$9,053	$10,206	$13,797	122.5%	$7,595
New Jersey	$9,775	$11,390	$13,781	$17,717	81.2%	$7,942
New Mexico	$5,861	$7,895	$8,622	$11,346	93.6%	$5,485
New York	$9,797	$12,325	$13,551	$17,750	81.2%	$7,953
North Carolina	$5,724	$6,786	$7,675	$8,303	45.1%	$2,579
North Dakota	$4,512	$6,683	$7,807	$8,880	96.8%	$4,368
Ohio	$6,479	$9,035	$10,034	$9,512	46.8%	$3,033
Oklahoma	$5,634	$5,976	$6,944	$8,311	47.5%	$2,677
Oregon	$8,605	$7,587	$8,649	$10,959	27.4%	$2,354
Pennsylvania	$7,243	$9,261	$10,711	$13,334	84.1%	$6,091
Rhode Island	$7,990	$10,258	$11,089	$15,803	97.8%	$7,813
South Carolina	$6,113	$7,043	$8,377	$9,616	57.3%	$3,503
South Dakota	$5,369	$7,129	$7,911	$9,310	73.4%	$3,941
Tennessee	$5,387	$6,501	$6,979	$8,393	55.8%	$3,006
Texas	$6,092	$7,168	$7,547	$9,128	49.8%	$3,036
Utah	$4,036	$5,091	$5,347	$7,056	74.8%	$3,020
Vermont (National Ranking)	$6,981 (16)	$10,763 (5)	$12,475 (4)	$17,447 (3)	149.9% (1)	$10,466 (1)
Virginia	$6,149	$8,705	$9,275	$11,753	91.1%	$5,604
Washington	$6,528	$7,353	$7,958	$10,367	58.8%	$3,839
West Virginia	$8,488	$9,018	$9,886	$11,369	33.9%	$2,881
Wisconsin	$7,886	$9,483	$9,965	$11,791	49.5%	$3,905
Wyoming	$6,911	$9,673	$11,596	$16,066	132.5%	$9,155

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table A1.5:
State and Local Revenue for Public Schools per $1,000 of Personal Income

	1999-2000	2003-04	2005-06	2007-08	Difference Between 1999-00 to 07-08 Dollars	Difference Between 1999-00 to 07-08 Percentages
National Average	$41	$43	$42	$41	$0	0.0%
Alabama	$35	$37	$39	$44	$9	25.7%
Alaska	$56	$50	$45	$39	-$17	-30.4%
Arizona	$37	$40	$37	$37	$0	0.0%
Arkansas	$40	$41	$46	$43	$3	7.5%
California	$39	$41	$40	$40	$1	2.6%
Colorado	$34	$37	$36	$35	$1	2.9%
Connecticut	$42	$44	$42	$40	-$2	-4.8%
Delaware	$41	$41	$43	$45	$4	9.8%
Florida	$34	$35	$34	$37	$3	8.8%
Georgia	$46	$48	$49	$51	$5	10.9%
Hawaii	$37	$46	$52	$41	$4	10.8%
Idaho	$43	$42	$39	$39	-$4	-9.3%
Illinois	$39	$40	$40	$40	$1	2.6%
Indiana	$48	$50	$51	$43	-$5	-10.4%
Iowa	$44	$43	$44	$42	-$2	-4.5%
Kansas	$43	$46	$45	$45	$2	4.7%
Kentucky	$40	$41	$43	$43	$3	7.5%
Louisiana	$41	$41	$41	$39	-$2	-4.9%
Maine	$46	$48	$49	$47	$1	2.2%
Maryland	$39	$38	$41	$45	$6	15.4%
Massachusetts	$36	$41	$44	$42	$6	16.7%
Michigan	$40	$50	$51	$52	$12	30.0%
Minnesota	$43	$44	$42	$40	-$3	-7.0%
Mississippi	$41	$41	$41	$38	-$3	-7.3%
Missouri	$40	$41	$42	$40	$0	0.0%
Montana	$47	$43	$40	$36	-$11	-23.4%
Nebraska	$37	$37	$38	$35	-$2	-5.4%
Nevada	$36	$36	$28	$29	-$7	-19.4%
New Hampshire	$37	$41	$41	$42	$5	13.5%
New Jersey	$42	$52	$48	$48	$6	14.3%
New Mexico	$48	$48	$46	$47	-$1	-2.1%
New York	$45	$49	$45	$44	-$1	-2.2%
North Carolina	$35	$34	$33	$33	-$2	-5.7%
North Dakota	$37	$39	$38	$34	-$3	-8.1%
Ohio	$45	$49	$51	$41	-$4	-8.9%
Oklahoma	$39	$39	$36	$36	-$3	-7.7%
Oregon	$41	$42	$41	$40	-$1	-2.4%
Pennsylvania	$43	$44	$46	$46	$3	7.0%
Rhode Island	$41	$39	$39	$47	$6	14.6%
South Carolina	$46	$47	$47	$48	$2	4.3%
South Dakota	$39	$36	$36	$32	-$7	-17.9%
Tennessee	$31	$31	$32	$32	$1	3.2%
Texas	$45	$46	$42	$42	-$3	-6.7%
Utah	$45	$43	$39	$45	$0	0.0%
Vermont (National Rankings)	$53 (2)	$55 (1)	$57 (1)	$56 (1)	$3 (11)	5.7% (15)
Virginia	$38	$39	$40	$40	$2	5.3%
Washington	$37	$36	$36	$35	-$2	-5.4%
West Virginia	$52	$52	$50	$48	-$4	-7.7%
Wisconsin	$48	$48	$48	$46	-$2	-4.2%
Wyoming	$53	$51	$50	$56	$3	5.7%

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table A1.6:

State K-12 Expenditures As a Percent of Total State Expenditures

	1999-00	2003-04	2004-05	2008-09	Change from 1999-00 to 2008-09
National Average	22.5%	21.4%	21.8%	21.7%	-0.8%
Alabama	25.0%	23.4%	23.4%	25.0%	0.0%
Alaska	17.8%	12.9%	12.5%	10.0%	-7.8%
Arizona	19.6%	18.8%	19.6%	23.9%	4.3%
Arkansas	19.5%	16.3%	19.3%	17.7%	-1.8%
California	27.4%	23.5%	25.7%	23.6%	-3.8%
Colorado	19.0%	24.1%	24.2%	25.7%	6.7%
Connecticut	13.9%	11.7%	14.6%	14.6%	0.7%
Delaware	22.3%	32.3%	26.6%	23.7%	1.4%
Florida	18.7%	20.6%	19.7%	19.5%	0.8%
Georgia	24.7%	26.6%	26.6%	24.2%	-0.5%
Hawaii	17.1%	23.6%	22.0%	21.3%	4.2%
Idaho	19.0%	26.2%	25.4%	27.4%	8.4%
Illinois	20.9%	16.9%	21.4%	23.9%	3.0%
Indiana	25.6%	22.9%	20.6%	28.1%	2.5%
Iowa	19.7%	17.4%	23.3%	17.6%	-2.1%
Kansas	29.5%	25.8%	26.3%	26.4%	-3.1%
Kentucky	26.3%	19.3%	20.1%	19.7%	-6.6%
Louisiana	19.5%	18.5%	24.9%	18.9%	-0.6%
Maine	19.9%	17.0%	17.4%	17.6%	-2.3%
Maryland	17.5%	24.2%	18.4%	20.3%	2.8%
Massachusetts	14.4%	19.7%	20.3%	13.0%	-1.4%
Michigan	31.6%	31.3%	30.8%	28.9%	-2.7%
Minnesota	24.9%	26.8%	28.4%	25.5%	0.6%
Mississippi	21.1%	23.5%	22.1%	19.0%	-2.1%
Missouri	24.1%	24.5%	24.3%	22.6%	-1.5%
Montana	20.6%	17.8%	18.0%	15.8%	-4.8%
Nebraska	16.7%	14.7%	14.1%	15.1%	-1.6%
Nevada	17.0%	16.9%	16.0%	20.6%	3.6%
New Hampshire	28.7%	24.6%	21.9%	22.4%	-6.3%
New Jersey	22.5%	24.6%	23.6%	24.1%	1.6%
New Mexico	24.1%	24.6%	27.9%	19.6%	-4.5%
New York	20.7%	19.3%	19.7%	21.5%	0.8%
North Carolina	23.6%	22.5%	21.6%	22.5%	-1.1%
North Dakota	17.3%	15.8%	14.6%	14.0%	-3.3%
Ohio	18.2%	19.4%	19.0%	21.7%	3.5%
Oklahoma	24.3%	22.9%	21.6%	15.4%	-8.9%
Oregon	29.5%	18.0%	14.8%	15.7%	-13.8%
Pennsylvania	18.8%	18.7%	18.7%	19.7%	0.9%
Rhode Island	16.6%	16.1%	16.2%	14.9%	-1.7%
South Carolina	16.9%	19.5%	17.8%	17.0%	0.1%
South Dakota	13.7%	17.1%	9.8%	16.7%	3.0%
Tennessee	18.6%	16.3%	16.0%	17.0%	-1.6%
Texas	30.3%	27.0%	27.3%	31.0%	0.7%
Utah	27.2%	25.3%	25.3%	25.5%	-1.7%
Vermont (National Ranking)	20.5% (25)	31.6% (2)	35.5% (1)	26.2% (6)	5.7% (3)
Virginia	18.1%	16.9%	17.1%	18.0%	-0.1%
Washington	23.9%	23.6%	22.7%	24.6%	0.7%
West Virginia	26.0%	11.8%	12.4%	10.6%	-15.4%
Wisconsin	19.5%	18.1%	18.9%	18.6%	-0.9%
Wyoming	NA	25.3%	10.3%	11.7%	

Source: National Association of State Budget Officers - Annual State Expenditure Report. 2000 through 2010.

Table A1.7:
Student Enrollment

	1999-00	2003-04	2004-05	2010-11	Change in Student Population 1999-00 to 2010-11
National	46,540,114	48,132,518	48,369,744	49,162,463	5.6%
New England	2,198,182	9,335,748	2,214,838	2,124,456	-3.4%
Alabama	730,037	729,339	731,085	740,975	1.5%
Alaska	137,800	133,933	132,970	132,000	-4.2%
Arizona	858,860	964,003	986,221	1,071,484	24.8%
Arkansas	447,352	452,036	452,057	459,419	2.7%
California	5,946,421	6,298,769	6,322,190	6,219,649	4.6%
Colorado	708,109	757,668	766,707	843,958	19.2%
Connecticut	554,899	576,205	577,398	566,030	2.0%
Delaware	113,598	117,777	119,109	128,530	13.1%
Florida	2,378,882	2,591,033	2,630,229	2,621,085	10.2%
Georgia	1,422,941	1,522,611	1,553,437	1,689,648	18.7%
Hawaii	185,036	183,609	183,185	179,122	-3.2%
Idaho	245,226	248,743	249,984	285,236	16.3%
Illinois	2,027,600	2,060,048	2,097,518	2,106,925	3.9%
Indiana	988,042	1,010,492	1,020,707	1,051,696	6.4%
Iowa	497,301	481,226	478,319	491,431	-1.2%
Kansas	469,377	469,825	468,512	481,000	2.5%
Kentucky	632,573	631,852	636,880	658,328	4.1%
Louisiana	750,982	727,316	724,002	702,133	-6.5%
Maine	209,254	202,210	199,253	187,401	-10.4%
Maryland	846,695	869,113	865,836	840,628	-0.7%
Massachusetts	967,336	980,459	975,574	953,223	-1.5%
Michigan	1,700,885	1,713,497	1,723,087	1,662,067	-2.3%
Minnesota	861,488	846,662	837,760	810,123	-6.0%
Mississippi	499,387	487,812	485,094	496,504	-0.6%
Missouri	894,466	892,872	892,821	903,887	1.1%
Montana	157,556	148,356	146,705	140,533	-10.8%
Nebraska	286,970	284,169	284,559	297,563	3.7%
Nevada	325,610	385,414	400,671	456,844	40.3%
New Hampshire	206,783	207,417	206,852	193,264	-6.5%
New Jersey	1,249,803	1,380,882	1,392,204	1,366,067	9.3%
New Mexico	324,253	322,657	324,924	326,940	0.8%
New York	2,850,729	2,826,116	2,822,000	2,642,524	-7.3%
North Carolina	1,248,548	1,377,014	1,345,101	1,405,706	12.6%
North Dakota	115,315	101,137	99,324	92,074	-20.2%
Ohio	1,821,276	1,845,428	1,846,763	1,914,222	5.1%
Oklahoma	627,030	625,826	629,134	656,655	4.7%
Oregon	545,033	555,880	552,320	564,620	3.6%
Pennsylvania	1,816,716	1,821,146	1,828,089	1,763,946	-2.9%
Rhode Island	155,351	159,825	160,574	138,803	-10.7%
South Carolina	653,779	676,817	680,635	716,524	9.6%
South Dakota	129,093	124,469	121,622	123,900	-4.0%
Tennessee	903,825	919,896	828,572	971,537	7.5%
Texas	3,991,763	4,311,502	4,383,871	4,824,778	20.9%
Utah	475,974	486,938	494,100	587,198	23.4%
Vermont (National Rankings)	104,559 (49)	98,051 (49)	95,187 (49)	85,635 (50)	-18.1% (49)
Virginia	1,133,994	1,192,539	1,204,808	1,252,529	10.5%
Washington	1,003,714	1,021,497	1,021,502	1,038,156	3.4%
West Virginia	290,944	280,561	279,457	283,469	-2.6%
Wisconsin	877,852	880,031	864,757	871,929	-0.7%
Wyoming	91,883	84,741	83,772	88,355	-3.8%

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table A1.8:
Average Enrollment Per District

	1999-00	2003-04	2005-06	2010-11	Change 1999-00 to 2010-11
National	3,169	3,133	3,169	3,213	1.4%
New England	1,701	7,276	1,703	933	-45.2%
Alabama	5,703	5,610	5,594	5,613	-1.6%
Alaska	2,600	2,527	2,518	2,444	-6.0%
Arizona	3,834	1,535	1,608	1,709	-55.4%
Arkansas	1,443	1,468	1,798	1,875	29.9%
California	6,031	5,948	5,986	5,969	-1.0%
Colorado	4,023	4,257	4,386	4,741	17.8%
Connecticut	3,049	3,049	3,036	2,903	-4.8%
Delaware	5,979	3,681	3,779	3,474	-41.9%
Florida	35,506	38,672	39,844	39,121	10.2%
Georgia	7,905	8,412	8,687	9,084	14.9%
Hawaii	185,036	183,609	182,767	179,122	-3.2%
Idaho	2,170	2,182	2,297	2,082	-4.1%
Illinois	2,255	2,325	2,421	2,425	7.5%
Indiana	3,384	3,281	3,125	3,013	-10.9%
Iowa	1,326	1,301	1,325	1,369	3.2%
Kansas	1,544	1,556	1,557	1,664	7.8%
Kentucky	3,594	3,590	3,668	3,783	5.3%
Louisiana	11,379	8,557	7,350	5,755	-49.4%
Maine	894	872	870	818	-8.5%
Maryland	35,279	36,213	35,834	35,026	-0.7%
Massachusetts	2,607	2,580	2,492	2,432	-6.7%
Michigan	2,172	2,279	2,316	2,150	-1.0%
Minnesota	2,504	2,498	1,774	1,720	-31.3%
Mississippi	3,285	3,209	3,250	3,266	-0.6%
Missouri	1,707	1,704	1,718	1,725	1.1%
Montana	353	336	337	337	-4.6%
Nebraska	503	574	636	1,186	135.9%
Nevada	19,154	22,671	24,309	26,873	40.3%
New Hampshire	1,269	1,280	1,246	1,200	-5.4%
New Jersey	2,104	2,329	2,356	2,311	9.9%
New Mexico	3,643	3,625	3,673	3,673	0.8%
New York	4,044	4,032	4,034	3,802	-6.0%
North Carolina	10,671	11,769	11,970	12,224	14.5%
North Dakota	504	479	491	506	0.5%
Ohio	2,981	2,071	2,091	1,941	-34.9%
Oklahoma	1,153	1,157	1,175	1,232	6.9%
Oregon	2,753	2,807	2,853	2,881	4.7%
Pennsylvania	3,633	3,642	3,661	3,535	-2.7%
Rhode Island	4,315	4,440	4,479	2,833	-34.4%
South Carolina	7,429	7,780	7,979	8,051	8.4%
South Dakota	746	737	731	815	9.2%
Tennessee	6,549	6,814	6,960	7,197	9.9%
Texas	3,374	3,514	3,672	3,900	15.6%
Utah	11,899	12,173	12,116	14,322	20.4%
Vermont (National Ranking)	342 (50)	345 (49)	330 (50)	299 (50)	-12.4% (44)
Virginia	8,591	9,034	9,203	9,489	10.5%
Washington	3,391	3,451	3,492	3,519	3.8%
West Virginia	5,290	5,101	5,087	5,154	-2.6%
Wisconsin	2,061	2,066	2,054	2,056	-0.2%
Wyoming	1,914	1,765	1,744	1,841	-3.8%

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table A1.9:
Average Teacher Salaries

	1999-00	2003-04	**2005-06**	2009-10	Salary Growth 1999-00 to 2009-10 In percentages	In Dollars
National	$41,754	$46,704	**$49,026**	$55,202	32.2%	$13,448
Alabama	$36,689	$38,285	$40,347	$47,571	29.7%	$10,882
Alaska	$46,462	$51,736	$53,553	$59,672	28.4%	$13,210
Arizona	$35,650	$41,843	$44,672	$46,952	31.7%	$11,302
Arkansas	$33,386	$39,314	$42,768	$46,700	39.9%	$13,314
California	$47,680	$56,444	$59,825	$68,203	43.0%	$20,523
Colorado	$38,163	$43,319	$44,439	$49,202	28.9%	$11,039
Connecticut	$51,780	$57,337	$59,304	$64,350	24.3%	$12,570
Delaware	$44,435	$49,669	$54,264	$57,080	28.5%	$12,645
Florida	$36,722	$40,591	$43,302	$46,708	27.2%	$9,986
Georgia	$41,023	$45,988	$48,300	$53,112	29.5%	$12,089
Hawaii	$40,578	$45,479	$49,292	$55,063	35.7%	$14,485
Idaho	$35,162	$41,080	$41,150	$46,283	31.6%	$11,121
Illinois	$46,486	$54,230	$58,686	$62,077	33.5%	$15,591
Indiana	$41,850	$45,791	$47,255	$49,986	19.4%	$8,136
Iowa	$35,678	$38,381	$41,083	$49,626	39.1%	$13,948
Kansas	$34,981	$38,623	$41,467	$46,657	33.4%	$11,676
Kentucky	$36,380	$40,240	$42,592	$49,543	36.2%	$13,163
Louisiana	$33,109	$37,918	$40,029	$48,903	47.7%	$15,794
Maine	$35,561	$39,864	$40,737	$46,106	29.7%	$10,545
Maryland	$44,048	$50,261	$54,333	$63,971	45.2%	$19,923
Massachusetts	$46,580	$53,733	$56,369	$69,273	48.7%	$22,693
Michigan	$49,044	$55,503	$54,739	$57,958	18.2%	$8,914
Minnesota	$39,802	$45,375	$48,489	$52,431	31.7%	$12,629
Mississippi	$31,857	$35,684	$40,576	$45,644	43.3%	$13,787
Missouri	$35,656	$38,278	$40,462	$45,317	27.1%	$9,661
Montana	$32,121	$37,184	$39,832	$45,759	42.5%	$13,638
Nebraska	$33,237	$38,352	$40,382	$46,227	39.1%	$12,990
Nevada	$39,390	$42,254	$44,426	$51,524	30.8%	$12,134
New Hampshire	$37,734	$42,689	$45,263	$51,443	36.3%	$13,709
New Jersey	$52,174	$55,344	$58,156	$65,130	24.8%	$12,956
New Mexico	$32,554	$37,877	$41,637	$46,258	42.1%	$13,704
New York	$51,020	$55,181	$57,354	$71,633	40.4%	$20,613
North Carolina	$39,419	$43,211	$43,922	$46,850	18.9%	$7,431
North Dakota	$29,863	$35,629	$37,764	$42,964	43.9%	$13,101
Ohio	$41,436	$47,482	$50,314	$55,958	35.0%	$14,522
Oklahoma	$31,298	$35,061	$38,772	$47,691	52.4%	$16,393
Oregon	$40,919	$47,829	$50,044	$55,224	35.0%	$14,305
Pennsylvania	$48,321	$52,590	$54,027	$59,156	22.4%	$10,835
Rhode Island	$47,041	$52,261	$54,730	$59,686	26.9%	$12,645
South Carolina	$36,081	$41,162	$43,011	$47,508	31.7%	$11,427
South Dakota	$29,071	$33,236	$34,709	$38,837	33.6%	$9,766
Tennessee	$36,328	$40,318	$42,537	$46,290	27.4%	$9,962
Texas	$37,567	$40,476	$41,744	$48,261	28.5%	$10,694
Utah	$34,946	$38,976	$40,007	$45,885	31.3%	$10,939
Vermont (National Rankings)	$37,714 (26)	$42,007 (25)	$46,622 (19)	$49,084 (28)	30.1% (30)	$11,370 (32)
Virginia	$38,744	$41,446	$43,823	$50,015	29.1%	$11,271
Washington	$41,043	$45,434	$46,326	$53,003	29.1%	$11,960
West Virginia	$35,009	$38,461	$38,284	$45,959	31.3%	$10,950
Wisconsin	$41,153	$42,882	$46,390	$51,264	24.6%	$10,111
Wyoming	$34,127	$39,532	$43,255	$55,861	63.7%	$21,734

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table A1.10a
Student to Teacher Ratio

	1999-2000	2003-04	2005-06	2009-10
National	16.1	15.8	15.6	15.3
Alabama	15.5	15.9	14.9	16.0
Alaska	17.5	17.2	16.7	14.9
Arizona	19.3	21.2	21.8	18.9
Arkansas	15.6	14.1	13.5	12.7
California	20.9	20.6	21.0	21.4
Colorado	17.4	16.9	17.0	17.0
Connecticut	13.7	13.4	13.5	13.2
Delaware	15.0	15.2	15.6	14.4
Florida	17.9	17.5	16.4	15.9
Georgia	15.7	14.7	14.8	14.4
Hawaii	16.7	16.3	16.0	15.2
Idaho	18.0	17.7	18.0	18.2
Illinois	16.0	15.9	16.0	14.9
Indiana	16.8	16.9	17.1	16.7
Iowa	14.7	13.8	13.7	13.8
Kansas	14.2	14.4	14.4	13.7
Kentucky	15.8	16.1	15.9	15.8
Louisiana	15.2	14.4	14.8	14.0
Maine	13.5	12.9	12.5	11.1
Maryland	16.8	15.7	14.9	14.3
Massachusetts	14.2	15.0	13.2	13.6
Michigan	17.7	18.0	16.8	17.1
Minnesota	15.4	16.2	16.3	15.4
Mississippi	16.2	15.9	15.4	13.9
Missouri	14.0	13.7	13.6	13.2
Montana	15.2	14.4	14.1	13.4
Nebraska	14.0	13.7	13.6	13.4
Nevada	18.6	19.2	19.0	18.5
New Hampshire	14.7	13.7	13.3	12.7
New Jersey	13.2	12.8	12.6	12.0
New Mexico	16.0	15.0	14.9	14.9
New York	14.0	12.6	12.3	11.8
North Carolina	15.6	15.7	14.6	14.8
North Dakota	14.4	13.2	12.8	12.1
Ohio	16.0	15.7	15.6	17.1
Oklahoma	15.1	16.0	15.2	15.5
Oregon	19.2	20.1	19.8	18.7
Pennsylvania	15.9	15.4	15.0	14.0
Rhode Island	12.9	11.7	11.1	13.0
South Carolina	15.0	15.0	14.6	14.8
South Dakota	13.9	13.8	13.5	13.4
Tennessee	16.3	15.7	15.5	14.7
Texas	14.9	14.9	14.9	14.5
Utah	21.5	22.5	21.3	22.4
Vermont (National Rankings)	12.3 (1)	10.9 (1)	10.5 (1)	9.8 (1)
Virginia	12.9	12.1	13.2	11.7
Washington	20.0	19.3	19.3	19.3
West Virginia	13.9	14.1	14.1	14.3
Wisconsin	15.3	14.7	14.7	14.8
Wyoming	13.5	13.0	12.6	12.3

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

Table A1.10b
Student to Administrator Ratio

	1999-2000	2003-2004	2005-2006	2009-2010
National	341.5	293.8	313.9	291.9
New England	311.3	266.3	230.5	233.0
Alabama	243.1	211.8	247.0	279.2
Alaska	193.4	198.4	172.0	150.8
Arizona	426.9	451.8	473.6	427.2
Arkansas	279.6	292.9	282.8	271.8
California	481.7	480.8	461.6	372.1
Colorado	368.0	318.1	314.8	293.1
Connecticut	282.8	263.2	248.1	257.9
Delaware	343.0	318.0	316.6	305.5
Florida	389.1	372.5	367.0	334.9
Georgia	317.3	300.7	250.8	255.2
Hawaii	374.0	364.3	370.8	340.6
Idaho	343.3	347.3	366.4	377.5
Illinois	356.9	327.2	322.2	282.4
Indiana	342.3	338.7	342.1	328.4
Iowa	251.0	228.0	221.6	274.5
Kansas	272.5	275.3	269.0	260.4
Kentucky	348.3	300.0	298.7	187.3
Louisiana	292.7	270.1	256.4	240.8
Maine	236.4	209.0	205.4	155.0
Maryland	279.3	274.2	253.2	221.7
Massachusetts	332.3	267.4	249.0	221.1
Michigan	300.8	356.0	341.4	338.8
Minnesota	477.4	384.9	422.6	399.7
Mississippi	305.5	280.9	275.9	248.9
Missouri	313.1	297.6	296.7	297.4
Montana	314.5	294.4	274.9	261.2
Nebraska	300.3	286.1	280.2	286.5
Nevada	368.3	357.2	420.8	420.3
New Hampshire	400.7	387.0	401.1	384.0
New Jersey	289.1	280.8	345.7	281.5
New Mexico	341.2	324.7	263.5	246.8
New York	392.2	366.2	319.7	292.6
North Carolina	285.4	284.7	286.1	289.2
North Dakota	277.0	258.8	250.1	222.1
Ohio	359.8	284.0	390.6	348.9
Oklahoma	311.8	324.1	290.4	293.9
Oregon	336.2	358.2	321.8	367.3
Pennsylvania	426.3	393.3	385.2	309.8
Rhode Island	405.3	287.2	109.3	321.1
South Carolina	282.2	216.9	208.1	281.8
South Dakota	309.8	312.3	302.0	293.9
Tennessee	233.3	184.4	271.9	292.8
Texas	306.9	146.2	245.9	223.7
Utah	506.1	490.1	469.5	449.7
Vermont (National Rankings)	256.9 (6)	224.7 (7)	217.2 (5)	184.1 (3)
Virginia	299.4	303.8	262.6	267.0
Washington	377.1	371.8	365.2	371.1
West Virginia	270.4	269.4	268.5	252.2
Wisconsin	344.5	350.3	357.9	352.2
Wyoming	270.1	262.6	251.2	245.6

Source: National Center for Education Statistics, Common Core of Data. 2000 through 2011.

Table A1.14
High School Graduation Rates
Average freshmen four-year graduation rates

	2001–02	2003–04	2005–06	2008-09	Change 2002 to 2009
National Average	72.6	75.0	73.2	75.5	2.9
Alabama	62.1	65.0	66.2	69.9	7.8
Alaska	65.9	67.2	66.5	72.6	6.7
Arizona	74.7	66.8	70.5	72.5	-2.2
Arkansas	74.8	76.8	80.4	74.0	-0.8
California	72.7	73.9	69.2	71.0	-1.7
Colorado	74.7	78.7	75.5	77.6	2.9
Connecticut	79.7	80.7	80.9	75.4	-4.3
Delaware	69.5	72.9	76.3	73.7	4.2
Florida	63.4	66.4	63.6	68.9	5.5
Georgia	61.1	61.2	62.4	67.8	6.7
Hawaii	72.1	72.6	75.5	75.3	3.2
Idaho	79.3	81.5	80.5	80.6	1.3
Illinois	77.1	80.3	79.7	77.7	0.6
Indiana	73.1	73.5	73.3	75.2	2.1
Iowa	84.1	85.8	86.9	85.7	1.6
Kansas	77.1	77.9	77.6	80.2	3.1
Kentucky	69.8	73.0	77.2	77.6	7.8
Louisiana	64.4	69.4	59.5	67.3	2.9
Maine	75.6	77.6	76.3	79.9	4.3
Maryland	79.7	79.5	79.9	80.1	0.4
Massachusetts	77.6	79.3	79.5	83.3	5.7
Michigan	72.9	72.5	72.2	75.3	2.4
Minnesota	83.9	84.7	86.2	87.4	3.5
Mississippi	61.2	62.7	63.5	62.0	0.8
Missouri	76.8	80.4	81.0	83.1	6.3
Montana	79.8	80.4	81.9	82.0	2.2
Nebraska	83.9	87.6	87.0	82.9	-1.0
Nevada	71.9	57.4	55.8	56.3	-15.6
New Hampshire	77.8	78.7	81.1	84.3	6.5
New Jersey	85.8	86.3	84.8	85.3	-0.5
New Mexico	67.4	67.0	67.3	64.8	-2.6
New York	60.5	—	67.4	73.5	13.0
North Carolina	68.2	71.4	71.8	75.1	6.9
North Dakota	85.0	86.1	82.1	87.4	2.4
Ohio	77.5	81.3	79.2	79.6	2.1
Oklahoma	76.0	77.0	77.8	77.3	1.3
Oregon	71.0	74.2	73.0	76.5	5.5
Pennsylvania	80.2	82.2	—	80.5	0.3
Rhode Island	75.7	75.9	77.8	75.3	-0.4
South Carolina	57.9	60.6	—	66.0	8.1
South Dakota	79.0	83.7	84.5	81.7	2.7
Tennessee	59.6	66.1	70.6	77.4	17.8
Texas	73.5	76.7	72.5	75.4	1.9
Utah	80.5	83.0	78.6	79.4	-1.1
Vermont (National Ranking)	82.0 (7)	85.4 (5)	82.3 (7)	89.6 (2)	7.6 (6)
Virginia	76.7	79.3	74.5	78.4	1.7
Washington	72.2	74.6	72.9	73.7	1.5
West Virginia	74.2	76.9	76.9	77.0	2.8
Wisconsin	84.8	—	87.5	90.7	5.9
Wyoming	74.4	76.0	76.1	75.2	0.8

Source: National Education Association. Rankings and Estimates, 2000 through 2011.

