Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools

Prepared for the
Vermont Legislative Joint Fiscal Office

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Executive Summary

One of the critical questions facing school finance today is how much does it cost to provide the resources needed to implement education programs that will ensure all students have an equal and robust opportunity to meet their state's proficiency standards and be prepared for college and/or careers. This document, prepared as part of the Vermont School Finance Adequacy Study, uses the Evidence-Based (EB) model (Odden & Picus, 2014) to provide the state with an estimate of the cost of such a system.

The intent of this adequacy study for Vermont is to identify the costs of providing an array of educational goods and services that allows each school and school district to provide all students an equal opportunity to meet **the state's student performance standards**. Although a direct linkage between funding and student performance does not exist, the intent of an adequacy study is to identify a base per pupil spending level, together with extra resources for students from poverty or non-English speaking backgrounds and/or with disabilities, that are adequate to provide all students with robust opportunities to meet college and career ready standards.

Using data for school year 2014-15, the Vermont EB model estimates an adequate funding level of $1.56 billion or some $163.9 million (approximately 10%) less than Vermont school districts spent for PK-12 education that year.

There are likely several explanations for the substantial difference between what Vermont schools currently spend and the EB cost estimate. Before identifying the source of the cost differences, it is important to note that the EB model, although designed from the school level, applies a set of standard measures to the schools in Vermont. The EB model therefore can not accommodate all of the individual circumstances of individual schools, particular in a state where local taxpayers and educators have a great deal of control in determining education spending levels. Policy makers should proceed cautiously in attempting to achieve savings because the complexities of school finance may lead to unintended consequences.

The most likely explanations for the cost difference include the following:

- **Pupil Teacher Ratios are higher in the EB model.**
    - The EB model assumes somewhat larger pupil/teacher ratios than are generally employed in many Vermont's schools, even though we modified our recommended EB ratios to meet Vermont policy on number of pupil contacts at the high school level.
- **There are fewer resources for Special Education in the EB model.**
    - Vermont schools identify a higher percentage of students as needing special education (16%) than the figure utilized in the EB model of 12%, which is based on the national average.

- The EB model provides resources that equate to 141 students per special education staff position while estimates of special education resources in Vermont districts are closer to 90 students per special education staff position. The extent to which the Vermont staffing structure is a result of the large number of small schools, or choices to provide more services to students in special education is not completely clear.

- The EB model provides full state funding for children with severe disabilities estimated to be $100 million but assumes a larger number of children are identified as having severe disabilities then are funded through the current special education funding formula.

- The EB model provides limited resources for paraprofessional positions in special education. This is based on recent research suggesting students with the greatest needs should be served by skilled teachers to provide the extra services they require who struggle to learn to standards. Yet, in Vermont and throughout the country, districts frequently rely heavily on paraprofessional positions to provide special education services. The EB model aligns with this recent research and only includes paraprofessionals for a few students with severe and profound disabilities. (See the special education section p. 88).

- The EB model provides approximately $95 million for "extra help" resources to enable teachers to provide additional instructional assistance to students struggling to learn to standards before they are labeled a student with a disability and provided an Individualized Education Plan (IEP).

- There is a growing demand for more physical and mental health services for children.

    - We address this in Chapter 4, noting that all four of our professional judgment panels identified the growing social and emotional needs of children as a major concern.

    - Consequently, the EB was modified to meet these increased needs of children by adding some additional staff, but not all that the professional judgment panels recommended.

- **The EB model provides a large array of resources to help at risk and (English Language Learner) ELL students.**

    - These resources are estimated to cost approximately $95 million and are intended to provide services to any student needing extra help to meet state standards

- **More efficient organization of Supervisory Unions or Supervisory Districts.**

    - The EB model assumes that SU services are provided to all schools/districts in the SU as if it were operating as one school district, establishing economies of scale in central operations. The *Vermont School Finance Adequacy Model* also makes it possible to

create alternative Supervisory Districts (SDs) to establish further economies from larger central organizations.

- **The EB model assumes a full day Pre-K program located in a public elementary school and available to all children currently enrolled in Vermont school districts in Pre-K programs. It is not designed to support a voucher program to support choice in placement of students in Pre-K programs.** This is a substantially different and more expensive program than the current approach to Pre-K education that establishes voucher payments of $3,000 to support Pre-K placements. Since many of these children are currently supported through voucher type payments to private providers that are capped at $3,000, this is one area where the EB costs may exceed current expenditures.

- **The EB model does not include instructional aides at any education level whereas most Vermont school districts employ substantial numbers of aides in their instructional programs.**

- **The EB model appears to have fewer administrators than generally found in Vermont school districts.**

- **There are likely other changes throughout the model with interactive effects that are driving the observed cost differences.**

It is important to note that the cost estimates contained in the EB model offer directions for future policy and resource allocation strategies and it may not be possible to recognize these potential savings in the short term. The estimates presented here arrive in the context of Act 46 and other efforts to consider unification of Supervisory Unions and school districts. The intent of this study is to complement the work of the Agency of Education and school district officials across the state.

We reached these fiscal findings by using a multi-step process that included the following activities and research efforts:

- Describing the critical elements of the EB model that are linked to increased student learning and the research that supports its resource allocation strategies (chapter 2 of this report)

- Analysis of the elements of the EB model and their applicability to PK-12 education in Vermont (chapter 3)

- Adjustments to the base EB model based on current Vermont law and policy (chapter 3 of this report)

- Further adjustments (as appropriate) to the base EB model from feedback provided by education stakeholders throughout the state (chapter 4)

- Analysis of five improving schools to understand how educational resources are used in effective schools in Vermont and how that use compares to the EB model (Chapter 5)

- A comparison of school finance adequacy approaches in other states (Chapter 6), and

- A detailed model of school finance adequacy in Vermont estimating the EB model costs by district and Supervisory Union, and providing the capacity to simulate alternative Supervisory District boundaries as well as combining schools/districts into larger school units (Chapter 7 and the accompanying Excel based *Vermont School Finance Adequacy Model*)

Chapter 5 summarizes the findings from our five case studies of improving schools. These schools have been successful in moving the achievement needle forward over a period of several years and our goal was to understand what resource allocation and education strategies they are using. Many of the strategies we identified are already imbedded in the improvement model embedded in the EB approach. Moreover, we found that the resources available through the EB model are sufficient to implement the successful approaches identified in all five case study schools.

An important part of this study was to help Vermont understand the potential for cost savings if schools are reorganized – and to support much of the work in this direction that has been started under the auspices of Act 46. Although the cost findings summarized above are based on the current number of schools and SUs in the state, the *Vermont School Finance Adequacy Model* also makes it possible to simulate alternative Supervisory District organizational structures, and even makes it possible to unify individual schools or districts to observe theoretical cost savings.

We caution readers that several features of Vermont's school funding system make comparisons of the EB model with current expenditures very difficult. The challenges in identifying and removing duplicated expenditures (i.e. districts "spend" money on tuition to other public schools that then report the same expenditures on behalf of the children for whom the tuition was paid); the existence of small school grans and phantom students in the finance system and other factors make a perfect comparison impossible.

There are also several expenditure categories (most notably food services, student transportation and capital debt) that are not included in the EB model. These are included in the total cost of the EB system and the current expenditures for the existing structure. We also include $72 million that represents the appropriation by the Vermont Legislature to pay for the retirement programs of certified staff in Vermont public schools.

Overall, it is not surprising that the EB model projects somewhat lower total costs for PK-12 education than current expenditures in Vermont. Education Week's Quality Counts (January 7, 2016 shows that Vermont has the highest per pupil expenditures among the 50 states, after adjusting for regional cost differences. Vermonters should be proud of the effort they make to provide education for the state's children.

This report is designed not to force reductions in expenditures, but rather to help the state identify the most efficient and effective ways to allocate the substantial educational resources the state now provides for public education.

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Chapter 1:
The Vermont Evidence-Based Adequacy Study

INTRODUCTION

One of the critical questions facing school finance today is how much does it cost to provide the resources needed to implement education programs that will ensure all students have an equal and robust opportunity to meet their state's proficiency standards and be prepared for college and/or careers. This document, prepared as part of the Vermont School Finance Adequacy Study, uses the Evidence-Based (EB) model (Odden & Picus, 2014) to provide the state with an estimate of the cost of such a system.

Following this introductory chapter, Chapter 2 provides a brief description of the EB model and the school improvement model that supports it. Chapter 3 offers a detailed description of the EB model, describing the personnel resources needed for regular education programs, along with estimated dollar per pupil resources needed for instructional materials, technology and other support services. In addition, Chapter 3 describes the additional resources needed for students who are struggling to meet proficiency standards, and offers estimates of the resources needed at the central office and to provide for maintenance and operations. We use current school district expenditures for transportation and food services because the cost of these programs was not part of this study.

An important component of this analysis is a review of the core EB elements by groups of education professionals from across Vermont. Specifically, we invited four Evidence-Based Professional Judgment (PJ) panels to review the components of the model and provide feedback on its adequacy and fit with Vermont. We asked the panels to recommend changes they thought were necessary to ensure adequacy and to tailor the core EB model to the specifics of Vermont's education system. One panel specifically focused on the central office and possible consolidation structures. The recommendations from these panels and the possible cost implications are described in Chapter 4. We also sought public input through a series of public "hearings" across Vermont. These hearings allowed us to hear the concerns and suggestions of education stakeholders, educators, and the public as this adequacy study proceeds. Chapter 4 details the findings from the PJ panels and the hearings and describes changes that were made to our core EB model based on the comments and suggestions of participants at those meetings.

As part of this adequacy study we sought to identify strategies used in successful and improving schools in Vermont. To that end, the research team conducted day-long case studies in five schools. The case studies provide information on multiple aspects of the improvement strategies in each of these schools and describe details about specific school resources, including, class size, percent of electives versus core subjects, and the level of resources for pupil support resources. A cross-site analysis of the case studies is included in Chapter 5, and the individual case studies are included as an appendix to this study.

Chapter 6 of our report provides data on adequacy standards and approaches in New England states. This chapter also describes how those states structure funding for both facilities and transportation.

To estimate the costs of adequacy for Vermont, we developed an Excel-based simulation model. Chapter 7 describes the model, how it can be used, and the cost estimates it provides for the State. The model is flexible, allowing the State to compare current education expenditures with the EB model's estimated costs. It will offer the State the ability to simulate alternative formula and ratio specifications for every element in the EB model, and to view results in comparison with (a) the core EB model (our EB model as we modified it for Vermont) and with (b) current expenditures to the extent available Vermont data allows us to do so.

We have developed three simulation capacities in the model as follows:

1. The ability to compare the core EB model[1] with current expenditures for Vermont school districts. Users will be able to modify the resource components of the model (i.e. the staffing ratios, per pupil dollar expenditures and other components) and see how the modifications compare both to the core EB model and to current expenditures.[2] In these simulations, we do not modify the structure of schools/districts or Supervisory Unions (SUs), although we do treat the SU as a single district (conceptually a Supervisory District) for the purpose of computing central office costs. Expenditure comparisons are only available at the SU level.

2. The ability to assign existing schools to alternative Supervisory Districts (SD). In this simulation, schools/districts are not changed, but they can be assigned to any combination of SDs the user wants to consider and the total costs of the system can be estimated. Because the new SD boundaries will differ from current districts and SUs, comparisons of estimated EB costs with current expenditures at the SU or school/district level are not possible.

3. The ability to combine schools/districts into one unified school and, in a second step, assign the newly formed schools/districts to Supervisory Districts. As with the second simulation option, comparisons of estimated EB costs with current expenditures are possible at the SU or school/district level.

WHAT THIS STUDY DOES NOT ADDRESS

Although many people assume that an adequacy study addresses all possible education funding issues, that is rarely the case. Before proceeding, we identify five issues this study will not address:

[1] The core EB model is the resource allocations for each element of the EB model as developed by Picus Odden & Associates and modified for Vermont based on the feedback from the professional judgment panels, public hearings and case studies conducted as part of this study, as indicated in Table 7.1.

[2] It is important to note that because of Vermont's unique and complex school funding formula and education governance structure, we are not able to provide a perfect comparison of EB costs with current expenditures. The complexity of these comparisons, and the potential variation in expenditures that exists are described in Chapter 7.

1. **Capital construction**. The study will not address issues of capital expenditures or funding.

2. **Market salaries for educators**. Although a few adequacy studies have included studies of the degree to which educator salaries are market based, that requires a major effort that is not part of this study. As a result, to price each staff element in the model, we used state average salary figures from 2014-15.

3. **Transportation**. Although transportation is a significant cost concern, it is not part of this study. Moreover, the impact of school consolidations as incentivized by Act 46 will have unpredictable implications for pupil transportation needs and costs. We recommend the state re-visit this issue once much of the unification of districts is complete.

4. **Food services**.

5. **Debt service**.

This study addresses all other significant components of the educational system. The goal is to identify the strategies and resources needed to enable schools to dramatically improve student performance, particularly on new standards that target college and career readiness, and to estimate the cost of meeting these standards.

Chapter 2:
The School Improvement Model

The intent of this adequacy study for Vermont is to identify the costs of providing an array of educational goods and services that allows each school and school district to provide all students an equal opportunity to meet the state's student performance standards. Although a direct linkage between funding and student performance does not exist, the intent of an adequacy study is to identify a base per pupil spending level, together with extra resources for students from poverty or non-English speaking backgrounds and/or with disabilities, that are adequate to provide all students with robust opportunities to meet college and career ready standards.

Regardless of whether high school graduates go on to college or enter the workforce, today's global, knowledge-based economy requires a similar set of skills and expertise of each graduate. No matter what course of studies a high school student completes – college prep or career tech – all Vermont students are expected to achieve to college and career ready standards. This includes children from low-income homes, students of color, English language learners (ELL) and students with disabilities. Since the 1990s, under both Acts 60 and 68, Vermont's policy makers have sought to provide equitable access to educational resources, but have not directly addressed the question of how much school revenue is needed in each school and district, although the issue of how much money is needed has been on the policy agenda for several years. Act 46 requires the state to conduct an adequacy study to estimate how much money is needed to ensure all students have access to programs that will enable them to meet state standards and be prepared for college or the workforce. This study is designed to estimate that adequate funding level for all schools and districts.

Before presenting the EB analysis that will be used to calibrate these key elements of the Vermont funding model, this chapter provides a description of the school improvement model that undergirds the EB model. The expectation is that funds provided through the school funding formula will be used to boost student achievement and close achievement gaps. Thus, this chapter contains an explicit and detailed description of the school improvement model embedded in the EB approach to adequate school funding. The concept is to link the level of funding with its effective use. Put differently, the EB model not only identifies a base level of staff and dollar resources, and extra resources for students struggling to meet standards, but also indicates how resources can be used to boost student performance and attain other education goals.

THE SCHOOL IMPROVEMENT MODEL EMBEDDED IN THE EVIDENCE-BASED APPROACH TO SCHOOL FINANCE ADEQUACY

The EB model used to estimate an adequate spending level for schools has been designed to allow districts and schools to provide every child with an equal opportunity to learn to state performance standards, which are currently the Common Core and College and Career Ready standards. The EB model is unique in that it is derived from research and best practices that identify programs and strategies that increase student learning. Further, the formulas and ratios for school resources that have been developed from that research have been reviewed by dozens of educator panels in multiple states over the past decade, and adjusted both to meet specific

state standards and also evolving best practices. The model relies on two major types of research:

1. Reviews of research on the student achievement effects of each of the model's individual major elements, with a focus more recently on randomized controlled trials, the "gold standard" of evidence on "what works."

2. Studies of schools and districts that have dramatically improved student performance over a 4-6 year period – what is sometimes labeled "a doubling of student performance" on state tests.

An Overview of the EB School Improvement Model

As a result of our research and work in other states, the EB approach has become more explicit in identifying the components of a school improvement model, and seeks to articulate how all the elements in the funding model are linked at the school level to strategies that when implemented produce notable improvements in student achievement (see Odden & Picus, 2014, Chapter 5).

Improving and high performing schools have clear and specific student achievement goals, including goals to reduce achievement gaps linked to poverty and minority status. The goals are nearly always specified in terms of performance on state assessments, though many schools also include behavior goals.

Compared to traditional schools where teachers work in isolated classrooms, improving schools organize instruction differently. Regardless of the context – urban, suburban or rural, rich or poor – improving and high performing schools organize teachers into collaborative teams: grade level teams in elementary schools and subject or course teams in secondary schools. With the guidance and support of instructional coaches, the teacher teams work with student data – usually short-cycle or formative assessment data – to:

- Plan and develop standards-based curriculum units
- Teach those units simultaneously
- Debrief on how successful the units were, and
- Make changes when student performance does not meet expectations.

This collaborative teamwork makes instruction "public" over time by identifying a set of instructional strategies that work in the teachers' school. Over time all teachers are expected to use the instructional strategies that have been demonstrated to improve student learning and achievement.

Improving and high performing schools also provide an array of "extra help" programs for students struggling to achieve to standards. This is critical, because the number of struggling students is likely to increase as more rigorous curriculum programs are implemented to prepare all students for college and careers. Individual tutoring, small group tutoring, after-school academic help and summer school focused on reading and mathematics for younger students,

and courses needed for high school graduation for older students, represent the array of "extra help" strategies these improving schools deploy. The idea is to "hold standards" constant and vary instructional time.

These schools exhibit dense leadership. Teachers lead by coordinating collaborative teams and through instructional coaching. Principals lead by structuring the school to foster instructional improvement. The district leads by insuring that schools have the resources to deploy the strategies outlined above with a focus on attaining aggressive student performance goals, improving instructional practice and taking responsibility for student achievement results.

Successful and improving schools seek out top talent. They know that the challenge to prepare students for the competitive and knowledge-based global economy is difficult, and requires smart and capable teachers and administrators to effectively get the educational job done.

We have continued to enhance the details of the strategy of school improvement embedded in the EB funding model. We most recently summarized our findings in Chapter 5 of the fifth edition of our textbook (Odden & Picus, 2014) as well as in several books that profile schools and districts that have moved the student achievement needle (Odden & Archibald, 2009; Odden, 2009; Odden, 2012). We have also studied dramatically improving schools in Vermont (as part of our firm's 2011assessment of the equity of the Vermont school funding system), Maine and Maryland as part of school finance adequacy studies we conducted in those states. We found the theory of improvement embodied in the EB model reflected in nearly all these successful schools (Picus, Odden, et al., 2011; Picus, Odden, et al., 2013). The Maine cases and two of the earlier Vermont cases show how small schools in rural settings follow similar strategies to those in the EB model. In addition, other researchers and analysts (Anrig, 2015: Blankstein, 2010, 2011; Chenoweth, 2007, 2009) as well as a recent compendium of results on educational effectiveness and improvement (Chapman, Muijs, Reynolds, Sammons and Teddlie, 2016) have found similar features of schools that significantly improve student performance and reduce achievement gaps. Our studies of improving schools in Maryland are not yet public but reinforce and align with the findings of the school cases in Vermont and Maine. The five Vermont school case studies that are part of this adequacy study further reinforce the outlines of the EB school improvement model.

In another recent book, Greg Duncan and Richard Murnane (2014) reached similar conclusions on how schools boost student learning. They note that for all students to have a chance at success in the emerging global economy, they will need high quality preschool programs, followed by effective elementary and secondary schools. The key features needed in each school include: 1) leadership focused on improving instructional practice; 2) within school organization of teachers into teams that over time create a set of effective instructional practices and deploy them systematically in all classrooms; 3) a culture of assistance (e.g., instructional coaches and ongoing professional development) and accountability (e.g., adults taking responsibility for the impact of their school actions on student performance); and 4) an array of extra help strategies to extend learning time for any student who needs more time to achieve to standards.

Although the details of studies of improving and high performing schools vary, and different authors highlight somewhat different elements of the process, the overall findings are more similar than different. This suggests all schools can improve if they have adequate resources –a goal of the current adequacy studies. The key to dramatic improvement in student learning is for schools and districts to effectively deploy those adequate resources to strategies that are effective in boosting student learning.

The Ten Strategies in the EB School Improvement Model

For clarity, the elements of the school improvement strategy embedded in the EB funding model are organized into ten areas. In general, we find that schools and districts that produce large gains in student performance follow ten similar strategies (see Chapter 4 and 5 of Odden & Picus, 2014; Odden, 2009), resources for each of which are included in the EB model:

1. Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap. The test score analysis usually first includes review of state test results and then, over time, analysis of short cycle/interim (e.g., Renaissance Learning Star Enterprise) as well as benchmark assessments (e.g., NWEA MAP) to help tailor instruction to precise student needs, to progress monitor students with an Individual Education Plan to determine whether interventions are working, and to follow the progress of students, classrooms and the school over the course of the academic year. Improving schools are "performance data hungry."

2. Set higher goals, such as aiming to educate at least 95 percent of the students in the school to proficiency or higher on state reading and math tests; seeing that a significant portion of the school's students reach advanced achievement levels; having more high school students take and pass AP classes; and making significant progress in closing the achievement gap. The goals tend to be numerically explicit, and far beyond just producing "improvement" or "making AYP." Further, because the goals are ambitious, even when not fully attained they help the school produce large gains in student performance.

3. Review evidence on good instruction and effective curriculum. Successful schools throw out the old curriculum, replace it with a different and more rigorous curriculum, and over time create their specific view of what good instructional practice is to deliver that curriculum. Changing curriculum is a must for schools implementing more rigorous college and career ready standards. And such new curriculum requires changes in instructional practice. Successful schools also want *all* teachers to learn and deploy new instructional strategies in their classrooms, so they also seek to make good instructional practice systemic to the school and not idiosyncratic to each teacher's individual classroom.

4. Invest heavily in teacher training that includes intensive summer institutes and longer teacher work years, provide resources for trainers, and, most importantly, fund instructional coaches in all schools. Time is provided during the regular school day for

teacher collaboration focused on improving instruction. Nearly all improving schools have found resources to provide instructional coaches to work with school-based teacher data teams, to model effective instructional practices and to observe teachers and give helpful but direct feedback. This focus has intensified now that schools are delivering a more rigorous curriculum focused on educating all students to college and career proficiency levels. In addition, professional development is viewed as an ongoing and not a "once and done" activity.

5. Provide extra help for struggling students and, with a combination of state and federal Title 1 funds, provide some combination of tutoring in a 1 to 1, 1 to 3, or 1 to 5 tutor to student format. In some cases this also includes extended day, summer school, and English language development for all ELL students. These Tier 2 interventions in the Response to Intervention (RTI) approach, called a Multi-Tiered System of Support (MTSS) in Vermont, to helping struggling students achieve to standards were absolutely critical. For many students, one dose of even high quality instruction is not enough; many students need a combination of extra help services in order to achieve to their potential. No school producing large gains in student learning ignored these extra help strategies altogether or argued that small classes or preschool were substitutes.

6. Restructure the school day to provide more effective ways to deliver instruction. This can include multi-age classrooms in elementary schools, and block schedules and double periods of mathematics and reading in secondary schools. Schools also "protect" instructional time for core subjects, especially reading and mathematics. Further, and critically important, improving schools today organize teachers into collaborative teams – grade level teams in elementary schools and subject/course teams in secondary schools. These teams meet during the regular school day, often daily, and collaboratively develop curriculum units, lesson plans to teach them, and common assessments to measure student learning that results. Further, teams debrief on the impact of each collaboratively developed unit, reviewing student learning overall and across individual classrooms.

7. Provide strong leadership and support for data-based decision-making and improving the instructional program, usually through the superintendent, the principal and teacher leaders. Instructional leadership is "dense" and "distributed" in successful schools; leadership derives from the teachers coordinating collaborative teacher teams, from instructional coaches, the principal and even district leaders. Both teachers and administrators provide an array of complementary instructional leadership.

8. Create professional school cultures characterized by ongoing discussion of good instruction and teachers taking responsibility for the student performance results of their actions. Over time, the collaborative teams that deliver instruction produce a school culture characterized by: 1) high expectations of performance on the part of both students and teachers, 2) a systemic and school-wide approach to effective instruction, 3) a belief that instruction is public and that good instructional practices are expected to be deployed by every individual teacher, and 4) an expectation that the adults in the school are

responsible for the achievement gains made (or not made) by students. Professionals in these schools accept responsibility for student achievement results.

9. Bring external professional knowledge into the school, e.g., hiring experts to provide training, adopting research-based new curricula, discussing research on good instruction, and working with regional education service agencies as well as the state department of education. Successful schools do not attain their goals by "pulling themselves up by their own boot straps." They aggressively seek outside knowledge, find similar schools that produce results and benchmark their practices to them, and operate in ways that typify other professions.

10. Finally, talent matters. Many improving schools today consciously seek to recruit and retain the best talent, from effective principal leaders to knowledgeable, committed and effective teachers. They seek individuals who are mission-driven to boost student learning, willing to work in a collaborative environment where all teachers are expected to acquire and deliver the school's view of effective instructional practice, and who are accountability focused. Often such schools also have principals who have lead the school for many years.

In sum, the schools that have boosted student performance deploy strategies that are strongly aligned with those embedded in the EB model. Further, in our adequacy and recalibration work in many other states including Maine, Maryland, North Dakota, Washington, Wisconsin and Wyoming, we found that most educators shared this view of how schools can increase student performance. These practices bolster our claim that if funds are provided and used to implement these effective strategies, significant student performance gains should follow.

Finally, as noted above, we have conducted several case studies in Vermont. Chapter 5 and the case study write ups in Appendix A suggest that school improvement in the "Green Mountain State" is similar to that in many other states and that many successful schools use strategies similar to the improvement strategies embedded in the EB funding model.

Chapter 3:
Using The Evidence-Based Model To Identify
A Base Spending Level And Extra Resources For Struggling Students

This chapter describes the components of the EB model used to estimate a new base spending level, along with additional resources for students from poverty backgrounds, for students who are ELL and for students with disabilities. Following an overview, the five parts of this chapter include the following:

1. Staffing for core programs, which includes preschool, full-day kindergarten, core teachers, elective/specialist teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses (the latter three constituting recent changes and additions to the EB model), substitute teachers, supervisory aides, librarians, principals/assistant principals and school secretaries

2. Dollar per student resources, including gifted and talented, professional development, school-based computers and other technology, instructional materials and supplies, and extra duty/student activities

3. Central functions: maintenance and operations, central office

4. Resources for struggling students including tutors, extended day, summer school, ELL programs, alternative schools and special education, and

5. Staff compensation.

In each section, the report provides an analysis of each element in the EB funding model in the context of current research.

OVERVIEW

Table 3.1 below provides a summary of all the recommendations suggested by the EB model. Chapter 6 shows how these recommendations are combined into a new base per pupil figure and additional per pupil resources for struggling students from low income and ELL backgrounds, and with disabilities.