APPENDIX 2

TABLES AND GRAPHS TO ACCOMPANY SECTION 4 (EQUITY ANALYSIS)

Table A2.1: Horizontal Equity: Town Level Local Education Expenditures Per Pupil, FY 2000 to FY 2011

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011
Mean Per Pupil Expenditures	$6,591	$7,054	$7,588	$8,014	$8,434	$9,400	$10,135	$10,835	$11,226	$12,053	$12,444	$12,550
Standard Deviation	$777	$883	$1,020	$1,077	$1,155	$1,231	$1,331	$1,346	$1,378	$1,376	$1,372	$1,427
Coefficient of Variation	0.12	0.13	0.13	0.13	0.14	0.13	0.13	0.12	0.12	0.11	0.11	0.11
Range	$7,335	$12,176	$11,210	$6,535	$7,335	$14,605	$58,478	$39,191	$12,040	$11,705	$21,201	$11,226
Restricted Range	$2,475	$2,731	$3,184	$3,111	$3,454	$3,945	$4,314	$4,599	$4,377	$4,270	$4,600	$4,765
Federal Range Ratio	0.45	0.47	0.51	0.47	0.49	0.52	0.52	0.53	0.48	0.43	0.45	0.46
McLoone Index	0.92	0.91	0.90	0.90	0.89	0.90	0.90	0.90	0.90	0.92	0.93	0.93
Verstegen Index	1.11	1.11	1.12	1.12	1.12	1.12	1.11	1.10	1.10	1.11	1.10	1.11
Correlation EEGL	-0.05	-0.11	-0.15	-0.16	-0.18	0.15	0.13	0.20	0.22	0.22	0.21	N/A
Elasticity EEGL	-0.01	-0.02	-0.02	-0.02	-0.03	0.02	0.02	0.02	0.02	0.02	0.02	N/A
Correlation Homestead	0.19	0.10	0.01	-0.02	0.02	0.24	0.23	0.27	0.32	0.29	0.30	N/A
Elasticity Homestead	0.07	0.03	0.00	-0.01	0.01	0.08	0.07	0.08	0.10	0.09	0.09	N/A
Correlation Income (per pupil)	N/A	0.03	0.01	0.01	-0.06	0.01	0.03	0.05	0.10	0.08	0.06	N/A
Elasticity Income (per pupil)	N/A	0.00	0.00	0.00	-0.01	0.00	0.00	0.01	0.01	0.01	0.01	N/A
Correlation Income (per return)	N/A	0.08	0.08	0.10	0.07	0.12	0.15	0.08	0.14	0.08	0.03	N/A
Elasticity Income (per return)	N/A	0.02	0.02	0.02	0.04	0.05	0.06	0.03	0.05	0.02	0.01	N/A

Table A4.2: Vertical Equity: Town Level Local Education Expenditures Using Weighted Pupils FY 2000-FY 2011

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Mean Per Pupil Expenditures	3,111	3,278	3,547	3,878	4,352	4,884	5,632	6,409	7,538	8,172	8,323	8,203
Standard Deviation	1,345	1,856	2,012	2,245	2,188	2,418	2,773	3,192	3,737	4,069	4,192	5,292
Coefficient of Variation	N/A	102,900	104,329	105,364	108,492	120,330	132,540	143,617	164,585	161,537	151,966	N/A
Range	$5,720	$6,124	$6,582	$6,943	$7,295	$8,107	$8,724	$9,305	$10,412	$11,158	$11,436	$11,480
Restricted Range	$692	$792	$909	$958	$1,026	$1,087	$1,171	$1,195	$1,315	$1,317	$1,322	$1,365
Federal Range Ratio	0.12	0.13	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12
McLoone Index	$6,348	$9,277	$11,733	$5,529	$6,392	$11,229	$46,320	$30,684	$10,543	$11,603	$21,688	$9,871
Verstegen Index	$2,267	$2,511	$2,935	$2,992	$3,245	$3,720	$3,771	$3,871	$4,258	$4,270	$4,391	$4,265
Correlation EEGL	0.48	0.51	0.56	0.55	0.56	0.58	0.55	0.53	0.52	0.47	0.48	0.44
Elasticity EEGL	0.92	0.91	0.91	0.89	0.88	0.90	0.89	0.90	0.89	0.92	0.91	0.91
Correlation Homestead	1.12	1.11	1.13	1.11	1.11	1.12	1.11	1.10	1.10	1.11	1.09	1.10
Elasticity Homestead	N/A	-0.07	-0.12	-0.14	-0.15	0.17	0.15	0.22	0.24	0.26	0.25	N/A
Correlation Income (Income per pupil)	N/A	-0.01	-0.02	-0.02	-0.02	0.02	0.02	0.03	0.03	0.03	0.03	N/A
Elasticity Income (per pupil)	N/A	0.15	0.06	0.04	0.09	0.29	0.28	0.33	0.38	0.38	0.40	N/A
Correlation Income (Income per return)	N/A	0.05	0.02	0.01	0.03	0.09	0.09	0.11	0.12	0.11	0.12	N/A
Elasticity Income (per return)	N/A	0.04	0.01	0.02	-0.04	0.03	0.05	0.07	0.12	0.11	0.10	N/A

Table A2.3: Changes in District Per Pupil Expenditures By Function, FY 1996 to FY 2009

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Increase	Percent Increase
Instruction	$4,273	$4,400	$4,525	$4,880	$5,196	$5,679	$6,064	$6,467	$6,860	$7,293	$7,771	$8,098	$8,510	$8,956	$4,683	110%
Pupil Support	$411	$434	$446	$514	$567	$649	$729	$776	$852	$909	$979	$1,025	$1,072	$1,143	$732	178%
Instructional Staff Support	$209	$208	$226	$260	$303	$323	$354	$398	$425	$470	$487	$543	$591	$618	$409	196%
Administration	$665	$664	$705	$758	$813	$857	$946	$1,035	$1,091	$1,168	$1,197	$1,270	$1,334	$1,421	$756	114%
Transportation	$230	$242	$251	$276	$299	$308	$338	$347	$383	$415	$442	$459	$502	$534	$304	132%
Other Support	$719	$749	$773	$857	$890	$981	$1,021	$1,093	$1,168	$1,268	$1,379	$1,512	$1,656	$1,785	$1,066	148%
Current Instructional	$6,508	$6,698	$6,925	$7,546	$8,069	$8,798	$9,453	$10,115	$10,779	$11,523	$12,255	$12,906	$13,667	$14,458	$7,950	122%
Current Instructional less transportation	$6,278	$6,456	$6,674	$7,270	$7,769	$8,490	$9,114	$9,768	$10,396	$11,108	$11,813	$12,447	$13,164	$13,923	$7,645	122%
Food Service	$207	$210	$223	$223	$240	$261	$285	$295	$328	$337	$363	$375	$395	$437	$230	111%
Other Enterprise	$8	$6	$7	$10	$7	$4	$9	$5	$6	$17	$6	$5	$14	$8	$0	3%
Total Current for local K-12 Programs	$6,723	$6,913	$7,155	$7,778	$8,316	$9,063	$9,747	$10,415	$11,113	$11,877	$12,624	$13,287	$14,076	$14,903	$8,180	122%
General Administration	N/A	N/A	N/A	N/A	N/A	N/A	$257	$283	$290	$316	$324	$329	$343	$367	$110	43%
School Administration	N/A	N/A	N/A	N/A	N/A	N/A	$689	$752	$802	$852	$873	$940	$991	$1,054	$365	53%

Figure A2.1: Average Per Pupil Expenditures by Wealth Decile, FY2000

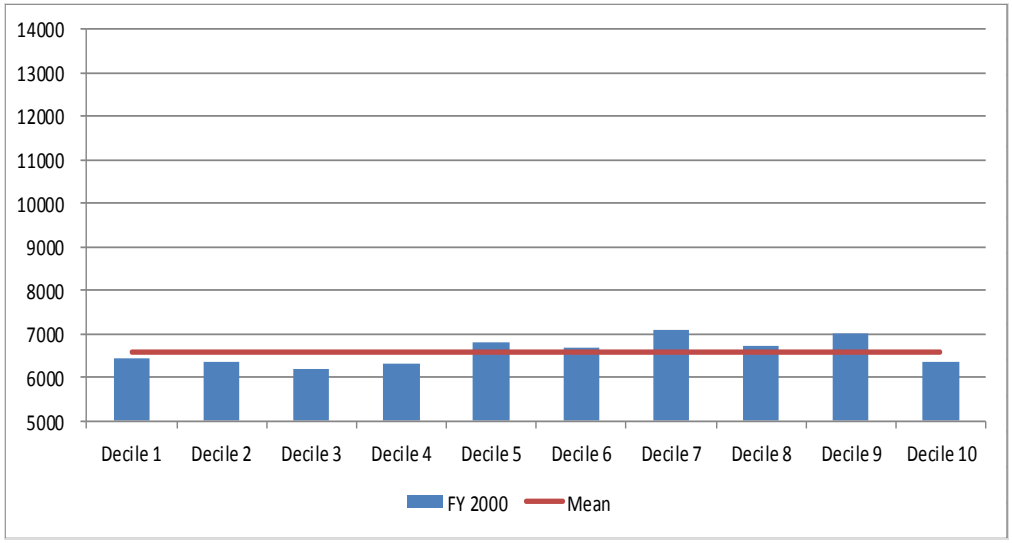


Figure A2.2: Average Per Pupil Expenditures by Wealth Decile, FY2001

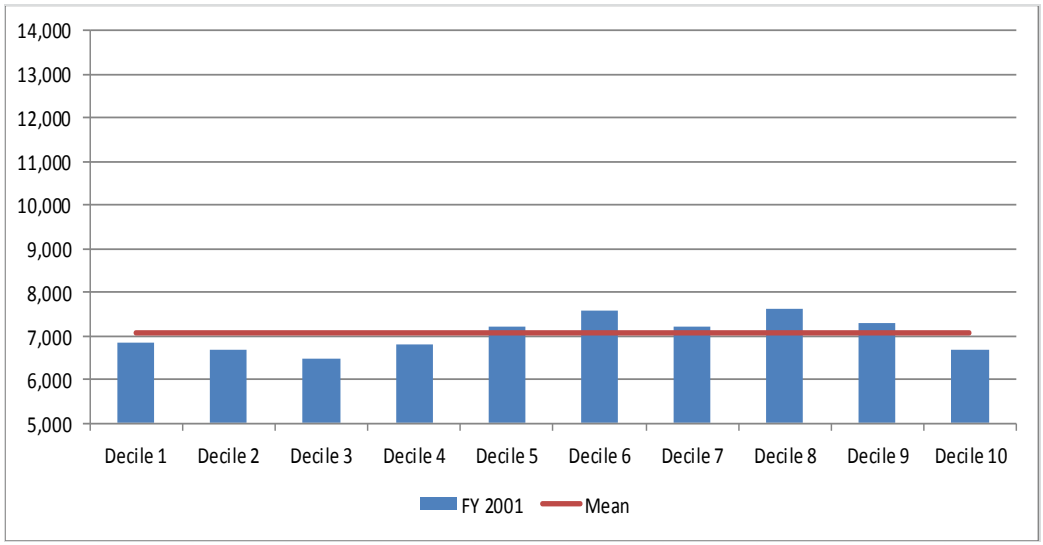


Figure A2.3: Average Per Pupil Expenditures by Wealth Decile, FY2002

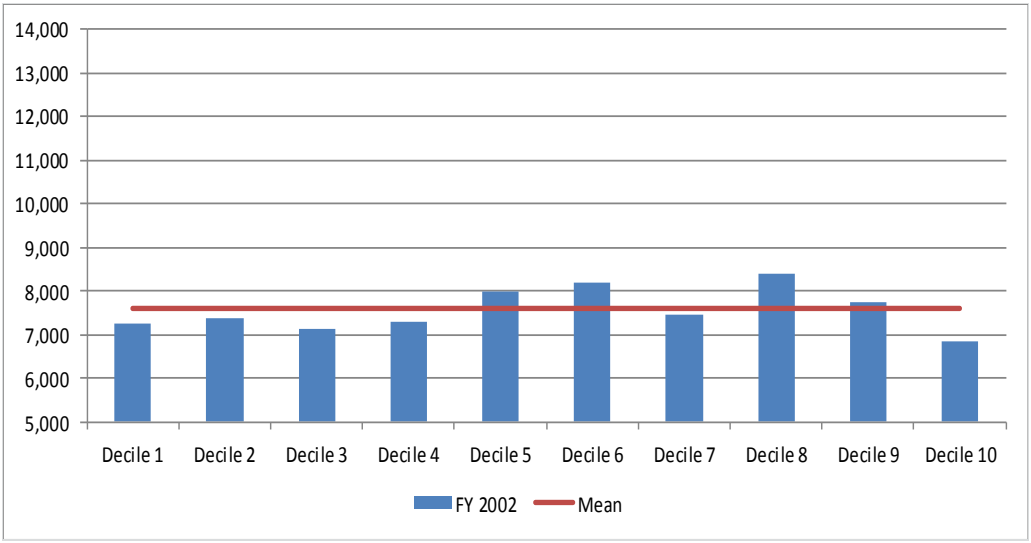


Figure A2.4: Average Per Pupil Expenditures by Wealth Decile, FY2003

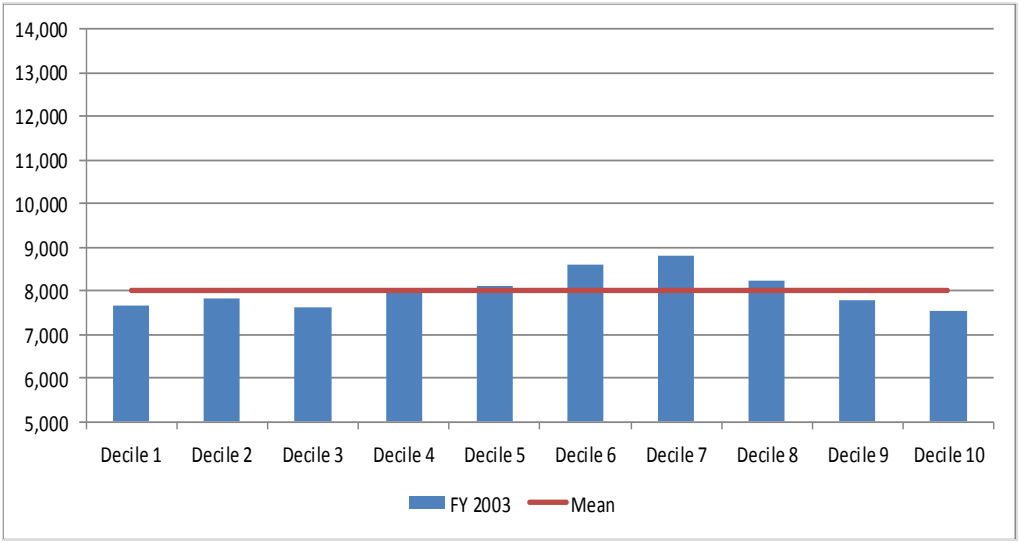


Figure A2.5: Average Per Pupil Expenditures by Wealth Decile, FY2004

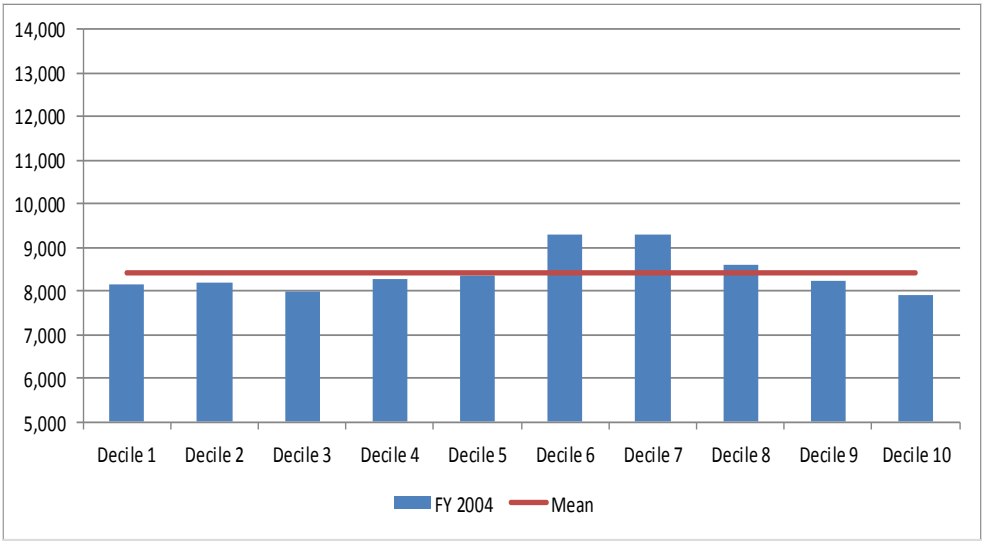


Figure A2.6: Average Per Pupil Expenditures by Wealth Decile, FY2005

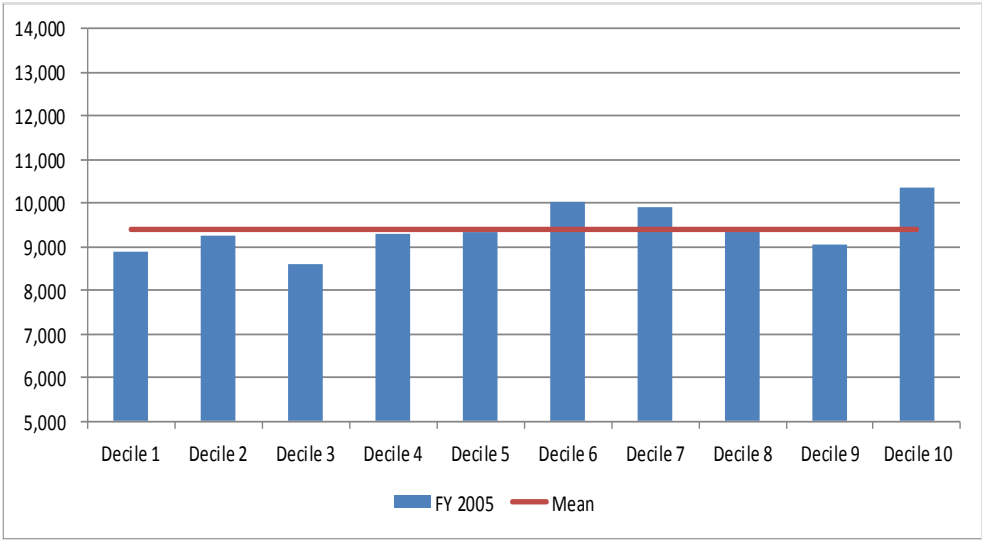


Figure A2.7: Average Per Pupil Expenditures by Wealth Decile, FY2006

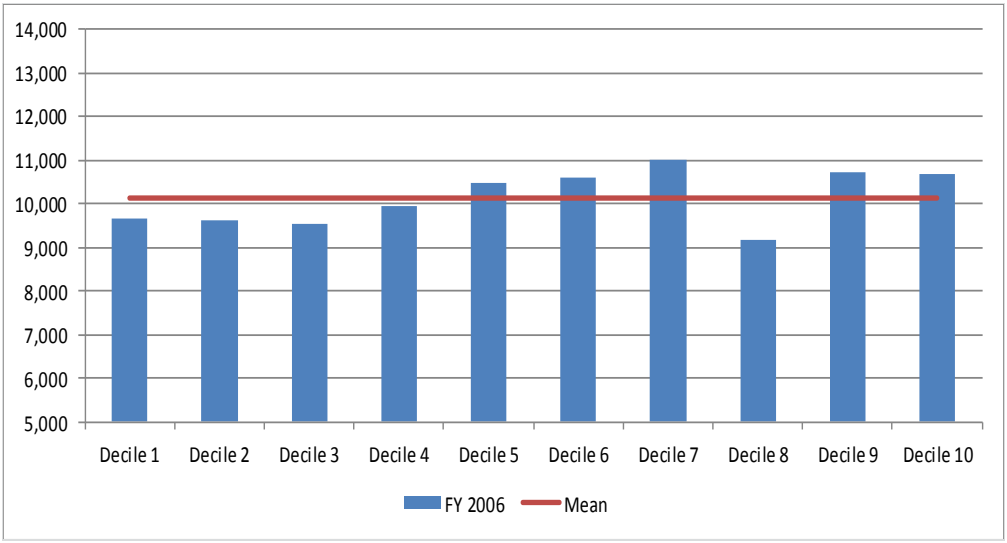


Figure A2.8: Average Per Pupil Expenditures by Wealth Decile, FY2007

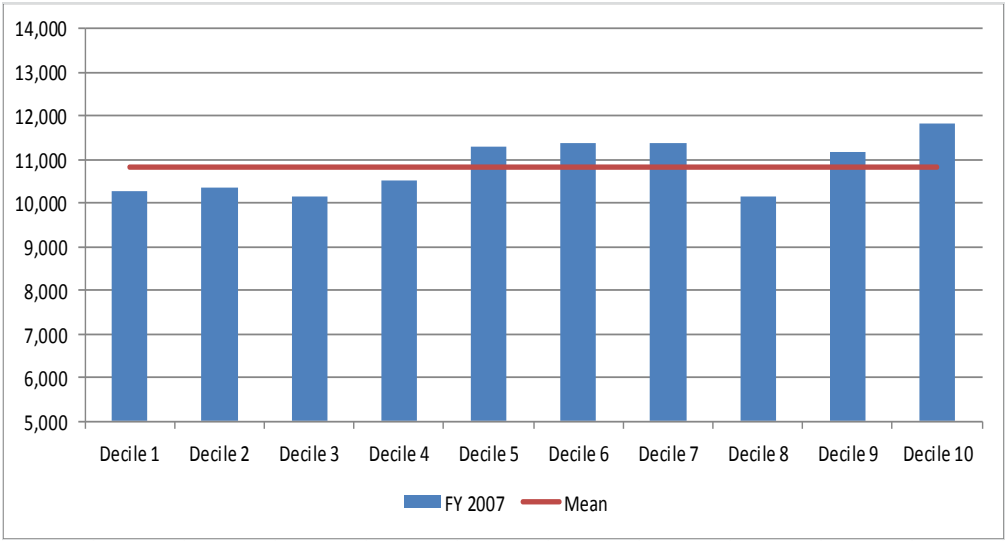


Figure A2.9: Average Per Pupil Expenditures by Wealth Decile, FY2008

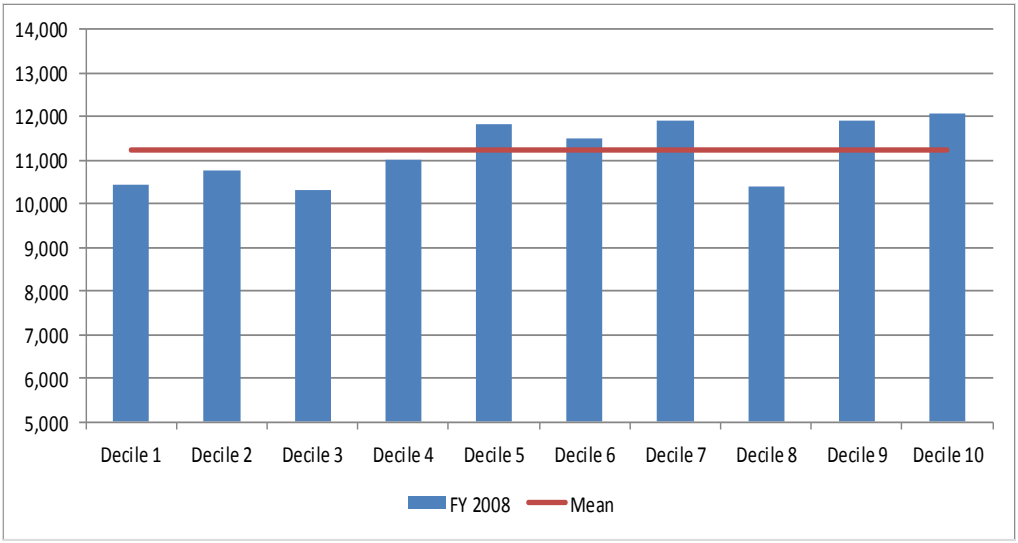


Figure A2.10: Average Per Pupil Expenditures by Wealth Decile, FY2009

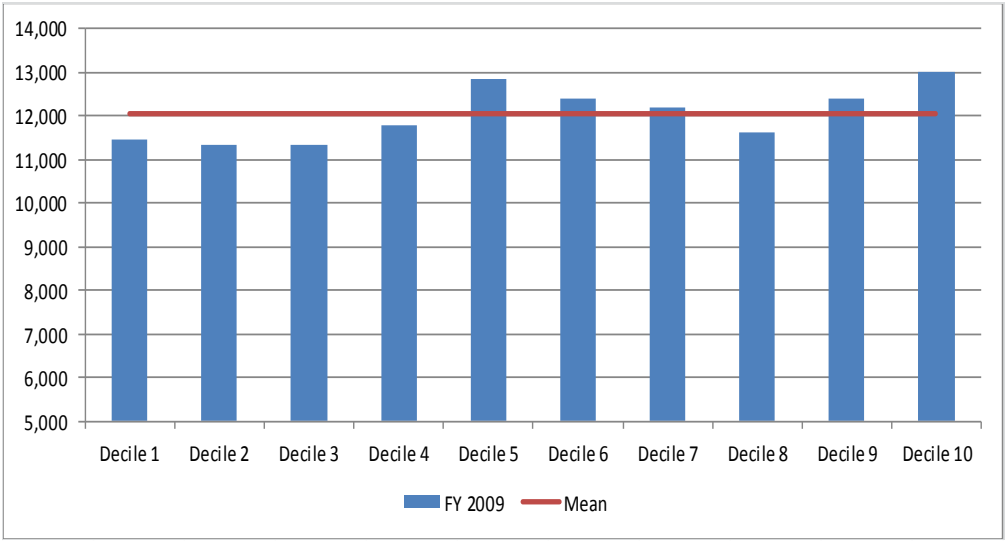
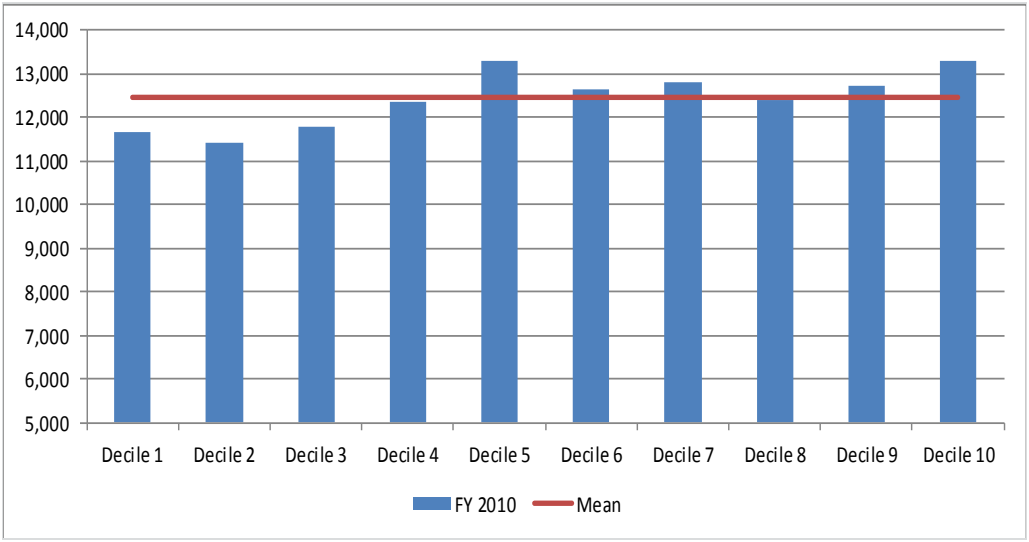


Figure A2.11: Average Per Pupil Expenditures by Wealth Decile, FY2010



APPENDIX 3
SUMMARY OF TAX PRICES BY SCHOOL DISTRICT: FY 2008 AND 2010

AND
DESCRIPTIVE STATISTICS FOR REGRESSIONS

Table A3.1: School District Tax Prices, FY 2008 and 2011

Town	2010 price	2008 price
Addison	0.44	0.40
Albany	0.22	0.18
Alburgh	0.24	0.21
Andover	0.60	0.57
Arlington	0.34	0.33
Athens	0.14	0.15
Bakersfield	0.23	0.21
Baltimore	0.21	0.20
Barnard	1.01	1.14
Barnet	0.24	0.21
Barre City	0.12	0.11
Barre Town	0.28	0.25
Barton	0.17	0.15
Belvidere	0.31	0.28
Bennington	0.16	0.13
Benson	0.17	0.17
Berkshire	0.19	0.17
Berlin	0.28	0.23
Bethel	0.24	0.22
Bloomfield	0.15	0.11
Bolton	0.38	0.23
Bradford	0.17	0.17
Braintree	0.22	0.21
Brandon	0.20	0.18
Brattleboro	0.19	0.26
Bridgewater	0.65	0.63
Bridport	0.43	0.45
Brighton	0.14	0.12
Bristol	0.19	0.18
Brookfield	0.34	0.32
Brookline	0.23	0.39
Brownington	0.16	0.13
Burke	0.25	0.23
Burlington	0.28	0.28
Cabot	0.24	0.25
Calais	0.33	0.33
Canaan	0.13	0.11
Castleton	0.28	0.28
Cavendish	0.22	0.39

Town	2010 price	2008 price
Charleston	0.21	0.19
Charlotte	0.78	1.20
Chelsea	0.26	0.25
Chester	0.23	0.20
Chittenden	0.32	0.33
Clarendon	0.23	0.35
Colchester	0.36	0.34
Concord	0.15	0.14
Corinth	0.22	0.21
Cornwall	0.76	0.84
Coventry	0.21	0.17
Craftsbury	0.52	0.48
Danby	0.44	0.27
Danville	0.33	0.29
Derby	0.23	0.20
Dorset	0.72	0.74
Dover	0.35	0.41
Dummerston	0.74	0.95
Duxbury	0.33	0.28
East Haven	0.10	0.12
East Montpelier	0.33	0.29
Eden	0.16	0.19
Elmore	0.45	0.42
Enosburg	0.13	0.13
Essex Jct.	0.26	0.27
Essex Town	0.36	0.34
Fair Haven	0.11	0.09
Fairfax	0.29	0.25
Fairfield	0.22	0.21
Fairlee	0.38	0.34
Fayston	0.51	0.56
Ferrisburgh	0.39	0.38
Fletcher	0.28	0.28
Franklin	0.23	0.23
Georgia	0.26	0.24
Glover	0.19	0.19
Goshen	0.25	0.22
Granby	0.19	0.12
Grand Isle	0.46	0.41
Granville	0.18	0.34
Greensboro	0.31	0.30