Table 3.1
Summary of Current EB Model Recommendations

EB Model Element	Current EB Formula, Ratio or Dollar Per Pupil Figure
STAFF RESOURCES FOR CORE PROGRAMS	
1a. Full-day Preschool	Preschool classrooms are staffed at a class size of 1 teacher and 1 aide for every 17 students.
1b. Full-day Kindergarten	Full-day kindergarten program. Each K student counts as 1.0 pupil in the funding system.
2. Core elementary class sizes/Core teachers	Grades PreK-3: 15 Grades 4-5: 25 Grade PreK-5,6 average: 17
3. Secondary class sizes/ Teachers	Grades 6-12: 25, reduced to 20 per Vermont class size guidelines
4. Elective teachers	Elementary Schools: 20% of core elementary teachers Middle Schools: 20% of core middle school teachers High Schools: 33 1/3% of core high school teachers
5. Instructional Coaches	1.0 Instructional coach position for every ~200 students, with a minimum of one in smallest school prototype
6. Core Tutors	One tutor position in each prototypical school (Additional tutors are enabled through the at-risk and ELL student counts in Element 22)
7. Substitute Teachers	5% of core and elective teachers, instructional coaches, tutors (and teacher positions in additional tutoring, extended day, summer school and ESL resources)
8. Core Guidance Counselors and Nurses	1 guidance counselor for every 357 grade PreK-5 students, changed to 1 per 300 Prek-5 students per Vermont standards 1 guidance counselor for every 250 grade 6-12 students, changed to 1 per 200 GR 6-12 students per Vermont standards. 1 nurse for every 750 PreK-12 students, changed to 1 per 500 Prek-12 students per Vermont standards. (Additional student support resources are provided on the basis of student at-risk and ELL students in Element 23)
9. Supervisory Aides	1 for every 178.5 elementary students 1 for every 225 middle school students 1 for every 200 high school students
10. Library Media Specialist	1.0 library media specialist position for each prototypical school down to 300 students, then prorated down with a minimum of 0.5 for smaller schools. 1.0 library aide prorated up from 300 to 600 students.
11. Principal/Assistant Principal	1.0 principal for the 357-student prototypical elementary school and down to the 119 student elementary school. 1.0 principal for the 450-student prototypical middle

EB Model Element	Current EB Formula, Ratio or Dollar Per Pupil Figure
	school and down to the 150 student middle school. 1.0 principal and 1.0 assistant principal for the 600-student prototypical high school, with the assistant principal eliminated at 300 students but a principal down to the 150 student high school.
12. School Site Secretarial Staff	1 secretary position for every 178.5 elementary students 1 secretary position for every 225 middle school students 1 secretary position for every 200 high school students
DOLLAR PER STUDENT RESOURCES	
13. Gifted and Talented	$40 per student
14. Professional Development	10 days of student-free time for training built into teacher contract year $125 per student for trainers (In addition to instructional coaches (Element 5) and time for collaborative work provided by Element 4)
15. Instructional Materials	$190 per student for instructional and library materials
16. Short Cycle/Interim Assessments	$25 per student for short cycle, interim and formative assessments
17. Computer Technology and Equipment	$250 per student for school computer & technology equipment
18. Career Technical Education Equipment	$10,000 per CTE teacher for specialized equipment Plus core administrative and physical resources required to staff the 17 Vocational Technical Centers, most of which are stand alone schools.
19. Extra Duty Funds and Student Activities	$300 per student for co-curricular activities including sports and clubs
CENTRAL OFFICE FUNCTIONS	
20. Maintenance and Operations	Separate computations for custodians, maintenance workers and groundskeepers, and utilities. $315.39 per pupil for utilities, the 2014-15 statewide average.
21. Central Office Staffing	A dollar per student amount for central office staffing and non-personnel resources is computed based on the district's total enrollment.
RESOURCES FOR STRUGGLING STUDENTS	
22. Tutors	1.0 tutor position for every 125 non-ELL free and reduced price lunch eligible students, and 1.0 tutor position for every 125 ELL students (in addition to the one core tutor position in each prototypical school). These positions are provided additional days for

EB Model Element	Current EB Formula, Ratio or Dollar Per Pupil Figure
	professional development (Element 14) and substitute days (Element 7).
23. Additional Pupil Support	1.0 pupil support position for every 125 non-ELL free and reduced price lunch eligible students, and 1.0 pupil support position for every 125 ELL students.
24. Extended Day	1.0 FTE teacher position for every 120 at risk and ELL students.
25. Summer School	1.0 FTE teacher position for every 120 at risk and ELL students.
26. English Language Learner Students	1.0 teacher position for every 100 identified ELL students. This provision is in addition to tutoring, additional pupil support, extended day and summer school resources. These positions are provided additional days for professional development (Element 14) and substitute teachers (Element 7).
27. Alternative Schools	One assistant principal position and one teacher position for every 7 alternative school students.
28. Special Education	7.1 teacher positions per 1000 students for services for students with mild and moderate disabilities and the related services of speech/hearing pathologies and/or OT PT. This allocation equals approximately 1 position per 141 students. 1.0 psychologist per 1,000 students to overview IEP development and ongoing review. Full state funding for students with severe disabilities, and state-placed students, minus the cost of the basic education program and Federal Title VIB, with a cap on the number covered at 2% of all students. Provided at the District or Supervisory Union level.
ADDITIONAL ISSUES	
Staff Compensation	Average of previous year salaries For benefits: Retirement or pension costs: 0, fully paid by the state Social Security: 6.45% up to a maximum of $118,500 Medicare: 1.2% with no maximum Workers' Compensation: 0.82% Unemployment Insurance: $102 per employee Health insurance fixed amount at $13,090

Response to Intervention

Before proceeding, we note that the design of the EB model, which includes core and elective teachers for all children and provides additional resources for struggling students, reflects the *Response to Intervention (RTI)* model. RTI is termed a Multi-Tiered System of Support (MTSS) in Vermont. RTI, or MTSS is a three-tier approach to meeting student needs. Tier 1 refers to core instruction for all students. The EB model seeks to make core instruction as effective as possible with its small class sizes, provisions for collaborative time, robust professional development resources and strong recommendation that teachers be organized into collaborative teams. Effective core instruction is the foundation on which all other educational strategies depend to effectively add value. Tier 1 usually includes some differentiated instruction in the regular classroom. After Tier 1 instruction, Tier 2 services are provided to students still struggling to achieve to standards before being given an IEP and labeled as a student with a disability. The EB model's current Tier 2 resources include one core tutor for every prototypical school and additional resources triggered by poverty and ELL student counts that provide funding for tutoring, extended day, summer school, additional pupil support and ESOL services for ELL students. Tier 3 includes all special education services.

Pupil Counts

The EB model typically recommends that states use an ADM pupil count for the funding formula. The EB model also includes a modest declining enrollment cushion, which is the larger of the average ADM of the previous year or the previous year.

Vermont uses several pupil counts in its current formula. In addition, many Vermont districts "tuition-out" students to schools in other districts and sometimes to private schools. Thus, Vermont uses a count of resident students and a count of "attending" students, i.e., counts of students where they are actually attending school.

Since the EB recommendations and cost analysis is tailored to each school, we use a student count based on where children attend school. For this work we used the Spring Census count, or in Vermont's vernacular, average daily attendance (ADA). Because excused absences are counted as an attending day, this student count is closer to what most states call average daily membership (ADM). We wanted, but were not able, to use three years of these pupil counts. Using a three year average pupil count helps to provide a cushion for schools with declining enrollment, treating a school's enrollment as the higher the most recent pupil count, or the average of the three preceding years.

This approach to modeling costs allows the dollars to follow students. This approach has the potential to reduce administrative efforts currently devoted to negotiating and sending tuition payments across districts and supervisory union boundaries for students who reside in one district/SU but attend school in another.

To this basic student count, the model will include two pupil counts for resident students that attend non-public schools; one count for students attending a non-public school within Vermont and a second count for students attending a non-public school outside of Vermont.

We note that our current EB approach to providing additional resources for poverty (i.e., students eligible for free and reduced price lunch) and ELL students has been changed from what appears in our textbook to make the EB recommendations for extra resources for ELL students clearer. All ELL students, regardless of eligibility for free and reduced price lunch, trigger tutoring, additional pupil support, extended day, summer school and ESOL resources. In the past, ELL students were included in an at-risk pupil count that was an unduplicated count of students eligible for free or reduced price lunch or ELL, with any one student counted only once. Today, though, the EB method defines at-risk students as non-ELL students eligible for free and reduced meals in grades PreK-12. The intent of this definition is to ensure that all ELL students, whether or not they are also free and reduced price lunch eligible students, as well as all non-ELL free and reduced price lunch eligible students, trigger resources for extra help services, yet to make sure that any individual student is counted only once for these resources.

Prototypical Schools and Districts

A key component of the EB model is the use of prototypical schools and districts to indicate the general level of resources in schools and districts, and to serve as a heuristic to calculate the base per pupil funding level. This figure can also be used to compute weights for programs for struggling students if a state elects to rely on a weighted pupil formula for distributing funds to *districts*. The EB model identifies resources for prototypical elementary, middle and high schools, as well as for a prototypical district. The model uses specific prototype school sizes so the relative levels of resources for all students are explicit. As described below, the standard EB prototypical school models will not work in Vermont because of the small average school size. Before describing our approach to prototypical schools in Vermont, we provide evidence on school and district size to help situate the discussion.

Research on School and District Size

Before describing the approach to prototypical schools in Vermont, we review the research on school size. Research on school size is quite consistent in its conclusions. However, most of the research on school size addresses the question of whether large schools – those significantly over 1,000 students – are more efficient and more effective than smaller school units (schools of 300 to 500), and whether cost savings and performance improvements can be identified by consolidating small schools or districts into larger entities. The research generally shows that school units of roughly 400-600 elementary students and between 500 and 1,000 secondary students are the most effective and most efficient (Lee & Smith, 1997; Raywid, 1997/1998; Ready & Lee, 2004).

Moreover, the research on diseconomies of small and large scale, which should consider both costs and outcomes, generally provides mixed evidence for a consolidation policy. In an early review of the literature, Fox (1981) concluded that little research had analyzed output in

combination with input and size variables. Ten years later, after assessing the meager extant research that did address costs as well as outcomes, Monk (1990) concluded that there was little financial support for school consolidation.

In more recent reviews of scale economies and diseconomies and potential cost savings from consolidation while controlling for student performance, Andrews, Duncombe & Yinger (2002) and Duncombe and Yinger (2007, 2010) found that the optimum size for elementary schools was in the 300-500 student range, and for high schools was in the 600-900 range. Both findings suggest that the very large urban districts and schools across America are larger than the optimum size and need to be downsized somehow. In sum, the research suggests that elementary school *units* be in the range of 400-500 students and that secondary school *units* be in the range of 500-1,000 students.

Most of the literature cited above describes research that was conducted to address the issue of potential cost savings from consolidating schools and districts into larger units, but much larger than nearly every school and district in Vermont. The research generally found that such changes produced modest cost savings but also resulted in performance reductions. On the other hand, these studies suggest that consolidating *very* small schools, which is the dominant situation in Vermont, is likely to produce cost savings with little negative and perhaps even positive impacts on learning, even if the consolidated schools are somewhat smaller than 300-500 students the literature suggests is the most efficient size.

In Vermont, which has scores of schools – and even districts – with 150 or fewer students, school mergers could produce significant cost savings. Indeed, in one econometric study of possible cost savings while maintaining performance, Andrews, Duncombe and Yinger (2002) concluded with a sentence that is quite applicable to Vermont: "Sizeable potential cost savings may exist by moving from a very small district … to a district with 2,000 to 4,000 pupils, both in instructional and administrative costs." Further, in studying actual school consolidations in New York State, Duncombe and Yinger (2007) found that operating expenditures per pupil declined by 61.7 percent when two 300-pupil districts merged and by 49.6 percent when two 1,500-pupil districts merged. They further found that the savings were largest for the subcategories of instruction and administration, but the study found no economies—or diseconomies—of size for student transportation.

This suggests the potential for cost savings if very small Vermont schools merged and if very small districts unified. Such changes, if they occurred, would need to be monitored to identify the actual costs savings and to determine how the changes impacted student performance.

Prototypical Schools and Districts for Vermont

In most states, the EB approach identifies resources for prototypical elementary, middle and high schools with enrollments of 450, 450 and 600 respectively. While these prototypical school sizes reflect the research on the most effective and efficient school sizes, in reality few schools are exactly the size of the prototypes. The EB model uses these prototypes to indicate the relative level of resources in schools, as well as to calculate a base district per pupil cost. Actual

resources to individual schools are then prorated up or down based on the actual enrollment of each school.

Few schools in Vermont are as large as the prototypical schools generally used in the EB model. In addition, Vermont has very clear standards on class size that are somewhat smaller than the EB model parameters. Consequently, the prototypical school sizes have been revised downward to reflect both the reality of actual school sizes in Vermont and to meet existing academic standards on school size across the state.[3]

As a result of these two factors, we have developed a range of prototypical schools that are more reflective of the reality of Vermont. Specifically the prototypes we developed are PK-5, 6-8 and 9-12. We included Pre-K in the prototypes because preschool is now required in Vermont. While these prototypes do not reflect all of the school organizations used in Vermont, they provide the flexibility to assign resources (and thus costs) to any school.

For elementary schools, we use a prototypical school of 357 students, which is a school of 3 sections of 17 students in each grade PK-5. We also develop a two section and one section elementary school, which are schools with two sections of 17 students per grade (238 students) or schools with one section of 17 students (119 students) per grade respectively.

For secondary schools, the standard EB model has a middle school of 450 students and a high school of 600 students, both with class sizes of 25. Given Vermont's class size guidelines, the Vermont model will use class sizes of 20, although we will continue to use prototypical schools sizes of 450 and 600 with additional prototypes established at enrollments of 300 and 150 students. The result is four high school prototypes (600, 450, 300 and 150 students) and three middle school prototypes (450, 300, and 150 students). To meet Vermont's class size standards, staffing for these schools will assume core class sizes of 20 students rather than the 25 used in other EB models.

We will finalize the school prototypes after the Professional Judgment Panels and conversations with staff and other Vermont education leaders.

Our approach is to estimate the resources needed in each of the ten prototypical schools identified above (3 elementary, 3 middle and 4 high school) and calculate the per pupil costs of each. Then for each school in Vermont, we will use the school's enrollment to compute base per pupil costs, which will be interpolated from the cost estimates of the two surrounding prototypes. For example, a middle school with 375 students will generate per pupil funding that is half way between the 300-student prototype and the 450-student prototype.

[3] Vermont academic standards require that, "Classes in grades K-3, when taken together, shall average fewer than 20 students per teacher. In grades 4-12, when taken together, classes shall average fewer than 25 students per teacher. The total class roll of a teacher shall not exceed 100 students, except where the specific nature of the teacher's assignment (such as in certain art, music, or physical education programs) is plainly adaptable to the teaching of greater numbers of students while meeting the educational goals of the program." http://education.vermont.gov/publications/model-policies

To these school level cost estimates, we provide estimates of district level costs based on enrollment at the district level, sum the school and district costs to achieve an estimated total school district cost. Our simulation model will enable us to "shift" schools into larger supervisory districts and re-estimate adequate cost levels to assist districts and policy makers in understanding the implications of the Act 46 alternative structures. As with individual school resources, the model accommodates different school district sizes and the resources required as the enrollment of a district changes.

Our approach is designed to meet the unique district and supervisory union structure in Vermont, and the current efforts to establish alternative district structures under the requirements of Act 46. In addition to the resources for schools and districts, resources are provided for special education, and based on student characteristics resources for struggling students as well.

In sum, the EB model will provide an estimate of the costs of adequacy for each school in Vermont as located in its current district and Supervisory Union. In addition, it will provide flexibility so that schools can be shifted into alternative supervisory district configurations and new costs estimates derived.

STAFFING FOR CORE PROGRAMS

This section covers full-day kindergarten, core teachers, elective/specialist teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses (the latter three being changes and additions to the EB model), substitute teachers, supervisory aides, librarians, principals/assistant principals and school secretaries.

1a. Preschool

The EB model provides for full-day preschool. In 2014, Vermont enacted Act 166, which requires all Vermont school districts to provide universal publicly funded prekindergarten education for a minimum of ten hours per week for 35 weeks annually for all 3, 4 and 5year-old children who are not enrolled in kindergarten. Act 166 was to come into effect on July 1, 2015; however, as a consequence of a transition policy, school districts may opt to wait until July 1, 2016 to fully implement Act 166.

Current EB Recommendation
Preschool classrooms are staffed at a class size of 1 teacher and 1 aide for every 17 students.

Analysis and Evidence

There is growing evidence that a high quality preschool program is an effective way to help all children succeed in school (Kauerz, 2006). Such programs are best paired with well-resourced elementary schools, which can continue the performance catch-up that preschool programs are designed to begin. And resourcing elementary schools adequately is a goal of this adequacy

project. In addition, there is a growing recognition that integrating Preschool programs with the traditional public school system, particularly the K-3 grades, could strengthen the effect of both Preschool programs and Grades 1-3. This analysis of preschool will estimate the structure of a high quality program for three- and/or four-year-olds that would be integrated with a high quality preschool-grade 3 programs.

Much of the research on the effectiveness of preschool-grade 3 programs has focused on the preschool component, with less research on the advantages of integrated programs that continue from preschool through the Grade 3, so the preschool research is addressed first. Drawing from a number of major studies that found long-term positive effects of pre-school programs on student learning, Reynolds and Temple (2008) constructed five possible pathways through which early childhood development programs produced their impacts, including a:

- Cognitive advantage pathway that leads to enhanced literacy, language and numeracy skills, and better school readiness (see also Conger, 2008 for evidence on the impact of early learning on acquisition of English language skills for English Language Learners)
- Family support pathway describing benefits from greater parental involvement in education and enhanced parenting skills (see also Kalil & Crosnoe, 2008)
- School support pathway that argues for high quality education programs beyond pre-school to strengthen the learning advantages of early childhood development programs, a pathway allowed by an overall adequate funding system
- Social adjustment pathway suggesting benefits from increased classroom and peer social skills and positive teacher-child relationships, and
- Motivational pathway arguing that early education programs provide benefits in terms of achievement motivation and commitment to school.

Whatever the pathway, most researchers find that "high quality" preschool, particularly for students from lower income backgrounds, significantly affects future student academic achievement as well as other desired social and community outcomes (Barnett, 2008, 2010, 2011a, 2011b; Camilli, et al., 2010; Pianta, et al., 2012; Reynolds, et al., 2001, 2011; Reynolds and Temple, 2006, 2008; Schweinhart et al., 2005). These longitudinal studies show that students from lower income backgrounds who experience a high quality, full-day preschool program perform better in learning basic skills in elementary school, score higher on academic goals in middle and high school, attend college at a greater rate, and as adults, earn higher incomes and engage in less socially-undesirable behavior.

In specifying more specific positive impacts, Lynch (2007), (Heckman, 2011) and a recent report from the Education Commission of the States (Workman, Griffith & Atchison, 2014) identify the multiple benefits of preschool programs for children who participate in "high quality" preschool programs:

- Require less special education
- Are less likely to repeat a grade
- Are less likely to need child welfare services
- Enroll in K-12 education better prepared resulting in lower spending at that level

- Are less likely to engage in criminal activity as juveniles and adults
- Are less likely to need social welfare support services as adults
- Generally have higher incomes when they enter the labor force
- Pay higher taxes as a result of their higher incomes, and
- Are likely to have employer-provided health insurance.

The consistently recurring theme in all of the analyses is that the multiple benefits and, as is discussed next, long term "savings" accrue to "high quality" preschool programs. Although to a large extent, a high quality program is defined by the individuals employed to run the program and their commitment to their job, as well as a comprehensive array of services beyond just the "school" component, it is possible to identify the resource levels needed to support such high quality programs.

Russo (2007) identified the components of effective preschool-grade 3 programs to include:

- Voluntary, full-day *preschool* available to all 3-and 4-year-old children
- Full-day *kindergarten* that builds on preschool experiences and is available to all children, which is supported by the current funding system
- Standards, curriculum, instruction, and assessments aligned within and across grades from preschool through grade three, which can be accomplished with new curriculum standards
- Curriculum focused on emotional development, social skills, and self-discipline, as well as reading and mathematics
- Early education lead teachers qualified to teach any grade level from preschool through grade 3 and compensated based on public elementary school teacher salaries, and
- Families and teachers who work together to ensure the success of all children.

More recently, the National Institute for Early Education Research (NIEER) has established ten quality benchmarks to identify program quality. Its ten "high quality" preschool program standards are similar to the above and include:[4]

1. Comprehensive learning standards.
2. Teachers with a bachelor degree.
3. Teachers with specialized training in early childhood.
4. Assistant teachers with a Child Development Associate credential or the equivalent.
5. Teacher in-service training of at least 15 hours per year.
6. Maximum class sizes of 20 or less.
7. Staff to child ratios of 1 to 10 or better.
8. Vision, hearing and health screening and referral and support services.
9. At least one meal per day provided.
10. Site visits to ensure program quality.

[4] See http://nieer.org/yearbook/compare/ for a detailed description of the NIEER quality standards.

Nearly all of the longitudinal studies of preschool programs have relied on data from three preschool programs that meet the above standards: the High-Scope Perry Preschool Program, the Carolina Abecedarian Project, and the Chicago Child-Parent Center Program. These results reinforce the finding that the most robust impacts of preschool programs are those that have studied the effect of high quality programs.

In sum, high quality preschool, offered for a full day and taught by fully certified and trained teachers using a rigorous but appropriate early childhood curriculum can provide initial effects of 0.9 standard deviation that fall to 0.45 in later primary years. By themselves, preschool programs can reduce achievement gaps linked to race and income by half. And the effect of preschool programs can be enhanced if followed by high quality education programming in the elementary grades, particularly grades K-3.

Furthermore, there is increasing recognition that preschool should be provided for *all students*. Research shows that this strategy produces significant gains for children from middle class backgrounds and even larger impacts for students from lower income backgrounds (Barnett, Brown & Shore, 2004). A prominent economist also supports this position (Greeley, 2014; Heckman, 2011).

Impact of Statewide Preschool Programs

Researchers have also analyzed the success of larger, more universal, i.e., statewide, preschool initiatives. A 2003 study of state-funded preschool programs in six states – California, Georgia, Illinois, Kentucky, New York, and Ohio – found that children from lower income families start catching up to their middle income peers when they attend a preschool program (Jacobson, 2003). There is evidence that state-wide universal programs in Georgia (Henry, et. al. 2006) and Oklahoma (Gromley, Jr. et. al. 2005) have improved the performance of students who participated in those programs. In addition, a 2007 study showed that preschool programs in New Jersey's urban districts had not only significant short-term cognitive and social impacts, but also long-term, positive impacts on students who enrolled in them, closing the achievement gap by 40 percent in second grade for a two year preschool program (Frede, Jung, Barnett et al., 2007).

Fiscal Returns to Preschool

Generally, estimates of the long term financial benefits of preschool programs are reported as returns to investment. Reynolds and Temple (2008) reported that in addition to benefits on child well being and student achievement, high quality preschool programs for low income children at risk for underachievement produced economic returns ranging from $4 to $10 per dollar invested. Others make similar arguments (e.g. Heckman et al., 2010). Indeed, several studies conclude that there is a return over time of *eight to ten dollars* for every one dollar invested in high quality preschool programs (Barnett, 2007; Barnett & Masse, 2007; Karoly et al., 1998; Reynolds et al., 2011; Zigler, Gilliam & Jones, 2006; and Gromley, 2007).

In a more detailed analysis, Lynch (2007) found that voluntary, high quality, publicly funded preschool programs targeted to the poorest 25 percent of three-and four-year old children generate substantial benefits that would eclipse the costs of the programs in six years. By 2050, Lynch estimated that the annual benefits of these preschool programs would exceed the program costs in that year by a ratio of 12.1 to 1. He estimated the costs of a high quality half-day program for these children at $6,300 (2006 dollars) for each of the 2 million children enrolled. He further estimated that if those programs were funded mainly by individual states (rather than the Federal Government), by 2050, all 50 states would realize net benefits in tax revenues from the programs in between four and 29 years.

Further, Lynch (2007) estimated that if a voluntary, high quality publicly funded universal half-day preschool program for three-and four-year-olds were established, budgetary savings would surpass costs in about nine years and that by 2050 benefits would exceed costs by an 8.2:1 ratio. He assumed these preschool programs would also cost about $6,300 per student and would enroll approximately 7 million children when fully phased in. Note University of Chicago economist Heckman (2015) goes beyond these assertions and argues investments in early childhood education could reduce deficits and improve the overall economy.

The Case for Integrated Preschool-Grade 3 Programs

The discussion above considered preschool programs, but said little about preschool-grade 3 programs or their benefits. While there is growing evidence that integrating preschool programs with primary grades can lead to increased educational benefits, this field has been less explored.

Takanishi and Kauerz (2008) argue that the preschool-grade 3 years are the "cornerstone" of any educational system, and point out the importance of quality integrated preschool-grade 3 programs in providing strong foundations for lifelong learning, educational excellence and competitiveness in the marketplace. Bogard (2003) suggests that variability in preschool experiences is a strong predictor of children's outcomes, and that the link is even stronger for low-income children. She suggests that a preschool-grade 3 approach to early childhood education will help to "level the playing field" by supporting better teacher preparation and qualifications, as well as establishing sequential learning experiences from preschool through the 3rd grade.

One of the challenges in thinking about preschool-grade 3 programs is the need to coordinate traditional education programs in K-3 with preschool programs. This takes on a number of dimensions. First, even if the preschool programs are in the same school, the need to coordinate education programs (curriculum, professional development, teacher collaboration, school facilities) becomes more complex with the addition of more staff, more students and more grade levels to integrate into the program. Second, many preschool programs are offered by providers other than the public school system – frequently at sites other than the local school. This makes all of the coordination efforts more complex yet.

Finally, this is further complicated by the fact that in the foreseeable future, preschool programs will remain voluntary. This means some children will continue to come to kindergarten without

the benefit of preschool programs, and other children who have had access to preschool programs will likely bring very different experiences to the first years of formal schooling. In addition, the success of a preschool-grade 3 program also depends on the quality of the educational program in grades K-3, which varies across schools, school districts and even states. This study addresses that issue by using an EB model to estimate the resources needed for a high quality program in all preschool- grade 3 classrooms.

Many of the components of success for high quality preschool programs are also part of the components advocated by preschool-grade 3 supporters. These include full-day programs with low pupil/teacher ratios staffed by highly qualified teachers and aides, along with support for articulating curriculum, professional development, teacher collaboration, and helping children with special educational needs.

In earlier research, Picus, Odden and Goetz (2009), as part of an overall effort to cost out preschool-grade 3 programs in all states, developed case studies of several integrated Preschool programs. The case studied showed that such programs were provided in regular elementary school settings; often organized schools into preschool-grade 1, grade 2-3, and grades 4-5 collegial teacher teams; provided preschool teachers with the same pupil free time as the grade level elementary teachers so they could all meet during the regular school day for collaborative planning; integrated the preschool-grade 1 curriculum; and generally augmented a K-5 elementary school with an additional one to three preschool classrooms. And, most of the preschool classrooms were staffed with one teacher and one aide for every 15-20 students. In addition, and as recommended by the NIEER standards, such programs had classroom teachers that were fully certified as early childhood educators and paid on the same salary schedule as the other teachers in the school and school system (see also, Camilli, et al., 2010; Whitebrook, 2004).

The Evidence-Based Method to Providing Preschool Integrated Program

The EB method has been used to identify costs for integrated preschool programs in three recent studies. The first was the major study 50 state study Picus Odden & Associates conducted for The Fund For Child Development, which developed estimated costs for providing such programs, using various assumptions of eligibility and participation, in all states in the country (Picus, Odden & Goetz, 2009). The second was a study conducted in 2011 as part of an adequacy study for the state of Texas (Picus, Odden, Goetz & Aportela, 2012). The third was an analysis conducted for Maine as part of a 2013 recalibration of its adequacy-oriented school funding system (Picus et al., 2013). In these three studies, the EB elementary school model was used to develop a per Preschool pupil cost for a high quality preschool program. The per-pupil cost for Pre-K was derived from a prototypical preschool program of 150 students, which included 10 classrooms of 15 students each. In addition, most of the staffing and program elements included in the EB model's typical elementary school were included for the preschool students.

The Pre-K elements draw from the elements and ratios that the EB model provides for regular elementary schools. The major difference is that for all preschool classes, the EB model

provides 1 FTE teacher position and 1 FTE instructional aide position for every 15 preschool students. The EB preschool teachers trigger elective teachers and substitutes just as in a regular elementary school. Pupils also trigger instructional coaches, pupil support, "census" or "mainstream" special education resources, secretaries, and all the per pupil dollar amounts – technology, instructional materials, professional development, and assessments – as for a regular elementary school. The model incudes an assistant principal position to provide a preschool program coordinator. And the model includes central office costs such as central administration and operation and maintenance. Further, the model includes putting preschool teachers on the same salary schedule as teachers of other grades, as a way to insure that the staff in the programs are high quality (Camilli, et al., 2010; Whitebrook, 2004).

Our approach in Vermont where Pre-K is required is to include preschool in the prototypical elementary school program. The preschool grades will be staffed with one teacher and one instructional aide for every 17 students. Since those students will also trigger elective teachers, it would be possible for schools to create Pre-K, K and grade 1 collaborative teaching teams to coordinate the early elementary education program. If preschool students were also at risk, they will trigger the resources for summer school and after school programs, allowing for a year-round, full service preschool program.

1b. Full-Day Kindergarten

The EB model provides for full-day kindergarten. For many years, Vermont has supported full-day kindergarten for all five-year olds.

Current EB Recommendation
Full-day kindergarten program. Each K student counts as 1.0 pupil in the funding system.

Analysis and Evidence

Research shows that full-day kindergarten, particularly for students from low-income backgrounds, has significant positive effects on student learning in the early elementary grades (Gullo, 2000; Slavin, Karweit & Wasik, 1994). Fusaro's (1997) late 1990s meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs, found an average effect size of +0.77[5], which is substantial. Children participating in full-day kindergarten programs do better in learning the basic skills of reading, writing and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all (see also Lee, Burkam, Ready, Honigman & Meisels, 2006).

[5] Effect size is the amount of a standard deviation in higher performance that the program produces for students who participate in the program versus students who do not. An effect size of 1.0 indicates that the average student's performance would move from the 50th to the 83rd percentile. The research field generally recognizes effect sizes greater than 0.25 as significant and greater than 0.50 as substantial.

In 2003, using nationally-representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS–K), Denton, West & Walston (2003) showed that children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. Cooper, et al.'s (2010) comprehensive meta-analysis reached similar conclusions, finding the average effect size of students in full-day versus half-day kindergarten to be +0.25. Moreover, a *randomized controlled trial*, the "gold standard" of education research, found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviations (Elicker & Mathur, 1997). As a result of this research, funding full-day kindergarten for 5-year-olds as well as for 4-year-olds is an increasingly common practice among the states (Kauerz, 2005).