Town	2010 price	2008 price
Groton	0.18	0.16
Guildhall	0.23	0.24
Guilford	0.34	0.51
Halifax	0.34	0.31
Hancock	0.22	0.17
Hardwick	0.11	0.10
Hartford	0.27	0.28
Hartland	0.39	0.37
Highgate	0.20	0.18
Hinesburg	0.41	0.60
Holland	0.17	0.16
Hubbardton	0.30	0.26
Huntington	0.32	0.31
Hyde Park	0.26	0.25
Ira	0.28	0.25
Irasburg	0.19	0.16
Isle LaMotte	0.35	0.28
Jamaica	0.26	0.36
Jay	0.23	0.17
Jericho	0.38	0.37
Jericho ID	0.27	0.25
Johnson	0.16	0.16
Killington	0.63	0.87
Kirby	0.27	0.25
Landgrove	0.90	1.80
Leicester	0.35	0.43
Lincoln	0.36	0.33
Londonderry	0.45	0.51
Lowell	0.13	0.13
Ludlow	0.36	0.38
Lunenburg	0.14	0.12
Lyndon	0.18	0.16
Maidstone	0.31	0.33
Manchester	0.45	0.45
Marlboro	0.47	0.45
Marshfield	0.26	0.24
Middlebury	0.41	0.51
Middlesex	0.35	0.35
Middletown Springs	0.33	0.29
Milton	0.26	0.25
Monkton	0.37	0.35

Town	2010 price	2008 price
Montgomery	0.27	0.25
Montpelier	0.29	0.27
Moretown	0.52	0.32
Morgan	0.40	0.42
Morristown	0.24	0.23
Mount Holly	0.40	0.38
Mount Tabor	0.08	0.16
New Haven	0.38	0.51
Newark	0.30	0.29
Newbury	0.24	0.23
Newfane	0.37	0.50
Newport City	0.11	0.10
Newport Town	0.26	0.22
North Bennington	0.11	0.14
North Hero	0.71	0.64
Northfield	0.21	0.20
Norwich	0.69	1.20
Orange	0.26	0.24
Orleans ID	0.10	0.08
Orwell	0.28	0.26
Panton	0.38	0.35
Pawlet	0.29	0.30
Peacham	0.44	0.40
Peru	0.76	0.88
Pittsfield	0.37	0.44
Pittsford	0.27	0.26
Plainfield	0.29	0.28
Plymouth	0.59	0.54
Pomfret	0.91	0.84
Poultney	0.22	0.21
Pownal	0.21	0.20
Proctor	0.15	0.31
Putney	0.29	0.41
Randolph	0.24	0.23
Reading	0.78	0.85
Richmond	0.32	0.31
Ripton	0.51	0.47
Rochester	0.28	0.25
Rockingham	0.13	0.13
Roxbury	0.25	0.20
Royalton	0.21	0.22

Town	2010 price	2008 price
Rupert	0.50	0.47
Rutland City	0.14	0.13
Rutland Town	0.44	0.44
Ryegate	0.26	0.20
Salisbury	0.42	0.48
Sandgate	0.29	0.52
Searsburg	0.16	0.15
Shaftsbury	0.38	0.35
Sharon	0.30	0.28
Sheffield	0.19	0.15
Shelburne	0.62	0.58
Sheldon	0.20	0.18
Shoreham	0.44	0.51
Shrewsbury	0.42	0.40
South Burlington	0.42	0.40
South Hero	0.69	0.61
Springfield	0.15	0.15
St. Albans City	0.12	0.13
St. Albans Town	0.26	0.25
St. George	0.23	0.25
St. Johnsbury	0.13	0.12
Stamford	0.34	0.31
Stannard	0.11	0.10
Starksboro	0.23	0.21
Stockbridge	0.29	0.26
Stowe	0.71	0.75
Strafford	0.39	0.40
Stratton	0.68	0.72
Sudbury	0.49	0.47
Sunderland	0.38	0.45
Sutton	0.22	0.20
Swanton	0.21	0.19
Thetford	0.33	0.63
Tinmouth	0.26	0.26
Townshend	0.27	0.39
Troy	0.17	0.16
Tunbridge	0.35	0.35
Underhill	0.48	0.44
Vergennes	0.16	0.15
Vernon	0.23	0.32
Vershire	0.22	0.23

Town	2010 price	2008 price
Victory	0.27	0.21
Waitsfield	0.44	0.41
Walden	0.18	0.15
Wallingford	0.45	0.44
Waltham	0.33	0.31
Wardsboro	0.22	0.25
Warren	0.41	0.57
Washington	0.31	0.28
Waterbury	0.38	0.36
Waterford	0.29	0.29
Waterville	0.24	0.21
Weathersfield	0.62	0.68
Wells	0.35	0.32
Wells River	0.11	0.10
West Fairlee	0.24	0.21
West Haven	0.25	0.22
West Rutland	0.20	0.19
West Windsor	0.77	0.70
Westfield	0.29	0.28
Westford	0.35	0.33
Westminster	0.29	0.25
Westmore	0.23	0.59
Weston	1.05	1.04
Weybridge	0.94	0.57
Wheelock	0.22	0.21
Whiting	0.23	0.19
Whitingham	0.22	0.42
Williamstown	0.21	0.17
Williston	0.44	0.43
Wilmington	0.26	0.25
Windham	0.44	0.56
Windsor	0.17	0.16
Winhall	0.70	0.58
Wolcott	0.20	0.19
Woodbury	0.40	0.35
Woodford	0.11	0.10
Woodstock	0.90	0.97
Worcester	0.28	0.25
Average	0.324	0.333

Table A3.2: Regression Variables and Descriptive Statistics

Variable Name	Description	No. of Obs	Mean	Std. Dev	Min	Max
Regression for Districts with ADM Less than 200						
admfy0810	Change in educational spending per ADM from 2008 to 2010	110	1,757.9	2,044.7	-5808	8,444
admpctch0810	Percent change in town ADM from 2008 to 2010	110	-0.042	0.105	-0.299	0.333
pricech	Change in town tax price 2008 to 2010	110	-0.008	0.119	-0.908	0.375
pctagich	Percent change in town average Federal adjusted gross income, 2008 to 2010	110	-0.078	0.130	-0.678	0.216
admfy2008	Town spending per ADM in 2008	110	15,112	2703.09	9,839	26,095
Percentren	Percent hold town households renter occupied, 2000 Census	110	16.91	5.18	5	32.6
ADM08	Town ADM in 2008	110	116.16	51.70	24.0	199.75

Table A3.2 (Continued): Regression Variables and Descriptive Statistics

Variable Name	Description	No. of Obs	Mean	Std. Dev	Min.	Max
Regression for Districts with ADM Greater than 200						
admfy0810	Change in educational spending per ADM from 2008 to 2010	130	1,462.2	1060.92	-1,645	4,398
admpctch0810	Percent change in town ADM from 2008 to 2010	130	0.036	0.552	-0.166	0.171
pricech	Change in town tax price 2008 to 2010	130	-0.009	0.087	-0.512	0.202
pctagich	Percent change in town average Federal adjusted gross income, 2008 to 2010	130	-0.049	0.055	-0.207	.178
admfy2008	Town spending per ADM in 2008	130	14,433	2,026.7	10,548	19,971
Percentren	Percent hold town households renter occupied, 2000 Census	130	24.39	10.77	8.5	64.2
ADM08	Town ADM in 2008	130	603.6	547.1	201.6	3,806.2

APPENDIX 4

DEFINITIONS OF PUPIL COUNTS USED IN VERMONT

DEFINITIONS OF PUPIL COUNTS USED IN VERMONT

Enrollment – a headcount of the students enrolled in a school as of October 1, regardless of district of residence.

Average Daily Membership (ADM) – the full-time equivalent enrollment of a school district's publicly funded resident students during a 20-day census period.

Long-term ADM – the average of a district's current year ADM count with the prior year's count, exclusive of any state-placed students. The state-placed student full-time equivalent count from the prior school year is added to the two-year ADM average to comprise the long-term ADM.

$$\text{Long - term ADM} = \frac{(\text{ADM}_{\text{prior year}} + \text{ADM}_{\text{current year}})}{2} + \text{State - placed FTE}_{\text{prior year}}$$

Weighted long-term ADM – the long-term ADM adjusted with specified weights for pre-kindergarten, secondary, economically deprived backgrounds, and English language learners.

Equalized pupils – the weighted two-year ADM average including state-placed students, normalized by a ratio so that the two-year average for the state is equivalent to the equalized pupil count. The ratio is the two-year ADM average including state-placed students divided by the weighted long-term ADM.

The statutory definition (16 V.S.A. § 4001 (3)):
"Equalized pupils" means the long-term weighted average daily membership multiplied by the ratio of the statewide long-term average daily membership to the statewide long-term weighted average daily membership.

Below is the student count developed by the Vermont Department of Education for your use in the report to align more closely with other states. It is not a count used in Vermont.

Weighted ADM – a single year of ADM weighted for pre-kindergarten, secondary, economically deprived backgrounds, and English language learners

APPENDIX 5
IMPROVING SCHOOL CASE STUDIES

AN EVALUATION OF VERMONT'S EDUCATION FINANCE SYSTEM

Brewster Pierce Elementary School
Case Study

Prepared by
Allan Odden
Lawrence O. Picus

January 18, 2012

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Brewster Pierce Elementary School
Chittenden East Supervisory Union
Huntington, Vermont

Brewster Pierce Elementary School is in the Chittenden East Supervisory Union, which the school refers to as "the district." It is located in the rural southwestern, portion of Chittenden County -- the county that also includes Vermont's largest city, Burlington. The school is about 30 minutes off Interstate 89, accessed via rural roads winding through picturesque farm and forest settings. Huntington, the town in which the school exists, is rural farming territory that is in transition to a more "suburban," and "professional" family community, though it continues to retain its rural nature. The community is diverse with a wide range of occupations and family Socio-Economic Status (SES). Though a number of farming families populate the community, there is also a growing number of independent business owners who work out of their home or own businesses that require extensive travel around the state. In recent years substantial numbers of artists, musicians, and professionals who work in Burlington and South Burlington have moved to this area. Reflective of the commuting nature of the Vermont workforce, many parents drop off their children at school by 7:00 a.m. and then commute to distant jobs.

Brewster Pierce enrolls about 120 students in grades Kindergarten through 4. It also has a preschool with 24 students who are enrolled in one of two half-day programs with 12 students each. Approximately 25% of students are eligible for free and reduced price lunch, which is prepared by a school cook who purchases many ingredients from local organic farmers; all students can buy lunch if they want. For the 2009 school year (the last year for which we have data for all districts), Brewster Pierce spent $7,704 per student for current instructional expenditures minus transportation, significantly below the state wide average of $13,923.

School Performance has improved in recent years. As shown in Table 1:

- Mathematics achievement on the New England Common Assessment Program (NECAP) increased from 49% at or above Proficient in 2005 to 75% in 2010, and the percent scoring at the Proficient with Distinction level nearly doubled from 16% to 29% during the same period.
- Reading performance also improved, growing from 57% performing at or above Proficient in 2005 to 76% scoring at those levels in 2010. The percent performing at the Proficient with Distinction level has varied from a low of 12% (2009) to a high of 33% (2007), and stands at 23% for the 2010 administration of the NECAP.
- Writing performance virtually doubled from 2005, rising from 22% performing at Proficient or above in 2005 to 43% performing at that level in 2010.
- Science performance in the fourth grade was high in both 2008 and 2009, but dropped from 78% at Proficient or above in 2009 to 43% in 2010. Though not shown in the table, the principal reported that science results in 2011 improved to 78% at or above Proficient.

This case is the story about how Brewster Place produced these impressive results. These results emerged from the professional work of teachers, implementing a solid curriculum program, complemented by multiple additional strategies designed to insure that all students received the instructional time needed to perform at proficient levels and above. The case is based on written documents as well as interviews with the principal and nearly all certified staff in mid-October. The case is part of a study of the Vermont school funding system being conducted for the legislature by Lawrence O.

Picus and Associates. The case has the following six sections: School Staff, Goals, School Schedule, Curriculum and Instruction Program, Assessments, Interventions, Professional Development, School Culture and a Summary.

Table 1

NECAP Scores for Brewster Pierce PreK-4 Elementary School, 2005-2010

Subject and Performance	2005 NECAP	2006 NECAP	2007 NECAP	2008 NECAP	2009 NECAP	2010 NECAP
Mathematics	**Grades 3-8**					
Proficient and Above	49%	71%	72%	82%	70%	75%
Proficient with Distinction	16%	23%	30%	26%	29%	29%
Reading	**Grades 3-8**					
Proficient and Above	57%	70%	78%	72%	70%	76%
Proficient with Distinction	17%	20%	33%	19%	12%	23%
Writing	**Grade 5**					
Proficient and Above	22%	45%	41%	49%	--	43%
Proficient with Distinction	4%	11%	15%	14%	--	4%
Science	**Grade 4**					
Proficient and Above				70%	78%	43%
Proficient with Distinction				5	0	4%

Source: LOP calculations from State NECAP data.

School Staff

We identified over 15.1 full-time certified staff positions and 3.6 paraprofessional positions at the school including the following (numbers reported in full time equivalents (FTE):

- 1 principal
- 1 school secretary
- 1 preschool teacher and 0.8 preschool aide
- 2 Kindergarten teachers
- 1 first grade teacher
- 1 second grade teacher
- 1 combined grades 2 and 3 teacher
- 2 combined grades 3 and 4 teachers
- 1.8 specialist teachers including
    - 0.2 art
    - 0.2 music
    - 0.6 P.E.
    - 0.2 Spanish
    - 0.6 librarian
- 1.1 extra help professionals including:
    - 0.2 math
    - 0.9 Title I reading
- 1.2 pupil support staff including:
    - 0.6 guidance counselor

- 0.4 nurse
- 0.2 social worker

- 2.0 Special education teachers
- 2.8 teaching assistants including:
  - 0.8 for Math Recovery and Do the Math (funded 50% regular program and 50% and special education)
  - 1.0 TA for My Sidewalks, Fundations and 1-1 special education (half of this position's time), funded 50% regular program and 50% and special education
  - 1.0 TA who teaches the Soar to Success intervention and provides in-class support for reading and math (funded with regular education dollars).

Put a different way, for professional staff, the school has one administrator (the principal), 7 grade level teachers (plus a preschool teacher). 1.8 specialist teachers that include the 0.6 librarian, 1.1 positions devoted to extra help in math and reading, 1.2 pupil support staff, 2 certified special education teachers, and 2.8 teaching assistants (2.0 with BA degrees) who are integral to the school's "intervention" strategies.

Excluding preschool, regular classes average about 17 students (120 students divided by 7 grade level teachers). The 7 core teachers are supported by an additional 5.9 certified teacher positions as well as 2.8 teaching assistant positions, with substantial special education staff – 2 teachers and 1.0 FTE teaching assistant positions.

School Goals

When the NECAP was first used in 2005, the Brewster Pierce's staff concluded that the student performance was lower than expected and lower than both the school and

community wanted. These low scores spurred the school to begin framing a plan to improve performance across the board. Since then the focus has been to improve student performance, but to date, no specific numerical targets for student performance have been established.

The school's overall goal is to improve student performance in reading and mathematics, and to have every student read and write at grade level and do math at grade level. The school has begun to develop goals to have students read at the Proficient with Distinction level, so there would be more academic "push" for higher achieving students.

School Schedule

The school day runs from 7:50 a.m. to 2:30 p.m., with 30 minutes for lunch. The art, music, PE, Spanish, guidance counselor and library teachers are used to provide instruction at times that allow grade level teachers to have pupil free time each day during the week. Typically, two specialist teachers provide electives for students in regular teacher classes on a daily basis but on Wednesday, there are three time periods when specialists provide elective classes for one period for each core teacher's class. The music teacher provides classes on Monday and the art and Spanish teachers provide classes on Wednesday. The PE teacher and librarian provide classes on Tuesday and Friday. The guidance counselor also provides some classes, doing so on Monday, Wednesday and Friday.

As a result, teachers have about 25-30 minutes of individual planning time every day plus some additional daily common time for collaborative work. Until this year, grade alike (K-2, 2/3, 3-4) teachers did not have common planning time, making it

difficult to develop much activity for collaborative teacher groups. This year each set of grade alike teachers has one 45-minute period of common planning time each week. In addition, there is a common extended lunch period which offers additional time for collaboration. The kindergarten teachers use this time to develop common units in social studies and science in addition to reading and mathematics. Every teacher in the school was interviewed and all indicated they liked the new common time for planning with grade-alike colleagues very much.

A second schedule innovation implemented this year was a 30-40 minute "intervention block" (IBlock) every day. This block of time is intended to provide more opportunities for students to get extra help generally from their regular teachers. Though some students receive targeted extra help during small group time during the regular reading and math instructional times, the IBlock provides another opportunity for the regular teacher, sometimes augmented by teaching assistants, to provide students with extra academic help. The hope is that the assistance students receive during IBlock will reduce the number of children who require more focused and individual services provided through additional interventions (discussed below).

Curriculum and Instructional Program

Prior to the arrival of the school's two most recent principals, the school was run in a pretty autonomous manner. Despite a formal district curriculum, teachers had considerable autonomy over what they taught, how they taught each subject and how much time each teacher devoted to instruction in all areas. This autonomy existed in all subjects including the core subjects of reading, writing and mathematics. As one teacher said, "We were given a curriculum and told to go teach it." There was little common

school wide focus or work. This teacher went on to say that "Today teachers receive a new curriculum, multiple tools to help deliver the curriculum, and training to acquire the instructional skills to be more effective in teaching it."

In recent years the school has developed a stronger academic focus. This has been particularly notable in the last two years since the arrival of the schools current principal. The school's general "theory of action" is that improved student performance requires:

- More instructional time for core subjects
- A strong curriculum and instruction program
- Early intervention in reading with an emphasis on phonemic awareness and phonics
- Tracking student progress during the year
- Providing extra help or interventions to struggling students throughout the academic year
- The use of research-based methods for the core instructional program as well as various interventions.

The performance gains made by the students at Brewster Pierce to date show that this theory of action has been successful so far.

For the 2011-2012 school year, teachers are required to allocate 90 minutes a day to both reading and mathematics instruction, and provide additional time for writing. In the past, time allocated for reading, writing and math instruction varied substantially among teachers and classrooms. Given the need to improve student performance in all three content areas, the current principal felt that the school needed a more formal

approach to allocated instructional time and instituted the required 90 minutes. Interviews with teachers indicated general support for this stronger academic focus and allocation of time.

The school also changed the curriculum for both reading and mathematics, adopting a new reading program at the school level and implementing a district (supervisory union) initiated change in the math program. For **reading**, the school chose not to adopt a text-based program and continues to implement a "guided reading" program, with leveled books; the literacy block is characterized by mini lessons, then small groups and centers within each class, and considerable independent reading. Because "guided reading" short changes if not ignores phonemic awareness and phonics, the principal had the school adopt the Wilson Fundations program, which is used in Grades K-3.

Wilson ***Fundations*** for K-3 is a phonological/phonemic awareness, phonics and spelling program for the general education classroom; it is not a complete reading program but appropriately used as a supplementary program. Often used as a supplement to the broader reading program or as an intervention, Brewster Pierce's teachers use *Fundations* as a supplementary reading program for all students to reinforce phonemic awareness, phonics and spelling. For spelling, writing and reading reinforcement in Grade 4, the school uses the *Megawords* program, published by Educator's Publishing Service. *Megawords* is a multisensory reading and spelling program that supplies students with strategies and procedures for reading and spelling multisyllabic words through a multisensory approach.

To provide early interventions for kindergartners struggling with phonemic awareness and phonics, the school also adopted the *My Sidewalks* program. According to its website,

> *My Sidewalks* is a research-based, intensive elementary reading intervention program. It is designed for students who are unable to read and comprehend grade-level materials and who are unable to benefit adequately from the strategic intervention that supports their core classroom reading instruction. *My Sidewalks* follows the Response To Intervention Model and is built on instruction in the priority skills of phonemic awareness, phonics, fluency, vocabulary, and comprehension skills and strategies …. as defined by the National Reading Panel …. . *My Sidewalks*…. is intense, includes fast-paced instruction delivered to small groups of students for at least thirty minutes per day in addition to their core classroom instruction.

One of the school's teaching assistants has been trained in *My Sidewalks* and provides the instruction for this supplemental program. *My Sidewalks* is designed to be used with groups of no more than six students in 30-45 minute lessons, with time varying for kindergarten students.

The 90-minute reading block is divided into 3-4 sets of activities. The first 15-20 minutes can include a short lesson in a reading skill, or a read aloud or some whole class activity. The next 40-60 minutes are guided reading, during which students are organized into 3-4 groups of 3-4 students, with each group working with a "leveled book." During this time, the teacher circulates among the groups to: monitor progress; provide; mini lessons on skills specific to each group; and sometimes is assisted by the "interventionists" that are part of the school's Literacy Team (discussed below).

Most teachers use the *Literacy Continuum* published by Fountas and Pinnell to aid the teacher in focusing on specific reading skills in the small groups, through there is a belief that more professional development is needed for teaching comprehension skills.

Students also spend substantial amounts of time engaged in "independent reading," much of it done in the library which is popular with the students. The current principal has purchased a large number of leveled books, both in all of the classrooms and in the library to ensure there are enough books in the school to meet the approach used to teach reading. Even with these purchases, there is a general view that more leveled books are needed.

Students also are taught writing for an additional 30-40 minutes, three to four times a week. Teachers typically use the Writers Workshop approach and address the Six + 1 writing traits. The Six + 1 writing traits draw from the work of Ruth Culham. Culham provides training for teachers in how to evaluate student writing in the traits—ideas, organization, voice, word choice, sentence fluency, convention s and presentation—with accuracy and reliability using clearly defined scoring rubrics. There is a Culham book for the primary Grades K-2, and another for Grades 3 and higher.

In the "writers workshop" approach to writing, teachers start with a mini lesson on some writing issue, students write, students then conference with the teacher and then have peer students review their writing (though there is less of this in the primary grades), then the student rewrites and prepares the writing as a final copy and shares it with the class.

The school also created a Literacy Team, which includes the special education teacher, the speech and language special education teacher, the Title I reading teacher (who has been trained in Reading Recovery), and two teaching assistants (both of whom have a BA and one of whom is just short of earning full teacher certification). The principal also is a member. The Literacy Team administers the AIMSWEB assessments three times a year, compiles the results, and then works with teachers to decide which

interventions each individual student needs. Further, members of the Literacy Team also provide targeted assistance to students during "push in" times during regular reading instruction, during the Intervention Block of 30-40 minutes, and sometimes in "pull out" sessions with very small groups of students.

The district (supervisory union) initiated a change in the **mathematics** curriculum to Pearson *Investigations*. According to the Pearson web site:

> *Investigations* is a complete K-5 mathematics curriculum, developed at TERC in Cambridge, Massachusetts. It is designed to help all children understand fundamental ideas of number and operations, geometry, data, measurement and early algebra. The curriculum is designed to:
>
> - Support students to make sense of mathematics and learn that they can be mathematical thinkers
> - Focus on computational fluency with whole numbers as a major goal of the elementary grades
> - Provide substantive work in important areas of mathematics—rational numbers, geometry, measurement, data, and early algebra—and connections among them
> - Emphasize reasoning about mathematical ideas
> - Communicate mathematics content and pedagogy to teachers
> - Engage the range of learners in understanding mathematics.
>
> Underlying these goals are three guiding principles that are our touchstones as both students and teachers become agents of their own learning:
>
> - Students have mathematical ideas. The curriculum must support all students in developing and expanding those ideas.
> - Teachers are engaged in ongoing learning about mathematics content and about how students learn mathematics. The curriculum must support teachers in this learning.
> - Teachers collaborate with the students and curriculum materials to create the curriculum as enacted in the classroom. The curriculum must support teachers in implementing the curriculum in a way that accommodates the needs of their particular students.
>
> Based on extensive classroom testing, *Investigations* takes seriously the time students need to develop a strong conceptual foundation and skills based on that foundation. Therefore, each curriculum unit focuses on an area of content, in depth, providing 2 to 5 weeks for students to develop and practice ideas across a variety of activities and contexts that build on each other.

Teachers in the school were quite articulate in describing their understanding of the bold objectives of the *Investigations* program. Several times they described how students are able to produce multiple solutions to various problems. One teacher even said, "One student seems to think mathematically in Base 5, so his approaches and solutions are always something unique and different."

All the *Investigations* curriculum units include two to three formative assessments, to be used during the teaching of the unit. The curriculum also includes suggested classroom activities as well as common end-of-curriculum unit tests. Thus it appears that in mathematics, teachers implement a pretty consistent curriculum, in that they teach all the curriculum units in Investigations, and use the formative assessments and the end-of-unit tests that are part of the program. These tests are also supplemented in Brewster Pierce with a fall and spring math test.

The typical math class is 65-70 minutes in length with another 10-15 minutes of math at some other time during the day. Classes begin with a 10-minute math warm up. Then there would is 15-20 minutes of direct instruction. This is be followed by 3-4 small groups where students work with the concept being taught, followed by classroom discussions with students who present their various solutions. The class ends with the teacher summing up student solutions and relating the work they completed back to the concepts, knowledge or skills being taught.

The core math program is supplemented by *Fastt Math*, a Scholastic online program that provides students with practice in basic mathematical skills. Students have Fastt Math sessions about four times a week. According to its web site:

> The *FASTT Math* intervention program (Fluency and Automaticity through Systematic Teaching with Technology) uses the research-validated FASTT system to help all students develop fluency with basic math facts. *FASTT Math* assesses all students to uncover fluency gaps and to establish a baseline of fluency for each student. Then, *FASTT Math* automatically differentiates instruction in customized, 10-minute daily sessions. *FASTT Math* ensures that all students, regardless of their fluency level, build the long-lasting fluency they will need to tackle higher-order math.

Fastt Math is available in both English and Spanish, and can be used with almost any school schedule.

Fastt Math is further supplemented by two interventions: *Math Recovery*, which is a tutoring program for students in grades K-2, and the Marilyn Burns developed Do the Math program, a 12-module intervention program that focuses on number and operations for students in grades 2-4. Do the Math targets addition and subtraction, multiplication, division, and fractions.

So the core math program includes for all students a text-based program, *Investigations*, supplemented by *Fastt Math* to reinforce acquisition of basic arithmetic skills, and two major interventions, *Math Recovery* (mainly for students in grades K-2) and *Do the Math* (mainly for students in grades 2-4).

Assessments

In addition to taking NECAP seriously, Brewster Pierce uses additional assessments that are required for the school's overall strategy to continuously monitor student performance so they can provide interventions and extra help when needed.

Several teachers mentioned entering multiple types of student data into the district's VCAT online system. VCAT – the Vermont Common Assessment Tool – was started in this district by Steve Perry, who now is an independent consultant; VCAT was

adopted across the state as a way to track student data. VCAT also includes curriculum and assessment guidelines for reading based on state standards; the system allows teachers to set goals for each student for the year and then to monitor student progress towards those goals over the course of the school year.

Though not used in the same way by all teachers, the school is able to track AIMSWEB data and DRA2 reading data, the formative and common end of unit test data for math, IEP plans, and any other diagnostic or tracking data for students.

In order for all teachers to have a common data system to track student progress in reading, AIMSWEB was adopted as a "benchmark" testing system. AIMSWEB testing is administered three times during the year (though there is discussion at the school to administer it more often), with the results used to help place students into various intervention programs. AIMSweb is a benchmark and progress monitoring system based on direct, frequent and continuous student assessment, focusing on reading skills in the primary grades. It includes both benchmark testing, which is administered three times a year, and what it calls strategic monitoring, which is administered monthly for at-risk student. Brewster Pierce currently uses the benchmark component of the program but intends to use the strategic monitoring component in the near future.

Brewster Pierce also uses the DRA2 reading assessment. The DRA2 is a research-based assessment used to determine a child's independent reading level. The DRA2 is a criterion-based authentic assessment that measures a student's ability to preview and predict a story, fluency in oral reading, and expression the student uses when reading. In a one-on-one conference, DRA2 enables teachers to systematically observe, record, and evaluate change in student reading performance and to plan for and teach

what each student needs to learn next. So by measuring reading comprehension and reading fluency teachers are able to determine appropriately leveled reading materials for instruction and what types of independent reading can be expected from each student.

Many teachers also develop their own "running records" for assessing student progress in reading.

As noted above, the Investigations mathematics curriculum program provides two to three formative assessments for each curriculum unit, as well as common end-of-curriculum unit tests. Both of these are supplemented in Brewster Pierce with a fall and spring math test, which can also be entered into VCAT.

Finally, the school uses the SNAP monitoring assessments for math. This is a research-based formative assessment program designed to assess student mastery of foundational skills in math and to enable teachers to target specific content that students need to secure that foundation. The early math skills assessed with SNAP are predictive of future success in upper grade mathematics performance for students in Grades K-4.

In addition to the assessment instruments described above, the school also uses several other diagnostic assessments in both reading and mathematics, and can further track student performance in both subjects through *Fundations, My Sidewalks, Fastt Math* and *Do the Math*.

Interventions

As described above, the theory of action for improving student performance in this school includes both early interventions as well as ongoing interventions. As a result, the school has a comprehensive array of interventions for both reading and mathematics. The intervention efforts begin in regular reading and math classrooms

where teachers provide targeted help to students individually or in groups during the time they are working in small groups.

Further interventions take the form of additional help from the regular teacher. This year the school created a separate, 30-45 minute Intervention Block every day for every class. This strategy has been developing all over the country to insure that all students are provided extra help by the regular teacher outside of the regular reading and math instructional blocks, before additional and more targeted intervention or extra help, such as reading and math tutoring.

Though the extra help provided during the Intervention Block is provided primarily by the regular teacher, their work is supplemented by a comprehensive group of "intervention staff" who provide extra assistance during the Intervention Block as well as offer additional extra help to students at other times during the day, often pulling students out of elective classes. The school's intervention or "extra help" staff includes:

- One Title I Reading/*Reading Recovery* teacher
- One Teaching Assistant trained in *Math Recovery* (this individual is in the final stages of earning a full teacher license)
- One TA trained in Literacy who teachers the Kindergarten *My Sidewalks* program, and
- Two special education teachers.

These staff provide both within classroom extra help as well as extra help through pull out sessions with small groups or one-to-one help.

In grades one and two, the Reading Recovery Title I teacher uses AIMSWEB and DRA2 to flag kids who need a double dose of reading instruction. This expert reading

teacher also provides similar extra help strategies for the lowest performing reading groups, and for the kindergarten students is assisted by the TA who is trained in *My Sidewalks*.

Intervention programs used in the school include:

- *My Sidewalks* for kindergarten children struggling with phonemic awareness and phonics.
- *Read Naturally*, a reading fluency program. *Read Naturally's* structured intervention programs combine teacher modeling, repeated reading, and progress monitoring to enhance reading fluency. In *Read Naturally*, students read along while listening to a recording of a fluent reader. For repeated reading, students practice reading a story until they can read it at a pre-determined goal rate. Mastering a story helps students build fluency and confidence.
- *SOAR to Success*, a published reading series with leveled books used for slower paced interventions so struggling students have more practice at their appropriate reading speeds. *Soar to Success* at Brewster Pierce is used a reading intervention for students in grades 1-4 who are reading below grade level. It is used in addition to a school's core reading program. Two primary goals of this intervention are: to accelerate students' reading ability, and, to help students to quickly and easily apply the comprehension and decoding strategies they have learned to other content area texts. The ultimate goal of *Soar to Success* however, is to increase students' understanding of what they read through an approach called reciprocal teaching, designed to strengthen reading comprehension and fluency.

- The school had provided Reading Recovery tutoring in the past but those services have been dropped because of budget cuts. Nevertheless, the Title I Reading TA still provides some 1-1 tutoring, but now only to students in grades K-2, with the emphasis on Grade 1.
- FasttMath to reinforce the acquisition of arithmetic facts for grades 2-4.
- Math Recovery, which is a tutoring program for students in grades K-2.
- *Do the Math* in grades 2-4, an intervention to further reinforce acquisition of arithmetic skills.

These extra help strategies and programs, or interventions, are further supplemented by a special education program for students with IEPs. The school has two special education teachers and two special education trained teacher assistants. Table 2 indicates the elements of the core reading and math programs, their program augmentations, key interventions and major assessments.

Table 2

Core Elements of the Reading and Math Programs, Augmentations and Interventions

	Reading Program	Math Program
Core Program	Guided Reading with Leveled Books, K-5	Investigations commercial program, K-5
Core Program Augmentation	Fundations for phonics and spelling, K-3	Fasst Math, for math fundamentals, all grades
Interventions:	MySidewalks for phonics for kindergarten	
	Tutoring for Grades K-3, but mainly Grade 1-2	Math Recovery tutoring for Grades K-2
	Read Naturally, for early grades to improve reading fluency	Do the Math, Grades 2-4 for arithmetic skills
	Soar To Success for help in Grades 1-4 for content reading comprehension	

Assessments:	AimsWeb for tracking reading skills in Grades 1-5	SNAP math assessments for math fundamentals, Grades 1-5
	DRA 2 assessments for comprehension and fluency	Formative assessments in each Investigations Curriculum Unit
	VCAT online management system	VCAT online management system

Professional Development

When the district adopted the *Investigations* program, it provided a range of professional development for all teachers to help them implement the program. Nearly all teachers mentioned this training and thought it was helpful for program implementation. They stated that Investigations has produced the most substantial gains in student performance of all the programs in use at the school.

The school took the lead in providing professional development for its literacy initiatives. It required teachers to take courses on new approaches to teaching reading, discussed literacy instruction and reading curriculum at staff meetings, encouraged teachers to form groups to discuss literacy strategies, and identified books the faculty would read and discuss together; all designed to have the school take a more intentional and school wide approach to teaching reading and writing., The district also allocates funds for each teacher to take one, three-unit course a year at the University of Vermont, which is located about 45 minutes from the school.

The district also has sponsored "Lesson Studies" in reading and math. Each year, there are four lessons in math and four in reading. Groups of teachers in the school are relieved from teaching for the entire day, and with a district reading or math expert,

prepare, teach and then critique lessons on specified topics. However, because of budget constraints, this program might be slimmed in the future.

Currently, the school does not have any instructional coaches and the district does not provide funding for instructional coaches as a normal part of school staff allocations.

The school would like to provide additional professional development but funds have become scare, and there is concern that even the existing professional development programs might lose funding in the future.

School Culture

The prime focus on school culture for this school is to create a strong academic focus inside the school; the goal is to have a culture that stresses academics – reading, writing and mathematics. The initiatives to lengthen instructional time for these subjects and to change the curriculum for both reading and mathematics have contributed to this new academic press.

This academic focus is reinforce by teachers use of common curriculum units in mathematics, the emerging use of common curriculum units in social studies and science, and the more structured approach to reading program. There is a hope that this academic focus could be further reinforced by the result of teacher work in collaborative teams, which began just this year

The school also has addressed student behavior. A few years ago, a student survey found that they felt safe at school and felt respected by the teachers but not respected by their peers. Thus, the school launched a "Positive Behavior Intervention Supports" program. This program provided teachers with strategies to acknowledge positive student behavior on a more timely basis as a way to engender the behaviors of

respect and to reduce referrals for misbehavior to the principal. The goal was to make it "cool" for students to respect and be nice to each other, and take school seriously.

Summary

Brewster Pierce Elementary School has produced significant improvements in student learning by:

- Setting the continuous improvement of student performance in reading, writing and mathematics as reflected in NECAP scores as its major goal
- Requiring more instructional time core subjects including 90 minutes for reading and 90 minutes for mathematics, as well as an additional 30 minutes for writing every day
- Adopting a strong curriculum and instruction program, which has become "guided reading" with leveled books supplemented by Fundations for reading, and the Investigations program for mathematics supplemented by Fastt Math to reinforce the acquisition of arithmetic facts. The school also encourages its teachers to develop and use common curriculum units in all subjects, including common formative assessments, common instructional activities and common end-of-unit tests. This consistency has been attained for mathematics and is developing in science and social studies.
- Providing early intervention in reading by using the My Sidewalks intervention that emphasizes phonemic awareness and phonics.
- Tracking student progress during the year through multiple monitoring assessments and formative assessments, using the district's VCAT online state data system

- Providing a comprehensive set of extra help or interventions to struggling students all through the academic year, including a full 30-40 minutes each day during the Intervention Block, as well as an "intervention team" of about 6 individuals who provide additional help in reading and mathematics. Reading interventions include one-to-one tutoring in the early grades, and *Read Naturally* and *Soar to Success* in other grades, with mathematics interventions that include *Math Recovery* and *Do the Math*.
- Using research-based methods for both the core instructional program and various interventions.

The school recognizes more can be done. It wants to dramatically extend the common free periods so there can be more collaborative teacher work, it wants to embed more technology into the ongoing curriculum and instruction program, it wants more professional development, and it is beginning to focus on achievement at higher levels than just "on grade" level.

AN EVALUATION OF VERMONT'S EDUCATION FINANCE SYSTEM

Colchester High School
Case Study

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COLCHESTER HIGH SCHOOL

Colchester, Vermont

By Allan Odden, Partner, Lawrence O. Picus and Associates

Colchester High School is located on a fifty-acre campus in Colchester, Vermont, a growing and diverse town of 17,000+ people with an active business community. Located on the scenic shore of Lake Champlain, thirty-five miles from the Canadian border and in close proximity to Burlington, the state's largest city, and Interstate Highway 89, Colchester enjoys access to a wealth of recreational, cultural, social and educational resources. Since 1960, the population of Colchester has more than tripled. Colchester is the fourth largest municipality in Vermont behind Burlington, Rutland and Essex.

For the 2011-2012 school year, Colchester High School enrolled about 770 students. The school has experienced declining enrollment from a high of about 800 students. Enrollments are predicted to decline to about 750 students over the next couple of years and then level off. About 25% of students qualify for free and reduced price lunch, though the number could be depressed as most said many students who would quality did not apply. The school has a very small ESL population. About 95 students, approximately 12 percent, have been identified as needing special education services. The graduation rate varies from 97 to 100 percent. For the 2009 school year (the last year for which we have data for all districts), Colchester School District, which includes the high school, spent $12,246 per student for current instructional expenditures minus transportation, below the state wide average of $13,923.

The school draws its students from a community with three socio-economic levels: a very wealthy population with old money, a lower income population who live in four manufactured housing parks, and a small middle class who mainly work in the area at a nearby IBM plant, General Dynamics, a local hospital or a large software company. The school has actively recruited students from the islands in Lake Champlain near Burlington, many of whom bring with them significant educational challenges. The average wage in Colchester in 2008 was $67,069, and the percentage of people living above the poverty level at that time was 93.7%, significantly higher than the percent of students eligible for free and reduced price lunch might suggest.

Colchester High School uses a block schedule for which students meet in each class every other day for approximately 86 minutes. Most classes for ninth and tenth graders last the full-year; classes are a mix between full year and semester courses for eleventh and twelfth graders. The average student has one study hall per semester. As a result, the average amount of instruction time is 5 hours 41 minutes, plus 27 minutes for lunch each day. School starts at 7:45 a.m. and ends at 2:20 p.m. On average each teacher provides instruction for 3 blocks every day and has pupil free time for the other block. Many teachers meet in collaborative teams every other day during their pupil free period.

Improvements in school performance at Colchester High School have been impressive, especially in reading, writing and mathematics, as shown in Table 1. The percent of Grade 11 students performing at the Proficient or above levels in mathematics more than doubled from 2007 to 2010, rising from just 22% to 54%.

In reading, the percent of Grade 11 students scoring at the Proficient and above levels also rose significantly, from 67%in 2007 to 85% in 2010. Even more impressive

was the near tripling of the percent scoring at the Proficient with Distinction level in reading, rising from 17% in 2007 to 46% in 2010. For reading, the percent scoring at the Proficient with Distinction level (46%) exceeds those scoring at just the proficient level (39% = 85% – 46%).

Gains also were produced in writing, with the percent of Grade 11 students scoring at the Proficient or higher level rising from 42% in 2007 to 60% in 2010, an increase of nearly 50% in the number of students reaching this level.

Scores in grade 11 science have not been that high, as will be explained below, but were expected to rise in 2011. The principal stated that science scores did rise by 15 percentage points at the Proficient and above levels.

Except for reading, though, improvements did not occur for the portion of students performing at the Proficient with Distinction level.

Table 1
NECAP Scores for Colchester High School, 2007-2010

Subject and Performance	**2007 NECAP**	**2008 NECAP**	**2009 NECAP**	**2010 NECAP**
Mathematics	**Grades 11**			
Proficient and Above	22%	32%	40%	54%
Proficient with Distinction	2%	2%	4%	7%
Reading	**Grades 11**			
Proficient and Above	67%	74%	73%	85%
Proficient with Distinction	17%	25%	38%	46%
Writing	**Grade 11**			
Proficient	42%	30%	56%	60%

and Above				
Proficient with Distinction	3%	1%	11%	3%
Science	**Grade 11**			
Proficient and Above	--	24%	29%	29%
Proficient with Distinction	--	1%	2%	3%

This case tells the story about how Colchester High School produced these impressive results. It was not from high spending, as the district spends below the state average. It was not from high teacher salaries, as salaries are also below the state average. And it was not from any change in school governance. As is the case around the country with nearly all schools that

produce large, measurable and valued gains in student learning over a 4-6 year time frame, these results emerged from the hard and smart work of teachers. The school implemented a solid curriculum program, established multiple strategies linked to that curriculum designed to help all students perform at proficient levels and above, and created a strong collaborative school culture. Creating a collaborative environment is one of the hardest cultural elements for high schools to establish, but we noted a strong element of collaboration in the school's culture, one where teachers in the school work on everything collaboratively and collectively, are expected to do so, and say they love working in this kind of environment.

The case is based on a review of written documents, including a recent self-study that was part of an accreditation visit, as well as interviews with the principal and nearly all certified staff in the humanities, math and science departments in mid-October. The case is part of a study of the Vermont school funding system being conducted for the

legislature by Lawrence O. Picus and Associates. The case is organized into the following eight sections: staff and class sizes, goals, curriculum, assessments, extra help for struggling students, organization of teacher work into collaborative work groups, professional development, and a summary.

The Staff and Class Sizes

Colchester High School has close to 69certified staff positions that include:

- 1 Principal
- 2 Assistant principals
- 1 Director of student support services (who oversees section 504 compliance, the Education Support team, Guidance Counselors and Special Education)
- 34.4 core subject teachers including 7.2 math teachers, 7.2 science teachers, 15.2 humanities (English and social studies) teachers, and 4.8 world language teachers
- 10.75 elective teachers including 1.2 business, 1.0 health, 3.0 physical education, 1.25 athletics, 0.5 driver's education 1.8 music, and 2.0 art
- 5.95 pupil support staff including 3.0 guidance counselors, 1.75 social workers, 1.2 nurses, and a 35 hour a week nurse aide
- 1.75 library staff
- 0.5 ESL teacher and 1 32 hour ESL aide,
- 1.0 teacher for pupil support in the "time out" room,
- 10.5 special education and section 504 teachers, plus 15 32 hour aides (excluding and addition 8 additional aide positions for more severe disabilities: three for visually impaired students, one for autism, and four for students with IQs below 80)

- 5.0 40 hour a week administrative support/secretarial staff, four who are year round and one who is school year only

In sum, the school has 4 administrators, 34.4 core subject teachers, 10.75 elective teachers, 5.95 pupil support teachers, 1.5 teachers for extra help, 10.5 special education teachers and 15 32 hour special education aides (for mild and moderate disabilities), 1.75 library staff and 5 administrative/secretarial assistants. This amounts to 4 administrators, 64.85 FTE certified teacher positions, 17 FTE aide positions, and 5 administrative support/secretaries. In addition, the school has an alternative school fully staffed and a special program, called Crossroads, for students with very low cognitive abilities. Put differently, there are 9 students for every special education teacher and 12.4 students for every non-special education certified positions.

If each teacher provides instruction for three blocks a day, a school needs 1.33 teachers for every four block period – a core teacher instruction for 3 blocks and then another 0.33 teacher for the fourth block, usually for an elective class. The 10.75 elective teachers are 31% of core teachers, which is slightly lower than 33% and a lower ratio than found in many high schools across the country, which usually have a higher percentage of elective teachers. However, few of those schools have pupil/teacher ratios as low as CHS. CHS's teacher allocations imply the school has put a priority on staffing core classes. This priority is reflected in the school's formal class size policies, which specify class sizes of between 20 and 22 for the core math, science and humanities classes, and higher for other subjects.

Though discussed more below, the School is organized into two "houses," one (Green) for students in grades 9 and 10, and the other (Blue) for students in grades 11 and

12. The goal is to have smaller classes for the younger (Green) and slighter larger classes for the older (Blue) students. Class sizes are moderate in size averaging the following:

Math: Green House 20 and Blue House 22

Science: Green House 20 and Blue House 22

Humanities: Green House 20 and Blue House 22

World Language: 24

Art: 24

Music: varies depending on type of class including band and choir

Business: 25.

Goals

The school has high expectations for all students, coupled with multiple opportunities for all students to perform well. The school expects all students to learn at least to proficiency in is Essential Expectations (described below) for every subject, but anticipates even higher performance because of its focus on problem solving and lifelong learning habits.

The school has lofty but general goals for its students. The mission of the school is to produce students who have expertise in reading, writing, problem solving and good learning habits. The faculty seeks to produce this expertise through differentiated instruction that caters to four different student learning styles – mastery, understanding, self-expressive and interpersonal – based on the work of Silver Stronge and Associates. This year the school has adopted an additional strategy, in their words, of going deeper in differentiated instruction by emphasizing instruction that stresses Rigor, Relevance and Relationships, all designed to produce Life, Career, and Work Ready Students (LCWRS),

arguing that it is the product of rigor, relevance and relationships (R x R x R) that produces LCWRS. Faculty further noted that if any of the Rs are low, the result for LCWRS also is low. They began this "deeper" approach to differentiated instruction by bringing in a Derek Cabrerra from Cornell University, with his Distinctions, Systems, Relationships, Perspectives (DSRP) approach to thinking and problem solving. This deepening of differentiated instruction has become the focus on ongoing professional development and staff meetings.

Complementing these cross-subject elements of effective instruction are essential expectations (EE) for all curriculum content areas. EEs are specific content and concept curriculum objectives for each content area. The strategy is to use rigorous, relevant, differentiated and personalized instruction to teach science, math and the humanities. Together with multiple extra help programs the strategy is designed to help ensure all students learn to high standards. And the school believes that if it successful in these more general efforts, students will score well on the NECAP tests – as long as the school's curriculum is aligned with the content assessed in NECAP (discussed below).

In sum, the school has a "point of view" about good instructional practice, as described above, and has many structures, activities and programs designed to produce a culture of learning that includes a systemic approach to instruction. Further, the school is quite "intentional" about everything it does, including the systems and structures designed to produce its collaborative and personalized learning culture. All this results from a clear goal to have Colchester High School reflect a "culture of learning" for both students and teachers.

Curriculum

This section draws both from interviews and material the school wrote about its instructional program in a recent accreditation review, nearly all points of which were reinforced by commentary during the interviews.

Curriculum generally. CHS is divided into two houses. The Green House/Blue House model recognizes that, in many cases, freshmen and sophomores have different needs than juniors and seniors. Green House students are challenged by a common and integrated curriculum. Both ninth and tenth grade years introduce students to the rigor of high school work within a supportive, collaborative, differentiated setting, while preparing students for the independence they will encounter in the Blue House.

In humanities, students in grades 9 and 10 receive their English/social studies curriculum through an interdisciplinary team taught model. All freshmen are enrolled in *Thinkers and Revolutionaries*, a required grade 9 humanities course that meets daily all year long for 2.0 credits. Each class includes two teachers – one English and one social studies – and has no more than 46 students. In grade 10 students are required to take *American Experience* a two credit course that meets daily. This course meets every day, has two teachers and no more than 46 students. Beginning in 2007, students in the Green House could earn Honors distinction through high achievement on the Habits of Learning Rubrics used in many Green House courses.

Courses in grades 11 and 12 – the Blue House – are more typical subject area courses. Advanced students can earn "honors" in many of these courses by fulfilling the honors contract for that course. Several AP classes are offered as well.

When Vermont adopted the NECAP assessments, the Colchester math, science, and humanities departments began to align the school's curriculum to ensure that the skills assessed on the NECAP were being taught in the school. The social studies curriculum revision process began during the 2010-2011 school year, math in 2009-10 and science more strongly this year. These initiatives were a result of what was perceived as unacceptably low statewide test scores.

In addition to addressing curriculum content specifically, Colchester High School places an even stronger focus on instructional practice per se, as discussed above in the goals section. Generally, the phrases the school uses to describe the instructional practices it wants teachers to use are: personalization, differentiation, active engagement, higher order thinking, application, problem solving, and continuous instructional improvement. These pedagogical emphases are expected to encourage students and teachers to develop strong "Learning Habits." For many years, the school has stressed and honored habits that promote learning in various forms. The structure of these habits evolved from "Habits of Mind" (based on Costa and Kallick's work) to "Habits of Learning" to "Learning Habits."

CHS implements *differentiated instruction* in terms of "learning styles," based on the work of Silver Stronge and Associates. Teachers of all subjects are expected to "personalize" and "differentiate" instruction for all students. Differentiation is defined as addressing four different learning styles: mastery, comprehension, interpersonal and expressive. And in recent years, differentiation has included a focus on rigor, relevance, and problem solving. As shown below, teachers use these frames to personalize

instruction by allowing many assignments to be addressed by students according to their various learning styles.

Further, according to the school's recent self study,

> Teachers are to use instructional strategies that in the first instance engage students as active learners at CHS. Throughout the school and across all disciplines, students are actively involved in their learning process and teachers act as coaches supporting students. Teachers use a variety of instructional strategies to engage students, such as Socratic seminars, chalk-talks, partner interviews, think-pairshare, investigations, laboratory experiments, examination of primary sources, student presentations, and skits. Specific projects that are student centered include the Energy Project, Essential Topics projects, Art Show, the school store, and the Heritage Project and Gallery.
>
> Teachers also use instructional strategies designed to involve all students in higher-order thinking to promote depth of understanding. Course curricula are developed using the backwards design model and are planned using the Know Understand and Do model. The understanding category of the KUDs and the essential questions that courses pose promote depth of understanding. In Humanities courses, students practice a method of questioning the text where they pose, answer, and find evidence to support their analysis and interpretation. In Green House Humanities courses, students work on summarizing, analyzing, interpreting and evaluating transactional, poetic, and narrative texts. Students are engaged in current events assignments and persuasive writing in a variety of courses. In science classes, students are often given a question or problem and asked to design their own approach to investigate further or solve the problem.
>
> In addition, teachers use instructional strategies that provide opportunities for students to apply knowledge or skills through large-scale projects such as Senior Seminar, Science Essential Topics Night, math projects, Heritage Project, and through opportunities such as Options credit, internships, pen pal letters, and art shows. Almost all teachers (95 percent) say their lessons provide opportunities to apply learned concepts in new situations. (The above is an edited version of the self study report).

Moreover, teachers are supposed to use instructional strategies that provide opportunities for students to self-assess and self-reflect. The faculty promotes student self-assessment and self-reflection, and students often have the option of assessing their own achievement.

In CHS, personalizing instruction also includes knowing students academically before many courses are taught, including getting to know the students when they

transition into the school from the junior high school. The faculty conducts a learning styles inventory for each incoming student and most grade 9 teachers conduct some sort of pre-assessment at the beginning of the year to understand each students' current academic knowledge base.

Personalizing instruction also includes students' access to teachers and to opportunities for one-on-one help. Teachers want students to feel comfortable going to their teacher for help and surveys indicate that students do feel that way. In addition to making appointments with teachers for individual help after school or during study halls, students at CHS are able to access the Writers' Workshop, Math Center and Homework Club to get individualized instruction, each of which (discussed more below) was historically covered all day long by a retired teacher. Teacher Advisory, Senior Forum, Special Education, ELL, Strategic Study, Strategic Reader, and Strategic Math, Colchester Alternative Program, Target Graduation, college connections, and alternate senior year are all designed to support and individualize instruction. Some are designed to meet the individual needs of students whose needs have not been met through traditional coursework or through the traditional school setting.

Finally, teachers are involved continuously in a process of improving their instructional practice. Teachers regularly use feedback from other teachers as a means of improving instruction, and teachers sometimes use feedback from students, supervisors and parents as a means of improving instruction. Teachers garner feedback via Collaborative Work Groups (discussed more below), department meetings, the Colleague Consultation teacher evaluation component, the shared drive, peer teacher observations, new teacher mentoring, and more. In some departments, teachers are able to receive and

give feedback and to discuss improvements to instruction via team teaching, common planning time, and paid curriculum hours.

And last, the discussion of instructional strategies and their improvement are significant parts of the professional culture of the school. These discussions often support the philosophy and practice of differentiated instruction, research on brain development, and research on best practices in teaching. Faculty implement the model of professional learning communities called Collaborative Work Groups (CWGs) by forming small groups that closely examine the effectiveness of particular instructional strategies on student learning. Faculty and department meetings and in-service days are often devoted to the discussion of instructional strategies. Most teachers use the shared drive to develop, share, and access common materials for courses. This fosters conversations about instructional strategies. The agreement to share materials and strategies across the entire faculty, such as the Style Manual and reading strategies, promotes further discussion of instruction.

More specifics on curriculum/instructional changes behind the school's success. Teacher interviews reinforced the above descriptions of the school's instructional approach and also provided more detail on subject matter curriculum change teachers believed also were important factors in the student performance gains. One key curriculum initiative was that the school actively aligned its curriculum not only to the concepts and standards assessed in the NECAP tests to insure that every student was exposed to the content in the test, but also to the various ways the NECAP assessed student achievement in various content area.

Math. Typically, the math curriculum provides Algebra I in Grade 9, Geometry in Grade 10, Algebra 2 in Grade 11, and then various more advanced math classes, including Calculus and AP math. About 20-30 percent of incoming freshmen have taken Algebra in the eighth grade, so about 20-25 percent of freshmen are in Geometry classes. Nearly all students have completed Geometry by the end of Grade 10, so generally are prepared for the NECAP which is given in the fall of students' junior year.

The math department believes that one reason student scores doubled in mathematics was because it worked hard to align the math curriculum with the NECAP assessment. Though basically covering Algebra I and Geometry, the Grade 11 math NECAP also includes some elements of Algebra 2 such as quadratic equations. Further, the geometry portion of NECAP includes substantial algebra as well; for example, when comparing two angles, the problem will not just have whole numbers but could have an algebraic form , like 3x +7, as the size of the angle, so requires algebraic equation solving to make a correct conclusion. Further, the NECAP includes more data and statistics than the school had included in its Algebra 1 and Geometry courses. So the department took seriously the curriculum scope embedded in NECAP and altered the school's curriculum so all students who took Algebra 1 and Geometry would have covered all content tested by NECAP.

The math faculty also modified approaches to testing during the teaching of Algebra 1 and Geometry to give students experience with the various ways NECAP structured test items – not the same items, but the same form as NECAP items. For example, the "do now" problems teachers use to start each class are often a NECAP-type problem, at least in most 9^{th} and 10^{th} grade classes. Educators in Vermont have access to

previous NECAP items and NECAP sample problems, so these are incorporated into the opening of many classes. The department also organizes the practice problems so they cover the four major mathematical strands assessed in NECAP – numbers and operations, geometry, statistics and probability, functions and algebra.

The math faculty do not see this practice as a problem; these are warm up problems, typically used in all math classrooms, so do not reduce core instructional time. Further, after NECAP practice items are covered, math classes then focus on practice ACT and SAT problems for juniors and seniors getting ready to take these college admission exams. So the math faculty seamlessly integrated NECAP practice into the ongoing instructional program, thus providing practice but not by diminishing instructional time.

During the alignment process, which occurred in Collaborative Work Groups (CWGs), discussed below as another strategic element of the school, the teachers who taught the same subjects – Algebra 1, Geometry, Algebra 2 – decided that all instructors of the same course should teach the same units, generally at the same time, using a set of core instructional activities, lesson plans, formative assessments, and projects for each curriculum unit, as well as the same end-of-unit assessments, the same end-of-semester and the same end-of-year final exams. As one math teacher said, "Math teachers no longer work by themselves; everything is coordinated and developed with other teachers." And another added, "There is no single math class taught individualistically."

The intent of this collaboration and consistency was twofold: 1) to ensure that all students taking the same math course would be exposed to and taught the same material, and 2) to ensure that students, who for whatever reason needed to change teacher during

the school year, did not lose time or content when the change was made. Producing this consistency in math courses also provided a specific focus for teachers collaborative work on math curriculum and instructional issues.

Beyond the specifics of the content in math courses, math teachers also attempt to provide applied problem solving activities in all math classes. For example, as the school is close to a ski area, one problem set, which required solving a system of equations, posed the question of which is cheaper per day of skiing: purchasing a package of X days at a certain price, paying the daily rate, or buying a season pass. In trigonometry, the teachers asked students to pick something like tidal waves or the predator-prey cycle, and plot the curve that represents that phenomenon.

Further, in an effort to provide multiple opportunities for Freshmen and Sophomores to do well in math classes, the department identified all the core math concepts in Algebra 1, 2 and Geometry and developed mid-week as well as end-of-week tests, in addition to end-of-unit tests. If students score low on the mid-week or weekly exams, the teacher provides time for the student to retake the lessons for the concept (e.g.. during study hall, or before and after school), with the point being to have the students learn the concept before taking end-of-unit and other more consequential tests. This initiative provided a mechanism for students to "double up" on instructional time for math concepts that provided learning challenges, with the goal of improving understanding and subsequent performance on school course exams as well as NECAP.

Finally, the math department has operated a Math Center for several years. The Math Center is a room where students can go any time during the day for extra math help. The Math Center has been particularly helpful for students struggling with specific math

concepts. Until this year, the Math Center was staffed by a 32 hour retired teacher paid at the rate of an instructional aide. Those dollars were cut this year, so math teachers cover the Math Center as one of their "duty" assignments, but there is concern that this is not a sustainable long term approach and loss of the Math Center would jeopardize student performance in math. It is a major way the math department provides extra help for struggling math students.

In short, the math department aligned the Algebra 1 and Geometry to insure it covered all content in the NECAP, gave students practice in the types of items that would appear on NECAP, extended the collaborative approach to aligning the curriculum to create a set of common curriculum units for both Algebra 1 and Geometry to insure all students were taught the same material in with a core set of activities and instructional strategies, incorporated applied problems solving activities in all math classes, created a set of "math concept" exams that supplemented the regular curriculum and provided students extra opportunities to learn the concepts if they did not know them, and created the Math Center to provide students extra help in math during the entire school day.

Science. About ten years ago, Colchester High School adopted a strong, "constructivist," inquiry-based approach to science. Students would do a laboratory experiment, collect the data, make graphs, analyze and interpret the data, come to conclusions, present the project to students in the class, and write a report. There was a concerted effort to minimize direct instruction to provide more opportunities for students to engage in learning just like a scientist. At various times during the year, the teacher might show how student work related to actual science theories. This approach was incorporated into the non-AP classes of "essentials of physics" and "essentials" of other

science areas such as chemistry and biology. AP classes were more structured. Science teachers were very satisfied with this approach and believed it was teaching students to understand what science actually was – a process of inquiry not just a lot of memorized names, formulas and procedures.

This approach produced significant challenges when Vermont adopted the NECAP test for three reasons: 1) NECAP was about half multiple choice questions on science content, 2) NECAP did include constructed response but it was on specific scientific processes, and 3) NECAP sequenced the science content – earth science, biology, chemistry, physics – differently than the school had structured its science curriculum. The result was very low student NECAP scores in science.

Responding to the challenges posed by NECAP was difficult for the science department, many of whom had real issues with the multiple choice part of NECAP, and all of whom knew that major change would be required to revise the science curriculum so that it aligned better with NECAP.

The major content sequencing problem was that the NECAP test, given at the end of the junior year, covered earth science and biology as well as both chemistry and physics, though the typical student took earth science in grade 9, biology in grade 10, either chemistry or physics in grade 11 and the other in grade 12. This meant that all juniors would score low on NECAP because they had missed either a chemistry or a physics class. Remedying this sequencing issue was not easy. The final strategy was to have students either double up on science in their junior year, taking a full year of both chemistry and physics, or take a yearlong class in either and a semester class of "essentials" in the other subject. The department would have been less challenged if the

science NECAP was given at the end of the senior year, after all four yearlong courses could be taken, but that was not the state approach.

The science department also struggled with becoming comfortable with the NECAP format, both because it interfered with a curriculum and the assessment systems that had been developed over several years and felt to be effective by the science faculty, and because of its focus on so much subject matter content knowledge. Nevertheless, the science curriculum has been adjusted to more fully align with the content sequencing of science and now many juniors take two kinds of science courses to insure that they are taught all the science content that is included in the NECAP assessment. Making these changes took considerable time and full alignment was not possible until the 2010-2011 school year, and that year the school's science scores rose by 13 percentage points, according to the principal.