Since research suggests that children from all backgrounds can benefit from full-day kindergarten programs, the EB model supports a full-day program for all students, by counting such students as 1.0 in the state aid formula.

2. Elementary Core Teachers/Class Size

In staffing schools and classrooms, the most expensive decision superintendents and principals make is that of class size. Core teachers are defined as the grade-level classroom teachers in elementary schools. In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world language.

Current EB Recommendation
Grades PreK-3: 15 Grades 4-5: 25 Average Pre-K-5,6: 17

Analysis and Evidence

The gold standard of educational research is randomized controlled trials, which provide scientific evidence on the impact of a certain treatment (Mosteller, 1995). Thus, the primary evidence on the impact of small classes today is the Tennessee STAR study, which was a large scale, *randomized controlled experiment* of class sizes of approximately 15 compared to a control group of classes with approximately 24 students in kindergarten through grade 3 (Finn and Achilles, 1999; Word, et al., 1990). The study found that students in the small classes achieved at a significantly higher level (effect size of about 0.25 standard deviations) than those in regular class sizes, and that the impacts were even larger (effect size of about 0.50) for low-income and minority students (Finn, 2002; Grissmer, 1999; Krueger, 2002). The same research also showed that a regular class of 24-25 with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and widespread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

Subsequent research showed that the positive impacts of the small classes in the Tennessee study persisted into the middle and high school years, and the years beyond high school (Finn, Gerger, Achilles & J.B. Zaharias, 2001; Konstantopulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopulos, 2001a, 2001b). Longitudinal research on class size reduction also found that the lasting benefits of small classes include a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Although some argue that the impact of the small class sizes is derived primarily from just kindergarten and grade 1, Konstantopoulos and Chung (2009) found that the longer students were in small classes (i.e., in grades K, 1, 2 and 3) the greater the impact on grade 4-8 achievement. They concluded that the full treatment – small classes in all of the first four grades – had the greatest short and long term impacts.

Though differences in analytical methods and conclusions characterize some of the debate over class size (see Hanushek, 2002 and Krueger, 2002), the EB model reflects those concluding that class size makes a difference, but only class sizes of approximately 15 students with one teacher (and not class sizes of 30 with an aide or two teachers) and only for kindergarten to grade 3.

Finally, in these times when funds for schools are scarce, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Chingos (2010) argue that though the Tennessee STAR study supports the efficacy of small classes, there is other research today that has produced more ambiguous conclusions. However, they also note that this other research includes class size reductions in grades above K-3 and "natural experiments" rather than randomized controlled trials. Most importantly, they also conclude that while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and that small class sizes in grades K-3 "pay their way."

Vermont academic standards require that, "Classes in grades K-3, when taken together, shall average fewer than 20 students per teacher. In grades 4-12, when taken together, classes shall average fewer than 25 students per teacher. The total class roll of a teacher shall not exceed 100 students, except where the specific nature of the teacher's assignment (such as in certain art, music, or physical education programs) is plainly adaptable to the teaching of greater numbers of students while meeting the educational goals of the program." (http://education.vermont.gov/publications/model-policies) As noted above, for Vermont we have created new elementary school prototypes to meet the unique school organizations found in the State. The Vermont EB model relies on average elementary class sizes of 17 students, a size that meets the Vermont academic standards for elementary class size.

3. Secondary Core Teachers/Class Size

In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies and world language. Advanced Placement classes in these subjects are considered core classes.

Current EB Recommendation

Grades 6-12: 25, reduced to 20 per Vermont class size guidelines

Analysis and Evidence

There is less research evidence on the most effective class size in grades 4-12 than there is on effective class size in grades K-3. As a result, in developing the EB model, we sought evidence on the most appropriate secondary class size from typical and best practices to identify the most appropriate class size for these grades. The national average class size in middle and high schools is roughly 25, and nearly all comprehensive school reform models were developed on the basis of a class size of 25 (Odden, 1997a; Stringfield, Ross & Smith, 1996), a conclusion on class size reached by the dozens of experts who created these whole-school design models. Although many professional judgment panels in many states have recommended secondary class sizes of 20, none cited research or best practices to support that proposal.
Citing more recent studies, Whitehurst and Chingos (2010) argue that there might be a modest linear relationship in improving student performance when class size drops from between 25 and 30 students to 15, but our view of the evidence and impact is that the gains identified are modest at best, and insufficient to alter the EB class size formulas.

The secondary EB class size recommendations are larger than the general parameters of class size policy in Vermont. The State's guidelines for grades 4-12, when taken together, require that "… classes shall average fewer than 25 students per teacher. The total class roll of a teacher shall not exceed 100 students, except where the specific nature of the teacher's assignment (such as in certain art, music, or physical education programs) is plainly adaptable to the teaching of greater numbers of students while meeting the educational goals of the program" (see http://education.vermont.gov/publications/model-policies). These standards suggest that the prototypical class sizes for secondary schools needs to be reduced to 20, because a teacher providing instruction for five periods would need to average no more than 20 students a period to meet the standard of not exceeding a total of 100 students on class rolls.

4. Elective/Specialist Teachers

In addition to core classroom teachers, the EB model provides additional elective, or specialist teachers, to support core teachers. This allows schools to offer a full liberal arts curriculum – core and electives – as well as time during the school day for teachers to collaborate on instructional plans, participate in professional development activities and otherwise plan for classroom instruction. Generally, non-core or elective teachers, also called specialist teachers, offer courses in such subjects as music, band, art, physical education, health, and career-technical education.

Current EB Recommendation
Elementary Schools: 20% of core elementary teachers Middle Schools: 20% of core middle school teachers

High Schools: 33 1/3% of core high school teachers

Analysis and Evidence

In addition to the core subjects addressed above, schools need to provide a solid well-rounded curriculum including art, music, library skills and physical education. Teachers also need some time during the regular school day to work collaboratively and engage in job-embedded professional development. Providing every teacher – core and elective – one period a day for collaborative planning and focused professional development requires an additional 20 percent allocation for elective teachers. Using this elective staff allocation, every teacher – core and elective – would teach 5 of 6 periods during the day, and have one period for planning, preparation and collaborative work. One of the most important elements of effective collaborative work is team-focused data-based decision-making, using student data to improve instructional practices, now shown to be effective by a recent *randomized controlled trial* (Carlson, Borman & Robinson, 2011). Indeed, this is one of the consistent findings of research on successful turnaround schools during the past several years (Anrig, 2015).

The 20 percent additional staff is adequate for elementary and middle schools, but the EB method developed a different argument for high schools. If the goal is to have more high school students take a core set of rigorous academic courses, and learn the course material at a high level of thinking and problem solving, cognitive research findings suggest that use of longer class periods, such as a block schedule, may be a better way to organize the instructional time of a high school. (Bransford, Brown and Cocking, 1999; Donovan & Bransford, 2005a, 2005b, 2005c). Typical block scheduling for high schools includes four 90-minute blocks where teachers provide instruction for three of those 90-minute blocks and have one block – or 90 minutes – for planning, preparation and collaboration each day. This schedule requires elective teachers at a rate of 33 1/3 percent of the number of core teachers. This block schedule would operate with students taking four courses each semester attending the same classes each day, or with students taking eight courses each semester while attending different classes every other day. Such a schedule could also accommodate a few "skinny" blocks (45 minute periods) for some classes. Each of these specific ways of structuring a block schedule, however, requires an additional 33 1/3 percent of the number of core teachers to serve as elective teachers to provide the regular teacher with a "block" for planning, preparation and collaboration each day.

It should be noted that this staffing recommendation for high schools would be sufficient for high schools to provide students with a rigorous set of courses for grades 9-12, and the 21 credits required for high school graduation in Vermont and to be college ready.

We explicitly note that the elective teacher recommendation described above does not provide sufficient resources, at the same class sizes, for either middle schools or high schools to offer a 7 period day and require teachers to instruct for only 5 of those periods. The EB model does not resource schools at that level for two primary reasons. First, the EB model formulates recommendations on strategies and resources that help to improve student performance in the core subjects of reading/English/language arts, mathematics, science, history/geography and

world language, in part by providing nearly an hour of instruction in each of these subjects daily. Restructuring the day to add a seventh period is usually accomplished by reducing the minutes of instruction in core subjects, and thus is not a strategy that is likely to boost performance in those subjects, regardless of the arguments about the motivational aspects of elective classes. Second, increasing the provision of specialist and elective teachers to 40 percent in both middle and high schools is more costly. Therefore, a recommendation of 40 percent specialists and elective teachers in secondary schools would result in added costs and a potential decrease in instructional effectiveness for the core subjects, something that is not aligned with the framework for the EB approach to adequacy.

5. Instructional Facilitators/Coaches

Coaches, or instructional facilitators, coordinate the instructional program but most importantly provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to change and improve their instructional practice (Cornett & Knight, 2008; Crow, 2011; Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means that they spend the bulk of their time with teachers, modeling lessons, giving feedback to teachers, working with teacher collaborative teams, and generally helping to improve the instructional program. The few instructional coaches who also function as school technology coordinators provide the technological expertise to fix small problems with the computer system, install software, connect computer equipment so it can be used for both instructional and management purposes, and provide professional development to embed computer technologies into a school's curriculum. This report expands on the rationale for these individuals in the section on professional development (Element 16), but includes them here as they represent teacher positions.

Current EB Recommendation
1.0 Instructional coach position for every ~200 students.

Analysis and Evidence

A few states (e.g., Arkansas, New Jersey, Wyoming and to a modest degree North Dakota) explicitly provide resources for school and classroom-based instructional coaches, yet instructional coaches are key to making professional development work (see Element 16). Most comprehensive school designs (see Odden, 1997; Stringfield, Ross & Smith, 1996), and EB studies conducted in other states – Arizona, Arkansas, Kentucky, Maine, North Dakota, Texas, Washington, Wisconsin and Wyoming – call for school-based instructional facilitators or instructional coaches (sometimes called mentors, site coaches, curriculum specialists, or lead teachers).

Early research found strong effect sizes (1.25-2.71) for coaches as part of professional development (Joyce & Calhoun, 1996; Joyce & Showers, 2002). A 2010 evaluation of a Florida program that provided reading coaches for middle schools found positive impacts on student

performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision-making initiative also improved both teachers' instructional practice and student achievement (Marsh, McCombs & Martorell, 2010). More importantly, a recent *randomized controlled trial* of coaching (Pianta, Allen & King, 2011) found significant positive impacts in the form of student achievement gains across four subject areas – mathematics, science, history, and language arts. This gold standard of research provides further support to this element as an effective strategy to boost student learning.

In terms of numbers of coaches, several comprehensive school designs suggest that although one instructional coach might be sufficient for the first year of implementation of a school-wide program, in a school with about 500 students, additional instructional coaches are needed in subsequent years. Moreover, several technology-heavy school designs recommend a full-time facilitator who spends at least half-time as the site's technology expert. Thus, drawing from all programs, we conclude that 1.0 FTE instructional coach/technology coordinator is needed for every 200 students in a school. This resourcing strategy works for elementary as well as middle and high schools.

Although instructional coaching positions are identified as FTE positions, schools could divide the responsibilities across several individual teachers. For example, the 3.0 positions in a 600-student high school could be structured with six half-time teachers and instructional coaches. In this example, each teacher/coach would work 50 percent time as a coach – perhaps in one curriculum area such as reading, math, science, social studies or technology – and 50 percent time as a classroom teacher or tutor.

We note that this level of staffing for coaches, combined with the additional elements of professional development discussed below, focus on making Tier 1 instruction (in the Response to Intervention frame) as effective as possible, providing a solid foundation of high quality instruction for everyone, including students who struggle to learn to proficiency.

6. Core Tutors/Tier 2 Intervention

The most powerful and effective approach for helping students struggling to meet state standards is individual one-to-one or small group (1-3 or 1-5 maximum) tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). In earlier reports, the EB model allocated tutors to schools on the basis of the number of at-risk students. Since that time, it has recognized that all schools, even with no at-risk students, have some struggling students and need some minimum Tier 2 resources. Thus, the EB model has been modified so that each prototypical school receives at least one tutor regardless of the number of at risk students. *Consequently, the report identifies tutor resources a school receives under the current EB model here in the core staffing section and also discusses the need for more tutors in Element 22 below.*

Current EB Recommendation
One tutor position in each prototypical school.*

*Additional tutors are enabled through the at-risk and ELL pupil counts in Element 22.

Analysis and Evidence

Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g. the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik & Kulik, 1982; Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors
- Tutoring initially provided to students on a one-to-one basis
- Tutors trained in specific tutoring strategies
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content-specific scaffolding and modeling
- Sufficient time for tutoring, and
- Highly structured programming, both substantively and organizationally.

Several specific structural features are associated with effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1-1 tutoring.) Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools.
- Second, most students do not require tutoring all year long. Tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, close to half the student body of a 400-student school unit could receive individual tutoring during the year.
- Third, not all students who are from a low-income background require individual tutoring, so core tutors and a portion of the at risk tutor allocation could be used for students in the school who might not be from a lower income family but nevertheless have a learning issue that could be remedied by tutoring. This also is part of the rationale for including 1 tutor in each prototypical school, regardless of the number of at risk students.

Though this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one

tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully. One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring say, at or below the 20th or 25th percentile on a norm referenced test, or below basic level on state achievement tests. Intensive instruction for groups of three-to-five students would then be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at risk children in kindergarten, first grade and second grade […..] only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though the EB model emphasizes 1-1 tutoring, and some students need 1-1 tutoring, other small group practices (which characterize the bulk of

Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect is often smaller, as it is much more difficult to undo the lasting damage of not learning to read once students enter middle and high schools with severe reading deficiencies. However, a new randomized control study (Cook et al., 2014), discussed below, found similarly positive impacts of a tutoring program for adolescents in high poverty schools IF it was combined with counseling as well. This is made possible by the EB model as it includes such additional non-academic pupil support resources (see Element 23 discussion).

The above rationale for tutors is strengthened by two recent *randomized controlled trials* of the effectiveness of tutoring for struggling students, which support our logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with more need. At the elementary level, using a randomized controlled trial, May et al., (2013) assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found that Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study, and a 0.47 effective size relative to the national population of first grade struggling readers. The effects were similarly large for reading words and reading comprehensive sub-scales.

For students in high schools, Cook, et al. (2014) reported on a *randomized controlled trial* of a two-pronged intervention that provided disadvantaged youth with tutoring *and* counseling. They found that intensive individualized academic extra help – tutoring – combined with non-academic support seeking to teach grade 9 and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy (CBT), led to improved math and reading performance. The study sample consisted mainly of students from low income and minority backgrounds, which generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48; the combined program also appeared to increase high school graduation by 14 percentage points (a 40 percent hike). The authors concluded that this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, *randomized controlled trials*, the "gold standard" of research supporting the efficacy of tutoring. Second, they show that tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses only elementary-aged students. Third, they show that tutoring can work even in the most challenging educational environments. And fourth, they bolster the EB argument below that extra help resources in schools triggered by poverty/at risk status should also include some non-academic, counseling resources, as the treatment in the second study was tutoring combined with counseling.

In earlier adequacy studies reports and even in the recently published 5th edition of our textbook (Odden & Picus, 2014), we recommended tutor positions be provided only on the basis of at-risk student counts. The recommended ratio was one position for every 100 at risk students with a

minimum of one for each prototypical school. As a result, a school without any at-risk students would receive the minimum of 1 tutor position for struggling students, but a school with 100 at-risk students would receive the same tutoring or Tier 2 intervention resources, even though it might have more need for such additional resources. Today, educators and policymakers across the country not only argue that schools with few low-income students still have students who struggle to learn to proficiency, but also that the number of such students will likely increase with the more rigorous college and career ready standards. We agree with those arguments and have modified the EB recommendations for tutoring resources as a result.

The revised EB model provides one tutor/Tier 2-intervention position in each prototypical school. In parallel with that change, the EB model adjusts the ratio for additional tutor positions to one position for every 125 at-risk and ELL students. The additional support beyond the first tutor per prototypical school is discussed again in Section 22 (struggling students) below.

The revised EB recommendation for tutor/Tier 2-intervention positions is more generous than the previous recommendation of 1/100 at-risk or ELL students with a minimum of one for each prototypical school. In the above example, a prototypical school with no at-risk or ELL students would receive 1.0 position, as would a prototypical school with 100 at-risk or ELL students. The revised EB recommendation would provide 1.0 position to the school with no at-risk or ELL students, but would provide a 1.0 core tutor position for a school with 100 at-risk of ELL students plus an additional 0.8 (100/125) position for the 100 at-risk or ELL students, for a total of 1.8 positions.

7. Substitute Teachers

Schools need substitute teachers to cover classrooms when teachers are sick for short periods of time, absent for other reasons, or on long term sick or pregnancy leave. In many other states, substitute funds are budgeted at a rate of about ten days for each teacher. The current EB model approach of providing funding equal to five percent of the cost of teacher salaries approximates that ten-day figure.

Current EB Recommendation
5% of core and elective teachers, instructional coaches, tutors (and teacher positions in additional tutoring, extended day, summer school and ELL).

Analysis and Evidence

Five percent of a teacher work year equals approximately 10 days, so this provision provides up to ten days of substitute teacher resources for each teacher. This approach does not mean that each teacher is provided ten substitute days a year; it means the district receives a "pot" of money approximately equal to 10 substitute days per year for all teachers, in order to cover classrooms when teachers are sick for short periods, absent for other reasons, or on long term sick or pregnancy leave. This allocation is not for 10 days above what is currently provided; it simply is an amount of money for substitute teachers estimated at 10 days for each teacher on

average. These substitute funds are not meant to provide for student free days for professional development. The professional development recommendations are fully developed in a separate section below (Element 16) and do not require substitute teachers.

8. Core School Counselors and Nurses

The previous EB model provided student or pupil support resources without specifying guidance counselor or nurse positions. During the past five years, that approach has been changed to provide guidance counselor and nurse positions in the core program, and to provide additional pupil support positions (e.g., social workers and family liaison persons) on the basis of at-risk student counts as described in Element 23 below. Thus, core student support services now specify guidance counselor and nurse positions.

Current EB Recommendation
1 school counselor for every 357 PreK-5 students • Changed to 1 per 300 Prek-5 students per Vermont standards. 1 school counselor for every 250 6-12 students • Changed to 1 per 200 grade 6-12 students per Vermont standards.* 1 nurse for every 750 PreK-12 students • Changed to 1 per 500 Prek-12 students per Vermont standards.

*Additional student support resources are provided on the basis of at-risk and ELL student counts in Element 23.

Analysis and Evidence

Schools need school counselors and nurses. For school counselors, the EB model uses the standards from the American School Counselor Association (ASCA). Those standards recommend one counselor for every 250 secondary (middle and high school) students. This produces 1.8 pupil support positions for a 450-student prototypical middle school and 2.4 pupil support positions for a 600-student prototypical high school.

Vermont standards require secondary school counselors at the rate of 1 for every 200 students, which would produce 1.5 positions for a school with 300 students.

Today many states require school counselors in elementary schools as well. Moreover, even in states that do not require counselors at the elementary level, a growing number of elementary schools have begun to employ these personnel. Consequently, the EB model has been modified in recent years to include a minimum of one school counselor for a prototypical elementary school. The EB model provides additional pupil support personnel to schools on the basis of at risk student counts as described in Element 23 below.

Since the EB prototypical elementary school has 357 students, the elementary counselor ratio needs to be changed to 1 counselor position for every 300 elementary students per Vermont standards.

The physical and medical needs of students also have changed dramatically over the past several years. Many students need medications during the school day; often, school staff are required to administer such medications. Other students have additional medical or physical needs, and our experience in several states is that these needs have been growing over the past decade. Thus, the EB model has been enhanced to provide nurses as core positions. Drawing from the staffing standard of the National Association of School Nurses, the EB model now provides core school nurses at the rate of 1 FTE nurse position for every 750 students. However, Vermont standards require one nurse position for every 500 students.

9. Supervisory Aides

Supervisory aides are non-certified individuals who provide needed services and supervision needed in a school such as lunch duty, hallways and external door monitoring, and helping elementary students get on and off buses. Supervisory aides do not provide assistance to teachers inside or outside the classroom nor instruction of any kind to students.

Current EB Recommendation
1 for every 178.5 elementary students 1 for every 225 middle school students 1 for every 200 high school students

Analysis and Evidence

Elementary, middle, and high schools need staff for responsibilities that include lunch duty, before and after school playground supervision, sometimes bus duty and other responsibilities that do not require a licensed teacher. Covering these duties generally requires an allocation of supervisory aides at about the rate of 2.0 FTE aide positions for a school of 450 students. This ratio has been adapted to the Vermont specific prototypical schools.

Research does not support the use of instructional aides for improving student performance. The Tennessee STAR study (described in element 2 above), also produced evidence that instructional aides in a regular-sized classroom do not add instructional value, i.e., do not positively impact student achievement (Gerber, Finn, Achilles & Boyd-Zaharias, 2001).

At the same time, districts may want to consider a possible use of instructional aides that is supported by research. Two studies have shown how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student

reading attainment. Some districts have used Farkas-type tutors for students still struggling in reading in the upper elementary grades. Another study by Miller (2003) showed that such aides could also have an impact on reading achievement if used to provide individual tutoring to struggling students in the first grade.

We note that neither of these studies supports the typical use of instructional aides as general teacher helpers. Evidence shows that instructional aides can have an impact, but only if they are selected according to educational criteria, trained in a specific tutoring program, deployed to provide tutoring to struggling students, and closely supervised.

10. Librarians

Most schools have a library, and the staff resources must be sufficient to operate the library and to incorporate appropriate technologies into the library system.

Current EB Recommendation
1.0 library media specialist position for each prototypical school down to 300 students Below 300, prorated down with a minimum of 0.5 for smaller schools. 1.0 library aide prorated up from 300 to 600 students.

Analysis and Evidence

There is scant research on the impact of school librarians on student achievement. In 2003, however, six states conducted studies of the impacts of librarians on student achievement: Florida, Minnesota, Michigan, Missouri, New Mexico, and North Carolina. In 2012, Colorado also conducted a statewide study using data from 2005-2011. The general finding is that, regardless of family income, children with access to endorsed librarians working full time perform better on state reading assessments (Rodney, M.J., Lance, K.C. & Hamilton-Rennell, C, 2003; Lance, K.C. & Hofschire, L, 2012). The Michigan study found that regardless of whether the librarian was endorsed, student achievement was better for low-income children, but having an endorsed librarian was associated with higher achievement than having an unendorsed librarian (Rodney, M.J., Lance, K.C. & Hamilton-Rennell, C, 2003). Each state examined the issue differently, but library staffing and the number of operating hours were generally associated with higher academic outcomes. The EB model recommendation for library staff is derived from best practices in other states, state statutes where they exist and the above research.

This recommendation aligns with standards for library programs for Vermont schools, which state that, "The services of a certified library media specialist shall be made available to students and staff. Schools with over 300 students shall have at least one full-time library media specialist and sufficient staff to implement a program that support literacy, information and technology standards. Schools with fewer than 300 students shall employ a library media specialist on a pro-rata basis."

11. Principals and Assistant Principals

Every school unit needs a principal. There is no research evidence on the performance of schools with or without a principal. All comprehensive school designs, and all prototypical school designs from all professional judgment studies around the country, include a principal for every school unit.

Current EB Recommendation
1.0 principal for the 357-student prototypical elementary school and down to the 119 student one section elementary school. 1.0 principal for the 450-student prototypical middle school and down to the 150 small middle school. 1.0 principal and 1.0 assistant principal for the 600-student prototypical high school, with the assistant principal eliminated at 300 students but a principal down to the 150 student high school.

Analysis and Evidence

Few if any comprehensive school designs for 500 students include assistant principal positions. Very few school systems around the country provide assistant principals to schools with 500 or fewer students. The EB model recommends that instead of one school with a large number of students, school buildings with large numbers of students be subdivided into multiple school units within the building, with each unit having a principal. This implies that one principal would be required for each school unit. The EB model provides one assistant principal for the prototypical high school, largely for discipline and athletics. Murphy (2016) provides a good overview of the key roles principals play in organizing schools to boost student learning.

12. School Site Secretarial Staff

Every school site needs secretarial support to provide clerical and administrative support to administrators and teachers, to answer the telephone, greet parents when they visit the school, and help with paperwork.

Current EB Recommendation
1 secretary position for every 178.5 elementary students 1 secretary position for every 225 middle school students 1 secretary position for every 200 high school students.

Analysis and Evidence

The secretarial ratios included in the EB model generally are derived from common practices across the country. There is no research on the impact that clerical staff have on student outcomes, yet it is impossible to have a school operate without adequate clerical staff support.

DOLLAR PER STUDENT RESOURCES

This section addresses areas that are resourced by dollar per student amounts, including gifted and talented, professional development, computers and other technology, instructional materials and supplies, and extra duty/student activities.

13. Gifted and Talented Students

A complete analysis of educational adequacy should include gifted and talented students, most of whom perform above state proficiency standards. This is important for all states whose citizens desire improved performance for students at all levels of achievement.

Current EB Recommendation
$40 per student.

Analysis and Evidence

Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low income and/or culturally diverse students
- Curriculum materials designed specifically to meet the needs of talented learners
- Acceleration of the curriculum, and
- Special training in how teachers can work effectively with talented learners.

Discovering hidden talents in low-income and/or culturally diverse high ability learners

Research studies on the use of performance assessments, nonverbal measures, open-ended tasks, extended try-out and transitional periods, and inclusive definitions and policies show that these produce increased and more equitable identification practices for high-ability culturally diverse and/or low-income learners. Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, high-ability, culturally-diverse learners who participated in three or more years of specialized elementary and/or middle school programming, had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high-ability students who did not participate (Struck, 2003).

Access to curriculum

Overall, research shows that curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increased complexity of the curricular material is a key factor (Robinson & Clinkenbeard, 1998). Large-scale curriculum projects in science and mathematics in the 1960s, such as the Biological Sciences Curriculum Study (BCSC), the Physical Science Study Committee (PSSC), and the Chemical Bond Approach (CBA), benefited academically talented learners (Gallagher, 2002). Further, curriculum projects in the 1990s designed to increase the achievement of talented learners in core content areas such as language arts, science, and social studies, produced academic gains in persuasive writing and literary analysis (VanTassel-Baska, Johnson, Hughes & Boyce, 1996; VanTassell-Baska, Zuo, Avery & Little, 2002), scientific understanding of variables (VanTassel-Baska, Bass, Ries, Poland & Avery, 1998), and problem generation and social studies content acquisition (Gallagher & Stepien, 1996; Gallagher, Stepien & Rosenthal, 1992).

Access to acceleration

Because academically talented students learn quickly, one effective option for serving them is acceleration of the curriculum. Many educators and members of the general public believe acceleration always means skipping a grade. However, there are at least 17 different types of acceleration ranging from curriculum compacting (which reduces the amount of time students spend on material) to subject matter acceleration (going to a higher grade level for one class) to high school course options like Advanced Placement or concurrent credit (Southern, Jones & Stanley, 1993). In some cases, acceleration means *content* acceleration, which brings more complex material to the student at his or her current grade level. In other cases, acceleration means *student* acceleration, which brings the student to the material by shifting placement. Reviews of the research on different forms of acceleration have been conducted across several decades and consistently report the positive effects of acceleration on student achievement (Gallagher, 1996; Kulik & Kulik, 1984; Southern, Jones & Stanley, 1993), including that of Advanced Placement classes (Bleske-Rechek, Lubinski & Benbow, 2004). Multiple studies also report participant satisfaction with acceleration and benign effects on social and psychological development.

Access to trained teachers

Research and teacher reports indicate that general classroom teachers make very few, if any, modifications for academically talented learners (Archambault, et al, 1993), even though talented students have mastered 40 to 50 percent of the elementary curriculum before the school year begins. In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners. Students report differences among teachers who have had such training, and independent observers in the classroom document the benefit of this training as well (Hansen & Feldhusen, 1994). Curriculum and instructional adaptation requires the support of a specially trained coach at the building level, which could be embedded in the instructional coaches recommended above (Reis & Purcell,

1993). Overall, learning outcomes for high- ability learners are increased when they have access to programs whose staff have specialized training in working with high ability learners, which could be accomplished with the professional development resources recommended below. Overall, research on gifted programs indicates that the effects on student achievement vary by the strategy of the intervention. Enriched classes for gifted and talented students produce effect sizes of about +0.40 and accelerated classes for gifted and talented students produce somewhat larger effect sizes of +0.90 (Gallagher, 1996; Kulik & Kulik, 1984; Kulik & Kulik, 1992).

Practice implications

At the elementary and middle school levels, our understanding of the research on best practices is to place gifted students in special classes comprised of all gifted students and accelerate their instruction, because such students can learn much more in a given time period than other students. When the pullout and acceleration approach is not possible, an alternative is to have these students skip grades in order to be exposed to accelerated instruction. Research shows that neither of these practices systemically produces social adjustment problems. Many gifted students get bored and sometimes restless in classrooms that do not have accelerated instruction. Moreover, both of these strategies have little or no cost, except for scheduling and training of teachers, resources for which are provided by Professional Development (Element 14).
The primary approach to serving gifted students in high schools is to enroll them in advanced courses, such as advanced placement (AP) and International Baccalaureate (IB), to participate in dual enrollment in post-secondary institutions, or to have them take courses through distance learning mechanisms.