Because of its focus on pedagogy in designing the initial science curriculum, the science department has taken differentiated instruction quite seriously. Indeed, the science department has been quite inventive in incorporating differentiated instruction into its courses. Some students are required to do work using all four learning styles – mastering the requirements of worksheet, reading an article and demonstrating understanding of its content, creating their own "substance" and a phase diagram for it for expressive students, and for interpersonal approaches working with another person and using role playing for explaining a scientific process. Lab reports cover both the mastery and understanding learning styles; some teachers allow expressive students to write a newspaper article on the data rather than write a formal lab report, and others allow interpersonal oriented students to do team lab reports. The point: even a "hard"

subject department such as science has found multiple ways to integrate the school's approach to differentiated instruction into its practice.

Humanities. The social studies and English teachers, i.e., the humanities teachers in this school, also have worked to align their curriculum to the concepts and skills covered in the NECAP reading and writing tests, but did not have a great deal of realignment to do. Humanities teachers also provide for some NECAP test practice throughout the year, but many of the tasks were already included in the curriculum, such as the ability to write a persuasive essay. Though such essays are part of the NECAP test and practice for it is part of the curriculum, the department believes that the ability to write good persuasive essays is an important academic skill and that focus has been part of CHS' curriculum for a long time.

There is heavy emphasis in all courses on writing and practice writing as well. During the six weeks before the grade 11 NECAP writing test, the department has something called the Big Game. Students are assigned writing in each of the six writing types on the test, students peer edit, evaluate other writing examples, and receive editing feedback from their teacher. The process is structured in part so students understand what a 4, 3 and 2 score on writing means. Student practice in making judgments about the writing of other students helps them to understand overall writing expectations and to improve their own writing. The program has a considerable amount of writing, feedback on writing, and student reflection about their own writing – all three activities that lead to better writing. Furthermore, if during these activities the teacher discovers systemic problems, the humanities teachers weave the missing skills into the ongoing curriculum.

A few years ago both the faculty and students viewed standardized testing as an "intrusion" into the instructional program. However, over the past several years the perspective has changed as humanities teachers viewed the skills on the reading and writing NECAP tests as skills students need to be successful. This has led both faculty and students had to take the test seriously. With this perspective, the test results could be and are now actually viewed as a reflection of what students have achieved as a result of the quality of the instruction in reading and in writing skills.

In addition, the humanities department takes seriously the school's emphasis on personalizing instruction for all students. Through inventories of learning styles, pre-assessments at the beginning of curriculum units and formative assessments during the teaching of units, the humanities teachers get to know the academic strengths and shortcomings of each student, including their preferred learning styles. They then tailor instruction for each student, expect every student to achieve at high levels, and provide extra help to aid students in doing so. Further, in the Green House (grades 9 and 10), humanities teachers instruct their students every day (as compared to most other courses which meet every other day) so have more exposure to their students, get to know them more quickly and so can tailor instruction more quickly, and get to know each student's academic struggles so can address them quickly and "work them" out sooner rather than later.

In addition to the continuous emphasis on writing, the humanities curriculum is also focused intensively on reading skills in all courses, and reading and writing are inextricably linked. The strategy is to have students write about something they have read. In grade 9, the department focuses on something called "strategic reading," which

focuses on students' struggling in reading and emphasizes vocabulary needed and reading strategies. Students are given extra practice in summarizing, analyzing and interpreting reading materials. Every night students are assigned something to read and then asked to write something about the book or reading materials that represents an element of fiction reading – something about the character, the setting, rhetorical style, symbols, etc. .

In grade 10 the department has a set of core reading books that all students must read, and writing assignments are linked to each book. And various writing assignments are designed to reinforce various reading skills, both for fiction reading and information texts, the latter focusing on such issues as subject, objective, audience, speaker, and tone. Further, across various subjects, the activities include having students questioning the text with three levels of questions:

a. Level 1 concerning the content of the text
b. Level 2 requiring some interpretation, having to think about the selection and at times reading "between the lines,"
c. Level 3 relating the text to broader world, and larger themes and ideas not explicitly embedded in the text but linked to it.

In sum the department's strategies are to teach English and social studies through integrated curriculum units, all of which stress multiple elements of good reading and writing. Put simply, the department takes reading and writing across the content areas seriously and sophisticatedly.

As implied in the above discussion, the humanities teachers have worked collaboratively over the last several years to have common curriculum units, common

approaches to rubrics used to score student work, and consistency throughout the entire humanities instructional program. Such common elements include:

- the vocabulary embedded in the writing and reading strategies taught to students
- formative assessments, which this faculty defines as low stakes assignments to give students early feedback on an academic task, such as writing a persuasive essay. Humanities teachers are give common formative assessments at various times during the teaching of a curriculum unit to determine whether any student is not learning.
- developing and using common rubrics for grading, especially during the junior year when the rubrics are aligned with NECAP test areas
- showing students teacher examples of student assignment, so having teachers do specific assignments and then using them as examples for students
- devoting portions of faculty and department to the work of CWGs, which has including persuasive writing for the 10th grade team, reading strategies such as graphic organizers and how to read texts closely for all teams, and using such common approaches to reading across all curriculum units
- using CWGs for several years to develop new team approaches to instructional strategies. Teachers select a group to work with, work to develop the new instructional approach during the school year, report it out at the end of the year to all faculty, and assess impacts in terms of student performance gains. Indeed, this approach helps insure the high achievement of the school's students. Through all the CWG and PD work done in the school, the conclusion of whether the initiative was effective is determined by the quality of student work it produced.

As several teachers noted with others nodding, "The question is: did the instructional initiative improve student work; the way to put students in a position to perform well is by making the "test" of all instructional change efforts be the quality of the student work that resulted."

- putting all their products on the share drive for everyone to access; the humanities faculty are totally open with classroom instructional activities and pedagogical practices; the goal is for every teacher to have access to everything each other teacher does

The humanities department approach to providing extra help for struggling students include:

- In the first instance, differentiation that seeks to personalize instruction for all students. And as the above documents, all teachers take this instructional approach seriously, comprehensively and sophisticatedly. There are multiple mechanisms that help teachers to know the strengths and weaknesses of each student and to tailor instruction to maximize student learning.
- Strategic reading and strategic math in grade 9, which are a separate classes for students not on in IEP, created to provide students with reading and math struggles the expertise needed to do well in all subjects. The departments would like a grade 10 strategic reading and math class but the budget cannot support them at this point.
- Writing workshop which is a center open all day; students can go there on their own or be referred by their teacher to get extra help in writing. Though covered by a retired teacher in the past, coverage is now an official "duty" during the day.

- Homework club
- An education support team of "volunteer" teachers who focus on students "starting to fall through the cracks" and provide them extra help outside of the regular classroom
- A strong, comprehensive, robust and large approach to special education, for students with IEPs.

But nearly everyone interviewed stated that the major approach to helping struggling students is for all teachers to know their students really well; if the student is struggling, then teacher should provide extra help – after school, before school, or during seat work. The foundation of the school's approach to extra help is providing individualized attention for all students and having teachers making themselves available for providing extra help outside regular class time. This approach both reduces the need for specific extra help and insures that core instruction and the work of "regular" teachers are as effective as possible.

Assessments

In addition to the above curriculum and instructional approaches, when NECAP was adopted the school decided to do nothing the first year and to see what the test scores showed. The scores were low, and the school was not happy. So in the second year, the faculty looked at individual student scores – who scored 2, 3 or 4 on the NECAP, and concluded that their students could score much higher and decided to make some changes. First, as noted in the above department discussions, the school studied alignment between the school's curriculum and the content on the NECAP assessment. It

found many gaps and began to modify the school's curriculum to align it more with the content standards embedded in the NECAP test

The next year scores rose some but not much. That year the principal surveyed every member of the senior class who took the NECAP examination; the survey asked the students about the test: were they prepared, did they try hard to do well, were they motivated, what could CHS do to motivate them on the NECAP, and so on. And they found that many students blew off the test, did not try to do well, and did not use all the time allowed. The students also said the state test had no meaning for them, did not impact their life, their classes or their life after high school, and that colleges did not care about NECAP scores. So another factor producing low NECAP scores was low student motivation to take them seriously and do well. The students also gave suggestions via the survey to school officials on what they could do to help the students to take the NECAP seriously and to motivate them.

The school decided it needed to incent the students to take the test seriously, and to help the school show through NECAP results just how high performing its students were. The principal became the leader of a very serious effort to have the students in grade 11 take the NECAP seriously and score as high as possible on it.

Every year the principal goes into every grade 11 English class; this insures that she is in front of every student in the high school who will take NECAP tests. During this time, she goes through a 15 minute PowerPoint that states why the NECAP is important – some key reasons being that parents and non-parents in the community want the school scores to be high, view the scores as reflecting the quality of the school, and are crucial in raising tax dollars for the schools budget. She also informs students that

NECAP scores are now placed on their high school transcripts as another indicator of overall performance. She shares historical data on school performance, beginning with 2007, showing how the initial scores were low and embarrassing. To encourage every student to do well on the tests, she identifies the incentives the school has developed which are that over the two weeks during which the tests are given the school will:

a. Lighten up on homework
b. Have no assignments due on test days
c. Provide an exemption from the final exam in a tested class subject, if the student earns a 3 or 4 on the NECAP, requiring a 3 or 4 in both reading and writing to earn the exemption in English
d. Provide a pizza party if this year's students do better or at least as well as last year's students
e. Informs this year's junior class that doing well on this year's NECAP will be hard because last year's junior class, now seniors, did so well, so the principal challenges each junior class to do better than the previous junior class (which hopefully provides additional motivation to do better)

The last slide in the PowerPoint presentation shows the NECAP scores for Colchester's strongest rival school, and the principal ends by asking the juniors if they can do better than that rival school – and of course, the chorus response is, "Yes we can!"

Finally, on the day before the first test begins, the principal brings all juniors into the gym and gives a motivating speech; at that convocation, the English head discusses the logistics for all the tests, including the provision that every student will be in a small classroom with their proctor being a teacher with whom they had a class. This latter

strategy was designed to help students be as comfortable as possible in the test taking situation, with a familiar adult in the classroom.

While the school takes NECAP seriously, it uses assessments far beyond those in NECAP. In fact, teachers at CHS use a wide variety of assessment types and strategies that reflect the school's commitment to differentiated instruction. Assessments range from traditional tests, quizzes and homework to projects, writing pieces, portfolios and presentations. They are frequently differentiated based on student readiness, interest and learning profile and require students to think critically and creatively. Assessments reflect the Essential Expectations (EEs) through course-specific and school-wide rubrics. The EEs were developed and approved by the CHS faculty with the support of the district and School Board. These EEs reflect the skills at the "heart of all learning," the skills students need to be "fulfilled, responsible and involved citizens."

As discussed above, some departments have grade-level common assessments and assess student work directly with EE rubrics or with rubrics that include EE language. Most teachers are able to provide examples of how EEs are addressed and assessed in their courses using course-specific rubrics. In sum, assessments at Colchester High School include:

- Clearly articulated Essential Expectations for student performance that are used in courses throughout the school.
- A wide variety of formative and summative assessment strategies and technique including writing across the curriculum, portfolios and presentations outside of school hours that incorporate artistic and technological skills and peer and self-reflection.

- An innovative and collaborative faculty who routinely use data to inform instruction and creatively use time provided to develop new assessments and revise current ones.
- A commitment to differentiated instruction with assessments routinely differentiated by process, product, learning style and readiness.
- Time for faculty to work on continuously improve its battery of assessments often through specific work of CWGs.

Extra Help for Struggling Students

For each department, Colchester High School has a sequence of elements designed to provide extra help for struggling students, beginning with accommodations within classes, sometimes specific courses for freshmen to get them prepared to do high school work (e.g., strategic reading in humanities), sometimes "extra" curriculum emphases (like math concepts in mathematics), systemic exposure to the content and form of NECAP testing, and other activities spanning the range from one-to-one help to special education that include:

- Differentiation that seeks to personalize instruction for all students
- Strategic reading in grade 9, which is a separate class, was created to provide students struggling in reading with the expertise needed to do well in all subjects. The department would like a grade 10 strategic reading class but the budget cannot support one at this point.
- Writing Workshop and the Math Center both of which are open all day; students can go there on their own or be referred by their teacher to get extra help in writing and math. Though covered by a retired teacher in the past, coverage is now an official "duty" during the day.

- An education support team of "volunteer" teachers who focus on students "starting to fall through the cracks" and provide them extra help outside of the regular classroom
- Homework club, but the late bus for students in this program might be cut from the budget
- IEPs for students with identified disabilities, but
- The major approach to helping struggling students is for all teachers to know their students really well; if the student is struggling, then the regular course teacher should provide extra help – after school, before school, or during seat work. So the foundation of the department's approach to extra help is providing individualized attention for all students and having teachers making themselves available for providing extra help outside regular class time

The department also noted that Colchester has an alternative school, staff separately, that now enrolls about 20 students, but there always is a waiting list of students desiring to get into this different environment.

Organization of Teacher Work into Collaborative Work Groups (CWG)

It would not be an overstatement to say that this school is infused with the Collaborative Work Group (CWG) approach to teaching and learning. Though not true for all classes, nearly all teachers who teach the same course – algebra 1, Spanish 1, Thinkers and Revolutionaries, American Experience, biology – have significant common planning time. During these times, teachers plan curriculum units together, the lesson plans and instructional activities, the projects, formative and summative tests, mid-term and final exams, etc. Since every teacher has 86 minutes daily for planning time, there is

ample time over the week for teachers to meet in collaborative groups as well as have time for their own work.

All teachers at CHS are required to grow professionally and take risks in their classroom. Each faculty member is required to be a part of a Collaborative Work Group (CWG) each semester. Collaborative Work Groups meet twice monthly afterschool and each CWG has their own goal with the purpose of improving their instruction. At the end of each semester each Collaborative Work Group presents a summary of their work to the faculty as a means of showing the rest of the faculty new tips or strategies that they can use to improve their own instruction.

Multiple school initiatives focused on improving instruction are funneled through CWGs. Though in the past, the CWGs had wide freedom to address any issue, the school concluded that the multiple individual CWG initiatives did not add up to a systemic approach on anything: there was lots of action but little forward movement. Thus, several years ago, the principal required that CWGs focus on differentiated instruction; some CWGs could be cross subject; and others within a subject or the same class. But all had to address specific new ways to implement a differentiated approach to instruction.

Last year the theme for CWGs was on formative assessment, and how to incorporate them into ongoing instructional practice; the math concepts discussed above were one result of this work. CWGs generally developed the new approach during the fall semester, and then implemented it during the spring semester. The "test" of whether the new approach worked was whether student performance improved; it was not effort or intention, but whether the initiative boosted student performance that determined if it was an effective initiative. At the end of the year, each CWG reports their instructional

innovation to the full faculty, describing the degree to which it worked, and if it did, implications for better instructional practice in other subjects. In the future, some CWGs will focus on peer instructional review, as some teachers were recently trained in peer review evaluations. In all these ways as one teacher said, CWGs produce a "deprivatization" of instruction; instruction is open, collegial and meant to be systemic and consistent across the entire school.

Products of CWGs are multiple and include:

- Pre-assessments in many courses, including assessments that identify misconceptions in science
- Formative assessments, like the math concepts tests, which are meant to give formative feedback to both teachers and students, to help improve performance on end of unit of final tests
- Rubrics for assessing student work, including rubrics for laboratory reports in science that have "slimmed" such reports to their essential elements
- Do Now problems for starting classes that both cover core concepts and provide NECAP practice
- Multiple ways to differentiate instruction and student projects in all subjects.

CWGs are also quite structured. This year teachers choose to join a CWG; teams cannot exceed 4 teachers. They must meet six times a semester and some meet more often, and then share their idea at a full faculty meeting. To insure that all CWGs actually meet and work, the principal assigned "sister" CWGs to every CWG, and required each CWG to meet with its sister and report progress twice during the semester. This placed

accountability for CWG work at the peer level, because it was embarrassing to report no work to a group of peer teachers.

Professional Development

The school's approach to professional development is structured and quite specific. Initially issues are identified, both from weekly administrator "instructional walk throughs" as well as from ongoing CWG work and department requests. Once identified, experts are invited to address the issue at all faculty sessions. Following the expert address, ongoing work on various aspects of the issues is devolved to CWGs, which is the school's way to address specifics that need to be addressed and to get new elements into ongoing instructional practice.

For 2011, the school created a professional development committee to work with them to identify professional development needs for the faculty and to determine how to address them.

Summary

Colchester High School has produced significant gains in student performance in math, reading and writing and hopefully set the foundation for a gain in science scores. In math, the percent of grade 11 students performing at the proficient and above more than doubled from 2007 to 2010, rising from just 22% to 54%. In reading, the percent of grade 11 students scoring at the proficient and above rose from 67% in 2007 to 85% in 2010; even more impressively, the percent scoring at the proficient with distinction level almost tripled over that time period, rising from 17% in 2007 to 46% in 2010. Gains also were produced in writing, with the percent of grade 11 students scoring at the proficient or higher level rising from 42% in 2007 to 60% in 20120, close to a change of 50%. And

the science scores at or above proficient rose by 15 percentile points to 44 % in 2011, according to the principal.

There are eight key factors behind these impressive student performance gains:

- **First**, the school has high expectations for student learning. It expects students to meet or exceed all Vermont standards, and be able to apply academic concepts to applied problems and analyses in new contexts. It expects students – and teachers – to develop solid "learning habits" and be strong readers, writers, and thinkers.
- **Second**, the school takes NECAP testing seriously and in all tested subjects has aligned its curriculum to the content in the NECAP tests as well as the form of testing used by NECAP. It incorporates "practice" NECAP testing into its curriculum in seamless ways and provides incentives and motivation for students to do well.
- **Third,** CHS has high expectations for faculty work; it expects teachers to "model" behavior in a learning community, to take academic learning seriously, to continuously improve their instructional practice and to work hard every hour of every day as part of developing culture of "effort.
- **Fourth,** CHS expects all teachers to personalize instruction for all students, not only during regular classroom hours by administering learning styles inventories and using common formative assessments but also by being available outside of regular classroom hours to provide extra help to any student needing it.
- **Fifth,** CHS has a particular view of effective instructional practice that gives teachers strategies for personalizing instruction. It expects all teachers to differentiate instruction according to four student learning styles – mastery,

comprehensive, expressive and interpersonal. It is going deeper into this instructional array with a specific approach to problem solving called DSR: distinction, systems, relationship and perspectives. It also has multiple approaches to involve all students in higher-order thinking to promote depth of understanding. The school's point-of-view about effective instruction also provide opportunities for students to apply knowledge and skills through multiple applied projects. Teachers also use instructional strategies that provide opportunities for students to self-assess and self-reflect. And it enhances this impressive array of instructional strategies each year by having groups of teachers create new specific strategies in all subject areas through focused work in Collaborate Work Groups (CWGs).

- **Sixth,** CHS faculty provide all students with consistency of instruction and exposure to academic content in all topics by having each department collaboratively create common curriculum unit for all major classes, including common formative assessments, lesson plans, instructional activities, end-of-unit and end-of-course examinations. Teachers at this school teach only collaboratively developed classes; no one teaches individualistically.
- **Seventh,** CHS has created a strong and cohesive collaborative and professional school culture through the creation and hard work of teacher collaborative groups. Collaborative groups can meet every other day for up to 86 minutes, have assignments to create new elements to their instructional repertoire, share those new strategies with all teachers, and test every new strategy as to whether it boosts student learning. Through the CWGs, which at various times operate

within and across departments, CHS has created common high expectations for all students, "deprivatized" instructional practice, made effective instructional practices public, "enforces" deployment of effective instruction through both peer pressure within departments as well as periodic "walk throughs" by the school's administrative team, and assumes accountability for student achievement results – including NECAP scores. In this school's culture, collaborate effort and hard work produce results.

- **Eighth,** the school provides a series of linked strategies to provide as many students as possible with "extra helps" so they can meet or exceed academic performance standards, including:
    - A strategic reading class for freshmen who need to strengthen reading skills.
    - A math concepts addendum for all freshmen math classes that ensures that all students know a core of foundational math concepts by the end of their freshmen year.
    - Writer's Workshop and Math Center, which are open all day long for students to get extra help in either writing or mathematics. Formerly these classes were covered by a retired teacher but are now covered by teachers as a "duty."
    - A Homework Club, for academic help after school.
    - An education support team of teachers who seek to find students at-risk of "falling through the cracks" and insuring they receive extra help.

- A robust special education program providing a final intensive set of instructional helps, including a special program for academically challenged students.
- An Alternative School for students who have difficulties performing in the regular school culture.

But the prime factor making all these extra help strategies work is a strong foundation of having all teachers know each of their students really well so that if any student is struggling, the regular teacher is the first to provide them extra help, before school, during school or after school. Students who need it receive significant extra and personalized help before they take advantage of the additional multiple help systems the school has created.

CHS is a strongly collaborative culture with high expectations for teacher and student work, a point of view about good instructional practice, a relentless focus on continuous improvement, an "intellectual" environment of continuous learning, and a belief that effort and work produce results – better teaching for the faculty and better performance for students, including continuously increasing scores on NECAP, not only at the proficient but now at the proficient with distinction level as well.

Finally, the school is well organized and managed, with systems and structures that help facilitate all the collaborate work and teaching that is done. Put differently, this is an "intentional school; things don't just happen at this school; they are planned, worked on and implemented school wide, with everyone having to participate – teachers and students.

AN EVALUATION OF VERMONT'S EDUCATION FINANCE SYSTEM

Montgomery Elementary School Case Study

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MONTGOMERY ELEMENTARY SCHOOL

Montgomery Center, Vermont

By Allan Odden, Partner, Lawrence O. Picus and Associates

Montgomery Elementary School is located in a picturesque community in North-Central Vermont, nestled at the foot of several mountains, relatively close to the Jay Peak Ski resort. It is part of the Franklin Northeast Supervisory Union. Montgomery is a high performing school, enrolling about 112 students in grades K-8, plus a preschool program that enrolls 15 four-year old children. Enrollment is up from about 100 students a decade ago. Generally, there is one class per grade level and the number of students in each grade ranges from 7 to 20. Between 55 and 60 percent of students are eligible for free and reduced price lunch, the poverty largely due to lower family incomes in rural areas. For the 2009 school year (the last year for which we have data for all districts), Montgomery Elementary School spent $9,499 per student for current instructional expenditures minus transportation, quite below the state wide average of $13,923.

The community is quite diverse with many children from families who were born and raised in the community, some from urban families that moved to rural Vermont and work via the internet and increasing numbers of people working for the expanding Jay Peak Ski Resort. The area also has many second homes, owned both by Canadians and Americans.

Students begin arriving at school at 8:00 am. Those eating breakfast enter the building when they arrive. By 8:35 all students enter the building, attendance is taken, there is a morning program, and instruction begins at 9:00. There is a half hour for lunch and classes end at 3:00. The last bus leaves at 3:35 p.m.

Student performance at the school has been phenomenal as the data in Table 1 show. The numbers show a strong consistent rise in student performance on NECAP exams over the six

Table 1

NECAP Scores for Montgomery PreK-8 Elementary School, 2005-2010

Subject and Performance	2005 NECAP	2006 NECAP	2007 NECAP	2008 NECAP	2009 NECAP	2010 NECAP
Mathematics	**Grades 3-8**					
Proficient and Above	73%	71%	69%	81%	89%	88%
Proficient with Distinction	25%	27%	14%	38%	52%	48%
Reading	**Grades 3-8**					
Proficient and Above	66%	70%	77%	84%	85%	89%
Proficient with Distinction	12%	20%	26%	29%	37%	37%
Writing	**Grade 5**					
Proficient and Above	66%	70%	46%	74%	--	84%
Proficient with Distinction	25%	23%	5%	43%	--	42%
Writing	**Grade 8**					
Proficient and Above	72%	33%	--	78%	--	83%
Proficient with Distinction	9%	0	--	21%	--	30%
Science	**Grade 4**					
Proficient and Above				44%	76%	73%
Proficient with Distinction				0	0	10%
Science	**Grade 8**					
Proficient and Above					57%	45%
Proficient					7%	5%

with Distinction						

years from the 2005 to the 2010 school year. But most important is the high percentage of of students scoring at or above the Proficient and above Levels in mathematics (88%), reading for Grades 3-8 combined (89%), and writing for both Grades 5 (84%) and 8 (83%). Scores this high are rarely attained by schools with the high poverty levels of Montgomery, whether in urban or rural areas. Moreover, the numbers show that even more impressive gains have been made by students scoring at the highest level -- Proficient with Distinction, with more students performing at these high levels in mathematics than at the proficient levels. These high performance levels could not have been produced without improvements by the majority of the students in the school who come from families with incomes below the poverty level. Montgomery Elementary School appears to be producing both excellence and equity in education by raising the performance of all students. These test scores represent what Vermont desires for all schools and students – high levels of performance for all students.

This case is the story of how Montgomery produced these impressive results. It was not from high spending, as the district spends below the state average. It was not from high teacher salaries, as salary levels were in the middle ranges of those across the state. These results emerged from the hard, professional work of teachers, implementing a solid curriculum program, complemented by multiple strategies designed to insure that all students receive the instructional time needed to perform at proficient levels and above.

The case is based on written documents as well as interviews with the principal and nearly all certified staff in mid-October 2011. The case is part of a study of the Vermont school funding system being conducted for the legislature by Lawrence O. Picus and Associates. The case has the following six sections: School Staff, Goals, Curriculum and Instruction Program, Student Assessments, Interventions, Organization of Teacher Work, Professional Development, Culture of Achievement and Hard Work, Talent**,** and a Summary.

The Staff

Montgomery Elementary School has 13.1 certified staff positions (presented in full time equivalents) that include:

- 1 Principal
- 8.6 classroom teachers including 1 Kindergarten teacher (the kindergarten program is all day and is joined by preschoolers in the afternoon), 1 Grade 1 teacher, 2 grade 2/3 teachers, 1.6 grade 4/5 teacher positionss (one individual counted as 0.6 here teaches math for grades4/5, social studies for grade 8, and PE for 0.4 which is counted next in elective teachers), and 3 Grade 6-8 teachers, one each in math, language arts and science.
- 1.2 elective teacher positions, including 0.4 music, 0.4 art teacher, and the grade 4/5 teacher who also teaches 0.4 PE.
- 0.9 pupil support staff, including a 0.5 nurse and a 0.4 guidance counselor.
- 1 special education certified teacher
- 0.4 librarian

- 2 paraprofessional Teaching Assistant tutors, including a reading tutor who works 4 hours 4 days a week, and a full time math tutor. Though paid at the teaching assistant level, the reading tutor is a retired, certified teacher reading expert from a neighboring district and the math tutor has a BA in engineering and is trained in the school's math tutoring program.
- 5 instructional aides, 3.5 in special education (one for speech and language), one supported by Title 1, and 0.5 for the preschool half day program.
- 5 classified staff including an administrative assistant, a cook and assistant cook, and two custodians.

Class sizes range from 7 to 20, depending on the class and the number of students in each grade, and average about 14. Class sizes are small. Elective teacher positions (1.2) are 14% of core teacher positions (8.6), less than the Evidence-Based Model of 20%. The school has several extra help staff positions and a strategic approach to interventions for struggling students as described below.

High Goals

Annually, the school reviews performance data over multiple years from multiple sources: a Vermont developmental reading assessment, their NECAP scores in math, reading, writing, and science; the annual mathematics portfolios; the school's previous SMART[54] goals, formative assessment results, Reading First test results, Youth Risk Behavior Survey results, and previous years disciplinary and attendance records.

Then, the school sets high goals for every student in multiple areas. Within most classrooms, students are expected to do work that is at least 80+% correct; that is the bar.

[54] Specific, Measurable, Attainable, Realistic, Time bound.

If any paper, worksheet or task gets a score of less than 80%, the student must redo the assignment. Over time, this has incented all students to focus on getting things right and to ask questions in class, as they know that if they do not understand what is being taught, and do poorly on the assigned work, they will have to do the work over. Students understand that it is better to ask questions and make sure they understand the material so they do assignments only once. As noted below, teachers check for understanding and often reteach, but this goal for student work has produced both extra student and extra teacher effort and focus.

This overall goal across all subjects is supplemented by specific numeric goals for improved student performance in all subjects and at each grade level. This includes goals in academic as well as behavioral areas. Further, the school has goals both to reduce performance at the lower levels and to increase performance at the higher levels. For example, for reducing low performance, the school set the following goals for the 2011 and 2012 academic years:

- Reduce by 10% the number of students falling in the bottom two performance levels
  on state and local assessments in **reading**, while maintaining or increasing the number of students who are meeting or exceeding the standards.
- Reduce by 10% the number of students falling in the bottom two performance levels on state and local assessments in **writing**, while maintaining or increasing the number of students who are meeting or exceeding the standards.
- Reduce by 10% the number of students falling in the bottom two performance levels on state and local assessments in **math**, while maintaining or increasing the number of students who are meeting or exceeding the standards.
- All students will have a learning environment that is safe and respectful, and where the dignity and uniqueness of each individual are honored.
- Improve access to learning opportunities for all students.

The following is an example of general goals for increasing performance at the higher levels for the 2011 and 2012 academic years:

- Performance Targets will be updated (and increased) annually. [Note: this means that every teacher must increase every goal every year, a practice that reflects a desire to be a continuous improvement organization, and which is reflected in the consistently improving results shown in Table 1 above.]
- Meet Adequate Yearly Progress (AYP) as determined by the State of Vermont's Accountability System.
- Maintain the low number of playground write-ups and discipline referrals (less than or equal to 15 severe infractions and less than or equal to 65 playground write-ups annually.)
- Have an average attendance rate of 95% or greater.

For additional more focused goals, the following are the specific numeric goals for Grades 6 for the 2010-2011 school year; similarly specific goals exist for every grade level and subject in the schools:

- **Reading- Item Bank Assessments:**
  - 80% of students will score an 80% or higher on 3rd and 4th quarter literary and informational text assessments
- **Reading- McGraw-Hill Unit Assessments**:
  - 80% of students will score an 82% or higher on McGraw-Hill unit assessments (non-familiar text).
- **Reading- FNESU Language Arts Assessment (Literary and Informational text):**
  - First Quarter: 65% of students will attain a 3 or above.
  - Second Quarter: 75% of students will attain a 3 or above.
  - Third Quarter: 85% of students will attain a 3 or above.
  - Fourth Quarter: 90% of all students will attain a 3 or above, and 80% of students will make a gain of at least one point
- **Writing:**
  - 85% of students will score a 3 or better as assessed by the VT Dept. of Education writing rubrics on each of the following genres: Report, Procedure, Persuasive, Narrative, and Personal Essay.
  - 100% of students will maintain or exceed their previous year's score.
  - Response to Literary Text (FNESU) 80% of students will achieve a 3 or higher on the district rubric.
- **Math:**
  - September- 80% of students will get at least 21 correct
  - January- 90% of students will get at least 32 correct
  - April- 100% of students will get at least 43 correct
- **Math- Unit Tests:**
  - 85% of students will get an 82% or higher on each of the 4 end of unit tests.
- **Math- Portfolio:**

- 85% of students will score a 3 or higher on end of the year portfolio problems.