We confirmed our understanding of best practices for the gifted and talented with the directors of three of the gifted and talented research centers in the United States: Dr. Elissa Brown, Director of the Center for Gifted Education, College of William & Mary; Dr. Joseph Renzulli, The National Research Center on the Gifted and Talented at the University of Connecticut; and Dr. Ann Robinson, Director of the Center for Gifted Education at the University of Arkansas at Little Rock.

To implement additional practice implications, the University of Connecticut center developed a very powerful Internet-based platform, Renzulli Learning, which provides for a wide range of programs and services for gifted and talented students. Renzulli stated that such an approach was undoubtedly the future for the very bright student and in 2005 could be supported by a grant of $25 per student in a district. Field (2007) found that after 16 weeks, students given access to an Internet-based program, such as Renzulli Learning to read, research, investigate, and produce materials, significantly improved their overall achievement in reading comprehension, reading fluency and social studies.

Recently, Renzulli Learning was sold to Compass Learning, an educational organization headquartered in Austin, Texas with technology-based applications used around the country. Compass Learning has renamed the Renzulli Learning program GoQuest. According to the company's website,[6] a student's first experience with Renzulli Learning is with the Renzulli

[6] http://www.renzullilearning.com/whatisrenzullilearning.aspx

Profiler, a detailed online questionnaire that allows the Renzulli software to generate a personal profile of each student's top interests, learning styles, and expression styles, making it easier for teachers to get to know their students and effectively differentiate instruction. Once a profile is generated, students and teachers may use it to guide their exploration of the 40,000 online educational resources in the Renzulli database. Students can engage in self-directed learning by exploring safe, fully-vetted resources that have been specifically matched to their individual profiles. Further, teachers can browse the database of resources to find activities that also align to specific objectives, skills, as well as State and Common Core Curriculum Standards.

This past summer, we spoke with a lead representative of Compass Learning, who described the attributes of Renzulli Learning and other products provided by Compass Learning. In that conversation, we confirmed a new pricing structure for Renzulli Learning. The cost today is $40 per student for up to 125 students in a school, at which point the cost is $5,000 for a school and all students have full access to the program.

Compass Learning also offers products that can be used for both teaching the regular curriculum and providing extra help to struggling students. These products integrate the instructional strategies with results of testing data from three of the most popular testing systems many districts use: the MAP results from Northwest Evaluation Association (NWEA), the STAR Enterprise assessments from Renaissance Learning, and Scantron. The costs of these additional Compass Learning programs range from $70 to $115 per student per program, and could be funded from a district's regular instructional and professional development budgets or the resources provided by the At-Risk or ELL programs.

Based upon our review of current costs for the Renzulli (GoQuest) program, the EB model now includes a rate of $40 per student for school year 2016-17. This would allow all schools – small or large – to provide a high quality gifted and talented program option for every child.

14. Intensive Professional Development

Professional development (PD) includes a number of important components. This section describes the specific dollar resource recommendations the EB model provides for PD. In addition to the resources listed here, PD includes the instructional coaches described in Element 7 and the collaborative planning time provided by the provisions for elective or specialist teachers. Those staff positions are critical to an adequate PD program along with the resources identified in this section.

Current EB Recommendation
10 days of student-free time for training built into teacher contract year $125 per student for trainers (In addition to instructional coaches (Element 5) and time for collaborative work provided by Element 4)

Analysis and Evidence

Effective teachers are the most influential factor in student learning (Rowan, Correnti & Miller, 2002; Wright, Horn & Sanders, 1997) and more systemic deployment of effective instruction is key to improving student learning and reducing achievement gaps (Odden, 2011a; Raudenbusch, 2009). All school faculties need ongoing professional development. Improving teacher effectiveness through high quality professional development is arguably one of the most important resource use strategies.

An ongoing, comprehensive and systemic professional development strategy is the way in which all the resources recommended in this report are transformed into high quality, Tier 1 instruction that increases student learning. Further, though the key focus of professional development is better instruction in the core subjects of mathematics, reading/language arts, writing, history and science, the professional development resources in the EB model are adequate to address the instructional needs for gifted and talented, special education, English language learning students, for embedding technology into the curriculum, and for elective teachers as well. Finally, all beginning teachers need intensive professional development, first in classroom management, organization and student discipline, and then in instruction. Finally, the most effective way to "induct" and "mentor" new teachers is to have them working in functional collaborative teacher teams, discussed above for Elements 4 and 5.

Fortunately, there is recent and substantial research on effective professional development and its costs (e.g., Crow, 2011; Odden, 2011b). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles that researchers and professional development organizations use to characterize "high quality" or "effective" professional development draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. Combined, these studies and recent reports from Learning Forward, the national organization focused on professional development (see Crow, 2011), identified six structural features of effective professional development:

- The *form* of the activity – that is, whether the activity is organized as a study group, teacher network, mentoring collaborative, committee or curriculum development group. The above research suggests that effective professional development should be school-based, job-embedded and focused on the curriculum taught rather than a one-day workshop.
- The *duration* of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place. The above research has shown the importance of continuous, ongoing, long-term professional development that totals a substantial number of hours each year, at least 100 hours and closer to 200 hours.
- The degree to which the activity emphasizes the *collective participation* of teachers from the same school, department, or grade level. The above research suggests that effective

professional development should be organized around groups of teachers from a school that over time includes the entire faculty.

- The degree to which the activity has a *content focus* – that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge as well as how students learn that content. The above research concludes that teachers need to know well the content they teach, need to know common student miscues or problems students typically encounter while learning that content, and effective instructional strategies linking the two. The content focus today should emphasize content for college and career ready curriculum standards.
- The extent to which the activity offers opportunities for *active learning*, such as opportunities for teachers to become engaged in the meaningful analysis of teaching and learning, for example by scoring student work or developing, refining and implementing a standards-based curriculum unit. The above research has shown that professional development is most effective when it includes opportunities for teachers to work directly on incorporating the new techniques into their instructional practice with the help of instructional coaches (see also Joyce & Showers, 2002).
- The degree to which the activity promotes *coherence* in teachers' professional development by aligning professional development to other key parts of the education system, such as student content and performance standards, teacher evaluation, school and district goals, and the development of a professional community. The above research supports tying professional development to a comprehensive, inter-related change process focused on improving student learning.

Form, duration, and active learning together imply that effective professional development includes some initial learning (*e.g*. a two-week – 10 day – summer training institute) as well as considerable longer-term work in which teachers incorporate the new methodologies into their actual classroom practice, with guidance provided by instructional coaches. Active learning implies some degree of collaborative work and coaching during regular school hours to help the teacher incorporate new strategies into his/her normal instructional practices. It should be clear that the greater the duration of the initial training as well as coaching, the more time is required of teachers as well as professional development trainers and coaches.

Content focus means that effective professional development focuses largely on subject matter knowledge, what is known about how students learn that subject, and the actual curriculum that is used to teach the content. Today, this means a curriculum program to ensure students are college and career ready when they graduate from high school. Collective participation implies that professional development includes groups of and at some point all teachers in a school, who then work together to implement the new strategies, engage in data-based decision-making (Carlson, Borman & Robinson, 2011) and build a professional community.

Coherence suggests that the professional development is more effective when the signals from the policy environment (federal, state, district, and school) reinforce rather than contradict one another or send multiple, confusing messages. Coherence also implies that professional development opportunities should be given as part of implementation of new curriculum and instructional approaches, today focusing on the Common Core curriculum. Note that there is

little support in this research for the development of individually oriented professional development plans; the research implies a much more systemic approach.

Each of these six structural features has cost implications. Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year as well. This time costs money. Further, all professional development strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to describe the resource needs of specific professional development programs.

From this research on the features of effective professional development, the EB model includes the following for a systemic, ongoing, comprehensive professional development program:

- Ten days of student free time for training via an extension of the teacher work year, and
- Funds for training at the rate of $125 per student.

These resources are in addition to:

- Instructional coaches (Element 5), and
- Collaborative work with teachers in their schools during planning and collaborative time periods (Elements 4).

These resources and professional development elements are fully aligned with Vermont's professional development standards.

15. Instructional Materials

The need for up-to-date instructional materials is paramount. Newer materials contain more accurate information and incorporate the most contemporary pedagogical approaches. New curriculum materials are critical today as school systems shift to more rigorous college and career ready standards. To ensure that materials are current, twenty states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Ravitch, 2004). Up-to-date instructional materials are expensive, but vital to the learning process. Researchers estimate that up to 90 percent of classroom activities are driven by textbooks and textbook content (Ravitch, 2004). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely.

Current EB Recommendation
$190 per student for instructional and library materials.

Analysis and Evidence

This section first addresses costs of instructional materials and second library materials.

Instructional Materials

Vermont has adopted the Common Core State Standards (CCSS) in Language Arts and Mathematics. Access to standards-aligned instructional resources is critical for teachers and students to successfully implement these standards. Vermont currently does not have textbook adoption cycles. However, it is wise for districts and schools to evaluate and review the uniformity and quality of the instructional materials and textbooks periodically, typically every six years or so. Adoption cycles backed by State funding for materials allow districts to upgrade their textbooks and instructional materials on an ongoing basis instead of postponing these purchases indefinitely. In 2004, 20 states had instituted adoption cycles in which they specify or recommend texts aligned to state learning standards (Ravitch). These cycles range from five to seven years. Vermont should consider a textbook adoption cycle as a mechanism of providing students with recent, relevant and reliable information. Textbook adoption is a time consuming, labor-intensive process; without state encouragement, these important decision processes can be delayed by districts for extended periods, to the detriment of the instructional programs and student learning.

The type and cost of textbooks and other instructional materials differ across elementary and secondary levels. Textbooks at the secondary level are more complex and thus more expensive. Elementary grades, on the other hand, use more workbooks, worksheets and other consumables than the secondary level. Both elementary and secondary levels require extensive pedagogical aides such as math manipulatives and science supplies that help teachers to demonstrate or present concepts using different pedagogical approaches.

Textbook prices range widely. At the high school level, textbooks can cost from $80 to $140. Most major textbook companies now offer electronic versions of their texts; however, contrary to popular belief, these versions can be more expensive than the paper-based texts. Some digital versions are offered with time-bound contracts, much like library database subscriptions, while others may require the purchase of the paper texts with the digital license. Most digital-only materials from standard publishers are the same price or are only marginally discounted from the paper-based version. Many publishers will offer to sell the paper-based texts with the electronic version for a 20% to 30% premium.

Unless Vermont decides to fund a one-to-one student computer program, it is not practical to rely exclusively on electronic-based textbooks. One-to-one programs also rely on home-based Internet connectivity. Until a one-to-one computer program is funded, it is necessary to continue to purchase paper-based textbooks to ensure all students have access to curriculum appropriate resources.

Considering the move to the CCSS, districts should focus on purchasing curriculum and instructional materials that will assist teachers to drive student success. The CCSS require more reading from information texts across all curricular subject areas. This necessitates the purchase of additional materials that have not been required prior to the implementation of these more rigorous curriculum standards Vermont and virtually all other states have adopted. A six-year standard adoption cycle would allow districts to purchase new and updated instructional materials for each course and subject every six years, ensuring curriculum materials are up-to-date. The resources provided by the $170 per student allow school districts to have a six-year standard adoption.

With more rigorous curriculum standards as a backdrop, the current EB recommendation is to create one unified rate of instructional materials per ADM, regardless of whether the student is an elementary or secondary school student. For school year 2016-17, the rate of $170 per student will support the purchase of instructional materials that are best organized to take advantage of Vermont teaching strategies. This funding level would also allow the purchase of digital access to some textbooks if districts desire to adopt and experiment with digital access to textbook materials. If combined with a regular adoption cycle, this annual allocation will allow districts to focus on purchasing new curricular materials for one subject area a year, including textbooks and supplementary materials, all of which are needed to enable teachers to raise student achievement.

Library Materials

The National Center for Educational Statistics (NCES) reports the average national expenditure for library materials in the 2011-12 school year was $16 per pupil, excluding library salaries (NCES, 2015). Over 90% of the $16 was spent on book titles and the remainder on other resources such as subscription databases. In the past, electronic databases were increasing in use, however use has declined in recent years as many instructional resources such as the Khan Academy and Wikipedia are offered free to the public.

Electronic database services vary in price and scope and are usually charged to school districts on an annual per student basis. Depending on the content of these databases, costs can range from $1-5 per database per year per student.

Inflating these numbers to adequately meet the needs of school libraries, the EB recommendation includes funding of $20 per student to pay for library texts and electronic services. These figures modestly exceed the national average, allowing librarians to strengthen print collections. At the same time, it allows schools to provide, and experiment with, the electronic database resources on which students rely (Tenopir, 2003).

Adding this $20 per student figure to the $170 per student figure for instructional materials, brings the current EB recommendation to $190 per student for instructional and library materials for school year 2016-17.

16. Short Cycle/Interim Assessments

The need to monitor the progress of students with Individual Education Programs, to benchmark students' progress over the course of the year, and for teachers to engage in collaborative work using student data, requires that faculties have access to short cycle, interim assessment data.

Current EB Recommendation
$25 per student for short cycle, interim and formative assessments.

Analysis and Evidence

Data-based decision-making has become an important element in school reform over the past decade. It began with the seminal work of Black and William (1998) on how ongoing data on student performance could be used by teachers to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour, et al., 2010; Steiny, 2009). The goal is to have teachers use data to inform their instructional practice, identify students who need interventions and improve student performance (Boudett, City & Murnane, 2007). As a result, data-based decision-making has become a central element of schools that are moving the student achievement needle (Odden, 2009, 2012).

Recent research on data-based decision-making has documented significant positive impacts on student learning. For example, Marsh, McCombs and Martorell (2010) showed how data-driven decision-making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a recent study of such efforts using the gold standard of research – a *randomized controlled trial* – showed that engaging in data-based decision-making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman & Robinson, 2011).

There is some confusion in terminology when referring to these assessment data. Generally, these student performance data are different from those provided by state accountability or summative testing, such as Vermont's end–of-year tests. The most generic term is "interim data," meaning assessment data collected in the interim between the annual administrations of state accountability tests, though some practitioners and writers refer to such data as "formative assessments." There are several kinds of such "interim" assessment data. Benchmark assessments, short cycle or formative assessments, screeners, and other student performance data gathered between the annual administrations of state accountability assessments. The following discusses several of these systems.

NWEA MAP

According to the Measures of Academic Progress (MAP) website, these assessments are electronically administered and scored achievement tests designed to measure growth in student learning for individual students, classrooms, schools, and districts. The tests provide accurate and immediate scores to help teachers plan instructional programs, place new students in the

appropriate courses, and screen students for special programs. MAP is a computerized adaptive testing system that tailors tests to a student's achievement level. Each student takes a test that is dynamically developed for him or her as the test is being administered. The program instantly analyzes the student's response to each test question and, based on how well the student has answered all previous questions, selects a question of appropriate difficulty to display next. The standard package includes tests for reading, language usage, mathematics, and the upper math series (Algebra I, Geometry, Algebra II, Integrated Math I, and Integrated Math II). A science assessment has recently been added to the MAP package. Further, NWEA has created a Skills Navigator for math and reading that can be used to progress monitor students receiving interventions. The Navigator is also an on-line assessment.

MAP assessments, which usually are administered in September, January and May and represent "benchmark" assessments, i.e., assessments that show how students are progressing over the course of the year to state proficiency. In the fall, the results from the screener portion of the MAP can be used to place students into small reading or math groups, and to identify appropriate interventions.

The core MAP assessments can be administered three to a maximum of four times a year. The cost for the reading, language usage and math assessments is $13.50 per student per year. The new science test costs an additional $2.50 per pupil. The Skills Navigator used for monitoring the progress of students with interventions can be administered as often as needed and costs $7 per student and covers both reading and math. All together these assessments would cost $23 per pupil. NWEA would negotiate a lower cost if the state negotiated a deal and paid for all students.[7]

DIBELS

One assessment used across the country is the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). DIBELS includes a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through sixth grade. They are *administered by teachers* and designed to be short (one to six minute) fluency measures used to regularly monitor the development of early literacy and early reading skills. DIBELS is comprised of seven measures to function as indicators of phonemic awareness, alphabetic principle, accuracy and fluency with connected text, reading comprehension, and vocabulary. DIBELS were designed for use in identifying children experiencing difficulty in acquisition of basic early literacy skills in order to provide support early and prevent the occurrence of later reading difficulties. The cost is a nominal $1 per student.

Sometimes DIBELS is administered by instructional coaches, school counselors, Title I teachers, or a trained paraprofessional, but not by the student's classroom teacher. Under these circumstances, the assessment data must then be provided to teachers if they are to use the results in classroom activities. It is best for classroom teachers to administer all short cycle assessments.

[7] These cost figures were obtained from an NWEA state liaison for the MAP assessments, Carolyn Mock.

AIMSWEB

Another assessment that is frequently used in Vermont is AIMSWEB. AIMSWEB, now owned by Pearson, is an assessment system that provides up to 33 alternate forms per skill, per grade. AIMSWEB covers more skill areas and grade levels than any other assessment system. Although browser-based scoring allows teachers to automatically upload scores to the AIMSWEB database system, the assessment itself is administered to each individual student by the teacher. AIMSWEB assessments include:

- Reading: early literacy, Spanish early literacy, reading (English and Spanish) and reading maze.
- Language arts: spelling and written expression.
- Mathematics: early numeracy, math concepts and applications, and math computations.
- Behavior: Exclusive screening, monitoring, and intervention tools for behavior and social skills.

The complete AIMSWEB package costs $6 per student.

FAST, Renaissance Learning, and STAR Enterprise

More schools are shifting to online, computer adaptive assessment systems linked to a learning progression. One such system is FAST, a system covering both reading and mathematics available for low cost from the University of Minnesota. Another system is Renaissance Learning STAR Enterprise, which includes Early Literacy, Math and Reading. These systems require much less staff time than the aforementioned teacher administered assessments as students can take these assessments virtually on their own. Since they are online, computer adaptive systems, they provide immediate feedback to teachers and include many instructional strategies to address any learning needs identified by the results. Both of these assessments can be administered as often as needed, at no extra cost, so they work well for progress monitoring.

The STAR Assessment programs support "instructional decisions, RTI, and instructional improvement" by measuring student progress in early literacy, reading, and math. The early literacy program measures student proficiency from the pre-kindergarten to grade 3. The reading and math programs assess student skills for grades 1 to 12. STAR tests are administered in an on-line, computer adaptive format. A science program is being developed. The math and language arts assessments have been modified to align with the expectations of Common Core standards. The new STAR 360 is a comprehensive K-12 assessment package, allowing educators to screen and group students for targeted instruction, measure student growth, predict performance on PARCC exams, and monitor achievement on Common Core State Standards. STAR 360 includes all the features of STAR Reading, STAR Math, and STAR Early Literacy, giving educators valid, reliable, actionable data in the least amount of testing time. It can be used for screening, benchmarking, student growth measurement, progress monitoring, and instructional planning. Educators have immediate access to the data and insights they need to improve student outcomes on PARCC exams.

Subscriptions to STAR products cost $3.80 per student for each of math, reading and early literacy, and the smallest subscription size available is 100 students. The more comprehensive subscription, STAR 360, costs $11.45 per student. In addition to the per student subscription fee, subscribers must pay a small annual fee ($500 in 2013) for online product hosting services. New subscribers to STAR pay a one-time licensing fee of $1,600.

Addressing the Costs of Assessment

Though districts need interim assessments to provide teachers with interim data for instructional decision making, grouping students, identifying appropriate interventions for struggling students, and monitoring the progress of all students, many districts have adopted too many and often overlapping assessments. DIBELS is largely a screener assessment. But AIMSWEB, FAST, MAP and STAR also can function as screeners. Districts do not need both DIBELS and one of FAST, MAP or STAR. Further, DIBELS and AIMSWEB (until recently), while popular, also require *teachers* to administer the assessments so consume teacher time. For these reasons, the online, computer adaptive assessments – STAR, MAP and FAST – have become more popular in many places, often replacing both DIBELS and AIMSWEB.

For more information about benchmark assessments, Hanover Research[8] recently completed an extensive review of the above and other interim assessment systems, including costs and ratings of them from the National Center for Response to Intervention.

The EB Model now provides $25 per pupil for short cycle, interim assessments, encouraging schools to take a parsimonious approach to these performance data. Indeed, the Renaissance Learning STAR assessments can function as both interim and benchmark assessments, can be used to progress monitor students with IEPs, include both math and reading Preschool-12, and cost less than this figure. In fact, some districts have dropped Scantron, NWEA MAP, and AimsWeb assessments and replaced them with just the single STAR Enterprise system that provides all the information of the previous three, and at a lower overall cost.

17. Computers, Technology and Equipment

Over time, schools need to embed technology in instructional programs and school management strategies. Today, more and more states require students not only to be technologically proficient but also to take some courses online in order to graduate from high school. Further, there are many online education options, from state-run virtual schools such as those in Florida and Wisconsin, to those created by private sector companies who run many virtual charter schools, such as K12 Inc. and Connections Academy. "Blended instructional" or "the flipped classroom" models, such as Rocketship, have also emerged (Whitmire, 2014). These programs infuse technology and online teaching into regular schools, provide more 1-1-student assistance, and put the teacher into more of a coaching role (see Odden, 2012). Research also shows that these technology systems work very well for many students, and can work very effectively in schools with high concentrations of lower income and minority students (Whitmire, 2014).

[8] Hanover Research. (2013). *Review of K12 Literacy and Math Progress Monitoring Tools*. Washington, D.C.

Moreover, they can be less costly than traditional public schools (Battaglino, Haldeman & Laurans, 2012; Odden, 2012).

Current EB Recommendation
$250 per student for school computer and technology equipment.

Analysis and Evidence

School-based technology and equipment provide access to a myriad of resources including the Internet, instructional software, multimedia resources, 21st Century business tools, and opportunities for peer interventions and communication. Increasingly, schools are embedding technology into instructional programs and school management strategies. Further, there are many online education options, from state-run virtual schools such as those in Florida and Wisconsin, to those created by private sector companies that run many virtual schools, such as K12 Inc. and Connections Academy.

Technology allows teachers to use different strategies for organizing and presenting knowledge, thus providing more individualized and improved instruction. Teachers can enhance learning through strategies such as "blended instruction" or the "flipped classroom," in which much of the instruction takes place online outside of the classroom, and the teacher provides individualized support and intervention in the classroom (Whitmire, 2014).

Infusing technology and online teaching into schools can support one-to-one student assistance and put the teacher into more of a coaching role (see Odden, 2012). Research also shows that technology systems work very well for many students, and can work effectively in schools with high concentrations of lower income and minority students (Whitmire, 2014). Moreover, they can be less costly than traditional public schools; in fact, some virtual schools cost only half the amount of traditional brick and mortar schools (Battaglino, Haldeman & Laurans, 2012; Odden, 2012).

Infusing technology into the school curriculum has associated costs for computer hardware, networking equipment, software, training and personnel associated with maintaining and repairing these machines. If these technology elements are not maintained and updated, teachers and students will become disengaged and learning opportunities will be lost.

Purchasing and embedding technology into the operation of schools has both direct and indirect costs. Direct costs include expenditures for the hardware, software, and labor costs for repairing and maintaining the infrastructure and machines. Indirect costs include the expenditures for professional development, loss of time for self-support and casual learning, and additional hours of user application development. This section of the EB Model focuses on direct technology costs, as the indirect costs of training and ongoing professional development are addressed in other model elements.

The EB Model assumes that no Vermont school is beginning at a baseline of zero. All Vermont schools have a variety of computers of varying ages, the large majority of which are connected to school networks and the Internet. Schools have been wired and most are now adding Wi-Fi capabilities and increasing bandwidth. The EB Model assumes major capital expenses such as access to fiber optics have been covered, or will be covered, with other capital funds.

The cost analysis does include funds for upgrading network switchgear and central servers that occur in the normal course of maintenance.

We refer readers to more detailed analysis of the costs of equipping schools with ongoing technology materials (Odden, 2012) that was spearheaded by Scott Price, now Chief Financial Officer for the Los Angeles County Office of Education, and who also wrote the bulk of this section. The analysis estimated four categories of technology costs totaling $250 a student. The amounts by category should be considered flexible, as districts and schools need to allocate dollars to their highest technology priority outlined in state and district technology plans.

The per-student costs for each of the four subcategories are:

- Computer hardware: $71
- Operating systems, productivity and non-instructional software: $72
- Network equipment, printers and copiers: $55
- Instructional software and additional classroom hardware: $52.

This per student figure is sufficient for schools to purchase, upgrade and maintain computers, servers, operating systems and productivity software, network equipment, and student administrative system and financial systems software, as well as other equipment such as copiers. System software packages vary dramatically in price; the figure recommended would cover medium priced student administrative and financial systems software packages.

The $250 per student figure, originally developed in 2006, updated in 2010 and reaffirmed in 2015, allows a school to have one computer for every two to three students. This ratio was sufficient to provide every teacher, the principal, and other key school-level staff with a computer, and to have an actual ratio of about one computer for every three-to-four students in each classroom.

Over the last few years, computer makers have developed alternative products, such as netbooks, Chromebooks and tablet computers that have a lower entry price point of about $300 per unit compared to the $500 to $800 cost for laptop or desktop computers. For school districts that value lowering the student-to-computer ratio, purchase of these devices provides an opportunity to significantly increase the number of student devices when replacing traditional units at their end-of-life. By using non-traditional form factors with lower-priced units, districts can purchase more units and lower their student-to-computers ratios. Additionally, many times it is cheaper for a district to buy additional units of these less expensive computers than to purchase multi-year service agreements.

Though Chromebooks use a different operating system than typically used in the educational environment, most instructional and interactive testing software is browser-based, making the instructional software agnostic regarding operating systems. Additional software is being continually developed for these new platforms as they become more commonly used in the educational space. Google develops applications that will work offline when a Chromebook is not connected to the Internet. However, when the Chromebook is not connected to the Internet, the functionality of the applications may be limited. This can be a disadvantage for low-income students in one-to-one models or loan programs who do not have Internet access at home. Finally, Chromebooks and other such platforms are still not appropriate for the school or district administrative office functions.

As the ratio of these new devices to traditional devices increases there is opportunity for districts to explore one-to-one student-to-computer ratios at key grade levels. As high stakes computerized testing is pushed further into the primary grade levels, moreover, it is essential that students are able to comfortably use computers to demonstrate their knowledge. If students have not had sufficient practice with computers in a testing environment, computerized testing can become a barrier to successfully assessing student achievement. If students cannot comfortably type, text responses become more of a test of "hunt and peck" skills than a reflection of the student's ability to respond to a prompt.

As Vermont moves to online testing, districts will need to increase the number of devices they have and expand their Internet bandwidth to accommodate this testing. Students will also have to become accustomed to using headphones that are required when testing groups of students together. Again, it is important that students feel comfortable with the computers they will use for testing so the hardware does not become a barrier to assessing student knowledge. Some students already may have some experience in online testing if they have used the NWEA MAP or Renaissance Learning STAR online assessment systems.

In considering the above factors, if a district begins to adopt a mix of standard and low cost units into district inventories, the "average" cost of a computer unit will drop depending on the percentage of higher and lower priced form factors. Despite this drop in average cost, the EB recommendation remains at $71 per student for computer hardware, recognizing that introducing lower priced units will allow districts to move closer to a one-to-one student to computer ratio and improve refresh rates on all units. It will also allow students to experience a wider breadth of form factors that will better prepare them for the workplace.

In the past, the EB Model has recommended districts either incorporate maintenance costs into lease agreements or, if purchasing the equipment, buy 24-hour maintenance plans to eliminate the need for school or district staff to fix computers. For example, for a very modest amount, one can purchase a maintenance agreement from a number of computer manufacturers that guarantees computer repair on a next business day basis. In terms of educator concerns that it would be difficult for a manufacturer's contractors to serve remote communities, the maintenance agreement makes meeting the service requirements the manufacturer's or contractor's problem and not the district's problem. Many of the private sector companies that offer such service often take a new computer with them, leave it, and take the broken computer

to fix, which often turns out to be more cost effective than to send technicians to fix broken computers. On the other hand, when districts analyze the cost of warranty programs for Chromebooks or similar low cost hardware, they may find it is more practical to replace broken machines than to pay for extended warranties.

As the number of computers in schools increases, it becomes more impractical to hard-wire connections into classrooms or other instructional spaces. Wireless connectivity is the only solution to creating an instructional environment in which Internet access is available anywhere, anytime on campus. Depending on campus configuration, it is possible to serve a small group of wireless computers with just a few wireless access points. However, as the number of computers being simultaneously used increases, additional access points must be added. The original EB Model technology and equipment figure of $250 per pupil figure included funds to complete small on-campus infrastructure improvements.

The EB recommendation for technology remains at $250. This figure has remained constant for several years. As technology has improved, price points for many technologies have remained fairly constant as the capacity and demands increase. While general computer and server costs have declined, other technology costs have risen. For example, as the need for bandwidth has increased, the older network switches with speeds of 100 megabits have been replaced with gigabit switches that cost the same as a 100 megabit seven years ago. If Vermont funds school-based technology and equipment at $250 per ADM, districts will be able to gradually upgrade necessary network equipment within their campuses and to lower their student-to-computer ratios using a mixture of traditional and new devices.

One-to-One Computing [Optional Consideration]

One-to-one computing, meaning each student is issued a laptop to use in all classes and at home, has been successfully implemented in some grade levels in districts across the country. Maine, which began a program of providing every student with a computer, has one of the longest running implementations of such a program.

Districts and schools usually begin one-to-one programs by assigning computers at a specific grade level and then letting the students use the computers as they advance to the next grades. In this manner, districts can build a one-to-one computer program over a series of years.

One-to-one programs are very expensive. These programs raise the cost of all four areas of the previously listed formula, namely: 1) computer hardware, 2) operating systems, productivity and other non-instructional software, 3) network equipment, bandwidth, Wi-Fi coverage, and 4) instructional software.

The largest increase occurs in computer hardware. In a one-to-one program, districts need to purchase a business grade laptop, approximately $850 for a Windows-based machine, with a three-year warranty, which accounts for $120 of the cost. A cost of $850 may seem to be a high price for a laptop when local office superstores advertise a Windows 8, or now Windows 10, laptop for as little as $300. However, these less expensive laptop models are consumer grade and

many come with very limited, short-term warranties. Implementing a one-to-one laptop program requires districts to utilize a business-grade model of laptop specifically designed for a large enterprise like a school district.

The business-grade laptop model is designed with stronger materials to guard against wear-and-tear that occurs in the normal course of usage. It is a machine that has advanced specifications to ensure its relevance and usefulness over the four years a student will use the laptop. The laptop is based on standardized parts from the same manufacturer. This type of design provides a "constant" form factor with hardware components requiring only one set of common software drivers. This consistent design simplifies maintenance allowing a machine to be re-imaged in a few hours instead of requiring a technician to search for unique hardware drivers, recreate network settings, install print drivers and perform other such time-consuming tasks.

The Chromebook does present a less expensive platform than a Windows-based machine. Though Chromebooks have been used successfully at all grade levels, they are most commonly used in the primary grades. Chromebooks use Google Apps, which provide a basic word processor and presentation software. Google Apps has a much more limited set of features than Microsoft or Apple productivity suites. Google Apps utilize cloud computing, meaning the software resides on a server in an offsite location accessible by the Internet. If a Chromebook does not have Internet access, Google Apps become even more limited. This means if a student takes a Chromebook home, but does not have Internet access there or cannot configure their Internet access to connect the Chromebook, then its value at home to the student becomes nominal.

For secondary students, a Windows or Apple platform helps prepare students for the workplace and/or the postsecondary environment. A Windows or Apple based machine has access to the full suite of productivity software used in businesses whether online or offline. Apple and Windows solutions also have robust image and video editing solutions not yet available with the Chromebook.

Apple has an excellent line of laptops for education. However, they are even more expensive than Windows-based platforms. This is the reason this analysis uses an enterprise grade, Windows laptop price to demonstrate the average cost of implementing a one-to-one program. Districts may be able to provide a one-to-one program for less by utilizing a Chromebook or other "netbook" platforms in the elementary grades, or even across grades. Other districts may choose the Apple platform, but should expect to spend additional funds for hardware.

The reason why the cost of a one-to-one program increases so quickly is the number of computers triples if a district has a three-to-one student to computer ratio. In a three-to-one ratio, three students bare the cost of one device over a four to five year timeframe. With a one-to-one program, one student carries the cost of one computer laptop over a shorter, three to four year period. To support the cost of an $850 laptop, assuming a four-year computer refresh rate for both, a three-to-one student to computer ratio would require the support of just under $71 per student ($850 divided by 4 years equals $212, that result divided by 3 students equals $71 per student). In a one-to-one program, the same laptop would require the support of $212 per

student, three times the cost of the three-to-one ratio. The dynamics of this equation change with the device. Chromebooks would be less; laptops from Apple more.

Because going to a one-to-one ratio from a three-to-one ratio triples the number of computers, a tripling of the other three costs within the $250 formula might be assumed. However, the cost curve is not as steep in the other three areas depending on the specific situation within each district.

For example, the $250 per student formula sets aside $55 per student for networking equipment, printers, and copiers. This figure presupposes capital costs for installation of district and school networks has already occurred and schools and districts are upgrading or replacing networking equipment such as switches and routers on a longer-term maintenance cycle. Considering the ongoing nature of the cost of these items, it would be very difficult to set aside funds from this area to extend the network or increase its capability, thus resources for copiers, printers, and the supplies needed to run these machines also come from this area.

To upgrade all district and school networks with the capacity to support a one-year implementation of a district wide one-to-one program would prove challenging and very expensive. Doubling or tripling the $55 per student cost might not be sufficient to complete this type of effort. As Vermont moves statewide assessment online, it will need to invest in the schools' networks in a more reasonable timeframe. To achieve a more sustainable pace of improving Internet access quality and coverage, the Legislature could double the $55 network cost to $110 per student, using the funds to extend their networks and increase bandwidth gradually. These are for within school costs such as switchgear at the main distribution facility (MDF) and in the intermediate distribution facilities (IDFs or switches for a building, or a building wing or even just a classroom) to handle the additional band width; additional IDFs in uncovered areas of the campus; wireless access points and wireless management software and server; fiber and/or copper wire runs to those additional IDFS and wireless access; additional access points to infill the existing network because few classrooms have enough drops to connect each computer in one-to-one. IDfs are connected to the MDF, which is connected via routers to the Internet.

When districts in other states began computerized statewide assessments, many found the additional demand on their networks hindered a successful implementation of the testing. Networks simply had not been designed to handle the bandwidth necessary to adequately accommodate large numbers of computers all demanding bandwidth at once throughout all areas of the campus. Districts had to scramble to find funds to extend their networks, mainly through Wi-Fi, and increase their bandwidth by buying new switches and routers and converting older connections. One-to-one programs, if successfully implemented, can produce the same network demands of online testing each day of the school year.

To successfully implement one-to-one programs, all areas of the campus must provide Internet connectivity ensuring every student has access to sufficient bandwidth anytime and from any learning space within the campus. If students are dropped from the network or there is slow access, the learning process is interrupted and students are distracted. As Vermont implements

more online assessments, it will be necessary to support districts in upgrading and extending their networks. In a high-stakes online testing environment, insufficient bandwidth will be a barrier to successful implementation and has the potential to mask student achievement.

Most campuses that have found the need to upgrade and extend their networks have chosen to do so through Wi-Fi. This is now the cheapest and most effective way to spread adequate bandwidth to all learning spaces. Large-scale implementation of Wi-Fi requires management software and hardware that can control and shift Wi-Fi resources based on the ebb and flow of need during the school day. Managed Wi-Fi is important in a non-one-to-one environment and absolutely necessary in a densely packed one-to-one situation. District technology personnel need the "dashboard" types of management that helps them understand bandwidth pinch points. Management of the Wi-Fi network creates an ongoing additional cost to the networking element of the formula.

It should be noted that once a network is “extended,” meaning access points have been placed to provide sufficient bandwidth to all areas of the campus, the ongoing cost of this element would diminish, but would not return to the $55 dollars per student as there are now more devices to maintain and replace in a natural maintenance cycle.

The other two elements of the formula deal with software, both enterprise software for financial and student systems and instructional software such as productivity or subscription-based data bases. The cost increase in these areas depends on the licensing. If licensing is per machine, then costs will increase as the numbers of computers rises. If the software is cloud-based and driven by the number of user logins, then additional machines will not generate additional costs. One example is the Microsoft Office package. Purchasing the license to install on a machine equates to a cost per machine; however, when using Office 365, the cost is per user and the user can download that package on multiple machines.

If all software were based on the number of logins and users, there would be no additional costs to these two software elements in a one-to-one implementation. However, if all software licenses were based on the number of computers on which the software resides, then the cost in this area would triple like the cost of the computers. The more likely scenario lies somewhere in between these extremes, with districts utilizing various products from the two different categories. For this reason, the one-to-one model estimates toward the middle, doubling the cost instead of tripling or projecting no increase at all. The actual cost will differ in each school district based on the mix it has. If extra funds are unspent in these two software elements, they should be directed to accelerate the network extension and the increase of bandwidth.

To summarize in Table 3.2, in a three-to-one student to computer ratio, the cost per student in the EB recommendation is $250 per student. In a one-to-one environment, the cost rises to $571 per student depending on the current networking capabilities of the district and its component schools and the software licensing agreements it maintains. It is important to note this does not include the increased costs for additional personnel needed to service the associated issues that come with three times as many computers.

Table 3.2: Cost of Implementing a 1-to-1 Student to Computer Ratio from a 3-to-1 Student to Computer Ratio

Subcategory	3-to-1 Student-to-Computer Ratio	1-to-1 Student-to-Computer Ratio
Computer Hardware[9]	$71	$213
Networking Equipment, Copiers, Printers	$55	$110
Non-Instructional Software	$72	$144
Instructional Software	$52	$104
Total Cost per Student	**$250**	**$571**

Benefits of One-to-One Computing

Advocates of one-to-one computing cite various benefits, including: improved student achievement (especially in writing skills), increased student engagement and collaboration, better implementation of project-based learning, an expansion of learning beyond the classroom, and instant access to information. Opponents claim it is difficult to isolate technology as the only contributing factor to these benefits. Other drawbacks mentioned include: the cost, need for increased student supervision, and the necessity to provide additional professional development to teachers and other district staff (Sauers & Mcleod, 2012; Jackson, 2009; Goodwin, 2011). Though moving to one-to-one computing is a popular education initiative across the country, to date there is little evidence that it is an effective strategy to dramatically boost student achievement (see for example, Goodwin, 2011; Lowther, et al., 2007; Shapley, et al., 2009; Silvernail & Gritter, 2007).

One of most important benefits of implementing a one-to-one program consists of extending the learning environment beyond the school day to the home. However, unless Internet access is ensured at a student's home and teachers use technology to change their strategies to take advantage of this access, then this benefit will be left unrealized.

One of the clear advantages of a one-to-one program is students collaborate more in off-hours on projects. This increases the frequency with which they practice writing and communicating in written and other forms. Once again this depends on the Internet access in the home.

Three basic scenarios exist regarding Internet access at home. If a student already has Internet access and a computer terminal provided at home for their use, it is likely that they will continue to use the home computer and the one-to-one laptop will remain in the backpack. Alternatively, if the student has Internet access at home but does not have access to a family computer, then the laptop would be used to varied success depending on whether the laptop could be configured to access the home connection and the software installed on the machine was cloud-based. In the third scenario, the student has no Internet access and no family computer available. In this case, the student will use the computer if applications are installed on the laptop, but would not be able

[9] Costs are associated with implementing a one-to-one computing program with a full-featured Windows-based laptop. Computer hardware costs could be lowered significantly using Chromebooks. Cost savings would vary depending on the mix of platforms selected for the specific implementation.

to take full advantage of cloud-based software or even basic collaborative tools such as email or document sharing. In short, technology provides access to resources. One-to-one programs can extend access to technology beyond the school day if conditions are right to connect to the Internet in the home.

Successful one-to-one programs are driven by district/school leader advocates for these programs (Oliver, 2012). These programs demand a high level of coordination between the instructional and business sides of the school district. They require board and community support. This is why one-to-one is not a decision to be taken lightly and why states and/or districts usually experiment with pilot projects either at a school or grade level. If one-to-one programs were less complex and less expensive, many more districts and states would be implementing them.

Vermont may want to consider creating a specific competitive grant program for districts to institute one-to-one model programs that could be evaluated and emulated. Different form factors and platforms could be used to understand the strengths of each: Chromebook, Windows, and Apple. Different configurations of the one-to-one programs such as grade level, school level (elementary vs. secondary) and school site based, could be explored. Various successful programs have been implemented across the nation. This would give Vermont educators an opportunity to utilize one of these successful models to implement a program in its own educational environment.

The core EB recommendation for school-based computers and related technologies is $250 per pupil.

18. Career Technical Education Teachers and Equipment/Materials

Vocational education, or its modern term, Career and Technical Education (CTE), has experienced a shift in focus during the past decade. Traditional vocational education focused on practical, applied skills needed for wood and metalworking, welding, automobile mechanics, typing and other office assistance careers, as well as courses in home economics. Today, many argue that voc-tech is more appropriately info-tech, nano-tech, biotech, and health-tech. The argument is that Career and Technical education should begin to incorporate courses that provide students with applied skills for new work positions in the growing and higher wage economy including information technologies (such as computer network management), engineering (such as computer-assisted design), a wide range of jobs in the expanding health portions of the economy and bio-technical positions – all of which can be entered directly from high school. The American College Testing Company and many policymakers have concluded that the knowledge, skills and competencies needed for college are quite similar to those needed for work in the higher-wage, growing jobs of the evolving economy, so all students need a solid academic high school program to be college and career ready when they graduate from high school.

Current EB Recommendation
$10,000 per CTE teacher for specialized equipment. Plus core administrative and physical resources required to staff the 17 Vocational Technical Centers, most of which are stand alone schools.

Analysis and Evidence

A key question is whether new career and technical education programs require more resources. Many districts and states believe that new career-technical programs cost more than the regular program and even more than traditional vocational classes. However, in a review conducted for a Wisconsin school finance adequacy task force, a national expert on career-technical education (Phelps, 2006) concluded that the best of the new career-technical programs did not cost more, especially if the district and state made adequate provisions for professional development (as teachers in these new programs needed training) and computer technologies (as computer technologies were heavily used). These conclusions generally were confirmed by the cost analysis we conducted of Project Lead the Way (PLTW), one of the most highly rated and allegedly "expensive" career technical programs in the country.

PLTW (**www.pltw.org**) is a nationally recognized exemplar for secondary CTE education. Often implemented jointly with local post-secondary educational institutions and employer advisory groups, these programs usually feature project- or problem-based learning experiences, career planning and guidance services, and technical and/or academic skills assessments. Through hands-on learning, the programs are designed to develop the science, technology, engineering and mathematics (STEM) skills essential for achievement in the classroom and success in college or jobs not requiring a four-year college education. Today, PLTW is offered in more than 5,000 elementary, middle and high schools in all 50 states and enrolls over 500,000 students.

The curriculum features rigorous, in-depth learning experiences delivered by certified teachers, and end-of-course assessments. High-scoring students earn college credit recognized by more than 100 affiliated post-secondary institutions. Courses focus on engineering foundations (design, principles, and digital electronics) and specializations (e.g., architectural and civil engineering, bio-technical engineering) that provide students with career and college readiness competencies in engineering and science. Students need to take math through Algebra 2 in order to handle the courses in the program, which also meets many states' requirements for science and other mathematics classes.

The major cost areas for the program are in class size, professional development and computer technologies. Most programs recommend class sizes of 25, a figure larger than the secondary class sizes provided by the Vermont EB Funding Model. The professional development and most of the computer technology costs are covered through the professional development and technology components of the EB model.

However, a few of the PLTW concentration areas require a one-time purchase of expensive equipment. We checked with representatives of this program and confirmed that these costs can be covered by a $10,000 allocation per career-technical education teacher. To implement this recommendation, Vermont would need to specify standards for career technical courses, and then collect the number of FTE career technical teachers for each school.

In Vermont, career and technical education is generally provided through 17 regional vocational technical centers or comprehensive high schools. Students who attend the centers are treated as enrolled at the secondary school they attend, and the cost of the technical centers is funded through state appropriations, tuition from the sending schools, and other career and technical education program grants. Funding through the EB model for these centers would largely be provided through the resources the students generate at their home schools and then sent to the regional technical center as tuition. Specific funding for the vocational technical programs would include $10,000 for each full time CTE teacher either at the comprehensive high school or at each center, as well as resources for the specific staffing requirements of vocational technical centers (Sections 2370-2398 of the Vermont Education Code). In addition, the maintenance and operations costs of the stand-alone technical centers would need to be funded.

19. Extra Duty Funds/Student Activities

Elementary, middle, and high schools typically provide an array of non-credit producing after-school programs, from clubs and bands, to sports and other activities. Teachers supervising or coaching these activities usually receive small stipends for these extra duties.

Current EB Recommendation
$300 per student for co-curricular activities including sports and clubs.

Analysis and Evidence

Research shows, particularly at the secondary level, that students engaged in student activities tend to perform better academically than students not so engaged (Feldman & Matjasko, 2005), although too much extra-curricular activity can be a detriment to academic learning (Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1996, 1997). Feldman and Matjasko (2005) found that participation in interscholastic (as compared to intramural) sports had a positive impact for both boys and girls on grades, post-secondary education aspirations, reducing drop- out rates, lowering alcohol and substance abuse, and led to more years of schooling. The effect was particularly strong for boys participating in interscholastic football and basketball. One reason for these impacts is that participation in interscholastic athletics placed students in new social groups that tended to have higher scholastic aspirations and those aspirations "rubbed off" on everyone. But the effects differed by race and gender, and were not as strong for African Americans.

During the past several years, the EB model has allocated between $250 and $300 per pupil for student activities, including inter-mural sports. These figures are in line with average amounts spent on such activities in many states. Currently, the EB model includes an overall figure of $300 per pupil.

CENTRAL OFFICE FUNCTIONS

In addition to school-based resources, education systems also need resources for district level expenditures including operations and maintenance and the central office. The study does not address transportation. These are outlined below.

20. Operations and Maintenance

Computation of operations and maintenance costs is complicated by the lack of a strong or consistent research base. Many models allocate a percentage of current expenditures to operations and maintenance. The EB model uses formulas to compute the number of personnel needed *at the school level* for custodial, maintenance and grounds work.

Current EB Recommendation
Separate computations for custodians, maintenance workers and groundskeepers as outlined in the analysis and evidence section below. $315.39 per pupil for utilities, the 2014-15 statewide average.

Analysis and Evidence

Drawing on professional standards in the field as well as research, the EB method has conducted analyses of the cost basis for maintenance and operations (e.g., Picus & Odden, 2010; Picus & Seder, 2010). The discussion below summarizes the research on operations and maintenance, identifying the needs for custodians (school level), maintenance staff (district level) and groundskeepers (school and district level), as well as the costs of materials and supplies to support these activities.

Custodians

Custodians are responsible for the daily cleaning of classrooms and hallways as well as for routine furniture set-ups and take-downs. In addition, custodians often manage routine and simple repairs like minor faucet leaks, and are expected to clean cafeterias/multipurpose rooms, lockers and showers. Custodial workers' duties are time-sensitive, are structured and varied. Zureich (1998) estimates the time devoted to various custodial duties:

- Daily duties (sweep or vacuum classroom floors, empty trash cans and pencil sharpeners in each classroom, clean one sink with faucet, and ensure the security of rooms), which take approximately 12 minutes per classroom
- Weekly duties (dust reachable surfaces, dust chalk trays and clean doors, clean student desk tops, clean sink counters and spots on floors, and dust chalk/white boards and trays), each of which adds 5 minutes a day per classroom, and
- In addition to these services, non-cleaning services (approximately 145 minutes per day) provided by custodians include: opening school (checking for vandalism, safety and maintenance concerns), playground and field inspection, miscellaneous duties (teacher/site-manager requests, activity set-ups, repairing furniture and equipment, ordering and delivering supplies), and putting up the flag and PE equipment.

A formula that takes into consideration these cleaning and non-cleaning duties has been developed and updated by Nelli (2006). The formula takes into account teachers, students, classrooms, and gross square feet (GSF) in the school. The formula is:

- 1 Custodian for every 13 teachers, plus
- 1 Custodian for every 325 students, plus
- 1 Custodian for every 13 classrooms, plus
- 1 Custodian for every 18,000 Gross Square Feet (GSF), and
- The total divided by 4.

The formula calculates the number of custodians needed at prototypical schools. The advantage of using all four factors is that it accommodates growth or decline in enrollment and continues to provide schools with adequate coverage for custodial services over time.

Maintenance Workers

Maintenance workers function at the district level, rather than at individual schools. Core tasks provided by maintenance workers include preventative maintenance, routine maintenance and emergency response activities. Individual maintenance worker accomplishment associated with core tasks are: 1) HVAC systems, HVAC equipment, and kitchen equipment; 2) electrical systems, electrical equipment; 3) plumbing systems, plumbing equipment; and 4) structural work, carpentry and general maintenance/repairs of buildings and equipment (Zureich, 1998).

Zureich (1998) recommends a formula for maintenance worker FTEs incorporated into the funding model for instructional facilities as follows:

[(# of Buildings in District) x 1.1 + (GSF/60,000 SqFt) x
1.2 + (enrollment/1,000) x 1.3
+ General Fund Revenue/5,000,000) x 1.2] / 4
= Total number of Maintenance Workers needed.

A review of state facility standards suggests that for prototypical schools of the sizes used in the EB model, approximate gross square footage should be 63,000 for elementary and middle schools, and 110,000 for a high school. In addition, allowances are needed for central functions including a central office, warehousing and maintenance and operations facilities. We estimate these three facilities would require an additional 25,000 gross square feet of space. Maintenance and custodial supplies are estimated at $0.70 per gross square foot, which for the prototypical district is 623,000 square feet.

Grounds Maintenance

The typical goals of a school grounds maintenance program are generally to provide safe, attractive, and economical grounds maintenance (Mutter & Randolph, 1987). This, too, is a district level function. Although groundskeepers generally work in teams and visit schools on a less than daily schedule, we have estimated groundskeeper resources on the basis of the number of schools. Specifically we have estimated that an elementary school needs the equivalent of 0.25 FTE groundskeeper staff, a middle school 0.5 FTE groundskeeper staff, and a high school 1.5 FTE groundskeeper staff.

Utilities

It is necessary to add the per student costs of utilities and insurance to these totals. It is unlikely that a district has much control over these costs in the short run and thus each district can best estimate future costs using their current expenditures for utilities and insurance as a base. The cost of utilities is estimated at $315.39 per student, the 2014-15 statewide average.

21. Central Office Staffing/Non-Personnel Resources

All districts require central office staff to meet the overall management needs of the educational programs. We have developed a central office staffing recommendation based on school district size. The EB model assumes economies of scale as districts get larger, and provides estimated numbers of administrative (credentialed) and support (classified) staff at alternative district enrollments. The model has staffing resources for districts with fewer than 500 students to districts with more than 25,000 students. Because the largest district in Vermont has 4,000 students, our recommendations are based on districts up to that size. The model is flexible enough so that if a new supervisory district emerges with more than 4,000 districts in the future, resources can be estimated as well.

Current EB Recommendation
A dollar per student amount for central office staffing and non-personnel resources is computed based on the district's total enrollment.

Analysis and Evidence

Picus Odden and Associates has identified resources for central office positions in other reports and the most recent version of our textbook (see for example, Odden & Picus, 2014; Picus & Odden, 2010) drawing on a variety of research studies and professional standards for best practices. Over the past several years, we developed central office staffing recommendations in several states, including Maine, New Jersey, North Dakota, Washington, Wisconsin, Wyoming and Texas. In all states, we began our analysis with the research of Elizabeth Swift (2007), who used professional judgment panels to determine staffing for a prototypical district. That research addressed the issue of the appropriate staffing for a district of 3,500 students. Swift's work formed the basis of each state's analysis, although in three states (Washington, Wisconsin and North Dakota) we also conducted professional judgment panels to review the basic recommendations that emerged from Swift's research.

Through that work we were able to estimate the central office resources required for a district of 3,500 students. The initial studies provided for about 8 professional staff (superintendent, assistant superintendent for curriculum, business manager, and directors of human resources, pupil services, technology and special education) and nine clerical positions in a 3,500 student district. Although the research basis for staffing school district central offices is relatively limited, analysis of the Educational Research Service (2009) Staffing Ratio report shows that nationally school districts with between 2,500 and 9,999 students employ an average of one central office professional/administrative staff member for every 440 students (Educational Research Services, 2009). This equates to about eight central office professionals (7.95) in a district of 3,500 students. Our research-based staffing formula of 8 FTE professional staff matches the ERS estimate of 8 FTE central office staff for a school district of 3,500 students nationally.

Because the 3,500 student district size did not readily incorporate the EB model's prototypical schools, over the past few years we increased our prototypical district size to 3,900 students so it would be better aligned with our prototypical school sizes. A 3,900 student district would include four 450 student elementary schools, two 450 student middle schools, and two 600 student high schools. The 3,900 student school district also allowed us to add testing and evaluation, and central office computer staff, which, in our discussions with school districts it became clear are needed today. In recent studies, it was recommended that we add individuals who work with schools to provide first line help for technology – installing computers and their software, insuring that wireless systems operate, keeping printers operating, and related technical assistance to keep all computers operating. The recommendation was one school computer technician for every 600 students. These individuals would work in the schools, but because of the transitory nature of their work would be housed in the central technology office. This adds 6.5 positions to the central office staffing. We were also aware that the EB model has been short on central resources for special education and related services.

As a result of the limitations we identified in our central office model, in the summer of 2015, we asked a group of superintendents to design central office staff for several alternative district sizes. The three consultants we worked with are all former school superintendents and have nearly 100 years of school district administrative experience among them.

We asked them specifically to provide staffing recommendations for school districts with enrollments of 250, 500, 1,000, 2,000, 4,000 and 12,000 or more students. Because the largest district in Vermont has 4,000 students, we limit the discussion here to districts of 4,000 or less. In the discussion that follows, we first describe the approach our consultants took to estimating resources. Following that, we display the central office staffing recommendations that emerged from this process. The result is a staffing recommendation for school districts at each enrollment level.

Approach to Estimating Central Office Staffing

The consultants used their collective experience in school finance and budgets, leveraged their networks and relationships with numerous superintendents and chief business officials, reviewed district organizational studies and budgets, and analyzed district spending patterns to develop a set of templates for central office staffing. Specifically, they undertook the following tasks:

- Reviewed budgets and funding streams for districts of 250, 500, 1,000, 2,000, and 4,000 students (they also considered districts of 12,000, 25,000 and 50,000 students but those findings are not relevant in the Vermont context)

- Scrutinized organizational charts, administrative regulations and Board policies to review staffing needs, patterns and formulas that determine state and district expenditures for central office staff

- Interviewed superintendents and chief business officials to understand their thinking and rational for organizational staffing and district spending

- Engaged in a two day conference to consider the staffing needs school districts require to successfully support the needs of a district's students at the district and school level

- Identified potential district office staffing templates for school districts that in their professional opinion adequately provide district offices with the necessary staff resources to provide support to their district school sites.

The consultants made a number of assumptions based on school district size. Because of Vermont's unique school district organizational structure (and the need to build a model that will help school districts model alternatives under Act 46), we adjusted their model assuming that very small districts (one or two schools) receive central offices from a Supervisory Union (SU), and that larger districts either are part of SUs, or are individual school districts. Our model will combine schools into their composite SUs, and we will treat central office functions at the SU or district level. The following assumptions were made for the central office staffing models:

- District/SU of 250 students
    - Support services such as special education services including occupational therapy, physical therapy, legal services, facilities support, grounds maintenance and transportation, and food services etc. would be contracted out

    - Instructional services, human resources, curriculum and assessment, special education and professional development would be the responsibility of the superintendent

- District/SU of 500
    - Support services such as some special education services including occupational therapy, physical therapy, legal services, and facilities support, grounds, maintenance, and transportation and food services etc. would be contracted out. However the increase in student enrollment would necessitate the need for some special educational services being provided in house
    - Instructional services, human resources, curriculum and assessment, special education and professional development would be the primary responsibility of the superintendent

- District/SU of 1,000
    - Support services such as some special education services including occupational therapy, physical therapy, legal services, some facilities support, and transportation etc. would be contracted out. However the continued increase in student enrollment would necessitate the need for additional support service services being provided in house both administratively and with clerical support.

- District/SU of 2,000
    - With the increase in enrollment the district now has the opportunity to provide district level resources and support in-house. This includes the sharing of responsibilities across divisions to provide the support schools and employees need. The individual school sites become increasingly autonomous and the superintendent provides both big picture and hands on leadership throughout the district.

- District/SU of 4,000 or greater
    - The size of the district now enables it to become a self-sufficient district that can operate on its own.

Central Office Staffing Recommendation

We asked the superintendent consultants to provide us with staffing recommendations for all of the central office positions a school district would need regardless of variations in state funding laws. Table 3.3 Displays the EB model recommendations for central office staffing for districts up to 4,000 students.