In sum, the school uses data, both to review past progress on student learning and each year to set higher specific, numeric goals linked to student learning – the goal is to have more progress on student learning for each subsequent academic year. *This represents a paradigm shift, from a focus on goals for teaching to a focus on goals for the results of teaching – student learning*.

The data covers the range of formative assessments, curriculum unit tests, portfolios and state and national student performance assessments, all data on student learning. Though the faculty said that none of these tests measure all of the learning of the students, they also said that these measurements should continue to rise as they implement their multiple and interrelated curriculum and instructional strategies. They also said that because of the requirement to boost the goal every year, they are under continuous pressure to do more, and that because so many students now perform at the proficient levels, they have no choice but to set goals for performance at the Proficient with Distinction level, and hence the student progress at that high level of achievement.

Finally, even though many of the performance measures pertain to different cohorts of students – this year's sixth graders versus last years, the faculty stated they had no qualms about that measurement approach. Faculty believed that student performance was produced primarily by their curricular and instructional strategies, not by student demographics, so improvements should result for every cohort of students.

Curriculum and Instruction Program

The school's curriculum has changed and everyone attributes better performance to the effective implementation of the new curriculum. Faculty concluded in about 2005 that student performance in ***reading*** was too low. For reading, the school had been implementing a "guided reading with grade-leveled books" curriculum but decided to adopt a more research-based approach to reading, the MacMillan McGraw Hill Treasures program, which also was supported by Reading First. The school had become eligible for a year of Reading First assistance, which required it to adopt a research-based program, and also provided professional development, reading coaches and reading tutors for good implementation. When asked what the McGraw Hill program had that the former "guided reading" program did not, the response was:

- A K-8 scope and sequence, and
- Consistent emphasis on phonemic awareness, phonics (particularly in the early grades), vocabulary, comprehension and fluency.

I would add that not only Reading First but also the National Reading Panel recommended that these features be part of every strong reading program, specifically noting the attention to phonemic awareness and phonics, especially for schools with large portions of its students coming from families with low incomes.

The school sets aside 90 minutes a day for uninterrupted reading instruction for the K-6 program. In a prototypical week, reading classrooms introduce new stories or materials at the beginning of the week, including introduction of new vocabulary words before the story is read, and then introduce new reading and writing skills. Reading includes a mix of informational and fiction text. The reading curriculum includes differentiation for student work, so includes different activities for below average and

students, and challenges or enrichment for higher achievers. Over the week, teachers have several small group times, with students reading leveled books, many of which have decoding exercises that reinforce the phonics in the overall reading instructional materials. Several times a week, students also go to centers that emphasize reading, writing and spelling.

During small group and center work, classroom teachers circulate among the different groups providing instruction on specific skills. Moreover, also during these times, teachers are able to organize the slowest learners into small groups so the *teacher,* him-or herself, can provide specific one-to-one and small group tutoring assistance. Sometimes, some of the school's teaching assistants (some of whom have a BA degree and are trained in specific reading and math programs) work with the other groups, reflecting the school's philosophy that "the best teachers should give focused extra help to the students struggling the most." This philosophy is further reinforced because it was the former Reading First coach, which the school had for three years, who stayed at the school and was assigned to teach the first graders: "You put your strongest literacy teachers in the early grades so children get the most highly trained person for learning how to read."

Both the first grade and Kindergarten teacher use the Wilson-Fundations reading program. Wilson **Fundations** for K-3 is a phonological/phonemic awareness, phonics and spelling program for the general education classroom. It is not a complete reading program but appropriately used as a supplementary program. Often used as an intervention, Montgomery's kindergarten and first grade teacher uses Fundations as a supplementary reading program for all students to reinforce phonemic awareness,

phonics and spelling, thus complementing and strengthening these emphases in the McGraw Hill program.

The ***writing*** program is allocated time in addition to the 90 minutes for reading, and the school has students do a considerable amount of writing. The school addresses the six traits of writing; Grade K-3 teachers use the Writer's Workshop model. They emphasize the writing process: prewriting and planning, producing a rough draft, conferencing with another student, self check list and perhaps rewriting, conferencing with a teacher, revising the draft as a final produce, illustrating and publishing. The strategy is to build writing skills from grade to grade, beginning in Kindergarten.

The school began its approach to writing several years ago when the grade 1-2 team was trained in a writing strategy that had devolved from the Vermont Portfolio system. The faculty has all students write responses to various literature that they read, and insures over time that all writing skills included in the NECAP tests are incorporated into the school's writing curriculum. As a result, all students are taught all appropriate writing skills.

The school also decided several years ago that student performance in ***mathematics*** needed to improve, even though it had been improving somewhat. The school adopted the research-based *Bridges* Curriculum and allocated 90 minutes of uninterrupted instruction for math. According to its web site, *Bridges in Mathematics* is a full K-5 curriculum. Developed with initial support from the National Science Foundation, Bridges offers a unique blend of problem-solving and skill building in a clearly articulated program that moves through each grade level with common models, teaching strategies, and objectives. A Bridges classroom features a combination of

whole-group, small-group, and independent activities. Lessons incorporate increasingly complex visual models - seeing, touching, working with manipulatives, and sketching ideas - to create pictures in the mind's eye that helps learners invent, understand, and remember mathematical ideas. By encouraging students to explore, test, and justify their reasoning, the curriculum facilitates the development of mathematical thinking for students of all learning styles. Bridges also was designed for use in diverse settings, with its curriculum providing multiple access points allowing teachers to adapt to the needs, strengths, and interests of individual students.

Even though Bridges includes strong attention to math facts and algorithms, Montgomery's faculty decided it needed more to build automaticity of math facts so it also adopted Rocket Math. This program teaches math facts in 5-10 minutes of instruction each day, and is used by all teachers in the school.

For students in Grades 6-8, the school uses *MATHThematics*, and allocates 90 minutes a day for math instruction, 60 minutes for the regular class and the other 30 minutes for re-teaching and skills work. According to the program's website, *MATHThematics* is a complete three-year mathematics curriculum for students in grades 6 to 8. This program presents mathematics in relevant and meaningful contexts; each module focuses on a theme that extends throughout the module. The goals of this program are to help all students develop their abilities to reason logically, apply mathematical skills to real-life activities, communicate mathematically, and feel confident in using quantitative and spatial information to make decisions. Conceptual skills are developed and spiraled through grade 5. Major mathematical strands of the

program include: number concepts, measurement, probability, statistics, algebra, geometry, and discrete mathematics.

Montgomery also offers Algebra for its eighth graders; students desiring algebra take both the *MathThematics* program as well as an algebra class that meets for 45 minutes four days a week in the afternoon.

Over the past several years, the school aligned their curriculum from kindergarten to grade 8 through a continuum of concepts that spiral up from the very lowest grades to the very highest grades. They also worked to develop common words and descriptors to use during instruction so students hear the same language about various subject areas from grade 1 to grade 8.

The school also created a common ***vision of effective instructional practice*** as a complement to the strategies included in its reading, writing and mathematics curriculum. The faculty studied Robert Marzano's, *Classroom Instruction that Works*, reviewed other K-8 instructional practices that were needed such as reading and writing across the curriculum, and have continued to read books on instructional and school improvement which are discussed at faculty meetings. To reinforce this view of effective instruction, the principal has conducted "Classroom Walkthroughs" for several years, using a form structured to the school's point of view about instruction and then giving feedback to each teacher observed. About three years ago, the principal began to have other teachers accompany her doing the Classroom Walkthroughs, and asked each teacher to write a reflection of what the Walkthrough meant for his/her own classroom instruction. This year teachers are doing peer observations and/or Walkthroughs on their own; moreover, they are not just doing "random" Walkthroughs but often ask teachers they want to

observe to "model" or "demonstrate" a particular instructional practice the observing teacher wants to improve. For example, the first grade teacher asked the fourth grade teacher to model a lesson for Words Their Way, a developmental spelling program, so the first grade teacher could mirror that approach at the earlier grade.

This school believes that effective instruction linked to a research-based curriculum program is THE key to school success and continuously higher levels of student achievement. And the "test" of whether their curriculum and instructional program works is whether student performance rises; if performance does not rise, the faculty concludes that something is missing in the instructional program.

In addition, Montgomery does not just address the academic side of students; it addresses student character and learning habits as well. The school embraces the "responsive classroom" philosophy, which has the following tenets:

- The social curriculum is as important as the academic curriculum.
- How children learn is as important as what they learn.
- The greatest cognitive growth occurs through social interaction.
- There is a specific set of social skills children need to learn and practice in order to be successful academically and socially.
- Knowing the children we teach is as important as knowing the content we teach.
- Knowing the families of the children we teach is an important as knowing the children.
- How grownups at school work together to accomplish our mission is as important as our individual competence.

Following this philosophy helps propel the school to be a learning community of adults as well as students.

Finally, and as a subpart of this focus on the social side of learning, Montgomery developed a school wide approach to discipline and behavior codes for the lunchroom and playground. And to insure that everyone knew these behavior rules, at the beginning of the year, all faculty and students go out to recess together and review rules for behavior; the goal is for students to see all the faculty, not just their grade level teacher, as their teachers and for teachers to feel they are instructors and disciplinarians for all students.

Student Assessments

Over the years and continuing today, the school uses multiple assessments at different grade levels to track student progress, facilitate instructional change and plan interventions for students. The school has used the system from Fountas and Pinnell for ongoing student monitoring, had a quarterly progress assessment (sometimes called benchmark tests) provided by the district, used the Peabody assessment for reading, use common end-of-curriculum unit and end-of-course exams, and draws on informal formative assessments.

Several teachers claimed that they did not need a "formal" formative assessment program because the school already used multiple assessment instruments, which together with the informal queries that are a normal part of ongoing classroom instruction, result in all teachers knowing the performance of every student in every appropriate content area. Teachers were expected to act individually on this knowledge by providing extra help during center work, the school's Reteach period (discussed below

under Interventions), and in the weekly meetings of the PLCs focused on the specific needs of each student.

Thus it would be safe to say that the multiple pieces of performance data the school uses, together with the PLCs, produced a situation in which each student's individual progress was monitored weekly with no need for a more formal formative assessment system. Several teachers stated that teachers in the school are expected to be "on top of all student needs both daily and weekly" and that this is accomplished both through the formal and informal performance, the "press" in the school for each teacher to insure every student's success, and the collaborative interactions over time focusing again on what was needed to help every student learn. In addition, teachers also mentioned the willingness of students to ask questions in class about concepts they did not understand (because they knew if they did not understand the materials they would likely have to do all assigned work over again).

Interventions

The school has a strong and structured approach to interventions – extra help programs to insure that all student achieve to a high level which is a 80 percent or more correct on assigned student work and performance in each curriculum unit, and to proficiency and above on state standards. To attain these goals, the school's first emphasizes core instruction; the objective, similar to that in the more formal definitions of Response to Intervention (RTI), is that core instruction is the first "instructional treatment" and must be high quality and as effective as possible. The new curriculum programs, ongoing training in the instructional strategies to implement them, and the core

focus of PLCs (discussed below) are targeted to making Tier 1 instruction as effective as possible.

As one teacher noted, the school has made a commitment to a curriculum continuum; every curriculum unit in every subject builds on what was previously taught and is designed to link to what comes next; teachers do not teach their own individualistic units. And the school wide emphasis on phonology and phonics in the early grades, with the McGraw Hill program that has that emphasis, supplemented with *Fundations*, is important in laying a solid core instructional foundation for learning how to read. Recall that for math, the school also uses Rocket Math in all classrooms as a supplement to the mathematics curriculum to emphasize the learning of all math skills, to produce automaticity and fluency for all math skills, in addition to the conceptual and problem solving focus of the math curriculum program. So the school decided to supplement the purchased reading and math programs with supplements designed to strengthen both teaching and learning in the fundamental reading and math knowledge and skills.

The second "extra help" strategy is additional assistance provided during a regular center or small group activities, with the teacher organizing such grouping so he or she can provide the most intensive help to the students with the thorniest academic challenges.

Third, Montgomery instituted a 30-minute period every day for additional interventions, called the ReTeach Period. This is a time during which regular teachers are able to provide extra help for struggling students, and to channel achieving students into enrichment activities. Often times during the ReTeach period, the reading and math

tutors as well as the special education teacher "push in" to classrooms to provide extra help to a very small group of students, or sometimes to an individual student.

Fourth, the school has a formal tutoring program in both reading and mathematics. For math tutoring, the tutor uses a program called VMath. VMath has 10 modules that cover core mathematical concepts for each year. Over the course of the year, the math tutor gives each student a pre-test for each module; if a student scores 7 or lower (on a scale of 1-10), the student then is given put into a pullout group that is given about 10 lessons, each 30 minutes in length, on that math concept. This continues for all the ten concepts in VMATH and is done every year. If the posttest is low, the math tutor would provide more review for the student, but so far no student has scored less than 8 on any posttest! Group size for this math intervention ranges from about two to six. These extra lessons consume about half of the math tutor's time each day, with the other half spent "pushing in" to a regular teacher's class either during small group time or the ReTeach period. VMath lessons are never given instead of the regular 90 minutes of math instructions; all VMath lessons are in addition to that time.

Reading tutoring is provided just for students in grades K-3. The reading tutor, who has a Reading Recovery background and is now retired, works from eight to noon, four days a week. Though Reading Recovery was designed to intervene only in first grade, and after a year of instruction provided by the regular kindergarten teacher, the reading tutor felt the broader tutoring strategy in this school was more powerful. She gets to know all new students in kindergarten, a year earlier than Reading Recovery. And she can begin to work even with struggling kindergarten students on phonological skills, hearing sounds and words, learning the letters and the sounds letters make, and beginning

to write. Tutoring sessions are generally one-to-one, and last for 20-25 minutes for kindergartners but 30 minutes for students in grades 1, 2 or 3 (although this year no third grader needs reading tutoring!). The reading tutor also does some small "push in" reading extra help both during small group and ReTeach time, but not every class every day.

Special education services come after all of these powerful core instruction and intervention practices. And the school believes that the incidence of students needing to get services through an IEP has dropped over the past several years as both the new reading and math programs have been implemented, as well as the ReTeach and tutoring programs. Indeed, research by others also found that such an approach to core instruction and intervention, that includes tutoring help for the kids struggling the most, can reduce the incidence of special education (usually reducing the students labeled learning disabled).

Special education services are provided only when the school's Education Support Team recommends students for such services, and require them in an IEP. Special education services are provided in addition to all of the previous services, including the tutoring services, and are provided on a one-to-one, small group and cote-aching basis by the special education teacher, and largely on a "push in" basis by an additional 3.5 FTE special education aides. The aides are trained in the Wilson Fundations program for reading and TouchMath, a multisensory math program for special education students.

In sum, the school offers a multiplicity of integrated extra-help services, with a special emphasis on services to bolster student learning in reading and mathematics.

Both teachers and the extra help staff stated that the extra help services are strongly aligned with the core curriculum, so reinforce the school's overall goals of having all students achieve to high levels.

Organization of Teacher Work

Montgomery Elementary School has worked hard to create a collaborative work culture. The goal has been to create an authentic school wide approach to all curriculum and instructional issues. To begin breaking up the egg crate approach to teacher work several years ago, the school created a "critical friends" system of people within the school. The objective was for various individuals to have "critical friends" giving them feedback on how they could improve. Critical friends meetings occurred after school; over time, critical friends began to specifically focus on developing a vertical alignment of the K-8 curriculum, identifying gaps in the school's curriculum vis a vis the Vermont content standards and the NECAP tests, and explicitly working to articulate the curriculum across all grade levels. Initially, critical friends was more an individualized initiative and independent of other school actions, but as "trust" in working together improved, the school moved into more complex and robust collaborative approaches to teacher work.

A few years after "critical friends" were launched, the principal attended a seminar offered by Richard DuFour on creating and implementing Professional Learning Communities (PLC); some teachers also participated in these seminars in subsequent years. The DuFour approach to PLCs is aggressive and ambitious; the idea is for groups of teachers to use student performance data, including formative assessment data, to continuously improve instruction, provide the best interventions for struggling students,

and to assess the impact of such efforts by measuring improvements in student performance – if student performance did not rise, then the PLC had gotten something wrong and needed to change its curriculum, instruction and intervention approaches. So the "measure" of the effectiveness of PLC work was whether student performance was positively impacted.

Initially, PLC meetings met less frequently; teachers were encouraged to meet when they could. But starting five years ago, PLC meetings became more formalized and scheduled three times a week for about 45 minutes. The goal was to continue the process of "taking the classroom walls" down that was launched with critical friends, and continue the process of building a school wide professional community.

The school adopted its version of this way to organize teachers by creating a K-2 PLC, a Grade 3-5 PLC, a Grade 6-8 PLC and a PLC including the special education teacher and the reading and math tutors. The notion was that these collaborative work groups were supposed to collaboratively develop the details of the K-2, 3-5, and 6-8 curriculum and instructional program, including common assessments and related interventions.

PLC meetings are structured. There is a PLC leader, an agenda, decisions are reached, notes are taken, and minutes are submitted to the principal. Some days the focus is on individual student needs; other days the focus is on curriculum and instructional issues. Most teachers see PLC time as a real benefit and often meet at times in addition to that scheduled, even though teachers in this school have lunch and recess duty, as well as bus duty before and after school. However, each teacher also has about four 45 minutes of individual plan time over the week in addition to the PLC time.

Professional Development

Nearly all teachers supported the school's approach to professional development, which systemically embeds training and courses into the school's ongoing professional learning community. This is reinforced by PLCs, staff meetings devoted to curriculum and instructional issues, and the other elements discussed above that engage all teachers in continuous instructional improvement. Professional development seems to be integrated into the ongoing work of the school. The principal meets with PLC leaders once a month and they collectively identify issues and needs that should be addressed. These issues are then addressed both in PLC meetings, for which there is pupil-free scheduled time every week, and at all staff meetings.

PLCs now are leading discussions at monthly faculty meetings,. This includes leading discussion of book chapters that are being studied or of other instructional improvement efforts, such as writing prompts and rubrics. In addition to the principal, teachers also engage in activities teaching their peers. As a result, both teachers and the principal learn new things together. Teachers also noted that PLCs focused a lot on teacher learning, particularly for the instructional strategies needed to have their students learn, and that subsequent all staff meetings focused on the same issues.

This year, moreover, PLCs and the entire staff are addressing the Common Reading and Math Standards that emerged nationally over the past several years, the gaps that might exist between these standards and the school's current curriculum, and the expertise faculty will need to respond positively when Vermont begins to implement those standards, and uses tests to measure student performance to them.

In sum, professional development is part of the overall school strategy towards curriculum and instructional improvement and developing a learning community. From the principal's perspective, it is about strategic professional development that has been embedded in the school over the past several years, with the goal of creating a "learning culture." And it should be clear from the case, that a learning culture for adults, as well as students, has been clearly established in Montgomery Elementary School. The faculty does not just read a book

and move on. Teachers are asked to bring examples what the book suggests to share at subsequent staff meetings. As noted, teachers also do walkthroughs with the principal to look for evidence of the strategy being studied in classroom practice. This approach helps develop connections, reflection and habits of mind, similar to using strategies to help students with metacognition.

Culture of Achievement and Hard Work

Nearly every one identified the school's culture as key to its success. And the culture has many elements. First, it is a culture of high expectations for teachers and students; both are expected to work hard and to perform to high standards. And nearly everyone interviewed said this culture of hard work and high expectations was infectious – not all students initially come to the school with these traits but they attain them over time. The school acculturates all students into this community; by Grade 3 they all have high expectations for themselves, expect that they can learn to high levels, and know what to do to attain those levels of performance. Unlike many schools, particularly those with concentrations of students from families with lower incomes, "It is cool to work hard in this school, it is cool to do your best, and you are expected to do well."

Second, behavior in the school is exemplary; everyone holds students accountable, everywhere, and all the time. All teachers are consistent in behavior management and consequences for misbehavior.

Third, the school provides a "personalized" learning environment for every child. Every adult in this school knows every single child, regardless of the level, subject or class they teach. All teachers know all students, both academically and behaviorally.

Fourth, this is a hard working school. As several teachers noted, "There are no whiners at this school, whining is something done at home but not in this school." Expectations for teacher work are high; every adult expects the highest performance from every other adult and … "this spills over to the students who know adults have high expectations for all of them."

Teacher work in this school requires effort; the curriculum and instructional strategies are multiple and seamlessly integrated; to be successful in this school a teacher must be exceptionally talented, equipped with an array of instructional and collaborative expertise, and be willing to work hard.

When one group of teachers was asked how they managed to do so much work, and so much integrated and complex work, one teacher answered by saying, "We are very smart." Another newer teacher agreed and said, "Joining this faculty was like joining an Ivy League Faculty; these teachers are so smart and they have the array of expertise needed to be effective in this school."

Fifth, this school has a professional and learning culture, first and foremost for teachers. Teachers mentioned study sessions and book sessions focused on effective instruction, such as Robert Marzano's *Classroom Instruction that Works*, the DuFour

work on professional learning cultures, Mike Schmoker's book *Focus* on elevating the essential elements of school improvement, and soon Allan Odden's *Ten Strategies for Doubling Performance*, all of which are present in this school.

Finally, this school's culture embraces accountability and accepts responsibility for performance results. The school uses state, national and local instruments to measure student progress in learning, and expect the numbers to rise every year. When they don't, the faculty accepts the responsibility, and seeks to figure out how to improve their curriculum and instructional approaches. Indeed, each year every teacher sets student performance goals for their class. At the end of the year, each teacher reports – to an all faculty meeting – his or her students' results. And as one teacher noted, "You don't want to be the teacher who does not meet their goals!" So expectations are high, accountability is real and public, and everyone is expected to produce.

Teachers are accountable to the administration, which sets goals and directions and provides tools and structures to meet them, and in turn, teachers hold students accountable for behavior, hard work and performance and also provide students with multiple opportunities to attain that success.

Montgomery also is an "efficient" culture; PLCs meet and get work done. One teacher, who was new to the school, said that PLCs in Montgomery accomplish more in one meeting than the PLCs in the previous school did in 4-5 meetings. Put differently, everything in this school is organized, structured and managed, which results in efficiency and effectiveness of all operational elements

It should be noted that, except when asked about the demographics of their students, no one interviewed ever mentioned school demographics as a cause of or

impediment to student learning and performance. Even though 55-60 percent of students come from families with low incomes, the faculty expected all to learn to high levels, and never said that demographics might be a reason why some student could not or did not perform. This perspective was reinforced by the faculty's not caring that different grade level cohorts had to "beat" the performance of the previous cohort; there were no comments that, "Oh, this year performance is down because of these fourth (or any grade) graders." And the faculty's efforts resulted in all students performing – recall that the math tutor never had to give extra help after giving tutoring in VMath and the reading tutor had no student who needed reading tutoring in grade 3 this academic year.

Talent

Over the course of the interviews, it became obvious that educator talent was high in this school. The principal and all teachers were smart and capable: they read research, stayed abreast of best practices, worked continuously to improve instruction, expected everyone to know every student, seamlessly incorporated multiple strategies into the ongoing daily work of teaching, worked hard, and relentlessly sought to get every student up to a high level of achievement. One new teacher in the school stated, "Coming into this school was like joining an Ivy League faculty; teachers here are so smart, knowledgeable and expert at teaching. I have never been surrounded by so many expert educators." Educator talent was another reason why this school succeeded. These were not average educators; they were highly effective educators who did everything needed to get the job done, which was having all their students learn to high levels.

Summary

Montgomery PreK-8 School is exemplary. It has produced an impressive record of student performance, showing consistent gains over the past six years. The performance gains include high percentages of student performing at the Proficient with distinction level on the New England Common Assessment tests (NECAP), sometimes with more than 50 percent performing at these high levels. Such high levels of performance including the significant gains in performance over the past six years, are unusual for a school with over 50 percent of students eligible for free or reduced price lunch, which makes the performance gains all the more noteworthy.

How did these changes occur? The above description tells the story. But a PowerPoint developed by the principal also tells the story. What do we need to do to increase student performance, asks the first PowerPoint slide? The answer is three fold:

- Develop excellence in teaching – focus on improving teaching so all students learn more
- Use data – practice crystal clear curriculum alignment, assessment and data analysis
- Accountability and motivation – focus on student motivation, push and support.

And the school implemented these three strategies through the ongoing work of structured and effective Professional Learning Communities (PLC). Having PLCs use data to continuously improve a school wide view of effective instructional practice, combined with research-based curriculum programs in both reading and math; a smart, talented and hardworking staff; and high expectations for both student and adult work, produced impressive student performance gains and high levels of student performance

and for all students – those from middle class backgrounds and those from less advantaged backgrounds.

Montgomery Elementary School shows how high expectations, a solid and research-based curriculum, emphasizing a systemic approach to effective instruction, using data to continuously improve instruction, providing an integrated set of intervention strategies, relentless effort by talented and capable teachers working in collaborative groups to continuously improve instructional practice to get the job done, and strong principal leadership and management –not just money – are the pathways to high performance.

AN EVALUATION OF VERMONT'S EDUCATION FINANCE SYSTEM

Whitcomb Junior/Senior High School Case Study

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WHITCOMB JUNIOR/SENIOR HIGH SCHOOL

Bethel, Vermont

By Allan Odden, Partner, Lawrence O. Picus and Associates

Whitcomb Senior High School is located in Bethel, Vermont. It is part of the Windsor Northwest Supervisory Union, which includes six towns, three of which have schools. Whitcomb is the school for the town of Bethel. The high school is one of three "school" units in a single building that includes all grades preK through 12. The building includes a preschool program, a primary school grades K-6 and a junior/senior high school grades 7-12.

Bethel is a small community of approximately 1,800 persons. Families work in many different capacities: industry, sales, education, manufacturing, medical, farming. However, Bethel is primarily a working class community with relatively low per capita income. Though the president of the Bethel School Board works at Dartmouth, about 30 minutes south east of the town on Interstate 89, the majority of people are farmers, assembly line workers, contractors (now rebuilding roads after the Hurricane Irene floods), carpenters, plumbers and electricians, employees at the local hospital, with a few in the professional class of lawyers and educators. Overall, the town is relatively self-sufficient with most people living and working in the general vicinity. Most families are middle or lower middle class. Bethel also is a political bell weather town; as the saying goes, "As Bethel votes, so votes Vermont."

The preK-12 school enrollment is about 306 students, with about 30 students in the preschool – 15 in each of two half-day sessions. The Junior/Senior High School enrolls about 140 students, with about 20-25 students in each grade. Though last year's

graduating class was small with only 16 students (and these are the students who took the Grade 11 NECAP tests in 2010), the senior class this year has 25 students. The free and reduced price lunch count for the entire school is about 50 percent, with somewhat less than that in the high school as many eligible students do not apply. The special education incidence is thought to be high; this year the entire school had 48 students with an identified disability, or 16 %. This reflects mostly students with learning disabilities but also includes a large number of students with speech and language disabilities. The school has a small percentage of transient families, due in part to several low income housing units in the town as well as its close proximity to Interstate 89, which facilitates movement around the state.

Average class size in the junior/senior high school is about 11, as most grades have two sections for each group of 20-25 students. Class sizes in the high school vary but from the low single digits to the mid-teens. The school offers three languages so the advanced language classes often have very few students. Class sizes in the elementary school average about 14. For the 2009 school year (the last year for which we have data for all districts), Whitcomb prek-12 spent $10,806 per student for current instructional expenditures minus transportation, significantly below the state wide average of $13,923.

Whitcomb High School uses a block schedule of about 90 minutes but with an interesting twist. On Monday, every class meets for 45 minutes, with the classes then meeting on Tuesday and Thursday, or Wednesday and Friday for the full 90 minute block. Given this schedule, students can take up to eight classes. Teachers provide instruction for 3 blocks each day and have pupil free time for the fourth block; so over the course of two days, teachers provide six different classes. Unfortunately there is little

opportunity for collaboration because the schedule does not provide common planning time for teachers in the various departments.

School performance at Whitcomb High School has shown important gains for the students in Grade 11, especially in reading, writing and mathematics, as shown in Table 1. The percent of Grade 11 students performing at the Proficient or above levels in mathematics rose from a very low 8 % in 2007 to 52% in 2010. The percent of Grade 11 students scoring at the Proficient and above levels also rose in reading, from 50% in 2007 to 80% in 2010; and the percent scoring at the Proficient with Distinction level in reading also rose over that time period from just 25% in 2007 to 44% in 2010. Gains also were produced in writing, with the percent of Grade 11 students scoring at the Proficient or higher level more than doubling from 25% in 2007 to 57% in 2010. Scores in grade 11 science have not been that high.

Table 1
NECAP Scores for Whitcomb High School, 2007-2010

Subject and Performance	**2007 NECAP**	**2008 NECAP**	**2009 NECAP**	**2010 NECAP**
Mathematics	**Grades 11**			
Proficient and Above	8%	38%	7%	52%
Proficient with Distinction	0%	0%	0%	0%
Reading	**Grades 11**			
Proficient and Above	50%	71%	69%	80%
Proficient with Distinction	25%	33%	23%	44%
Writing	**Grade 11**			
Proficient and Above	25%	22%	53%	57%
Proficient	0%	0%	0%	0%

with Distinction				
Science	**Grade 11**			
Proficient and Above	--	20%	16%	--
Proficient with Distinction	--	0%	0%	--

However, several of those interviewed stated that some caution should be taken in assessing these numbers because the number of students represented is quite small, usually 25 or less, so some of the change in the scores can be attributed to small numbers of students.

Of the graduating class of 2011, which was one of the smallest in recent years, 5 went on to four-year college, 4 went on to two-year college and 6 went on to work/military.

This case tells the story about how Whitomb High School produced these impressive results. The case is based on a review of written documents as well as interviews with the principal, assistant principal, curriculum directory and nearly all certified staff in the English/language arts, social studies, and math departments, as well as other selected teachers, in mid-November. The case is part of a study of the Vermont school funding system being conducted for the legislature by Lawrence O. Picus and Associates. The case is organized into the following eight sections: staff, goals, curriculum, assessments, interventions, professional development, school culture, and a summary.