Table 3.3: EB Model Central Office Staffing Recommendations

Office and Position	FTE									
	250		500		1,000		2,000		4,000	
	Admin	Class	Admin	Class	Admin	Class	Admin	Class	Admin	Class
Total	**3.5**	**3**	**4.5**	**5.5**	**8**	**9.75**	**15**	**15.25**	**21**	**29**
Superintendent's Office										
Superintendent	1		1		1		1		1	
Clerk		0.5		1		0.5		1		0.5
Administrative Asst./receptionist						0.75		1		2
Curriculum and Instruction/Ed Services										
Assistant Superintendent							0.5		1	
Director of Assessment and Accountability							0.5		1	
Director Early Childhood							1		1	
Clerk										1
Administrative Assistant						0.5		1		3
Instructional Technology and Technology Network and Support										
Director	1		1		1		1		1	
Network Supervisor								0.5		1
Systems Supervisor						0.5		0.5		1
Technician		1		1		1.5		3.25		6.5
Administrative Assistant				0.5		0.5		0.5		1
Clerk		0.5						0.5		1

\Office and Position	FTE									
	250		500		1,000		2,000		4,000	
	Admin	Class	Admin	Class	Admin	Class	Admin	Class	Admin	Class
Human Resources/Personnel										
Assistant Superintendent					0.5		0.5		**1**	
Director	0.5		0.5				1			
Credential Specialist										
Personnel Technician				1		0.5		0.5		1
Administrative Assistant						0.5		0.5		1
Special Education										
Director			1		1		1		1	
Secretary		0.5		0.5		1		1		1
Administrative Assistant								0.5		1
Business Office/Business Services										
Assistant Superintendent					0.5		1		1	
Director Fiscal Services	1		1				0.5		1	
Accounting Technician				1		1.5		1		2
Risk Manager							0.5		1	
Payroll/purchasing Clerks						1		1		2
Warehouse Manager									1	
Director Child Nutrition/food services					1		1		1	
Director Transportation					1		1		1	
Director M & 0					1		1		1	
Clerk		0.5		0.5		1		1.5		2
Administrative Assistant								1		2

Central Office Non-Personnel Resources

In addition to staffing, central offices need a dollar per student figure for such costs as insurance, purchased services, materials and supplies, equipment, association fees, elections, district wide technology, communications, and other costs. That figures is approximately as $350 per pupil.

RESOURCES FOR STRUGGLING STUDENTS

The core staffing section of this document contains positions for supporting teachers and students beyond the regular classroom core teacher. Those positions include elective or specialist teachers, tutors and pupil support personnel. However in many instances, *additional* support for struggling students is needed. The programs described in this section extend the learning time for struggling students in focused ways. The key concept is to implement the maxim of standards-based education reform: keep standards high for all students but vary the instructional time so all students can achieve to proficiency levels. The EB elements for extra help are also embedded in the "response to intervention" schema described at the beginning of this chapter.

It is important to note that we use two specific counts of pupils.

1. For programs that use an "at risk" count, the EB model includes an unduplicated count of students eligible for free and reduced meals, i.e., students eligible for free and reduced price lunch but who are not ELL students. All resources provided for at-risk students are also provided for ELL students. The EB model adopted the practice of using an unduplicated at-risk free and reduced price lunch eligible student count to ensure that all ELL students, regardless of poverty status, are eligible for the extra help strategies that most if not all ELL students need as they work to learn both content and a new language – English.

2. For the ELL program, the EB model uses the count of all ELL students regardless of free and reduced price lunch status.

The EB model provides substantial additional resources for students based on the at-risk and ELL student counts including tutoring, extended day, summer school, and pupil support. These resources for students struggling to achieve to academic standards should be viewed in concert with resources for students with identified disabilities. Districts sometimes over identify students for special education services as the "only" way to trigger more resources for some struggling students. The EB goal for a robust set of extra resources for struggling students triggered by at risk and ELL counts is to provide adequate resources for all struggling students, with or without a diagnosed disability, and to reduce over identification in special education.

This section includes discussion of seven categories of services: 1) tutoring, 2) additional pupil support, 3) extended day, 4) summer school, 5) programs for ELL students, 6) alternative schools, and 7) special education.

22. Tutors

The first strategy to help struggling students is to provide additional support as described in Element 8 above. In addition to the one core tutor position provided to every prototypical school discussed above for Element 6, the EB model provides additional tutor positions at the rate of one for every 125 at-risk and ELL students.

Current EB Recommendation
1.0 tutor position for every 125 non-ELL free and reduced price lunch eligible students Plus 1.0 tutor position for every 125 ELL students (in addition to the one core tutor position in each prototypical school). These positions are provided additional days for professional development (Element 14) and substitute days (Element 7) discussed above.

Analysis and Evidence

The most powerful and effective extra help strategy to enable struggling students to meet state College and Career Ready standards, including Common Core standards, is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g. the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik & Kulik, 1982; Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors;
- Tutoring initially provided to students on a one-to-one basis;
- Tutors trained in specific tutoring strategies;
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content-specific scaffolding and modeling;
- Sufficient time for the tutoring; and

- Highly structured programming, both substantively and organizationally.

We note several specific structural features of effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1-1 tutoring.) Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools.
- Second, most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, close to half the student body of a 400-student school unit could receive individual tutoring during the year.
- Third, not all students who are from a low-income background require individual tutoring, so a portion of the allocation could be used for students in the school who might not be from a lower income family but nevertheless have a learning issue that could be remedied by tutoring. This also is part of the rationale for including 1 tutor in each prototypical school, regardless of the number of at risk students.

Though this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring say, at or below the 20^{th} or 25^{th} percentile on a norm referenced test, or below basic level on state achievement tests. Intensive instruction for groups of three-to-five students would then be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at risk children in kindergarten, first grade and second grade […..] only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading

> ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though we have emphasized 1-1 tutoring, and some students need 1-1 tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect is often smaller as it is much more difficult to undo the lasting damage of not learning to read once students enter middle and high schools with severe reading deficiencies. However, a new randomized control study (Cook et al., 2014) discussed below found similarly positive impacts of a tutoring program for adolescents in high poverty schools IF it was combined with counseling as well. This is made possible in the EB model as it includes such additional non-academic pupil support resources (see Element 23 discussion).

The rationale outlined above is strengthened by two recent *randomized controlled trials* of the effectiveness of tutoring for struggling students, which support our logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with greater need. At the elementary level, using a randomized controlled trial, May et al., (2013) assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found that Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study, and a 0.47 effective size relative to the national population of first grade struggling readers. The effects were similarly large for reading words and reading comprehensive sub-scales.

For students in high schools, Cook, et al. (2014) reported on a *randomized controlled trial* of a

two-pronged intervention that provided disadvantaged youth with tutoring *and* counseling. They found that intensive individualized academic extra help – tutoring – combined with non-academic support seeking to teach grade 9 and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy (CBT), led to improved math and reading performance. The study sample consisted mainly of students from low income and minority backgrounds, who generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48; the combined program also appeared to increase high school graduation by 14 percentage points (a 40 percent hike). The authors concluded that this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, *randomized controlled trials*, the "gold standard" of research supporting the efficacy of tutoring. Second, they show that tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses only elementary-aged students. Third, they show that tutoring can work even in the most challenging educational environments. And fourth, they bolster the EB argument below that extra help resources in schools triggered by at risk status should also include some non-academic, counseling resources, as the treatment in the second study was tutoring combined with counseling.

In earlier adequacy reports and in the recently published fifth edition of our textbook (Odden & Picus, 2014), we recommended tutor positions be provided only on the basis of at risk student counts. The recommended ratio was one position for every 100 at risk students but with a minimum of one for each prototypical school. As a result, a school without any at risk students would receive the minimum of one tutor position for struggling students, but a school with 100 at risk students would receive the same single tutor, even though it might have more need for tutor resources. Today, educators and policymakers across the country argue that schools with few low-income students still have students who struggle to learn to proficiency and that more rigorous college and career ready standards will lead to greater numbers of struggling students in the future. We find those arguments convincing and have modified the EB recommendations for tutoring resources.

The revised EB model provides one tutor per Tier 2-intervention position in each prototypical school. In parallel with that change, the EB model adjusts the ratio for additional tutor positions to one position for every 125 at risk and ELL students. The new EB recommendation for tutor per Tier 2-intervention positions is more generous than the previous recommendation of 1 tutor per 100 at risk students with a minimum of one for each prototypical school. For example, under the old EB model, a prototypical school with no at risk students would receive one position, as would a prototypical school with 100 at risk students. The revised EB model calls for 1.0 FTE position at a school with no at risk students. For a school with 100 at risk students, the model provides 1.0 FTE tutor position plus an additional 0.8 FTE (100/125) position for the 100 at risk students, for a total of 1.8 FTE positions. Both the old and revised EB models would provide 5 positions for a school with 500 at risk students.

23. Additional Pupil Support

Core pupil support positions for school counselors and nurses are discussed above in core resources as Element 10. At risk students, however, generally have more non-academic needs that should be addressed by additional pupil support staff, which could include more school counselors, as well as social workers, family liaison individuals, and psychologists. Thus, in addition to the core school counselor and nurse positions provided to every prototypical school discussed above for Element 10, the EB model provides additional pupil support position at the rate of one for every 125 at risk and ELL students.

Current EB Recommendation
1.0 pupil support position for every 125 non-ELL free and reduced price lunch eligible students, and 1.0 pupil support position for every 125 ELL students.

Analysis and Evidence

At-risk and ELL students tend to have more non-academic issues for schools to address. This usually requires interactions with families and parents as well as perhaps more school counseling in school. The EB model addresses this by providing more staffing resources to meet these needs. Although there are many ways schools can provide outreach to parents or involve parents in school activities – from fundraisers to governance – research shows that school-sponsored programs that have an impact on achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, such as the new college and career ready standards, programs that help parents and students understand both what needs to be learned and what constitutes acceptable standards for academic performance have been found to improve student outcomes. Parent outreach that explicitly and directly addresses what parents can do to help their children be successful in school, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on students' academic learning (Steinberg, 1997).

At the secondary school level, the goal of parent outreach programs is to have parents learn about what they should expect of their children in terms of academic performance. If either performance on end-of-course examinations or performance on comprehensive high school tests are required for graduation, such as Vermont's proficiency standards for high school graduation, they too should be discussed. Secondary schools need to help parents understand how to more effectively assist their children in identifying an academic pathway through middle and high school, understand standards for acceptable performance, and be aware of the course work necessary for college entrance. This is particularly important for parents of students in the middle or lower end of the achievement range, as often these students know very little of the

requirements for transition from high school to post-secondary education (Kirst & Venezia, 2004).

At the elementary level, parent outreach and involvement programs should concentrate on what parents can do at home to help their children do academic work for school. Too often parent programs focus on fundraising through the parent-teacher organization, involvement in decision-making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities might impact other goals – such as making parents feel more comfortable being at school or involving parents more in some school policies – they have little effect on student academic achievement. Parent actions that impact learning would include: 1) reading to children at young ages, 2) discussing stories and their meanings, 3) engaging in open- ended conversations, 4) setting aside a place where homework can be done, and 5) ensuring that children complete homework assignments.

The resources in the EB funding model are adequate to create and deploy the ambitious and comprehensive parent involvement and outreach programs that are part of two comprehensive school designs: Success for All and the Comer School Development Program. The Success for All Program includes a family outreach coordinator, a nurse, a social worker, a guidance counselor and an education diagnostician, for a school with about 500 students. This group functions as a parent outreach team for the school, serves as case managers for students who need non-academic and social services, and usually includes a clothing strategy to ensure that all students, especially in cold climates, have sufficient and adequate clothes and coats to attend school.

The Comer Program was created on the premise of connecting schools more to their communities. Its Parent-School team has a somewhat different composition and is focused on training parents to raise expectations for their children's learning, to work with social service agencies, and to work with the school's faculty to raise their expectations for what students can learn. Sometimes the team co-locates on school site premises to provide a host of social services.

A program called Communities in Schools, which now operates in 26 states and the District of Columbia and can be resourced by the resources provided by this model component, has been successful in raising school attendance rates, as students need to attend school in order to learn. The program adds a caseworker, often trained in social work, to a school's pupil support team, to help match social services provided by non-educational agencies to students who need them.

24. Extended-day programs

At both elementary and secondary school levels, some struggling students are likely to benefit from after-school or extended-day programs, even if they receive tutoring/Tier 2 interventions during the regular school day. Extended-day programs are created to provide academic support as well as to provide a safe environment for children and adolescents to spend time after the school day ends during the regular school year.

Current EB Recommendation
1.0 FTE teacher position for every 120 at risk and ELL students. 2.0

The allocation of staff for extended-day programs is derived through the following process. We assume that extended day programs offer academic support for two hours a day five days a week for at risk and ELL students. We further assume that half of the eligible students will participate, and classes will be limited to 15 students each. Thus, if there are 120 eligible students, 60 will take advantage of the program, requiring four extended day classes of fifteen students. Teaching two hours a day is approximately 0.25 FTE, and since four classes are required, a total of 1.0 FTE teacher position is needed to serve the 120 eligible students. These positions are provided additional days for professional development (Element 14) and substitute days (Element 7).

Analysis and Evidence

In a review of research, Vandell, Pierce and Dadisman (2005) found that well designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (see also Fashola, 1998; Posner & Vandell, 1994). On the other hand, the evaluation of the 21st Century Community Learning Centers (CCLC) Program (James-Burdumy et al., 2005), though hotly debated, indicated that for elementary students, extended-day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce & Dadisman, 2005) argued that the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. They also argued that the small impacts that were identified had more to do with lack of full program implementation during the initial years than with the strength of the program.

Overall, studies have documented positive effects of extended-day programs on the academic performance of students in select after-school programs (e.g., Takoata & Vandell, 2013; Vandell, 2014). However, the evidence is mixed both because of research methods (few randomized trials), poor program quality and imperfect implementation of the programs studied. Researchers have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program; staff expertise; staff stability/turnover; compensation; institutional supports)
- Program/group size and configuration (enrollment size, ages served, group size, age groupings and child-staff ratio) and a program *culture of mastery*
- Consistent participation in a structured program
- Financial resources (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery, curricular resources in relevant content areas, and a location that is accessible to youth and families)
- Program partnerships and connections (with schools to connect administrators, teachers and programs; with larger networks of programs; with parents and community), and
- Program sustainability strategies (institutional partners, networks, linkages, community linkages that support enhanced services, long-term alliances to ensure long-term funding).

The resources recommended in the EB model could be used to provide struggling students in all elementary grades and in secondary schools with additional help during the school year but before or after the normal school day. Because not all at risk students need or will attend an after-school program, the EB model assumes 50 percent of the eligible at risk students will attend the program – a need and participation figure identified by Kleiner, Nolin and Chapman (2004). As a result, providing resources at a rate of 1.0 FTE teacher to 30 at risk students will result in class sizes of approximately 15 in extended-day programs.

The state should monitor over time the degree to which the estimated 50 percent figure accurately estimates the numbers of students needing extended-day programs. We also encourage Vermont to require districts to track the students participating in the programs, their pre- and post-program test scores, and the specific nature of the after-school program provided, to develop a knowledge base of which after-school program structures have the most impact on student learning. We recognize that how these extended-day services are provided will vary across Vermont's school districts, and that any monitoring of the impacts of these resources should focus more on impacts on student performance than on the strategy for providing the services. We also found that most of the schools we studied in other states that improved student performance had various combinations of before- and after-school extra help programs.

25. Summer School

Many students need extra instructional time to achieve to the state's high proficiency standards. Thus, summer school programs should be part of the set of programs available to provide struggling students the additional time and help needed to achieve to standards and earn academic promotion from grade to grade (Borman, 2001). Providing additional time to help all students master the same content is an initiative that is grounded in research (National Education Commission on Time and Learning, 1994). It should be noted that summer school services are provided outside of the regular school year.

Current EB Recommendation
1.0 FTE teacher position for every 120 at risk and ELL students 2.0

Resources for summer school are funded on the assumption that summer school programs are six to eight weeks long, with four or more hours of academic course work each day. We assume that half of the eligible students (at risk and ELL) will participate in classes of fifteen students. Although the total summer school hours are not equivalent to a 0.25 FTE teaching position, it is funded at this level under the assumption that teaching summer school requires additional planning time outside of class. Thus, 120 eligible students would generate 60 summer school participants in four classes of 15 each staffed by a 0.25 FTE teacher for a total of 1 FTE for each 120 eligible students.

Analysis and Evidence

Research dating back to 1906 shows that students, *on average*, lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Summer breaks have a larger deleterious impact on poor children's reading and mathematics achievement. This loss can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). A longitudinal study by Alexander and Entwisle (1996) showed that these income-based summer learning differences *accumulate* over the elementary school years, such that poor children's achievement scores – without summer school – fall further and further behind the scores of middle class students as they progress through school grade by grade. As a result of this research, there is emerging consensus that what happens (or does not happen) during the summer can significantly impact the achievement of students from low-income and at risk backgrounds, and help reduce (or increase) the poor and minority achievement gaps in the United States.

But evidence on the effectiveness of summer programs in attaining these goals is mixed. Though past research linking student achievement to summer programs shows promise, several studies suffer from methodological shortcomings and low quality of the summer school programs (Borman & Boulay, 2004).

A meta-analysis of 93 summer school programs (Cooper, Charlton, Valentine, & Muhlenbruck, 2000) found that the average student in summer programs outperformed about 56 percent to 60 percent of similar students not receiving the programs. However, the certainty of these conclusions is compromised, because only a small number of studies (e.g., Borman, Rachuba, Hewes, Boulay & Kaplan, 2001) used random assignment, and program quality varied substantially. More recent *randomized controlled trial* research of summer school reached more positive conclusions (Borman & Dowling, 2006; Borman, Goetz & Dowling, 2009). Indeed, Roberts (2000) found an effect size of 0.42 in reading achievement for a *randomized sample* of 325 students who participated in the Voyager summer school program.

Researchers (see also McCombs, et al., 2011) note several program components related to improved achievement effects for summer program attendees, including:

- Early intervention during elementary school and a full 6-8 week summer program
- A clear focus on mathematics and reading achievement, or failed courses in high schools
- Small-group or individualized instruction
- Parent involvement and participation
- Careful scrutiny for treatment fidelity, and good instruction in reading and mathematics
- Monitoring student attendance.

Summer programs that include these elements hold promise for improving the achievement of at risk students and closing the achievement gap. Indeed, the most recent review of the effects of summer school programs reached this same conclusion (Kim & Quinn, 2013). Their meta-analysis of 41 school- and home-based summer school programs found that K-8 students who attended summer school programs with teacher directed literacy lessons showed significant improvements in multiple areas including reading comprehension, with effects much larger for students from low-income backgrounds.
In sum, research generally suggests that summer school is needed and can be effective for at risk students. Studies suggest that the effects of summer school are largest for elementary students when the programs emphasize reading and mathematics, and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics.

Because summer school can produce powerful impacts, the EB model provides resources for summer school for classes of 15 students, for 50 percent of all eligible students in grades K-12, an estimate of the number of students still struggling to meet academic requirements (Capizzano, Adelman & Stagner, 2002). The model provides resources for a program of eight weeks in length and a six-hour day, which allows for four hours of instruction in core subjects. A six-hour day would also allow for two hours of non-academic activities. The formula would be one FTE position for every 30 at risk and ELL students or 3.33 per 100 such students. Because not all at risk students will need or will attend a summer school program, the EB model assumes 50 percent of the eligible at risk students will attend the program – a need and participation figure identified by Kleiner, Nolin and Chapman (2004). Although a summer school term of 6-8 weeks will have fewer hours than five day a week extended-day programs, the EB resources this at the same rate to allow for teacher planning time for the summer school program – something that is less needed in extended day programs. Simplified, the EB summer school formula equates to 1.0 FTE teacher position for every 120 at risk and ELL students.

26. English Language Learner (ELL) Students

Research, best practices and experience show that in addition to the above resources, ELL need assistance to learn English, in addition to instruction in the regular content classes. This can include some combination of small classes, English as a Second Language classes, professional

development for teachers to help them teach "sheltered" English classes, and "reception" centers for districts with large numbers of ELL students who arrive as new immigrants to the country and the school throughout the year. ELL students also receive the resources described above including tutors, additional pupil support, extended day and summer school.

In addition, ELL students some additional services focused on ensuring their learning English. Funding is provided for *all* ELL students for these additional services regardless of free and reduced price lunch status.

Current EB Recommendation
1.0 FTE teacher position for every 100 identified ELL students.

These positions are provided additional days for professional development (Element 14). This provision is in addition to all the resources triggered by the at risk student count, all of which are also provided for ELL students and include tutors, extended day, summer school and additional pupil support.

Analysis and Evidence

Good ELL programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. However, bilingual education is difficult to provide in most schools because students come from so many different language backgrounds. Nevertheless, bilingual programs have been studied intensively. A best-evidence synthesis of 17 studies of bilingual education (Slavin & Cheung, 2005) found that ELL students in bilingual programs outperformed their non-bilingual program peers. Using studies focused primarily on reading achievement, the authors found an effect size of +0.45 for ELL students. A more recent *randomized controlled trial* also produced strong positive effects for bilingual education programs (Slavin, et al., 2011), *but* concluded that the language of instruction is less important than *the approaches taken to teach reading*.

Addressing that important issue in *The Elementary School Journal*, Gerstein (2006) concluded that ELL students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary, and reading comprehension. Gersten's studies also showed that ELL students benefit from instructional interventions initially designed for monolingual English speaking students, the resources for which are included above in the four at risk student triggered programs: tutoring, extended day, summer school, and additional pupil support.

Beyond the provision of additional teachers to provide English as a Second Language instruction to students or other types of extra help for ELL students, however, research shows that ELL students need a solid and rigorous core curriculum as the basis from which to provide any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). This research suggests that ELL students need:

- Effective teachers – a core goal of all the staffing in this report. Moreover, a recent study found that teachers who are effective with non-ELL students are also effective with ELL students, and vice versa. In addition, this study found that effective teachers who are fluent in the ELL student's native language are even more effective with those students (Loeb, Soland & Fox, 2014).
- Adequate instructional materials (Element 15) and good school conditions.
- Good assessments of ELL students so teachers know in detail their English language reading and other academic skills (Element 16).
- Less segregation of ELL students.
- Rigorous and effective curriculum and courses for all ELL students, including college and career ready, and affirmative counseling of such students to take those courses.
- Professional development for all teachers, focusing on sheltered English teaching skills (Element 14).

Hakuta (2011) supports these conclusions and also notes that English language learning takes time (one reason the EB model includes the above resources for every grade level) and that "academic language" is critical to learning the new Common Core Standards. The new standards require more explicit and coherent ELL instructional strategies and extra help services, if these are to be effective at ensuring that ELL students learn the subject matter English generally, and academic English specifically, i.e., learn how to read content texts in English. While this instruction requires smaller regular classes, those are already provided by the EB model, particularly at the early elementary level.

However, additional teaching staff are needed to provide English as a Second Language (ESL) instruction during the regular school day, such as having ELL students take ESL in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of ELL students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ESL program, each 100 ELL students should trigger one additional FTE teaching position. This makes it possible to provide additional instructional opportunities for ELL students to provide an additional dose of English instruction. The goal of this programming is to reinforce ELL student learning of academic content *and* English so at some point the students can continue their schooling in English only.

Research shows that it is the Limited English proficient or ELL students from lower income and generally less educated backgrounds, who struggle most in school and need extra help to learn both academics and English. The EB model addresses this need by making sure that the ESL resources triggered by just ELL pupil counts are *in addition* to other Tier 2 intervention resources, including tutoring, additional pupil support, extended day and summer school resources as well as pupil support staff (Elements 22-25).

For example, a prototypical school with 125 at risk students and no ELL students would receive 1.0 FTE core teacher and pupil support staff, and in addition, approximately 1.0 FTE tutor position, 1.0 FTE extended day, 1.0 FTE summer school, and 1.0 FTE additional pupil support

resources. But if the 125 at risk children were all ELL students, the school would receive an *additional* 1.25 FTE teacher positions primarily to provide ESL instruction.

Given these realities, it is more appropriate to view the EB approach to extra resources for ELL students as including both resources for students from at risk backgrounds (unduplicated free and reduced price lunch recipients and ELL) and ESL specific resources (Jimenez-Castellanos & Topper, 2012). That is a major reason why the EB model today augments the at risk student count to include the *unduplicated* count of students who are either free and reduced price meals recipients or ELL. This ensures that all ELL students trigger the extra resources for the Tier 2 interventions as well as the resources for ESL instruction.

27. Alternative Schools

Current EB Recommendation
One assistant principal position and one teacher position for every 7 alternative school students.

Analysis and Evidence

A small number of students have difficulty learning in the traditional school environment. The Alternative Learning Environment (ALE) students this report addresses are those who also have some combination of significant behavioral, social, and emotional issues, often also including alcohol or drug abuse. Such students often do much better in *small* "alternative learning environments." However, we note that this rationale for ALE does not consider alternative schools for students who simply prefer a different approach to learning academics, such as project-based learning, or more applied learning strategies that can be deployed in new career technical programs such as computer assisted engineering. The EB concept of alternative schools, which we believe is also the state's concept, is for "troubled" youth who need counseling and therapy embedded in the school's instructional program.
The Institute for Education Sciences at the U.S. Department of Education published statistics on Alternative Schools and Programs for the 2007-08 school year (Carver & Lewis, 2010). That study identified 558,300 students in 10,300 districts that administered alternative education schools and programs across the United States. Although the report did not provide data on the size of these schools or on staffing ratios, the data above suggest an average alternative school size of 54 students. Most of the programs served students in grades 9-12. The main reasons students were enrolled in alternative programs – all of which meet our initial definition of severe emotional and/or behavioral problems – included:

- Possession or use of firearms or other weapons
- Possession, distribution, or use of alcohol or drugs
- Arrest or involvement with the criminal justice system;
- Physical attacks or fights
- Disruptive verbal behavior

- Chronic truancy
- Continual academic failure
- Pregnancy/teen parenthood
- Mental health needs.

One of the major issues states face in creating funding programs for alternative schools, is defining them. Our 2010 review of literature and state practice on alternative education provided little guidance for developing a clear definition of alternative education. More recently, and as part of implementing its compulsory attendance laws, Maryland commissioned a study to review state definitions of alternative education programs (see Porowski, O'Conner & Luo, 2014). Maryland needed a definition, because attendance in an alternative education program was an exemption in its compulsory attendance law and the state did not have a clear definition of such programs. The study found great variation across the states in both defining and structuring alternative education programs. Because individual states or school districts define and determine the features of their alternative education programs, they tended to differ in key characteristics, such as target populations, setting, services and structure.

A formal definition of an alternative education program would need to consider the target population (including both grade levels served and types of students), program setting (within a public school or outside such a structure), program offerings (academic, behavioral, counseling, social skills, career counseling, etc.), and structure (how programs are scheduled, staff responsibilities, etc.). The Porowski, O'Conner & Luo (2014) study found wide variation across states (and districts) for all of the four elements.

We have concluded that the 2006 Urban Institute (Aron, 2006) definition of alternative education closely follows our understanding of such programs, and we believe this definition is aligned with the intent of such programs in Vermont:

> Alternative education refers to schools or programs that are set up by states, school districts, or other entities to serve young people who are not succeeding in a traditional public school environment. Alternative education programs offer students who are failing academically or may have learning disabilities, behavioral problems, or poor attendance an opportunity to achieve in a different setting and use different and innovative learning methods. While there are many different kinds of alternative schools and programs, they are often characterized by their flexible schedules, smaller teacher-student ratios, and modified curricula.

There is also the issue of standards for alternative education programs. Most states use definitions similar to that of the Urban Institute, but we are aware of only one state, Indiana, that has actually established standards for what an alternative education program might look like. The Indiana Department of Education's (2010) web site states that:

> While each of Indiana's alternative education programs is unique, they share characteristics identified in the research as common to successful alternative schools.

- Maximum teacher/student ratio of 1:15
- Small student base
- Clearly stated mission and discipline code
- Caring faculty with continual staff development
- School staff having high expectations for student achievement
- Learning program specific to the student's expectations and learning style
- Flexible school schedule with community involvement and support
- Total commitment to have each student be a success.

We conclude that these characteristics align with the EB view of alternative education programs. From work in other states, we have found that funding formulas for alternative schools differ substantially. In a few states, the typical staffing ratio for an alternative school is one administrative position for the school plus one teacher position for every 7-10 students. Because alternative high schools are generally designed to serve students who are severely at risk, we recommend they remain relatively small. As a result of the small size of alternative schools, staff at these schools often must fill multiple roles. Many teachers in alternative schools provide many different services for students, including instruction, pupil support, and counseling services. This suggests that the staffing structure and organization for instruction in alternative high schools is usually quite different from that found in typical high schools.

Though Vermont could launch a process to more formally define alternative education programs as well as set standards for them, it might also want to simply adopt the above definition. It could also include a maximum size for any alternative education programs that would trigger alternative education funding. The EB model staffs alternative education programs with 1.0 FTE assistant principal position and 1.0 FTE teacher position for every 7 alternative students, and assumes the programs enroll fewer than 100 students.

28. Special Education

Providing appropriate education services for students with disabilities, while containing costs and avoiding over-identification of students, particularly minority students, presents several challenges (see Levenson, 2012). Many mild and moderate disabilities, often those associated with students learning to read, are correctable through strategic early intervention – before a student is identified as an individual with a disability and an IEP is created. This intervention includes effective core instruction as well as targeted Tier 2 intervention programs, particularly one-to-one tutoring (Elements 6 and 22). For those with mild and moderate disabilities who require special programs as identified through an IEP, the EB model relies on a census-based, or as Vermont terms it, mainstream funding formula that provides additional teaching resources based on the *total* number of students in a school. As described below, these resources are expected to meet the instructional needs of children with mild and moderate disabilities. For children with severe and profound disabilities, the EB model recommends that the state pay the entire cost of their programs, minus the cost of the basic education program for all non-public placements, up to 2 percent of all students. This section also addresses the issue of related services: speech and hearing disabilities, and the need for Occupational and/or Physical Therapy

(OT and PT). Finally, the recommendation in Vermont is for these resources to be provided at the district, supervisory union or supervisory district level, not the school level.

Current EB Recommendation
7.1 teacher positions per 1,000 students for services for students with mild and moderate disabilities and the related services of speech/hearing pathologies and/or OT PT. This allocation equals approximately 1 position for every 141 students. 1.0 psychologist per 1,000 students to oversee IEP development and ongoing review Full state funding for students with severe disabilities, and state-placed students, minus the cost of the basic education program and Federal Title VIB, with a cap on the number covered at 2% of all students. Provided at the District or Supervisory Union for Supervisory District level.

Analysis and Evidence

In their book on the best approaches to serve students with disabilities, Frattura and Capper (2007) conclude that both research and most leading educators recommend that educating students in general education environments results in higher academic achievement and more positive social outcomes for students with and without disability labels, as well as being the most cost effective way to educate students. Thus, they recommend that school leaders focus their efforts on preventing student underachievement and alter how students who struggle are educated. Doing so, they argue, will overcome the costly and low performance outcomes of multiple pullout programs. Further, fewer students will be inappropriately labeled with a disability, more students will be educated in heterogeneous learning environments, and higher student achievement and a more equitable distribution of achievement will result (Frattura & Capper, 2007). Vermont has implemented this philosophy for several years and it is the philosophy behind the Evidence-Based model as well.

The core principles of such a proactive approach to teaching students with disabilities are that the education system needs to adapt to the student; that the primary aim of teaching and learning is the prevention of student failure; that the aim of all educators is to build teacher capacity; that all services must be grounded in the core teaching and learning of the school and particularly skilled teachers; and, that to accomplish this, students must be educated alongside their peers in integrated environments (Frattura & Capper, 2007).

Supporting this argument, research shows that many mild and moderate disabilities, particularly those associated with students learning to read, are correctable through intensive early intervention. For example, several studies (e.g., Borman & Hewes, 2003; Landry, 1999; Slavin, 1996) have documented that through a series of intensive instructional interventions (e.g.. preschool, small classes, rigorous reading curriculum, 1 to 1 tutoring), nearly 75 percent of struggling readers identified in kindergarten and grade 1 can be brought up to grade level without

the need for placement in special education. Other studies have noted decreases in disability labeling of up to 50 percent with interventions of this type (see for example, Levenson, 2011; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996).

That is why the EB recommendations for extended learning opportunities (Elements 22, 24 and 25) are so important. They, along with core tutoring and pupil support services, are the series of service strategies that can be deployed *before* IEP specified special education services are needed. This sounds like a common sense approach that would be second nature to educators, but often educator practices have been rooted in a "categorical culture" that can be modified through professional development and leadership from the district office and the site principal. Using a census approach to providing most of the extra resources for students with disabilities, an approach increasing in use across the country, works best for students with mild and moderate disabilities, but only if a functional, collaborative early intervention model (as outlined above) is also implemented. At the same time, it is perfectly legal for a student's IEP to call for tutoring, extended day help or summer school services that are part of the EB model, even though the services may not be provided by a person with a special education certification.

This proactive approach to special education became evident in the Individuals with Disabilities Education Act (IDEA) of 2004, which changed the law about identifying children with specific learning disabilities. The reauthorized law states that schools will "not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability ..." (Section 1414(b)). Instead, in the Commentary and Explanation to the proposed special education regulations, the U.S. Department of Education encouraged states and school districts to abandon the IQ-achievement discrepancy model and adopt Response to Intervention (RTI) models, also discussed above, based on recent research findings (Donovan & Cross, 2002; Lyon et al., 2001; President's Commission on Excellence in Special Education, 2002; Stuebing et al., 2002). An RTI model, what we call a proactive approach above, identifies students who are not achieving at the same level and rate as their peers and provides appropriate interventions, the first ones of which should be part of the "regular" school program and not funded with special education resources (Mellard, 2004).

The core features of RTI, which is a critical part of the EB approach, include:

- High quality classroom instruction
- Research-based instruction
- Classroom performance
- Universal screening
- Continuous progress monitoring
- Research-based interventions, that would include 1-1 tutoring
- Progress monitoring during interventions
- Fidelity measures (Mellard, 2004).

Common attributes of RTI implementations are: a strong core instructional program for all students; multiple tiers of increasingly intense student interventions; implementation of a differentiated curriculum; instruction delivered by staff other than the classroom teacher; varied

duration, frequency, and time of interventions; and categorical or non-categorical placement decisions (Mellard, 2004). This proactive model fits seamlessly into the EB broader approach to helping all struggling students through early interventions.

In many instances, this approach requires school-level staff to change their practice and cease functioning in "silos" that serve children primarily in "pullout" programs identified by funding source for the staff member providing the services (e.g. General Fund, Special Education, Title I). Instead, all staff would team closely with the regular classroom teacher to identify learning challenges and work together to address them as quickly as possible.

For children with more severe disabilities, clustering them in specific schools or at the SU/district level to achieve economies of scale is generally the most effective strategy and provides the greatest opportunity to find ways to mainstream them (to the extent feasible) with regular education students. Students in these categories generally include: severely emotionally disturbed (ED), children with intellectual disabilities and orthopedic disabilities and children within the autism spectrum. The ED and autism populations have been increasing dramatically across the country, and it is likely that this trend will continue in the future. To make the provision of services to these children cost-effective, it makes sense to explore clustering of services where possible and design cost parameters for clustered services in each category. In cases where students need to be served individually or in groups of two or three because of geographic isolation, it would be helpful to cost out service models for those configurations as well, but provide full state funding for those children. This strategy would reduce the likelihood of overwhelming the financial capacity of a small school district that happens to be the home of a child with a severe disability.

On the Use of Paraprofessionals

In Vermont and many other states across the country, school systems often use paraprofessionals to provide a significant portion of services to students with disabilities. As Vermont's own expert, University of Vermont Professor Michael Giangreco argues, this strategy puts the least expert individuals in the role of providing instruction to the students with the most educational challenges and is not the most effective strategy. In testimony to the Vermont House of Representatives, Giangreco (2015) goes on to say that the use of paraprofessionals often occurs when schools do not have a proactive strategy for addressing the needs of students who struggle to achieve to standards and recommends, as does the EB model, the proactive approach. Called RTI across the country and a multi-tiered system of support in Vermont, the proactive approach is the most effective strategy for dealing with students who struggle, whether having a specific disability or not.

In another instance of heavy use of paraprofessionals, individual students with severe and profound disabilities often are provided the service of a 1-1 paraprofessional aide, a common long time practice across Vermont. Indeed, up to half of paraprofessionals in Vermont might be assigned 1-1 to individual students (Giangreco, 2015; Shultz, et al., 2015). Although there are situations for which a student needs an individual aide, in may cases such aides can work to the inadvertent detriment of students (Giangreco. et al., 2005) implying that the use of

paraprofessionals generally as well as in the 1-1 context should be discouraged and implemented only when absolutely needed.

As should be clear, the EB model aligns with these arguments and includes few paraprofessionals, except for some students with severe and profound disabilities, and instead provides skilled teachers to provide the extra services needed by students who struggle to learn to standards particularly students with disabilities.

Census Approach to Funding

The proactive approach to providing services to struggling students as well as students with disabilities has led to what is called the census approach to funding core special education services. The census method is accomplished by providing additional teacher resources at a fixed level. The census approach emerged across the country for several reasons:

- The continued rise in the number and percentage of "learning disabled" students and continued questioning by some of the validity of these numbers
- Under-funding of the costs of students with severe disabilities
- Over-labeling of poor, minority, and ELL students into special education categories, which often leads to lower curriculum expectations and inappropriate instructional services,
- The proactive approach to providing services to struggling students and the RTI system
- Reduction of paperwork.

Often, the census funding approach for the high-incidence, lower-cost students with disabilities is combined with a different strategy for the low-incidence, high-cost students, whose costs are funded separately and totally by the state (with the exception of basic education funding), as these students are not found proportionately in all districts. This is the catastrophic funding for school districts that provides resources for special education students who require services exceeding some figure (after Medicaid, federal special education grants, and other available third-party funding are applied).

Today, diverse states such as Alabama, Arkansas, California, Montana, North Dakota, Pennsylvania, and the New England states of Massachusetts and Vermont to some degree all use some version of census-based special education funding systems. Moreover, all current and future increases in federal funding for students with disabilities are to be distributed on a census basis.

The issue then becomes the staffing standards for the various categories in special education:

- Students with mild and moderate disabilities
- Students with severe and profound, and high cost-to-serve, disabilities
- Related services
- Costs associated with developing and continually reviewing IEPs.

Each of these is addressed below.

As background, however, we accomplish this task by making an assumption that 25 percent of the 16 percent incidence of students with disabilities in Vermont could be serviced by the EB model's extra help resources: core tutors and school counselors, and additional tutors, pupil support, extended day, summer school and ESOL resources. This would bring the percentage of students needing and triggering additional special education resources to 12 percent.

Mild and moderate Disabilities

At an incidence rate of 12 percent, it would be reasonable to assume that 1 to 2 percentage points of that total would be for children with severe and profound disabilities. That would leave 10 percent with mild and moderate disabilities. Although the previous EB provision for resources for students with mild and moderate disabilities was 1 teacher and 1 aide for every 150 regular students, we are changing that via the following analysis.

The service load for special education teachers for mild and moderate disabilities ranges widely across the country, with some school districts setting the load at 15 and others at 30. And there is no national legal requirement for service loads, or to our knowledge, a national standard. In the following analysis, we will assume special education teachers service an average of 20 students with mild and moderate disabilities, which is at the lower end of the range. If the incidence of such students is 10 percent, that means about 15 students of the 150 would have a mild or moderate disability. The EB formula then needs to be modified to provide 0.75 (15/20) teacher for every 150 which is equivalent to one teacher position for every 200 students to align the teacher allocation to a 10 percent incidence, or five positions for every 1,000 students.

Nate Levenson, a national expert on effective special education servicing, also recommends, as does the above discussion, that most of the services needed by students with mild and moderate disabilities should be provided by skilled teachers, not by less skilled special education aides. In fact, he argues that places with many special education aides serving students with mild and moderate disabilities usually work in educational sites that have few preventive services like the EB model provides. Thus, the argument is that few – if any – aides are needed for students with mild and moderate disabilities.

Moreover, many of the aides used by many if not most schools across the country focus on behavioral issues. But rather than having aides working individually with students on behavioral issues, what is needed is a teacher behaviorist, who works with teachers to develop their skills to manage classrooms even with student with behavior challenges, including students with autism. Indeed, some of the best private schools for students with autism do not have any aides in the classroom, but the teachers are skilled in classroom management and behavior strategies. The EB model proposal is to provide one teacher behaviorist for every 5 special education teachers. This equates to a formula of one behaviorist teacher for every 1,000 students.

In comparison to the current Vermont formula of 9.75 teachers per 1,000 students, the above formula equates to 5 special education teachers and 1 teacher behaviorist, or a total of 6 teacher

positions, for every 1,000 students, but funded at 100% in the EB model, and not funded at 60% per the current Vermont approach.

Related Services

Related services include the need for speech/hearing pathologists and OT and PT and other services required for a student to benefit from special education. The incidence of related services are generally half of that for mild and moderate disabilities, or 5 percent in this case. Further, related service personal usually service 45 students needing these kinds of related services.

Thus a group of 1000 students, at an incidence of 5%, would have 50 students needing related services, or 1.1 related services staff.

This brings the total special education services staff for 1,000 students to 7.1, the sum of 6 positions for mild and moderate disabilities and an additional 1.1 for related services.

Severe and Profound Disabilities

The EB approach for children with severe and profound disabilities is for the state to fund 100% of the costs for students with severe and profound disabilities, minus federal Tile VIb and the cost of the basic education program. In order to control costs for this recommendation, the EB model would limit the number of students so covered to 2 percent of students in the district or SU. We estimate that expenditures for students with severe and profound disabilities consume close to one-third of Vermont's approximately $300 million total special education expenditures.

Psychologists

Finally, districts need psychologists for the primary role of overseeing the development and continued review of Individual Education Programs, which must be reviewed and reassessed every three years. A typical standard for psychologists is 75 IEPs a year. At a special education incidence rate of 16%, a group of 1000 students would have 160 who needed an IEP. As IEPs are reviewed every three years, that reduces the burden to 53. On the other hand, for every 1000 Prek-12 students there typically would be the need to go through the IEP review process for an additional 20 or so students for incoming preschoolers, kindergartners and first graders, many of whom would need the review but most of whom would not actually receive an IEP. This adds to the 53 another 20 IEP reviews for a total of 73. At a typical load of 75, a group of 1000 K-12 students would trigger the need for an additional 1.0 psychologist.

Total EB recommendation for special education:

- 7.1 positions per 1,000 students for services for students with mild and moderate disabilities and for the related services of speech/hearing pathologists and/or OT PT, which equals approximately 1 position for every 140 students.
- 1 psychologist for every 1,000 students.

- 100 percent state funding of services for students with severe and profound disabilities, minus federal Title VIb funds and the basic education program, capped at 2% of all students.

ADDITIONAL ISSUES

29. Staff Compensation

As is usually done in most adequacy studies, the EB approach – as well as the successful schools and professional judgment methods – to costing out the above recommendations is to use the average of the previous year's staff salaries to put a salary "price" on each staff element of the funding model. Staff would include the major certified categories such as teacher, principal, superintendent, assistant superintendent, as well as the major classified categories such as secretary, custodian, maintenance worker, groundskeeper, and supervisory aide.

In some cases, adequacy studies explicitly include a market analysis of salaries, for example, comparing teacher salaries to salaries of workers in other occupations with similar skills and competencies to teaching. These market analyses, however, are not part of the current study. Therefore, average salaries from the preceding year will need to be used as the salary price to cost out the various elements of the model in the process of identifying both a new base per pupil figure and appropriate pupil weights.

We examined salary data provided to us by the Agency of Education for nearly all individuals working in Vermont schools. We then cross-walked the staff categories in the EB model with those in the Vermont accounting system, and calculated the following average salaries for the 2014-15 school year (see Table 3.4) all of which are used in the cost simulations described in Chapter 7.

Table 3.4: Vermont 2014-15 Average Salaries

EB Position	Vermont Title	Average Salary
School		
Principal	Principals	$90,747
Assistant Principal	Assistant Principals	$79,911
Teacher	Teachers (combined elementary and secondary)	$56,387
Instructional Coach	Teachers (combined elementary and secondary)	$56,387
Substitute Teacher	Teachers (combined elementary and secondary)	$56,387
School Counselor	Guidance Counselor (combined elementary & secondary)	$58,633
Nurse	Nurses	$52,000
Instructional/Supervisory Aide	Regular Education Paraprofessionals	$19,732
Library Media Specialist	Librarians	$56,881
School Secretary/Clerical	Admin. Assists., Clerical & Secretarial Support (2400)	$32,265
Maintenance and Operations		
Custodian	Maintenance and Security	$33,251
Maintenance Worker	Maintenance and Security	$33,251
Grounds Maintenance	Maintenance and Security	$33,251
Central Office		
Superintendent	Superintendents	$116,991
Asst. Supt. of Instruction	Assistant Superintendents	$93,428
Business Manager	Business Managers	$85,483
Director--Personnel/HR	Director of Special Education	$85,847
Director of Pupil Services	Director of Special Education	$85,847
Director of Assessment	Director of Special Education	$85,847
Director of O&M	Director of Special Education	$85,847
Secretary/Clerical	Admin. Assists., Clerical & Secretarial Support (2300)	$41,473
Director of Technology	Assistant Superintendents	$93,428
Network/Systems Supervisor	Guesstimated	$75,000
School Computer Technician	Statistical, Data Processing & IT Staff	$50,599
Psychologist/IEP Case Manager	Estimated	$75,000

Benefits present a set of issues that need to be addressed individually and in more detail. Benefits generally include:

- Social Security and Medicare
- Worker's Compensation Retirement or pension costs
- Unemployment Insurance, and
- Health Insurance.

These are usually calculated as a percent of salary. For example, today Social Security is 6.2 percent of salary up to a maximum salary of $118,500 and Medicare costs are 1.45 percent of salary with no maximum.

Retirement costs generally are set by the state. In some cases, the state pays pension costs directly to the retirement fund, and that cost is not included in local district costs. Vermont pays the state cost of teacher pensions "off the top," or directly to the teacher retirement fund, and thus there is no district cost for teacher pensions.[10] The simulation provides a row to include the state appropriation for teacher retirement, but it is included only to ensure all costs of the education system are included in the model.

Health care costs are an important part of total compensation. Because our goal is to provide adequate resources for health care, our approach in each individual state adequacy study is to use the average *state* cost for health care for state employees as the basis for adequate health care costs for all school districts. In a similar study in North Dakota, we estimated that the state average cost for health insurance for all state employees was about $12,000. Though North Dakota had not explicitly adopted a policy of health care coverage for school district employees, the recommendation was made by the Legislative committee conducting the adequacy analysis to use the cost of health insurance for state employees as an "indirect" indicator of health insurance costs in the school aid formula. This decision was bolstered by a previous state policy that allowed school districts to "opt into" the state health care program. Thus, in calculating a new per pupil cost figure for North Dakota, the $12,000 state cost for health insurance was used for all school district staff categories. Wyoming also uses the cost of health insurance for state employees in its school aid formula – the funding level in Wyoming is approximately $15,000 per employee and is assumed to cover 85 percent of health insurance costs.

Our Vermont model assumes health insurance costs of $13,090 per school district employee. To estimate this, we received information on the cost of health insurance for Vermont educators from VEHI. The "standard" plan for most employees has been the VHP Plan; higher cost plans require greater employee contributions and lower cost plans can be covered with the employer paying the amount it pays for the VHP plan. About 38 percent of participating employees have single coverage, 25 percent two-person coverage, and 36 percent have full family coverage. The 2015-16 annual cost of the single, two-person and family plans is $8,370, $16,453 and $22,057, respectively. This produces a weighted average health insurance cost of $15,399 a year. If that figure is multiplied by 80 percent, which is the percentage the state pays for state employees, the health insurance cost would be $12,320 per employee. If the $15,399 figure is multiplied by 85 percent, which is the standard across school districts, the health insurance cost would be $13,090, which is the figure we initially will use in determining employee compensation for the costing model.

The same agency provided figures of 0.82 percent for worker's compensation and $102 per school employee for unemployment insurance.

SUMMARY

Each of the components described above is used to estimate an adequate level of resources for schools, as modified via Professional Judgment Panel recommendations and findings from the

[10] Beginning in 2015-16, districts have been required to pay the pension costs of Federally funded teachers.

case schools. Chapter 7 describes how this is operationalized across all 301 schools in Vermont, provides an estimated level of adequate funding for each school and SU and describes how the specific parameters of each element identified above (and summarized in Table 3.1 at the beginning of this chapter) can be modified to reflect alternative scenarios.

Chapter 4 describes the findings from our professional judgment panels, and describes how this "core" EB model was modified to meet the specific needs of Vermont schools based on the recommendation of the education professionals who participated in the professional judgment panels in November 2015.

Chapter 4: Professional Judgment Panels

INTRODUCTION

As part of our Evidence-Based (EB) approach to estimating school finance adequacy, we conducted four Professional Judgment (PJ) panels across Vermont in November 2015. The purpose of these panels was to seek input from educational professionals on the content and elements of the EB model described in Chapter 3. At each of the panel meetings we shared the elements of the EB model, asked the panel members to reflect on those elements and provide us with Vermont-specific assessments as to how the element could function in Vermont. Based on this feedback, we identified several areas where adjustments to the EB model might be considered in estimating an Evidence-Based level of school finance adequacy, as well as several areas where the EB model would not need to be changed.

This chapter describes the outcomes of the four PJ panels. We have used the findings from these panels to refine the EB model to reflect the issues and contexts of Vermont. Three general outcomes to each model element resulted from the PJ panels:

1. Panel members agreed that the proposed EB model element would support schools in the state to attain their desired educational outcomes.

2. Panel members recommended changes in the EB model that they believed would address the specific needs/goals of schools in the state of Vermont. We incorporated many of these recommendations into the EB model (for example, many panel members suggested additional nurse staffing).

3. Our reading of the evidence and best practices diverges from recommendations made by panel members. In these cases we provide a detailed description of the differences, document the rationale for our recommendations, and provide information for state policy makers so that they can determine which approach they prefer.

The Excel-based simulation model that accompanies this report makes it possible for stakeholders to model alternative recommendations in real time and review alternative cost projections based on those alternatives. Particularly in cases where we have not accepted recommendations from the panels but state policymakers might want to do so, the simulation model allows the state to simulate the change in that model element and the impact on each district as well as state costs.

PROFESSIONAL JUDGMENT PANELS

We conducted four Professional Judgment panels on November 10 and 11. PJ panels were held across the state with the goal of ensuring representation from all regions of the state. The PJ panels were held in the following locations:

November 10

- Northern Vermont (St. Albans)
- Southern Vermont (Bellows Falls)

November 11

- Urban North Central Vermont (Burlington)
- Middle Vermont (Montpelier).

We sought to have approximately 20 panelists at each PJ panel meeting. Education community stakeholders and school officials nominated panelists, and all nominated individuals were invited to attend a panel meeting. We specifically sought to include a range of school staff at each PJ session. Our goal was to have half of the members of each panel be teachers from different levels of schools (elementary, middle, and high school) as well as teachers with varying work assignments including core subjects, elective classes, special education, English for speakers of other languages (ESOL), and others. We wanted teachers with experience in helping to improve student performance in schools as we expected that experience would make them particularly helpful in understanding the resource implications of programs to meet new Common Core and college and career ready state standards. We also sought lead teachers, mentor teachers, instructional coaches, National Board Certified Teachers, and certificated personnel serving in the role of tutors.

In addition to teachers, we asked for participation from school site administrators at all school levels, as well as various central office administrators including superintendents, assistant/associate/deputy superintendents, curriculum directors, special education directors, business managers, and school board members.

We sought to focus the Burlington meeting on the central office and invited more central office individuals to that meeting. However, several individuals had to cancel, so while that panel spent more time on the EB central office recommendations than other panels, it also reviewed all other elements of the EB model. Although the Burlington meeting did not focus exclusively on central office operations, the central office elements of the EB model were the topic of focused discussion with many knowledgeable professionals, since, in addition to the four PJ panels, Lawrence Picus met with the Vermont Association of School Business Officials on Friday, July 13 and received further feedback on the central office and maintenance and operations components of the EB model.

The panelists attending the four meetings are shown in Table 4.1. The table shows that 21 attended the Bellows Falls meeting, 15 attended the St. Albans meeting, 18 attended the Montpelier meeting, and 15 attended the Burlington meeting.

Table 4.1: Panel Attendees in the November 10 and 11 PJ Panel Meetings

Bellows Falls	St. Albans	Montpelier	Burlington
Chris Hodgeton, Principal Bellows Falls HS	Joan Cavallo, Principal, St. Albans and president-elect VP	Cathy Newton, Ottauquechee School Principal	Dr. Daniel French, Superintendent, BRSU
Nancy Baker, Kindergarten Teacher and Lead Teacher	Tonja (Toni) Gray, math teacher at BFA	Amy Rex, Co-Principal, Harwood Union High School	JoAnn Taft-Blakely, Principal, Ferrisburgh Central School
Dana Jacobson-Goodhue, Principal Elm Hill Primary School	Stacie Scangas, Classroom teacher, General, Swanton Central School	Adam Bunting, Principal, Champlain Valley Union HS (formerly Montpelier HS principal)	L. Paul Irish, Senior Director of Infrastructure and Technology, Burlington School District
Kristin Hubert, Principal of Northwest primary School, Rutland	Neal Smith, Classroom teacher, Basic Ed.,Bellows Free Academy	Evan Ellerson, Classroom teacher, Physical Sciences, Hartford High School	Bob Mason, Chief Operations Officer, Chittenden South SU
Francie Marbury, Principal of Marlboro School (K-8)	Mary Anderson, Principal, Cambridge Elementary School	Emmy Hausman, Retired teacher, lives in Ryegate	Jeanne Jensen, CSSU Board Chair, Past CVU Board Chair
Frank Rucker, Business Manager Windham Southeast Supervisory Union	Marilyn Frederick, Lamoille North Supervisory Union Business Manager	Carl Johnson, Classroom teacher, Physical Sciences, Gilman School	Deb Killkelley, Classroom teacher, Basic Ed., Shelburne Community School
Philip Taylor, member of the Twin Valley School Board	Silas St. James, Curriculum Leader, ACSU	Brian O'Farrell, Guidance Counselor, St. Johnsbury School	Chris Sumner, Director of Business
Jill Stahl Tyler, Brattleboro School Board	Merri Greena, principal of the Craftsbury Schools	Guy Pearce, Classroom teacher, Health & PE, Danville School	Alyce Schermerhorn, Classroom teacher, Art, Mary Hogan School
Liz Mirra, Instructional Coach HS	Linda Keating, Director of Curriculum	Cathy Wilkins, Classroom teacher, General, Burke School	Gladys Collins, PreK Coordinator
Tom Green, Middle School Science	Linda Walsleben, ELL Teacher, Burlington School District	Kaiya Korb, Principal, Waitsfield Elementary School	Helen MacAndrews, Classroom teacher, Phys. Ed, Alt. Ed, CVU Life Prog.
Kristina Hansen, Classroom teacher, English/LA, Mount Anthony UHS	Andrew Evans, Teacher	Sheila Soule, Director of Curriculum and Instruction, Washington West Supervisory Union	Lisa Bisbee, Classroom teacher, Special Education, Williston Central School
Nancy Pejouhy, Classroom teacher, Mathematics, Woodstock	Shelly Mathias, Principal, Edmunds Elementary School	Tina Muncy, School Board Member, Montpelier	Ian Bleakney, Classroom teacher, Mathematics, Edmunds Middle School (Burlington)
Kathryn Schonbeck, Classroom teacher, Mathematics, Mount Anthony	Armand Messier, Teacher	Lisa Grout, Classroom teacher, Social Studies, North Country UHS (Newport)	Cheryl Scarzello, Business Manager Rutland Central Supervisory Union and Current President of Vermont Association of

Bellows Falls	St. Albans	Montpelier	Burlington
			School Business Officials
Jennifer Harper, Classroom teacher, General, Cavendish Town Elementary	Linda Rowell, Teacher	Tony DeMasi, Burke Town School Board Chair and Caledonia North Supervisory Union Board Vice Chair	Dr. Daniel French, Superintendent, BRSU
Amy Thivierge, Classroom teacher, English/LA, Mount Anthony UHS	Patrick Burke, Principal, South Burlington HS & president of the VPA	Celeste Marie Girrell, Sutton Town School Board Member; past Chair, Caledonia North Supervisory Union; Board Chair, Vermont School Board Assn.; Board of Directors, Caledonia - Southern Essex Region Representative	Kevin Campbell, school board member, Mount Mansfield Modified Unified School District in Chittenden East and current chair of our finance committee. Formerly chair of a small single school board known as the Underhill ID
Erik Schickedanz, Marlboro School and Windham Central SU special educator		Laurie Wilson, Classroom teacher, Vocational and Tech Ed., Rutland High School	
Deb Brighton, JFO Consultant		Lori T. Bibeau, WCSU Business Administrator	
Dr. Dorinne Dorfman, Principal, Leland and Gray Union Middle/High School		Ken Page, ED, Vermont Principals Association	
Roberta Stradling, Retired K-8 School Principal			
Liz Coen, SHS Social Studies			
Shelley Wilson, Special Education Coordinator			

Several days prior to the meetings, all PJ panel members received an e-mail outlining the purpose of the panel meetings along with a link to a web-site where panel members could download a copy of the draft EB report (Chapters 1, 2, and 3) to review prior to the meetings. PJ panels met for an entire day, starting at 9:00 in the morning and ending around 4:00 in the afternoon. Each panel was supported by two Odden Picus & Associates team members, who presented an overview of the EB model and then sought input – model element by model element – regarding the appropriateness of the model's resources for Vermont schools. We also solicited panel members' views on how the allocation of those resources could improve student learning. The notes from each of the four panels form the basis for the findings presented in this chapter.