Staff

Staff at Whitcomb Junior/Senior High school is a bit challenging to identify since the school is organized as an integrated preK-12 unit, with for example the principal serving as the principal of the elementary and well as the junior/senior high school. The following estimates the staff time for the junior/senior high school (given in Full-Time-Equivalents – FTE):

Administration

- 0.5 Principal
- 0.5 assistant principal
- 1.0 Athletic Director

Core classes:

- 2.0 English/language arts
- 2.0 Social studies
- 2.0 Mathematics
- 2.0 Science

Elective classes:

- 1.0 World language
- 1.0 Physical education/driver education
- 1.0 Family/Consumer Sciences/Health/Language
- 1.5 Art and music, including 0.5 each of instrumental music, vocal/general music and art
- 0.5 Librarian

Pupil support:

- 1.0 Guidance counselor

Extra help:

- 1.0 special education
- Some portion of the school's total of 13 educational assistants

In other words, Whitcomb junior/senior high school has 2 FTE administrative staff positions (including the athletic director as administration), 8 core teacher positions, 4.5 elective teacher positions plus a 0.5 librarian, one guidance counselor, one special education teacher and some portion of the school's total of 13 paraprofessional education assistants. Assuming equal class sizes, a block schedule requires elective teachers at the ratio of 33 % or core teachers, which would be 2.67 positions for Whitcomb, compared to the actual 4.5 elective teacher positions. This staffing pattern reflects a trend in many American high schools with larger numbers of elective teachers. As stated above, class sizes are very small, ranging from the low single digits to the mid-teens.

Goals

Goals have varied substantially over the past several years in part because principal turnover has been high. And every time the school received a new principal, that person set new goals. The goals, however, have not been stated in terms of student performance but rather in terms of implementing new programs. For example, the goal for the 2011-2012 school year is to implement a behavior program called Positive Behavior Intervention and Supports, PBIS. The objective of this program is to reduce behavioral referrals. It was launched in Fall 2011.

A few years ago the school goal was to develop Grade Essential Standards (GES) for each grade level; that activity has now switched to assessing those GESs in light of the forthcoming common core standards in mathematics and reading.

Three years ago, the school goal began to implement a program called Drop Everything And Read (DEAR). DEAR is a program designed to increase student's reading interests and skills. So every day at Whitcomb, right after lunch, the high school "drops everything" and has students read independently (in an assigned room) for 30 minutes, from 12:45 to 1:15. Teachers and administrators believe this has led to more reading by most students and to more and more sophisticated discussions with students about literature.

Several years ago, the supervisory union (referred to as the district in this school) also launched Curriculum Councils. Such councils, which are comprised of teachers and administrators from across the three schools in the district and a central office leader, have been created in most content areas, including science, math, reading, social studies and the arts. This provides a mechanism for collaboration both across grades within schools and across schools within the district.

Because principals have changed so often over the past many years, the current administrators believe that assessing those things that have stayed constant – e.g., parental involvement, good instruction, personalization, more collaboration – might be more powerful in explaining improvements in school performance, than specific programmatic goals per se.

Curriculum

When asked about how Whitcomb had produced the gains in student performance, several teachers and administrators interviewed stated that the 2010 scores reflected that specific cohort of students, now seniors, who had been strong performers throughout their career in the K-12 school, from the elementary and through the junior and senior high school. And some said the 2011 NECAP scores would drop because that group of students (this year's seniors) had not been performing that well. So there was some feeling that demographics and small numbers might be factors behind the Grade 11 data showing high school performance.

When asked what makes this school tick – what were the strong elements of this school, many of those interviewed stated that the key factors might be less the curriculum per se, and more other factors like good teaching, good connections with students and their parents, personalization of instruction, the school's small size that facilitated personalization and connections, open communication within the school and with parents, a caring faculty and considerate student body, collaboration among the faculty, and high expectations for student performance. Several said it was these factors rather than school leadership – which had changed a great deal over the past decade –were the constants in the school, provided consistency across leadership changes and helped to produce student performance over time.

The factors most identified were small school size, personalization of instruction, engagement with both students and parents, and faculty collaboration – and everyone felt these factors reinforced each other. The small size meant that there were fewer adults to get to know within the school and that there were fewer students and parents to get to

know at a deep level. Thus the small size facilitated a cultural element of getting to know every student, every student's parent and all faculty; this knowing then helped foster teacher collaboration and personalization of instruction, in both formal and informal settings.

Nevertheless, there also were several comments about the curriculum and instructional program, as well as professional development, which interviewees suggested also under helped improve the levels of student performance.

Mathematics. As mathematics is a more sequenced content area, the school has two tracks in mathematics as well as a unique approach to the mathematics curriculum. Rather than the typical Algebra 1, Geometry and Algebra 2 sequence, Whitcomb (and its supervisory union) created "integrated" math courses that combine the content of Algebra 1, Geometry and Algebra 2 from the beginning and then address the various concepts in a spiraled way until students begin to take more traditional courses like pre-Calculus. So a typical college oriented student would take College Prep Math 1 in Grade 9 and College Prep Math 2 in Grade 10. The first class would cover data collection, presentation, and interpretation; introduction to linear and exponential functions; probability and proportions; and surface area and volume. The second class continues to use the mathematics from previous year, and introduces trigonometric ratios, matrices, linear programming and statistics, while also encouraging the development of algebraic skills. Exploring mathematical concepts on the TI-84+ calculator also is a regular part of this course. College Prep Math 3 then builds on the mathematical concepts from the previous two courses and covers rational, logarithmic and circular functions; proofs, combinatorics and curve fitting. Students would then take a pre-Calculus class in their senior year.

More advanced students could take the College Prep Math 1 in eighth grade, and then be able to take a full Calculus class in their senior year.

However, this year the school returned to a more traditional Algebra 2 course because the new common math standards have that as the typical junior level math course, and colleges and universities expect students to have taken a traditional Algebra 2 course.

Students slower in learning mathematics would take math classes that cover the same content as College Prep Math 1 and 2 but at a slower pace. So they would take Integrated Math 1a in Grade 9, Integrated Math 1b in Grade 10 and Integrated Math 2 in Grade 11. These courses would satisfy the school's requirement for taking 3 years of math in order to graduate.

However, the Integrated Math sequence does not cover all of the content that is tested on the Grade 11 math NECAP test, which is given in the fall of Grade 11. So students in this math track are not as well prepared to do well, and generally not expected to do well, on the NECAP mathematics test. And if students do not meet the Proficiency standards on the test, they then must take one of two additional math classes that have been developed for such students – Problem Solving or Essential Mathematics.

One reason for the rise in math scores in 2010 is that most of the juniors in that year had taken the College Prep math sequence, while most juniors this year have not, so it could be that the 2011 math scores will drop.

English/language arts. As the school's course of studies notes, students are required to complete four years of English study to earn their high school diploma. And the school has a two-strand approach to the English curriculum: one for students desiring

to attend a four-year college and university programs and another that prepares students for entry-level work and most two-year colleges.

For the four year college bound students, the curriculum includes American Literature in Grade 9, Literature 10, Understanding Film and English 11/12 as well as an Honors English class. These classes are available to students who show superior skill and motivation.

The sequence for the other students is designed in Grade 9 to improve students' reading strategies, vocabulary, grammar skills, and basic writing abilities. Students explore a variety of literature including short stories, novels, essays, plays, and poetry. The major novels are contemporary young adult fiction titles. Grade 10 English concentrates on English fundamentals including reading comprehension, interpretation of texts, composition, and the "basics" (grammar, punctuation, etc.). Students are asked to read and respond to various works of literature (e.g. *Planet of the Apes, Animal Farm, Dr. Jekyll and Mr. Hyde*); writing projects include three formal on essays – the persuasive essay, the narrative, and the reflective essay. The Grade 11 course emphasizes reading comprehension, interpretation of texts, composition, and basic writing skills. Students read and respond to various works of literature on a weekly basis (novels like *Speak, A Separate Peace, etc*.). Writing projects include three of the standard Vermont Portfolio essays (response to literature, reflective essay, narrative, etc.) and numerous exercises related to the study of English grammar and usage.

In addition to the above specifics, the English teachers try to have students become as good readers as possible – even to fall in love with reading, to read more books, to expand their vocabulary and to work hard at writing. The department believes

that an expanded vocabulary is a key to becoming a better reader and thinker, so seeks to expose students to more challenging literature that has both more complex vocabulary and more complex issues; instruction then emphasizes the learning of the new words, analysis of the issues addressed in the text, and then connecting those issues to the broader world and the personal lives of students. The intent is to broaden the students' awareness of the outside world and their ability to relate literature to it, to continue to expand their vocabulary so they become more adept at reading, and by writing about these issues, to become better at writing., One teacher had the students write about their personal experiences with the Hurricane Irene flooding this past summer and the class is in the process of publishing the resultant essays as a book.

Finally, the Grade 7 and 8 English classes this year have eliminated "leveled books" for teaching reading and writing, and the teacher has all students reading the same and more challenging texts. She then scaffolds the instruction to bring the slower students along while they all address the same English issues related to reading and writing about literature.

Writing. Several teachers stated that the school has placed heavy emphasis on writing over the past several years including professional development in how to teach writing. It is clear from the descriptions of the English courses that writing is emphasized in every course, both writing mechanics and various types of writing. The school emphasizes writing across the curriculum so there are writing projects in most courses – persuasive essays, responses to literature, reports, etc. The social studies courses include persuasive and report writing that are included in every social studies course from grade 7 to 12; the social studies courses also emphasize research writing and includes research

reports in nearly all courses. The English department focuses on narrative and personal essay; and the science department on the report form of writing. So the school has an intentional and systemic approach to teaching students how to write various kinds of essays.

Teachers emphasize the writing process. For example, in English, students write a minimum of three formal essays a year. The courses begin with some pre writing activities, then teach what a narrative or persuasive essay is, and then the elements of a good essay: an introduction, several paragraphs for the body of the essay, and then a concluding paragraph. Teachers will give students examples of essays and will read them narratives. A few weeks later, students must submit a first completed draft for the assigned essay. The teacher then gives each student a memo identifying what they did well and things need to work on to improve the essay. Specific feedback might include including more examples to illustrate their points, to explain their examples a bit more, to make each point relate to their thesis, and so on. A second draft is then submitted and the student receives additional feedback. The final version, then, might be the third or fourth draft. Each student must have the teacher accept the essays in order to meet the requirements to pass the course; rewriting is required until a draft is produced that meets standards.

There also is a Writers Fair every year, which is a major, public event for the school and the community.

Reading. The faculty believes that one reason students do well in reading at the high school level is because of the reading program in the elementary part of the school. From a program two decades that was idiosyncratic to each teacher, the elementary

grades in Whitcomb now have a more structured reading program. The elementary school's reading change was spurred by an individual who is now the district's Title I coordinator and formerly a Reading specialist, and is housed at Whitcomb. She became trained in Reading Recovery, the Marie Clay approach to reading which includes leveled books, and has worked both with teachers in Whitcomb elementary and teachers in the other elementary schools in the district on reading and writing issues for almost two decades.

For the past ten years, this person has worked with a voluntary group of elementary teachers across the district who want to create and implement a stronger reading program. This Early Literacy Team started in 1995 and meets from 3:30 to 5:05 addressing such issues as:

- what is a good reading program
- what to do during literacy block
- what is good writing and what to do during a writing block
- what to do with kids who are struggling.

The informal goal for Whitcomb elementary, as well as for the district's other elementary schools, is to have a reading block, a writers workshop block, a spelling block, and ongoing word work during which the teacher would focus on phonics. In addition to guided reading with leveled books, the district adopted the Wilson Fundations program, which is used K-2, to provide a more systematic approach to phonemic awareness, phonics and spelling. **Fundations** for K-3 is a phonological/phonemic awareness, phonics and spelling program for the general education classroom; it is not a

complete reading program but appropriately used as a supplementary program. However, Grade 3 teachers do not use Fundations but implement their own approach to phonics.

The Title I Reading teacher teaches Writers Workshop, based on the work of Lucky Calkins, in the fourth grade in Whitcomb. The workshop approach to writing includes having students write about topics they know; providing mini lessons on such issues as language, grammar, vocabulary, use of illustrations; and then having students move through the process of writing, getting feedback, editing, revising and then submitting a final product. She is modeling Writers Workshop for the new teachers in Grades 2 and 3 this year. And all students are writing about their experiences in the Hurricane Irene flooding which devastated this community in early September.

The reading and writing programs are augmented by individual and very small group tutoring for students struggling in reading. The district has trained Title I staff in a solid approach to tutoring, similar to but not formally Reading Recovery. To ensure subsequent effectiveness for tutors, the Title I Reading Teacher created what is called the "Reading Bible, "so all tutors have a reference document describing reading development, how to teach reading, how to teach phonics, how to collect formative assessments called "running record," how to do word work," and so on. Further, the Title I coordinator meets with the Title I Reading professional and paraprofessional staff four times a year when they discuss complex reading problems for specific students and how to address them, both in the regular classroom and in tutoring.

At the high school, one of the most noted initiatives in reading has been the DEAR program – Drop Everything And Read. For about 30 minutes every day in the middle of the day, every student goes to an assigned room and does independent reading

by choosing a book from a set of books created by the teachers. This is the fourth year the school has implemented this program. The program has instilled consistency in staff's stressing reading, paying attention to books that students select, and emphasizing more reading in classrooms. As a result, teachers are paying more attention to selecting books in their courses – and for the DEAR period – that are of interest to their students. Reading for pleasure is a disposition the school intentionally is trying to create for both students and staff. Nearly everyone mentioned the DEAR program as a factor in student's improved reading performance.

The school also participates in two Vermont book award programs -- the Dorothy Canfield Fisher program for Grades 4-8 and the Green Mountain Book Award for Grades 9-12. Each award has a list of 3-5 books for students to read, and after reading them, students vote for their favorite book. The author of the most popular book receives the award. This participation provides all students with a common experience in book reading and subsequent literary discussion.

Social Studies. The social studies program provides a seventh grade course of geography, which is a combination of physical and cultural geography. Grades 8 and 9 cover U.S. History, through the Civil War for Grade 8 and up to World War II in Grade 9. Students must take a European History or World History class in Grade 10 and then have electives for Grades 11 and 12.

Teachers have gone the extra mile in developing elective classes, soliciting student interest in creating courses in response to them. Electives have included courses on the Middle East and Human Rights. The department also provides a "capstone"

course for writing, which helps prepare students to write their college application essay. All Grade 11 and 12 classes emphasize writing and research report writing.

Further, the social studies and English teachers have begun to coordinate the teaching of some curriculum units, so when the social studies teacher covers a certain time period, the English teacher will have students read literature books from the same time period.

Point of view about teaching. In this school, there is a common understanding about what is good teaching. Good teaching means strong and authentic connections with students, getting to know students on an academic as well as personal level, personalizing instruction and having a "passion" to make sure all students learn. So to be a good teacher in this school means knowing each individual student, figuring out what works for each student, communicating with other teachers about what instructional approaches and activities work in general and work for specific students, and then exerting effort to make sure no student falls through the cracks and gets the help – in the class and outside the class – to achieve to standards. Teachers new to the school recognized this aspect of the school culture and its approach to instruction. Further, most teachers believed that the small size of the school – and each classroom (which rarely if ever has more than 15 students) – facilitated this approach to teacher work in this school.

Assessment

Most teachers stated that they are not "driven" by the NECAP testing system; they also said that if the school provides a solid curriculum, focuses on reading comprehension and writing across the curriculum, and emphasizes higher order thinking skills in all curriculum areas, students would perform well on NECAP and NECAP

scores would rise. A few teachers provided some exposure to NECAP by having students take some NECAP items, but generally most said they paid little attention to NECAP.

Nevertheless, over the past 5-6 years, the school did do some analysis of its curriculum and made changes to some of the curriculum so it more closely aligned with NECAP. For example, in the math program, teachers discovered that the integrated math approach deemphasized computation skills, solving algebraic equations and almost ignored geometry proofs, all skills and concepts that were on the NECAP math test for Grade 11. So the teachers augmented the integrated curriculum to include these topics to better prepare all students.

In addition, Whitcomb also created a policy to motivate students to take the state NECAP testing seriously. About 10 years ago, Whitcomb was identified as a non-performing school under the federal Adequate Yearly Progress (AYP) standards. When the faculty investigated the under lying reasons, they discovered that many students did not take the state test seriously – they guessed at answers, doodled during the test taking time and finished the test far before the testing time was exhausted so did not work hard to do well on the test. Thus the faculty encouraged the school board to adopt a policy that would give meaning to the NECAP test and it did so. Today, if students do not meet standards on NECAP, i.e., get a Proficient or higher score, they must take an additional elective class in the subject in order to graduate from high school. As a result, faculty believe that all students take NECAP testing seriously and perform as well as possible on the test.

Though many faculty discussed "formative" assessments they used and stated that every teacher is expected to know the academic and motivational strengths and weakness of all students, the approaches were individualistic to each teacher; there did not seem to be a systemic approach to a formative assessment system in any subject matter area at least at the high school.

The school does use some benchmark assessments to monitor student performance. It administers the online NWEA MAP assessments twice a year for Grades 2-10, once in September and once in May, and for both reading and mathematics. In addition, the school administers the DRA2 reading assessment three times a year for all students in Grades 3-6, and for targeted students in Grades 7 and 8. The DRA2 is a criterion-based authentic assessment that measures a student's ability to preview and predict a story, fluency in oral reading, and expression the student uses when reading. In a one-on-one conference, DRA2 enables teachers to systematically observe, record, and evaluate change in student reading performance and to plan for and teach what each student needs to learn next. So by measuring reading comprehension and reading fluency teachers are able to determine appropriately leveled reading materials for instruction and what types of independent reading can be expected from each student. But other than the MAP, Whitcomb Senior High School has no reading or math assessment – other than NECAP – for high school students.

The school has a computer based data system called BEAMS, Betel Education Assessment Management System. Teachers noted that "everything" about students and their performance is in that system. For example, for all students, a teacher can see grades in other classes, comments other teachers have written on assessments, behavioral

issues and who has had detentions, all contained in quarter reports and interim-quarter reports. These data help teachers understand academic strengths and weakness for each student. So if a student is struggling in English, for example, but doing well in math and science, the English teacher could go to those teachers and ask them what they are doing to motivate the student. If the student is struggling in all classes, the teachers as a group could schedule a visit with parents and have the parents visit with the team of teachers, rather than just each individual teacher at different times.

Interventions

There are not many formal interventions for struggling students at Whitcomb Junior/Senior High School. On the one hand, the two "tracks" in mathematics and English/language arts provide an instructional path for the slower learning students in those subjects, which hopefully obviates the need for additional extra help. In addition, the block schedule of 90 minutes provides time for teachers to provide some individual attention to students who need it, at the end of each instructional block when most students are applying the concepts for the day or starting homework.

Though Whitcomb does have an after school Homework Club, where some students can get extra academic help, more than one teacher wished that there was a place in the school, or a time during regular school hours, where a struggling student could find some kind of extra help.

For several years, the junior high school had a summer program to "catch-up" students with reading problems and to give them help before their high school experiences began. The program focused on reading books; teachers would spend half the morning reading books with the students and providing lessons on various reading

skills. The goal was to give students lagging in reading performance a "jump start" for performing to standards in the more difficult secondary English/language arts classes.

Students with an identified disability generally have an IEP that requires the help of a paraprofessional during their content classes. So in many core content classes, there is a paraprofessional in the class in addition to the teacher. The paraprofessional will work with all the students in the class (whether one or more) during the class, and sometimes outside the class, to provide the needed extra assistance. The special education teachers also work with students who have an IEP outside of regular class hours when the IEP requires it.

Professional Development

There was some but not much mention of professional development. The more veteran teachers noted that there had been considerable professional development over the past several years on writing, and in the years before NECAP, on helping students prepare writing portfolios. The school's emphasis on writing in virtually all subjects probably derives in part from this training.

Teachers also mentioned considerable professional development for mathematics, for both the junior and senior high math teachers. This training was mostly focused on the "integrated" math courses that were taught from Grade 9 to Grade 11 for most students. The district provided the training for the integrated mathematics for three full summers; the training covered the organization of the content and the math content itself, as well as instructional strategies for teaching the content. Teachers felt this training was excellent.

More currently, there has been training on incorporating technology into the curriculum. Per the district collectively bargained teacher contract, which is district wide, teachers can take, at district expense, up to six credits every year at the University of Vermont. Teachers are rarely if ever turned down for any professional development experience requested. In this district and school, the teacher drives professional development experiences.

School Culture

The culture in this school is important; it transcends the lack of turnover of school leadership and is seen by many if not all teachers as a key to why the school has been effective. New teachers quickly became aware of the school's culture – how much each individual teacher cares about the performance of each student, how well they know students both academically and non-academically, how strongly they personalize instruction, how strongly they expect all students to learn, how much they collaborate with other teachers though mostly on an informal basis, and how hard they are willing to work to insure that every student has multiple chances to achieve to standards.

Another aspect of this school's culture is the commitment of each teacher to serve students in this not-particularly-economically-advantaged community. Teachers choose to work in this school and in this community, teachers are committed to insuring that every child in the school has opportunities to learn and expect other teachers to do the same, and teachers stay in this school (the new hires this year were primarily because of retirements).

Summary

The success of Whitcomb high school has multiple roots, some culture based, some teaching based, some curriculum based and one related to class size. They include:

- Committed faculty matter in this school. They have chosen to work and want to work in this school. They like working in the school. And they stay in this school for many years. They are committed to serving the students in this school including their parents, many of whom do not have the advantages of other families. Several teachers interviewed said they have a passion to work in this school, and serve this community and its students.
- Teachers who get to know students both academically and non-academically, connect with students both academically and non-academically, and use that knowledge to *personalize instruction*, make sure no child falls between the cracks, and provide whatever assistance is needed in order for all students to learn.
- Teachers who reach out to parents and encouraging parents to be involved with their children and with the school. The school believes that outreach to parents and parent involvement are key to student learning. School leaders stated that if the school had more resources it would expand parental outreach, create classes for parents, and provide or orchestrate more social services for them.
- Teacher collaboration, but mostly on an informal basis because there is no common planning time for teachers in the same department. Nevertheless, teachers expect to collaborate with other teachers on many issues and expect other teachers to be available for such collaboration.

- An emphasis on reading and writing, including reading and writing across the curriculum and in the content areas of social studies, science and math. Beginning in the elementary school and continuing through the junior and senior high school years, reading and writing is stressed in this school. The goals are not only to enable students to read to learn complex material but also, through the DEAR and other programs, to instill a love for reading in all students and incent students to read independently. The English/language arts curriculum in the school provides for advanced students to move forward and stresses the basic writing, grammar, reading, and reading comprehensive skills all students will need for success in work or a two year college.
- A solid mathematics and social studies curriculum. The math curriculum is more aligned with the NECAP for the college bound students than non college-bound students. The non-college bound math curriculum is undergoing changes to align with the common math standards and the NECAP test that measures performance on those standards.
- Small class sizes.. Several teachers said that the small class and small school size facilitated their goal of getting to know all students, personalizing instruction for all students and collaborating on an often but informal basis., Many teachers said it was the small class size that attracted them to this school in the first place and is part of what keeps them at the school.

AN EVALUATION OF VERMONT'S EDUCATION FINANCE SYSTEM

White River School
Case Study

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White River School

White River Junction, Vermont

By Allan Odden, Partner, Lawrence O. Picus and Associates

White River School is located in White River Junction, Vermont, right across the border and river from Lebanon, New Hampshire, and within five miles of Hanover, New Hampshire, which contains Dartmouth University and its large Medical Center are located., White River Junction is primarily a working class community with above average unemployment rates for the "upper valley" region of Vermont and New Hampshire (not including Hanover). The community has significant poverty including families living in rural poverty and several homeless shelters. White River workers are mostly employed as carpenters, plumbers, electricians and builders, as well as sales clerks in nearby department stores in the upper valley broader community; a few have jobs in a small number of nearby factories. Some work in mainly classified jobs at the Dartmouth Health Medical Center. Many are seasonal workers who get laid off in the winter.

White River School is one of three elementary schools in the Hartford School District, which also has a middle and a high school. It has a preK through Grade 5 enrollment of 232 that includes 28 students in preschool. The preschool program is half day with 14 students in each session. The K-5 portion of the school enrolls 214 students, averaging 35 students per Grade K-5. There are two classroom sections for each grade, with grade level class sizes average about 17 students. Close to half the students are eligible for free and reduced price lunch. In part because about 11 percent of the students live in homeless shelters, and another 10-15 percent are from transient families (enrolling

and leaving schools several times during an academic year), the school has a relatively high percentage of students with an identified disability – 26 percent at the end of the 2011 school year. The school day runs from 8:00 am to 2:45 pm. The Hartford district, which includes White River, spent approximately $15,114 per pupil in 2009 (the last year for which we have data for all districts) for current instructional expenditures minus transportation, which was above the state average of $13,923.

School performance has been excellent as the data in Table 1 show. The numbers show a strong consistent rise in student performance on NECAP exams over the six years from

2005 to the 2010 school year. But the most important finding from the data in Table 1 is the overall high level of performance – unusual for a school with a high percentage of students from poverty, homeless and transient families. In mathematics, the percent of Grade 3-5 students' performing at the Proficient (meets standards) or above levels rose from 57 percent in 2005 to 75 percent in 2010, with the percent at the Proficient with Distinction levels almost doubling from 15 percent to 25 percent. Paralleling this rise, Grade 3-5 student performance in reading also rose significantly, from 64 percent performing at the Proficient or higher levels in 2005 to 76 percent in 2010, with the percent at the Proficient with Distinction levels more than doubling from 11 percent to 28 percent. Writing scores have had a more varied track record, but in 2010, 67 percent of students in Grade 5 performed at the Proficient or above levels with 23 percent at the Proficient with Distinction level. And science performance for students in Grade 4 hit 73 percent at Proficient and above in 2010, with 9 percent at the Proficient with Distinction

levels. These overall high levels of performance and large increases over the past six years are indeed impressive.

This case is the story about how White River School produced these impressive results. It was not from high spending, as the district spends about the state average. It was not from high teacher salaries. It was not from parent involvement though parents are welcome at the school and the school reaches out to parents and encourages their involvement. These results emerged primarily from the hard, professional work of teachers and an unusual cadre of paraprofessionals, implementing a solid curriculum program with effective instructional practices, complemented by an integrated and comprehensive array of interventions, and a school culture focused on student learning results.

Table 1

NECAP Scores for White River PreK-5 School, 2005-2010

Subject and Performance	2005 NECAP	2006 NECAP	2007 NECAP	2008 NECAP	2009 NECAP	2010 NECAP
Mathematics	**Grades 3-5**					
Proficient and Above	57%	59%	51%	70%	67%	75%
Proficient with Distinction	15%	22%	10%	19%	23%	25%
Reading	**Grades 3-5**					
Proficient and Above	64%	64%	56%	67%	65%	76%
Proficient with Distinction	11%	14%	8%	26%	17%	28%
Writing	**Grade 5**					
Proficient and Above	56%	50%	21%	36%	--	67%
Proficient with Distinction	26%	0%	7%	20%	--	23%

Science	Grade 4					
Proficient and Above				49%	62%	73%
Proficient with Distinction				3%	0%	9%

The case is based on written documents as well as interviews with the principal and nearly all certified staff in mid-November 2011. The case is part of a study of the Vermont school funding system being conducted for the legislature by Lawrence O. Picus and Associates. The case has the following ten sections: School Staff, Goals, Curriculum and Instruction Program, Interventions, Student Assessments, Organization of Teacher Work, Professional Development, School Culture, Talent**,** and a Summary.

The Staff

White River School has 26.1 certified staff positions and 6 paraprofessional staff for the K-5 program that include:

- 1 Principal, and 1 school secretary
- 0.5 FTE Teacher leader positions, which is one-third of three individuals, 0.5 FTE for each of reading, math and science, and shared among the three elementary schools
- 12 FTE K-Grade 5 teachers, two for each grade level
- 3.0 FTE elective "related arts" subject teacher positions, including 0.8 PE, 0.5 art, 1.0 library, 0.2 band and 0.5 music
- 2 Title I teachers and 1 Title I paraprofessional
- 5 FTE special education teacher positions, including 1 speech/language teacher and 5.0 special education paraprofessionals

- 2.6 FTE pupil support positions, including 1.0 guidance counselor, 0.6 mental health counselor, and 1.0 school nurse
- (1 Preschool teacher and 1 preschool paraprofessional)

The above figures exclude a Medicaid Clerk and about 5 paraprofessional positions who work mainly one-one with students with severe disabilities.

Class sizes average about 17 in each grade but can range from 16 to 18. The elective related arts teacher positions are in an appropriate ratio to the 12 core grade level teacher positions, especially given that the librarian is included in this group and instructs classes of students, thus providing teachers with pupil free time. The substantial special education staff reflect the high incidence of students identified with a disability.

Goals

White River School has five major goals for the 2011-2012 school year:

- Monitor Students' academic growth
- Provide timely instruction to address academic and behavioral needs
- Share expertise with each other
- Continuously improve communication about students' needs and staff's needs
- Reduce the "outside pressure" and remain focused on our students and each other.

These overall goals are supplemented by more specific goals, articulated in the school's Action Plan, related to improvements in student learning as measured by NECAP for each of the core subjects:

- For **reading**, to improve all students' comprehension skills: informational text, initial understanding, analysis, interpretation and fluency, with five measurable objectives tracked by scores on NECAP and monitoring reading progress three

times a year using multiple measures including the Fountas and Pinnell Reading Benchmark assessments, NECAP released items, and items in the Vermont Item Bank (an online system of items of reading, writing and math assessments that align with the VT state learning standards).

- For **mathematics**, identify essential math concepts in each classroom for each class, and use multiple assessments to measure ongoing student performance in math to determine which students need math interventions, again using multiple assessments including the Vermont math standards, released NECAP items, the Vermont Item Bank Assessment resources and the assessments in the Bridges math program. In September 2011 the school added the Primary Number Observation Assessment (PNOA) for some K-2 learners as well as Ongoing Assessment Project (OGAP) Formative Assessments for Grades 3-5, each developed in Vermont through the Vermont Math Partnership.
- For **writing**, all students will improve their writing skills with a specific focus on students in poverty who have not met standards in writing, and measured through showing proficiency to the Vermont writing standards, the Hartford School District Portfolio Assessments, NECAP released items and Vermont Item Bank Assessment resources.
- For **science**, improve student's proficiency in science inquiry specifically students' written responses.
- For **motivation**, to increase student motivation to be an engaged learner and to follow the schools Behavior Guidelines.

- For **students with disabilities**, to insure that each one received a free and appropriate education.

For each of these goals, the Action Plan includes strategies, ways to measure strategy implementation, the person(s) responsible for the goal, and needed resources. In addition, each grade level team creates goals, assessed by grains in student performance, for that grade level for each of the above six areas. The grade level action plans reflect needs based on the data wall (discussed below).

The focus on reading comprehension, math concepts, and science inquiry derive from analyses of the students' previous NECAP (and other assessment) scores identifying those areas as places where improved student performance is needed.

As a part of the overall strategy to meet these goals, the staff in June and Fall 2011 reviewed performance data for all students to determine whether students were performing at a 1, 2, 3 or 4 level of performance, win terms of the Vermont Grade Expectations which are aligned with NECAP. Note cards for all students (without names) were placed in the appropriate performance category for each of reading and math, on a Data Wall in the student's cafeteria. The wall shows the status of student performance at the beginning of the school year. The objective of the Data Wall is for performance 4 level students to stay performing at that level, to move significant portions of performance 3 level students to performance 4, to provide appropriate interventions to performance 2 level students so they can move their performance forward with the hope that many would move into performance level 3, and to provide even additional assistance for performance level 1 students, most of who already have an IEP. Periodically over the year, the faculty will re-score all students and move the

performance level note cards appropriately, in this way making a public show of performance improvements over the course of the school year. Though the prime purpose of the data wall is to provide a public visual of where the school's students are in terms of Vermont Grade Expectation Standards.

Curriculum and Instruction Program

The curriculum and instruction program for the school is unique, particularly the reading program. From the district, the school has a curriculum that is aligned with the Vermont Grade Level Expectations across all content areas, and disaggregated into the specific concepts, knowledge and skills that must be taught during the school year for each content area and each grade level in the school.

Faculty stated that a hallmark of the school's curriculum was consistency. Consistency was defined as teaching to this detailed set of content standards that were clearly articulated across grade levels. To teach this content in mathematics, the school adopted a common mathematics curriculum program – *Bridges* math, which teachers are expected to implement fully and with fidelity.

But the school did not adopt a common reading curriculum program. The **reading program** also is NOT "balanced literacy" with leveled books. The expectation is that each teacher implements a reading program that appropriately stresses phonemic awareness and phonics in the primary grades, and vocabulary, spelling, reading comprehension and reading fluency in all grades. Each teacher is expected to craft a yearlong reading program that comprehensively and grade appropriately covers all the key elements that would be included in a reading program – phonics, spelling, vocabulary, leveled and decoding books, comprehension, and reading fluency. Each

teacher, and sometimes each pair of teachers, implements their own unique reading program – with the test of the effectiveness of their program being gains on multiple measures of student performance in reading.

When asked why the school hadn't adopted a research-based reading program, such as the McGraw Hill Macmillan series, the response was that the range of student reading performance in the various classes was so wide that no one program would work. Faculty felt that even programs with "tracks" for below average, average and greater than average performing students (like McGraw Hill) were not flexible enough for the wide spread of student reading levels in their classes (with even the slower paced activities too fast for some students). Reading levels are so diverse in part because significant portions of the student body come from families in poverty as well as homeless shelters and transient families and thus have had their academic learning often interrupted (though in discussing the reading program, teachers never made reference to student demographics). Their point was that every teacher had a wide range of students in terms of reading knowledge and had to tailor a program that met the individual needs of each student, whatever their extant reading level. Each teacher had to be nimble, flexible and able to tailor instruction each day to the unique needs of each child.

To effectively implement a reading program in this manner requires expert teachers in every classroom. Indeed, the teacher has to be "more expert" than any commercially available reading program! So first the school only hires teachers who are well trained in how to teach elementary reading. Further, over the past 10-15 years, the school has sought to develop *every* teacher into an expert and knowledgeable reading teacher through ongoing training every year. Several teachers have been trained in

Orton-Gillingham, which is a highly regarded one-to-one tutoring program in phonics used most often by reading experts for students with reading disabilities. Many teachers have earned Master's degrees in reading. There has been professional development in all aspects of teaching reading, from phonics to spelling, vocabulary, reading comprehension and writing, and the training continues today with the Fountas and Pinnell Benchmark Assessment and Leveled Literacy Intervention programs. Several teachers have learned to take the diagnostic student "running reading records" and the school has experts in Reading Recovery. The faculty has been trained in "guided groups" for teaching reading, and in individual reading tutoring approaches. The faculty also understands that the K-3 reading program should be designed to teach students how to read, and the Grades 3-5 reading program designed to teach students how to read to learn.

Put a different way, the school expects each teacher to have and acquire a comprehensive set of reading knowledge, skills, expertise and tools beyond what would be included in any purchased reading program, and to be able to deploy that reading expertise to the wide range of unique needs of the students in each of their classes. This is a robust expectation but student performance in reading suggests the school is having considerable success with this approach.

When the school hires a new teacher, they assess where the individual was trained to determine whether the training meet the school's standards for what teachers need to know and be able to do to effectively teach reading. The school also reviews where the teacher had done student teaching, internships and, if experienced, where they had worked. The goal is to determine whether the applicant has sufficient expertise in teaching reading to meet the standards and expectations to be effective in White River

School. Of course, once hired, the new teacher becomes part of the school's PLC culture which helps in developing even more skills. But the point is the school is very selective in who it considers to hire. It should also be noted that teaching positions in this school are desirable; last year, there were 150 applicants for one new Kindergarten teacher position.

Throughout the year, all teachers use the Fountas and Pinnell Benchmark Assessment program to monitor student progress in multiple skill areas in reading. This Benchmark Assessment program is a one-on-one, comprehensive assessment to determine independent and instructional reading levels and for placing students into appropriate reading groups and interventions. Recording Forms guide teachers through a Reading Record that reveals a wealth of information about the reader, including the reader's accuracy and self-corrections, comprehension, and fluency. A Comprehension Conversation is part of the assessment protocol at every level and provides details about a reader's thinking within, beyond, and about the text. Optional assessments allow teachers to gather further details when necessary to more precisely pinpoint a reader's needs. So across the unique approaches to reading in each grade, there is a robust, comprehensive, detailed and common approach to monitoring student progress and using the resulting data to design classroom instruction as well as target students for interventions.

In terms of the reading approach of each grade level, the two kindergarten teachers use the Fountas and Pinell Phonics program as one central piece of their curriculum program to insure that phonemic awareness and phonics are addressed in systemic ways in both kindergarten classrooms. The kindergarten teachers organize their classrooms in the same way. In the fall, there are 30 minute blocks of reading

instruction, with 15 minutes for the whole class and then individual or small group activities. In the spring, the teachers create five groups of students by reading level in their classes (of about 17), so each group is very small – two to four students. During reading groups, there usually is another adult in the room, often a paraprofessional but sometimes a Title I reading teacher or a special education teacher. The teacher makes sure that she spends 30 minutes with each group on at least one day over the course of a week; during that time, students are in groups working on things they already know, and monitored or further instruction by the other adults

The four Grade 1 and 2 teachers loop, i.e., the teacher keeps the same group of students from Grade 1 to Grade 2; thus, the work of getting to know each individual student academically (as well as their family) carries over into the second grade. These teachers work on each of phonics and word study for 30 minutes four to five days a week, in addition to another 30-60 minutes of reading and writing. One grade 1 teacher uses the Reading Workshop approach: a 5-10 minute lesson, followed by students' reading and practicing the skill for 20-25 minutes with the teacher circulating among groups, then students sharing with the rest of the class. Another teacher has reading stations with 5 reading groups of 2-3 students each, with the groups changing periodically. The stations are divided into 15 minute segments, with silent reading, reading with the teacher, and working on words and other reading skills. Often in both Grade 1 and 2 classrooms, there will be other adults in the room during these reading times, including regular paraprofessionals, the Title I paraprofessional or the special education teachers working with specific groups of students. The classes are organized to provide each student and each group of students with reading instruction targeted to their specific reading needs.

In Grade 3, the teachers differentiate instruction according to student performance on the Fountas and Pinnell assessment system, which is substantively aligned with the concepts and skills in the district's curriculum standards for grade 3. So these teachers said they taught to the concepts and skills in the curriculum standards and monitored progress with multiple formative assessment data tracking individual student performance. The Grade 3 teachers also noted that students in this grade are beginning to read for content knowledge so reading classes are starting to read social studies and science books, and to learn how to read these books not only fluently but also for meaning and information. The reading curriculum also includes the vocabulary needed for these science and social studies books. Assessment data also showed that many students had difficulty reading beyond the text, so the Grade 3 teachers are helping students make connections to the broader world – what kinds of questions scientists ask, what are the key issues in social studies and history, etc.

The two fourth grade teachers organize their classes in similar ways. They teach reading at the same time. They form reading groups inside their 16-17 student classes, usually forming four groups. They structure the instruction so all groups are working on the same skills, but are using different books tailored to their reading levels. These teachers said that even the lowest performing readers have average intelligence so can handle the concepts, knowledge and skills in the overall reading program, but often need specific extra help on decoding skills or other identified foundational reading skills. The major "problem" for these students is that they are not able to read fluently, because they are missing some basic reading skills. During reading groups, there usually are one or more other adults in the room working with various groups, and sometimes pull outs for

students with IEPs, so students rarely go more than 20 minutes without an adult monitoring their work or providing instruction. The classroom teacher will take the "toughest" reading group, thus putting the most expert person in the classroom with the students having the most challenging reading problems. Students engage in reading and writing independently often during the week. The teacher also sets personal reading goals for every student so in small groups students are working on targeted skills on which they need practice – looking up words they do not know when reading a book, checking for understanding the plot, and so on.

Sometimes the entire class reads the same book, and then goes through several reading skills and analyses with the same book, including whole group work, desk work, small group work, reporting out and writing responses to the text. Currently the Grade 4 classes are reading historical fiction that addresses problems and issues families faced in years past with one goal being to apply the ideas in the book to the present. Further, each teacher reads with every student individually at least once every week, giving them another opportunity to monitor reading progress and note issues that present themselves.

The two fifth grade classes organize themselves differently but follow the same general approach, and use a combination of fiction and content books. The focus of the reading program in Grade 5 is questioning, reading comprehension, and reading fluency developed through a myriad of approaches and activities. A specific emphasis this year is inference – making an assertion about the text that is read and supporting the assertion with evidence. This focus is an extension of a similar focus in the fourth grade, where teachers structure this reading skill by using the Report Form and Story Form from the Language Circle of Project Read. Grade 5 reading also extends concepts students need in

reading fiction – theme, characters, setting, plot, conflicts, etc. to develop skills students can use in reading all fiction literature. The teachers also have reading groups during which students are reading books of their choice and at their reading level. Students also have assignments to read on their own at home every night. The overall goal is to have a wide variety of reading activities designed to get all students to meet the Grade 5 reading standards.

There is considerable time spent on content reading in Grade 5. In addition to the 60 minutes for reading in the morning, the teachers will have a 30-45 minute block in the afternoon reading books in science and social studies – learning how to read to learn content.

In addition the reading instruction in all classes, the school provides multiple reading interventions, all discussed in the next section.

White River School has addressed **writing** with a special emphasis in past years. Several years ago the staff realized that consistent issues emerged as data showed students were not meeting the Vermont writing standards. The staff collectively reflected on this finding and asked for and received professional development in writing. For 3-4 years the faculty worked with Joey Hawkins and Dianne Leddy, Vermont experts who had developed a Writing for Understanding program. They then researched different writing programs and finally adopted Framing Your Thoughts, which is derived from Project Read.

Framing Your Thoughts is a scope and sequence for teaching writing. In the Framing Your Thoughts curriculum, the initial focus is on writing good sentences; the parts of a sentence are represented by graphic symbols that allow students to tactilely

manipulate sentence design as they express thoughts and ideas in writing. Research shows that knowledge, understanding, and analysis of sentence structure are powerful tools in increasing reading comprehension, fluency, and decoding text through context clues. This program leads students from understanding the function of sentence parts to standard labels of parts of speech – and thus grammar. The concepts and skills are taught sequentially and logically. The process teaches correct sentence structure and punctuation using the students' own expressive language. In the upper elementary grades, the Framing Your Thoughts program begins the process of transferring Sentence Structure to paragraph development. The curriculum provides direct instruction to shape five types of paragraphs. Each paragraph type is taught with its unique graphic organizer and skill instruction. The strength of this process is that students not only learn the standard paragraph construction, but also master the ingredients needed to develop a specific type of paragraph. A strong editing piece teaches students to write with responsible independence.

The writing curriculum is quite ambitious. The Hartford School District requires several types of writing samples at each grade level – response to text, narrative, reports, procedure, persuasive, etc.

Kindergarten teachers also use a program called Handwriting Without Tears, to teach students how to write letters; this activity is based on research concluding that there is a motor pathway of writing letters to understanding phonics, so handwriting reinforces the sound and writing of letters, and the connection of the sound to the letter. K-2 teachers have a common alphabet chart to teach letter sounds, so students get consistent instruction for the first three grades. This is reinforced and followed by Framing Your

Thoughts, which also stresses grammar. As noted earlier, the upper grades use Report Form and Story Form to help structure writing activities. In addition, teachers use something called the "painted paragraph," which emphasizes the paragraph as a topic sentence, supporting sentences and a summary sentence. This approach is then applied to a "painted essay" which has several paragraphs, with a thesis paragraph, supporting paragraphs with evidence, and a summary paragraph.

The Hartford School District also decided several years ago that student performance in ***mathematics*** needed to improve, and that this required a change their math curriculum. The school then adopted the research-based Bridges Curriculum and allocates a minimum of 75 minutes of uninterrupted instruction for math. According to its web site, *Bridges in Mathematics* is a full K-5 curriculum. Developed with initial support from the National Science Foundation, Bridges offers a unique blend of problem-solving and skill building in a clearly articulated program that moves through each grade level with common models, teaching strategies, and objectives. A Bridges classroom features a combination of whole-group, small-group, and independent activities. Lessons incorporate increasingly complex visual models - seeing, touching, working with manipulatives, and sketching ideas - to create pictures in the mind's eye that helps learners invent, understand, and remember mathematical ideas. By encouraging students to explore, test, and justify their reasoning, the curriculum facilitates the development of mathematical thinking for students of all learning styles. Bridges also was designed for use in diverse settings, with its curriculum providing multiple access points allowing teachers to adapt to the needs, strengths, and interests of individual students.

Both the principal and teachers liked Bridges because it takes into account the developmental levels of students and is linked to the curriculum standards of the National Council of Teachers of Mathematics. Further, several Vermont teachers were involved in developing the Bridges math program. The faculty liked the Bridges math spiraling of math concepts up through the curriculum and its somewhat slower pace than Everyday Math, thus being more appropriate for this school's students.

Bridges covers numbers and operations, patterns, as well as algebraic thinking, and also has many applied emphases that families and community leaders value, like time and money. Another important element is that Bridges includes multiple visual models, and many manipulatives, so students have concrete materials to review if they forget something. Further, Bridges also includes materials on what educators call "content specific pedagogy," i.e., the math concepts teachers need in order to understand more fully the math that is being taught in order to be able to reinforce students' mathematical thinking during classroom discourse. Finally, Bridges has an excellent web site which now includes lessons for elements that are under emphasized in the program (see below discussion).

Bridges also includes a daily Math Corner activity that focuses on practicing math skills such as arithmetic calculations, patterns, weather, calendar, graphing, and so on; this 30 minute daily skill practice helps students remember the skills needed to engage in the broader math concepts.

After adoption, the teachers received extensive professional development to help insure effective implementation. Grade level teachers took content courses focused on the math and student's mathematic thinking for that grade level. The training covered

both an understanding of elementary school mathematics – the *mathematics* involved and not just arithmetic – and how to teach such mathematics, which meant learning about elementary student perceptions of math. The district participated in the well known Vermont Math Partnership; the district had several teachers heavily involved in that program including, for White River School, the Math Teacher Leader, a fourth grade teacher and the current principal, and the school is still is still involved in the Vermont Mathematics Initiative through the University of Vermont.

Teachers implement the entire Bridges program with fidelity. Teachers teach all the curriculum units, use the formative assessments that are included with each curriculum unit, and use the common end-of-unit tests. In fact, teachers at each grade level must provide a yearlong schedule to the principal that shows how and when they will teach each curriculum unit in the program. Indeed, teachers must provide this kind of annual "curriculum map" to the principal for all content areas.

Most math instruction over the day includes 60 minutes of math class and then, often at another time, 30 minutes for Math Corner. In the 60 minute block, there often is a lesson, students then work sometimes on their own and sometimes in groups with just the teacher circulating among the children, and then children report back to the class what they found. So social discourse is an essential part of the math instruction.

As noted above, over time teachers recognized that Bridges was not strong on every dimension. The school felt it needed more than just the end of curriculum unit assessments as some children would do well on the unit test but struggle in the next unit because they were missing some more fundamental math skill or concept. So in 2009-10, White River adopted the Primary Number Observation Assessment (PNOA), to assess

students in grades K-2 and beginning of year third graders. PNOA is a one-to-one administered an assessment provided by the Vermont Department of Education that assesses basic concepts and skills in math, from arithmetic skills to core math concepts like number sense and basic numeracy. The school also adopted the Ongoing Assessment Project (OGAP) Formative Assessments for math for Grades 3-5. Both PNOA and OGAP were developed in Vermont through the Vermont Math Partnership. These assessments help teachers target extra help during math groups as well as the Math Corner. Not surprising, the staff discovered that students needed more practice to develop automaticity of arithmetic facts, and more instruction on numeracy and the number line, the conceptual element which undergirds conceptual understand of what numbers are and thus what adding and subtracting are – mathematically.

Interventions

White River School has a systemic and comprehensive approach to interventions, and talks about them in the Response to Intervention (RTI) framework. RTI holds that core instruction, including extra help within the regular classroom, is Tier 1 and that Tier 1 instruction needs to be of the highest possible quality in order for any additional help or intervention to be effective. Thus, at White River, the first interventions are provided during regular reading, writing and math groups, many of which have another adult in the room at that time.

Reading interventions are heavily based on data: how students did on the Fountas and Pinnell benchmark assessments, and the other more informal reading assessments. These data structure both in class groupings and then the need for additional Tier 2 interventions, of which there are several.

Grade 1 students struggling in reading receive Reading Recovery tutoring in a one-to-one format. The school has 2 Reading Recovery tutors – the Title I reading teachers – each of whom can tutor 4 students at a time, with the tutoring lasting for a semester. So up to 16 first grade students can receive Reading Recovery tutoring over the course of a year. The Title I teachers also provide additional tutoring for students who need it in Grades 2 and 3.

This year, the school as adopted the Leveled Literacy Intervention, which will be implemented during the new intervention block at the end of the day. The *Fountas & Pinnell Leveled Literacy Intervention System* (LLI) is a small-group, supplementary intervention program designed to help teachers provide powerful, daily, small-group instruction for the lowest achieving children in the early grades. Lessons progress from beginning reading in Kindergarten or Grade 1 to beginning reading for Grade 3. LLI is designed to be used with small groups of young children who need intensive support to achieve grade-level competency. English language learners can also benefit from LLI. Each LLI lesson provides specific suggestions for supporting English language learners. White River School uses LLI for Grades K-2 and organizes the students into groups of three. Each teacher can identify a maximum of six students who might need LLI. The school trained three teachers to provide the LLI instruction.

To provide additional support for students' learning both math facts and math concepts, this year the school scheduled an intervention block in the afternoon for 30-45 minutes at the end of the day for students in grades K-2. Teachers of those grades can identify up to 5 students who need this math intervention, which is provided by the two

Title I teachers and Title I paraprofessional. Over the past year and continuing this year, the school has trained the two Title I teachers and Title I paraprofessional in mathematics interventions and instructional strategies for helping students struggling with math. The math interventions are organized into 6 week time periods, each beginning with a pretest and ending with a post test. Students are organized with respect to performance on the PNOA assessment, as well as all other data sources including Bridges Math, classroom observations and other formative assessments.

These more structured approaches augment the push-in assistance provided in many reading and math classes by two Title I teachers, one Title I paraprofessional, and five special education teachers and five special education aides, two supported by local funds. The special education staff also provide Tier 3 intervention throughout the day, sometimes during regular class periods and sometimes in pull out formats. The Title I and special education staff and their work is seamlessly integrated into the overall operation of the instructional program.

Student Assessments

As mentioned throughout the above discussion, White River School uses multiple kinds of student performance data to assess student achievement, to review historical trends, identify problems and plan new actions. The school uses the annual NECAP results, released items from NECAP for formative assessments, the Fountas and Pinnell Reading Benchmarks given three times a year, the PNOA and OGAP math assessments, the Vermont assessment bank, the formative assessments in the Bridges curriculum, and other diagnostic and informal teacher assessments. The school uses these data to track student performance through various levels of performance on the Data Wall in the

student cafeteria, to design instruction and in class extra help, and to slot students into various interventions.

Organization of Teacher Work

The school has scheduled substantial time for both individual and collaborative teacher work. All teachers, including the related art teachers, have a prep time every day; the prep period for the related arts teachers is from 8:00 to 8:40. In addition, each grade level teacher team has a common pupil free time every day, except for the fourth grade teachers who have common pupil free time only four days.

And nearly all teachers said that they collaborated in many, many ways over the course of a week and school year. Certainly teachers engaged in collaborative work in their grade level teams, especially the grade 1-2 team that loops so collaboration for them is essentially mandatory. Further, each grade level needs to develop a grade level action plan for improvement in student performance in each content area, which is their primary focus for collaboration during common planning time. The grade level action plans, moreover, focus on boosting student performance in specific ways – inquiry in science, problem solving in math, as well as moving students from category to category on the Data Wall.

The teachers also can use their pupil-free time to meet with the Teacher Leaders in math, reading and science for three major purposes: to improve their core instruction, to get help in crafting in class interventions, and to work on their goals from the individual professional growth plans., Many of the professional development goals cut across grade levels so if the goal is on science, the appropriate teachers would meet with the science teacher leader.

Teachers also use these times during the day to talk with and collaborate with teachers outside of their grade level. In fact, the teachers said there is much collaboration and communication that goes far beyond formally scheduled times; teachers talk and collaborate with each other before and after school (and most work after school on a voluntary basis), during the weekends (as many are working at the school on weekends), through emails, phone calls and so on. Sometimes the school hires substitutes so teachers have pupil free time to meet; that approach has been used this year for working on the professional growth plan goals.

So it could be argued – and several teachers did so argue – that collaboration at White River is organic; teachers know what questions to ask themselves and other teachers and find time to collaboratively seek answers to those questions. Collaborative teacher work at this school "just flows." Teachers know what is taught in the grade before them and in the grade after, and therefore know what they need to teach. So they just find the time for collaboration to address problems, issues and needs that might emerge for the school's highly articulated curriculum programs.

Professional Development

It should be clear that this Hartford School District has invested heavily in professional development over the past decade and continues to invest heavily today. The Hartford School District not only pays for multiple trainings for all teachers in reading and mathematics, but also pays for training for groups of teachers in specific areas – Orton Gillingham, Reading Recovery, the Leveled Literacy Intervention, math interventions, etc. The district will also pay for 6 units of courses in nearby universities, which has helped nearly every teacher to earn a Master's degree, many in reading. In

short, the school has and continues to invest significant resources in professional development every year.

The Hartford School District has three half time teacher leaders, one each in reading, math and science. The primary job of these teacher leaders is to work with grade level teams as well as "professional growth plan" teams on specific issues related to improving instructional practice. Each year, every teacher must propose and have the principal approve a professional growth plan. Nearly all the goals in such plans address improving student performance in specific areas. For example, one Grade 2 teacher's goal is to improve all students' comprehension skills including informational text, initial understanding and analysis, interpretation and fluency, with improvement shown on the Fountas and Pinnell Benchmark assessments. A fourth grade teacher goal is to improve students' math problem solving skills and computation; the measurement of success is that 90 percent of the class will score at or above standard on the Bridges Unit tests, and students will demonstrate increasing understanding of equality and associative, commutative and distributive properties when working with numbers. So the professional growth goals are ambitious, specific and measurable. Further, teachers have goals in similar areas form collaborative work groups and then work together and with the Teacher Leader to develop instructional practices that will help them attain the goals.

Finally, the district also has a teacher mentoring program for teachers new to the Hartford School District, which is supported by a district Mentor Teacher Leader, who also happens to be the music teacher at White River School. All mentor teachers receive specific training in how to do mentoring, and meet with the Mentor Teacher Leader during the year to identify issues and frame solutions. The Mentor Teacher Leader is also

sent to trainings for such individuals. Each new teacher receives ongoing help from a mentor during the entire course of their first year at the district and school.

Culture of Achievement and Hard Work

Though all of the above "technical" elements are critical to the school's effectiveness, all strategies are executed within a robust school culture that has several elements:

- Consistent high expectations for academics and behavior. All students, regardless of family context, are expected to learn to standards and abide by the school's behavior codes. Achieving to standards is the minimum goal for all students and teachers expect each student to meet that performance benchmark. In articulating these high expectations, no teacher said it was difficult to achieve because the school enrolled many children from blue collar, poverty income, homeless or transient families. Whatever the situation of the student, the school expects them to learn and behave and provides the structures, instruction and extra supports to make that happen.
    - Recognizing that many children have rather chaotic lives, the school seeks to provide a structure to the day with routines, behavior codes, clear classroom processes, etc. Further, to insure each child knows the routines, the school provides direct instruction for all of them, e.g., reading routines in classrooms, washing hands, behavior inside and outside the classroom, during recess, in hallways and so on. And all teachers are expected to hold all students to those behavior rules and routines, even not in their classroom.

- Further, all adults in the school accept every child – and every child's family – who walks through the door, whatever the family situation or learning background, and provide academic and social supports and accommodations to meet the diverse, individual needs.

- Teacher collaboration within and across grades, some formal but numerous and ongoing informal collaborations. Indeed, teacher work in this school is collaborative work.
- Consistency of curriculum and instruction practice. Every teacher is expected to teach all the content standards in reading, writing, mathematics and science. Teachers adopted a common math program that each one implements with fidelity, and every teacher implements a robust reading curriculum tailored to the needs of each student in the class, and providing appropriate emphasis on phonics, vocabulary, spelling, writing, reading comprehension and reading fluency.
    - The consistent curriculum is enhanced with a series of targeted interventions including one-to-one tutoring for reading in grades 1-3, Leveled Literacy Intervention for those grades for students with somewhat less intensive reading problems, new math interventions this year for the newly scheduled Intervention Block at the end of the day, and seamless integration of the Title I reading teacher and Title I paraprofessionals, and the 5 special education teachers and five special education aides into the instructional program throughout the day.
- Data driven decision making, drawing on multiple forms of student performance data, including NECAP scores, NECAP released items, benchmark assessments

for both reading and mathematics, PNOA and OGAP math assessments, and a Data Wall that publicly tracks student performance over the course of the academic year. Moreover, all improvement goals for the school as a whole and for each content area in each grade are specified in terms of these performance measures, with an overall goal of having all students perform at least at the 3, or meets standards, level.

- Accountability for results. Teachers in this school assume responsibility for the student performance results of their work. If students perform to standards (or above) they know it is from their hard instructional work; if some instructional approach or initiative does not boost student performance, "It is back to the drawing board," with nary a comment that it was "the kids" that led to the lack of success. The goal is for no child to fall through the cracks. Every teacher in the school is responsible for every child, academically and behaviorally, and every child is accountable to any teacher. Teachers expect every child, whatever his or her background, to learn to standards, and if the student does not, they figure out why and work to fix or improve instruction, instructional supports and/or other supports so the student does succeed.

Put differently, the school is characterized by a strong professional culture: high expectations for student learning, agreement on instructional approaches, use of student performance data for making all key decisions, accountability for results and relentless pursuit for attaining those results.

Talent

It also should be clear at this point that talent is a factor at this school. White River School has teaching and paraprofessional staff who are equipped with a comprehensive array of behavioral, curriculum -- particularly reading, collaborative, and analytic expertise, and who are willing to work hard all the time. It appears to be the case that the professionals at this school have a above average skill set, a statement also true for the school's paraprofessionals. The faculty are continuous learners; they never feel they have all the instructional tools they need; they continue to learn more so they can make even more improvements for students. Within the school, staff have different areas of expertise; some are super strong in language arts and reading, others in math and others in science. Some teachers have two Master's degree; several have a Master's degrees in reading. This mean the school has deep content expertise in all major content areas. Many of the faculty have been at the school for a long time so there is accumulated knowledge and wisdom. As mentioned above, staff collaborate informally all the time, they are always asking each other questions, trying to do better, to learn more, and desiring to implement new strategies that work for their students.

The school is well positioned to recruit top teachers. The district, Hartford, has a good reputation throughout the region. Though salaries are average, the district and this school are known for being student focused, supporting a professional community within the school, mentoring all new teachers and having administrators support teachers – the elements that teachers want when looking for a place to work. Proof of the desirability of working at the school is the 150 applicants for the one open kindergarten teacher position

last year. Additional evidence of the attractiveness of the school is low teacher turnover and the many numbers of teachers who have been at the school for well over a decade.

In short, talent is another part of the White River Story. Teachers have instructional expertise that is comprehensive, complex and sophisticated. The school expects teachers to know more about how to teach reading than would be embedded in a commercially bought textbook series. The school expects teachers to educate all the students to high standards, with large percentages of students coming from family contexts that in most other places around the country result in low levels of achievement – but not at this school. Without the talented and skilled staff in this school, its strategies would not be as effectively implemented and its results would not be as high. Talented teachers and paraprofessionals, and supportive and equally talented administrators, are another reason behind the success of White River School.

Summary

At one level, the elements behind the high levels of performance and improvements in student performance at White River School are what drive student performance in other schools across the country:

- High expectations for student learning despite the family context from which they come
- A rich and rigorous curriculum and instruction program, which in this school includes a reading program with appropriate emphases on phonics, vocabulary, spelling, writing, reading comprehension and reading fluency, a math program that seeks to develop student understanding of mathematics as well as automaticity in the arithmetic facts, as well as science, behavior and other subjects

- Multiple interventions to help struggling students to learn to standards including one-to-one tutoring for students below standards, another small group intervention for struggling readers (Leveled Literacy Intervention) but in groups of 3, a new intervention block for students struggling with mathematics, and a seamless integration of the services of 2 Title I teachers and 5 special education teachers as well as six paraprofessionals.
- Data driven decision making, drawing on multiple sources of data including a detailed benchmark assessment system for both reading and mathematics, and public display of the performance levels of all students that tracks performance progress of the year.
- A collaborative teacher culture, facilitated by pupil free time for professional learning communities each day, and enhanced by teachers collaborating on virtually everything, every day, including weekends and evenings.
- Heavy, continuous investments in ongoing training in all subjects for all teachers as well as for groups of teachers, reinforced by three half-time positions for teacher leaders in each of reading, math and science.
- A professional culture with common high expectations for student academic and behavioral performance, for a consistent approach to curriculum and instruction, and for accepting responsibility for the results of teaching, i.e., accountability for results.
- Top teacher talent. The school is intentional about who they hire, about equipping the teachers in the school with the broad and deep array of skills and

knowledge needed to be effective in the school, and about holding teachers accountable for being effective with their students.

- Strong and supportive school leadership – by the principal, teacher leaders and the teachers themselves. Leadership is broad and dense in this school, and includes paraprofessionals as well.

What this school has done can be duplicated by other schools. What this school has accomplished proves that demographics are not academic determinants, but that the hard, professional work of teachers relentlessly seeking to produce high levels of student performance is what ultimately matters.