The balance of this chapter describes the discussion emanating from the PJ panels and is presented in the same order as the components of the EB model described in Chapter 3.

PROFESSIONAL JUDGMENT PANEL RECOMMENDATIONS

Six overall themes emerged from the panel conversations:

1. Panelists expressed strong and universal support for the overall instructional elements of the EB model. Those elements – small class sizes, core and elective teachers, instructional coaches, intensive and ongoing professional development, extra resources to provide more instructional time for struggling students, teachers organized into collaborative work teams, etc. – were viewed as on target and reinforcing the delivery of best practices in schools.

2. Panelists were highly concerned about the time and challenges involved in developing and implementing Personalized Learning Plans for each student and providing alternative pathways to student learning. They expressed less concern about implementing the Common Core standards. These emphases could have been just the issues of the moment and panelists might have assumed everyone was working on Common Core implementation. Still, we were struck by the lack of commentary on challenges provided by implementing Common Core/college and career ready curriculum standards.

3. There was only modest pushback to the substantially fewer instructionally focused paraprofessionals in the EB model than are typically employed in Vermont schools. Most panelists agreed that skilled teachers provide more effective services than paraprofessionals – even trained paraprofessionals – but cautioned on the need for time to shift from paraprofessionals to skilled teachers for many extra help services.

4. Nearly all panel members talked extensively about the increasing challenges facing children, citing intense behavioral, emotional, physical health, mental health, and substance abuse issues that seem to have increased over the last several years and require substantial attention – and additional resources for children when they are in school.

5. Most panelists noted that Vermont, like many states in the East and Northeast, have a tradition of providing more school administration than the EB model.

6. There was understanding and acknowledgement that unifying districts could produce cost savings and that merging small schools would provide not only additional cost savings but also broader educational opportunities, The panelists did not suggest how those changes could be produced, nor was that the charge to the panels.

As indicated above, PJ panel recommendations fell into three categories:

1. Areas where the panelists recommended changes that we believe have a sound evidence basis or need to be modified to meet state requirements and have been incorporated into the EB model.

2. Areas were panelists recommended that we consider changes or identified potential concerns with the EB model but for now have not been changed in the EB model.

3. Areas where panelists were in general agreement with the EB model recommendations.

We consider each of these areas below, identifying the EB model elements from Chapter 3 in each section that are impacted.

Areas Where Panel Recommendations Led to EB Model Changes

There were five areas where PJ panel recommendations suggested a strong reason to modify the EB model as presented to the panels. These include: core nurses, school administrative staffing, elements of the professional development recommendations, student activities, and some elements of compensation. Each is described below.

Elements 8 and 24: Nurses

The EB model provides guidance counselors and nurses for schools. The first recommendation, which we have accepted, was to change the label for guidance counselors to school counselors; this is in line with current terminology and with a major role for such individuals today – providing counseling to many students. The issue of school counselors is discussed more below in the section on areas where we did not change the EB model

The second relates to an overall contextual issue, discussed in point 4 above. All panelists shared thoughts about the increasing challenges faced by children in Vermont, stating that children today – for all grades, and often in kindergarten and first grade – have substantial health, behavioral, medical, and emotional needs that require significant amounts of time from school staff. Many students require daily prescriptions; others need insulin; some need breathing tubes changed periodically. All of this reinforces the need for nursing help.

As Chapter 3 noted, the National Association of School Nurses recommends one nurse position for every 750 students, and Vermont standards require one nurse position for every 500 students. Some panelists recommended that every school have a full time nurse, but other panelists noted the more than 100 schools with fewer than 100 students makes this approach not only expensive but also a bit unwieldy. Nevertheless, we were impressed by the panelists' argument for increased nurse allocations and recommend that the Vermont EB model be enhanced to one nurse for every 250 students.

Element 11: Principals and Assistant Principals

The EB model provides one principal for every prototypical elementary, middle school, and high school, and in addition provides one assistant principal for a 600-student high school, which is prorated to zero assistant principals at 300 students.

The PJ panels strongly recommended that the large prototypical middle (450 students) and high school (600 students) be resourced with an additional assistant principal, arguing that the 450 student middle school should have a principal and an assistant principal, and that the 600 student high school have a principal and two assistant principals. Panelists provided several arguments to support this recommendation including: the fact that traditionally more school administration has been provided in Vermont; administrative needs have grown given the rising and more difficult educational and disciplinary needs of children; the need for time to engage in more performance-oriented teacher evaluation systems; more time to coordinate the development of Personal Learning Plans for all students; and the need for an athletic director for secondary school sport programs.

Because the EB model provides substantial instructional leadership resources in the positions for instructional coaches, it provides less school administration resources. Nevertheless, we recognize the historical practices that have provided more school administration in Vermont than the EB model offers. As a result we have added an assistant principal position to the 450-student middle school, which is prorated down to a 0.33 assistant principal positions at the 150-student middle school. Further, we will add an additional assistant principal position to the 600-student high school to provide two assistant principal positions at a high school enrollment of 600. This too will be prorated down to one half time assistant principal position at the 150-student high school.

Element 14: Professional Development

The panelists generally supported the recommendations for professional development, although two areas emerged that required further review.

First, we asked panelists about the number of pupil-free days for professional development that are in the typical teacher contract, and the answers varied widely, from a low of three to a high of 11. There also was confusion about interpreting the purpose of pupil-free days in teacher contracts, some of which are used for professional development, but some of which are used for opening and closing schools, as well as for parent-teacher conferences. We also discovered that some district collective bargaining contracts provided for 175 days of instruction and others as many as 180 days.

Our suggestion to most states is to create a 200 day teacher work year: 180 days of instruction, 10 pupil free days devoted exclusively to professional development, two to three days at the beginning and end of each year for opening and closing school, and another two to four days for parent-teacher conferences in the fall and spring. We encourage Vermont to set a standard for the number of instructional days in the school year, and argue that 180 days is appropriate. At present, however, the EB model does not explicitly include a recommendation that the instructional year should be a set number of days, accepting the instructional year a state determines.

As a result of the many district contracts in Vermont, it is difficult to determine either the average number of days in a teacher work year or the average number of professional

development days included across Vermont school districts. Recognizing this uncertainty, the EB model for Vermont will add five days to the teacher contract years for professional development training. These days will be priced at a full daily rate of teacher salaries by taking current average salaries and dividing by 190 days.

Second, in the discussion of professional development costs, the issue of districts paying for tuition units emerged. We were told that many districts pay teachers for up to two college or university courses a year, at the average course cost at the University of Vermont, either to acquire a master's degree or to fulfill recertification requirements. The EB model has never included such an element in the fringe benefit package and will not for Vermont in part because there is very mixed evidence on the degree to which college or university course credits are linked to student learning gains.

Moreover, in terms of continuing education credits we recommend Vermont count district- and school-provided professional development hours towards any recertification requirements; such training is required clearly to implement the state's new college and career ready standards, as well as the aspirations included in Act 77 for Personalized Learning Plans and creation of alternative pathways to learning curriculum materials.

Element 19: Activity Funds and Extra Duty Pay

The panelists supported the inclusion of resources for sports, clubs, and other extracurricular activities, but argued that the funding levels were too low, particularly at the secondary level. Several panelists in more than one panel stated that their secondary extracurricular programs cost closer to $600 per pupil, excluding transportation. These panelists suggested that the activities amount be differentiated by school level, with different amounts for elementary, middle, and high schools.

Though there are no nationally comparable data on student activity costs, in Wyoming districts report spending at a similar level to Vermont schools, in part because sport programs are more expensive on a per-pupil basis in small schools. The EB recommendation for activities in Wyoming is closer to $350 per pupil, but allocated to districts on the basis of the number of pupils, with larger districts receiving less per pupil than smaller districts. However, Wyoming does not have a regional high school system like Vermont.

Given these arguments, we have concluded the Vermont EB model should be changed to provide a different amount for each school level, and recommend $50 per pupil for elementary students, $300 per pupil for middle school students, and $600 per pupil for high school students.

Element 20: Maintenance and Operations

This topic was not discussed in detail, as most of panelists lacked knowledge in this area.

However, the report had identified a figure of $26 per pupil for utilities expenditures and several panelists, including all school business officers, said that figure was far too small. We have

reviewed the state expenditure file and have determined that a statewide average expenditure per pupil for utilities and energy for 2014-15 is approximately $315 per pupil.

Element 29: Compensation

Panelists generally understood that the model will use the prior year average salaries to "price" out all staff, and there was support for including realistic assumptions about the cost of various benefits, particularly health insurance, in the model.

In addition, panelists identified three benefits categories that are typically included in benefit packages for school district employees. Based on the panel recommendations, we have modified the initial benefit recommendations in the EB model.

First, non-licensed staff in Vermont (positions such as secretaries, instructional and supervisory aides, custodians, groundskeepers and maintenance works, and technology staff) are not included in the teacher retirement system. Moreover, some districts provide a pension benefit to these staff, and others do not, or provide a very small pension benefit. Nevertheless, the EB model recommends that all staff be provided a retirement benefit. Though the level of retirement benefits, when provided, also varies, we recommend including an eight percent pension benefit for all staff positions resourced in the model that are not included in the state's teacher retirement system.

Second, we were told that most districts provide dental insurance as part of the overall health insurance program. Staff at VSBIT suggested that Plan 3 without orthodontics is a reasonable assumption for a typical district plan. Such plans cost about $500 a year for a single person, $1,000 for two people, and $1,500 for three people. We do not have the data to compute a weighted average benefit amount so have included $1,000 per employee for dental insurance.

Third, some districts also provide disability and small life insurance policies. The EB model does not include life insurance as a benefit and the costs of short-term disability are extremely low so the model does not include a line for these items.

Areas Where PJ Panels Recommended Potential Changes That are Not Included in the Core Evidence-Based Model

PJ panelists offered suggestions regarding four elements of the EB model that have not been incorporated into our recommendations. We describe those recommendations here, and remind readers that in all cases, the Excel simulation of the Vermont EB model can be used to estimate the impact of these changes on the per pupil revenue. The four elements are:

1. Core school counselors,
2. Supervisory aides/school resource officers,
3. School secretaries/administrative assistants, and
4. Special education.

Elements 8 and 24: School Counselors

As noted above, we have changed the term from "guidance counselors" to "school counselors." The standard EB model provides one school counselor for every 450 preK-5 students and one school counselor for every 250 students in grades 6 through 12. These recommendations were enhanced – as described in Chapter 3 – to align with Vermont standards that require one counselor for every 300 elementary and every 200 secondary students. Nevertheless, there was considerable discussion as to whether the counseling allocation was adequate. Many panelists argued that more counseling resources were needed.

After deliberation, we have not enhanced the school counselor recommendation. However we note, as we did at the panel meetings, that the EB model already provides additional pupil support staff on the basis of the incidence of poverty and English language learner (ELL) students. In addition to core school counselors the EB model provides an additional counselor for every 125 free and reduced-price lunch and ELL students. These additional positions could be a school counselor, social worker, or family liaison, etc. Indeed, when we discussed combining core school counselors with this additional pupil support allocation, we discovered that the EB model provides more of these support staff than are employed in several districts represented at the PJ panels.

Behavioral problems were also identified as challenging issues for most schools across the state; and many panelists suggested this required more counselors and/or behaviorists. Though skills in organizing and managing classroom rules and behavior are reinforced by school wide strategies and programs that are uniformly enforced, panelists felt the need for behavioral expertise. As noted, Element 28, special education, includes a behaviorist position; this position is intended largely to provide assistance to schools and teachers to develop and implement a positive assertive discipline strategy in the school and in each teacher's classroom. Thus, we did not enhance counseling staff for behavioral purposes.

Finally, we note that many panelists at all four locations stated that large numbers of students currently suffer from mental health issues that require therapy and suggested that therapists, such as psychologists, be added to the model. One big issue here is whether such services should be included in the education budget or in the broader state and local health and human/social services budget. We have not included therapists in the EB model at this point, but note that Vermont as a state may need to enhance the level of mental health services it provides it citizens, including its children.

Element 9: Supervisory Aides/School Resource Officers

The goal of the EB model's providing supervisory aides is to create a system in which teachers do not have non-instructional duties such as hall, lunch, recess, or bus duty. The PJ panels broadly supported the recommendation for supervisory aides in all schools to remove these "duties" from teacher responsibilities, hire non-licensed and lower-priced staff for these functions, and have teachers use the extra time for some combination of collaborative teacher work and individual planning and preparation. The general EB allocation is two supervisory

aide positions for each prototypical elementary and middle school and three for a prototypical high school.

One panel struggled with determining whether this allocation was adequate, with elementary school educators often arguing that both lunch and recess time required one person for every 20 students and that the allocation did not provide for this level of monitoring. Other panels, however, concluded that the allocation was adequate. In reaching this conclusion, one panel suggested that rather than thinking about 2 full time positions, the allocation should be thought of as 80 hours for duty time in the elementary and middle schools and 120 hours in the high school allocated to the number of individuals required at certain hours only. With these numbers, most panelists concluded that the allocation was sufficient.

Several panelists in multiple panels raised the issue of school resource officers (SROs). These are individuals who provide additional safety for schools, which can include multiple activities, including securing doors and hall duty. The EB model's perspective on SROs is that they often are (in other states), and should be, funded by the police/sheriff/public safety budgets of towns or local municipalities, not school districts. We know that is the case for some Vermont schools as well. Public safety offices generally estimate resource needs based on the population of their jurisdiction, which includes students. Thus public safety officers should be available to provide protection to schools during school hours when that portion of the population is in school. In addition, public safety agencies also maintain the high cost insurance required for safety and police officers, costs that would substantially increase the cost to school districts if they employed SROs.

Element 12: School Site Secretarial Staff

The allocation of two secretarial positions at prototypical elementary and middle schools and three secretarial positions at prototypical high schools was generally supported. Some panelists indicated this was more staff then they had at schools in their districts, others said it was somewhat less. We have left these allocations as originally recommended.

Some panelists suggested, however, that we change the term from secretary to administrative assistants.

Element 28: Special Education

The EB model provides one teacher position for every 141 students in a school (total students, not only special education students) as well as the allocation of a position to oversee development and implementation of IEPs (referred to as psychologists in Chapter 3). In addition, the model continues the practice of the state paying for state-placed students and recommends that the state fund 100 percent of the costs of students with severe and profound disabilities – the high cost students. This full state funding would be capped at 2 percent of total school enrollments across the state. In addition, the EB model recommends special education funding should be net of Federal Title VIb funding.

The panel discussions about special education were closely linked to the discussion of strategies for struggling students. The research behind the EB model includes multiple resources for educators to provide for Tier 2 interventions – tutoring, extended day, summer school and extra pupil support – before a student is given an IEP. The model also considers those resources in combination with the resources in the special education element to address the issues of all students who need extra help to learn to standards. Further, the substantial Tier 2 resources, if provided as preventative extra help before a student is given an IEP, have been shown over time to reduce the need for special education services. As a result, the EB model puts more resources into these Tier 2 strategies and less into special education under the theory that the combination of resources can be used to address the needs of all struggling students, those in and those not yet in a special education program.

Initially, many panelists observed that the EB special education allocation would result in fewer educators providing extra help to struggling students, including students with IEPs, than are currently employed in their schools. Some panelists had difficulty considering the special education resources in combination with the multiple and additional extra help resources – tutoring, extended day, summer school, and additional pupil support.

However, when panels discussed examples that showed how to meet the needs of students who require extra help – both those with and without an IEP – several panelists noted that the EB allocations actually provided more resources than their schools currently had, leading to a conclusion that the combination of extra help resources and special education resources were adequate.

A few of the panelists understood and agreed with the assertion that effective use of more preventative Tier 2 programs along with early intervention supports embedded in the EB model – preschool, small K-3 classes, multiple Tier 2 interventions including tutoring by certificated personnel – can reduce the number of students who require special education services and that the academic struggles of many students are best addressed before and without an IEP (which is made possible by the EB approach). This perspective aligns with the theory of action embedded in the EB model and drives the logic behind the way resources are allocated in the model. This leads us to reaffirm our recommendation of one teacher position for every 141 students, which covers services for students with moderate and mild disabilities, related services (OT, PT, speech and hearing help), and behaviorists to help teachers and schools implement a school-wide strategy of behavior and discipline.

It is important to note that the PJ panels supported the concept of full state funding of programs for students with severe and profound disabilities and argued that it would be important for the state to develop rules and regulations to identify these students and programs.

Areas where PJ Panelists Were in Agreement with the EB Model Recommendations

For most of the elements of the EB Model, the PJ panelists generally agreed the resources allocations were adequate for meeting state performance standards. Each of those elements is listed below with any comments from the panels included.

School Prototypes

The panelists generally supported the general recommendations for multiple school prototypes for Vermont. Unlike other states that request a common per-pupil revenue number as the adequate base for a foundation type school finance structure, the strategy in Vermont is to apply the EB formulas and ratios to each individual school in the state, thus producing a modestly different adequate level of spending for each school district.[11] Our approach is to utilize several school prototypes and to identify an adequate per-pupil revenue number based on the school's actual enrollment. This is interpolated via a straight line adjustment based on the school's enrolment and the per-pupil revenue figures for the two prototype schools that bracket that enrollment (Chapter 7 includes further elaboration of this approach).

The EB model uses the following prototypes for Vermont:

- Elementary Schools:
    - A three-section elementary school with three sections of 17 students in each grade for 357 total students,
    - A two-section elementary school with 238 students, and
    - A one-section school with 119 total students.
- Middle Schools:
    - A 450-student prototype,
    - A 300-student prototype, and
    - A 150-student prototype.
- High Schools:
    - A 600-student prototype,
    - A 450-student prototype,
    - A 300-student prototype, and
    - A 150-student prototype.

All three school levels also include a prototype of 56 students. Below that number of students, schools would be resourced through a block grant produced by costing one assistant principal position and one teacher position for every seven students, plus the dollar per pupil elements and the resources triggered by free and reduced-price lunch, ELL, student counts and the dollars per pupil for mild and moderate disabilities.

Panelists supported this approach and felt it recognized the various and small school sizes in the state.

Element 1a: Preschool

The panels supported the EB model recommendation of one teacher and one instructional aide for each group of 17 students for a preschool program. A number of panelists mentioned that a

[11] This is the strategy used by the EB model in Wyoming, a state that also has many small districts and schools.

full-fledged preschool program could help acculturate to formal schooling many students who have been entering kindergarten with significant behavioral and social issues, in addition to laying a foundation for learning.

Several panelists on one panel suggested that this allocation also include a special education teacher per preschool class. However, the EB model already provides extra resources for students with disabilities, including students in preschool programs, in the special education allocation. Because of this we concluded that there was no need to adjust the models preschool allocation.

A few panelists felt that preschool classes require two teachers and an aide to meet students' needs, but this was not a dominant theme. Panelists also said the state needed to recognize that additional transportation might be needed as preschool programming expanded.

Element 1b: Kindergarten

The panels supported the EB model recommendation of one teacher for 17 students. A few panelists suggested that kindergarten classrooms also need an instructional aide but this was not a dominant theme at all panels.

Element 2: Core Elementary Teachers

The EB model provides core elementary teachers at a ratio of 17 students per teacher in preK-5 and preK-6 schools. The PJ panels supported this recommendation. It should be noted that this number – 17 – is the average elementary school class size of the standard core EB recommendations of one teacher position for every 15 students in kindergarten through grade 3 and one teacher position for every 25 students in grades 4 and 5, and meets Vermont's Education Quality Standards for elementary class sizes.

Element 3: Core Secondary Teachers

The EB model provides core secondary teachers at a ratio of 20 students per teacher in all middle and high schools, generally grades 6-12. The PJ panels supported this recommendation. It should be noted that this number – 20 – is smaller than the standard core EB recommendations of one teacher position for every 25 students in grades 6-12, and was reduced from 25 to 20 to meet Vermont's Education Quality Standards for secondary class sizes, which are to be less than 25 and not to exceed 100 in any one day for any middle or high school teacher.

Element 4. Elective Teachers

The EB model provides elective teachers to prototypical schools at a rate of 20 percent of elementary and middle school core teachers and 33.33 percent of core high school teachers. The combination of core and elective teachers allows every school in Vermont – elementary, middle and high school – to provide a full liberal arts curriculum program, to provide a curriculum for both college and career ready focused students, and to have a focus on both what the EB model

labels “core” courses (mathematics, science, reading/English/language arts, social studies and world language) and other subjects such as art, music, physical education, and career-technical education.

With this mix of staffing, the EB model provides for five 60-minute daily periods of pupil free time for elementary and middle school teachers. The high school elective allocation allows high schools to organize using a block schedule with four 90-minute blocks each day and allows for teachers to teach during three blocks and have 90 minutes each day for individual and collaborative planning (this time period also could be organized as two 45 minute periods).

When viewing the issue of core and elective teachers in most states, the challenge has been to ensure that this staffing of schools allows for sufficient time for both individual planning and preparation and for collaborative teacher teamwork. This has been a challenge in part because the teacher workday in other states tends to be shorter than it is in Vermont, sometimes only six hours and 30 minutes. However, at the panel meetings we learned that most Vermont schools had seven to eight hour workdays, usually six hours of instruction, 30 minutes for lunch, and then an additional 30-60 minutes for other work. Given this longer day, Vermont principals could straightforwardly organize school days so that all teachers – elementary, middle, and high – could have at least 45 minutes of pupil free time during the regular day and at least 45 minutes of pupil free time after the instructional day, both of which could be organized in various ways to ensure adequate time for individual teacher planning and preparation and daily teacher collaborative time. The EB model’s goal is to have 45 minutes of teacher collaborative time daily or at least three times a week, because teacher collaborative work is a key to improving student performance in virtually all studies of schools – including our Vermont case study schools – that have moved the student achievement needle.

We note that some individuals in all panels were uncomfortable with the use of the term core and elective teachers, feeling it values elective teachers less than core teachers. We recognize and acknowledge this perspective and note that the EB model generally is directed to improvements to student learning in the core subjects.

Element 5: Instructional Coaches

This EB model recommendation was strongly supported by panelists, who indicated that the allocation of one coach for every 200 students generally was higher than is now provided to schools. Panelists agreed that coaches are critical to support collaborative time and professional development to improve instructional practice. Some panelists suggested that a minimum of one instructional coach be provided to the smallest school prototypes, as compared to the current EB minimum of a one-half coach instructional position, and we accepted that suggestion.

Although we did not ask the panelists if instructional coach funds should be included in the block grant funding or separated as a categorical program, if we were asked, we would recommend that the state make funding of coaches a categorical program. This would help to ensure that instructional coach funds were actually used to hire and deploy instructional coaches. Our

research in other states has shown that when funding for coaches is not dedicated, up to half of coaching funds are diverted to other expenditure items and coaches are in short supply.

Element 6: Core Tutors

The EB model provides one core tutor for each prototypical school. The PJ panels supported this recommendation, agreeing that there will be students in every school who struggle to achieve to the new higher Common Core standards and this extra help strategy is important to providing all students an equal opportunity to meet the new and more rigorous standards.

Many panelists urged the EB model to use the term "Tier 2 interventionist" instead of tutor; the EB model acknowledges this perspective but as Chapter 3 noted, tutors, teachers in extended day and summer school are all part of Tier 2 resources the model provides. And the EB model continues to support one-to-one tutoring in the early elementary years as the most effective, initial Tier 2 intervention.

Element 7: Substitute Teachers

The recommendation that substitutes be provided at the rate of five percent of all core and elective teachers as well as for instructional coaches, tutors, special education, extended day and summer school teachers was supported. School business officers who attended the panels indicated this would be sufficient.

Element 10: Library Media Specialists

The panelists supported the recommendation of one library media specialist for each prototypical school, and suggested the category be changed from "librarian" to "library media specialist." In the EB model, a library media specialist is provided for all schools with 300 or more students. The prototypical 450 student middle and high school is also provided a 0.5 library media aide, and the 600 student high school is provided a 1.0 library media aid position. The library media specialist position is prorated down below 300 students to a minimum of a half time position in the smallest school prototypes.

Element 13: Gifted and Talented

The panels supported the recommendation of $40 per student, which provides access to the internet-based GoQuest system, formerly called Renzulli Learning. Generally the panelists endorsed the concept of this type of approach for enriched experiences for areas of interest or talent for all students. As Chapter 3 explained, GoQuest is the new name for what had been called the Renzulli Learning program, which was developed by the Gifted and Talented Center at the University of Connecticut. Compass Learning, an educational organization headquartered in Austin, Texas with technology-based applications used around the country, recently purchased the Renzulli Learning program and renamed it GoQuest.

Element 14: Professional Development

The PJ panels supported the professional development recommendations in the EB Model. These include sufficient time during the regular school day for collaborative teacher work, instructional coaches (Element 5), additional days in the teacher work year to ensure a total of 10 days for training and $125 per pupil for trainers and other professional development costs (such as coffee and donuts at professional development sessions but not for tuition credit costs).

Elements 15, 16 and 17: Instructional Materials, Interim, Short Cycle Assessments, and Instructional Technology

The panelists were supportive of the EB model allocations of $190 per pupil for instructional materials, $25 per pupil for formative and short cycle assessments, and $250 per pupil for school-based technology. Most of the school business officers on the panels indicated this was more than is currently expended in these three categories. To ensure that districts and schools are not engaging in "over testing," the EB recommendation for short cycle assessments is that no more than $25 per student be allocated to encourage schools to purchase just one, integrated, on-line battery of such assessments, rather than multiple additional assessment systems.

Some panelists raised the issue of the costs of going to a one-to-one computer to student ratio, and argued that the $250 per pupil allocation was insufficient for that strategy. We agree that a one-to-one computer to student ratio costs more, closer to $570 per pupil as estimated in Chapter 3. However, at this time the EB model does not support moving to a one-to-one computer ratio, both because, as noted in Chapter 3, there is very little – if any – evidence that it helps to boost student performance and it is more than twice as costly as the current EB allocation.

Element 18: Career and Technical Education

In Vermont, the bulk of career and technical education occurs in 17 regional centers. Each center is provided a core level of resources, and the instructional costs of providing the programs are paid to the regional center by schools that send students to the center for CTE courses.

The PJ panel members generally supported the recommendation of $10,000 per CTE teacher for advanced computer and technology equipment.

Core funding for each of the 17 centers provides administrative resources as well as funds for specialized equipment. Consequently, our EB recommendation is that the 17 centers receive current levels of funding for these positions and equipment, but teacher and other resources will be funded, as today, through the allocation provided to the schools that send students to the centers.

Element 21: Central Office

We told all panels that the EB model will create four central office prototypes at enrollments of 4,000, 2,000, 1,000, and 500 or fewer students. In the panel session that spent more time on the

central office as well as at the Vermont ASBO meeting, the prototypes were generally supported, with the 4,000 prototype providing nearly exactly the same number of staff as the district represented that had that number of students. Similarly, supervisory union business officers indicated that their staffing was currently at or below their current staffing at these enrollment levels, and further indicated that fewer positions might be needed if the unification into supervisory districts resulted in the development of fewer individual "district" budgets each year.

Elements 23,24,25 and 26: Strategies for Struggling Students

Panelists were generally supportive of the recommendations of resources for these services. We note that the EB model now provides all these resources for students who are eligible for free and reduced-price lunch as well as for all ELL students. ELL students trigger these extra help resources whether or not they are eligible for free and reduced-price lunch. The goal is make resources for students from poverty and for ELL students more robust, and in addition to special education.

All panels stated that transportation would need to be addressed and probably expanded for both extended day and summer school programs. Transportation was specifically excluded from this study.

Element 26: English Language Learner Students

We note again how the EB model funds ELL students. For ELL students, the EB model provides extra tutoring (1 position for every 125 ELL students), extended day (1 position for every 120 ELL students), summer school (1 position for every 120 ELL students), additional pupil support (1 position for every 125 ELL students) and additional resources for language services (1 position for every 100 ELL students). All together, this provides 4.2 positions for every 100 ELL students; put differently, each group of about 23 ELL students triggers an additional licensed position. By any measure, this allocation is adequate and panelists generally agreed with this perspective.

Element 27: Alternative Schools

The EB model provides funding for the equivalent of one assistant principal and one full time teacher or educational professional for every seven students in an alternative school. This allocation provides a source of funding that can then be used to staff schools a variety of different ways, depending on the specific needs of the students in those particular alternative schools. Generally PJ panelists felt that for typical alternative schools, with a small number of students – usually 49 or fewer – this formula would work well, particularly if alternative school students were defined as children with multiple behavioral and emotional issues, including concern over substance abuse. At the same time, few specifically identified alternative schools exist in Vermont and many such programs are schools within regular schools, without separate pupil counts.

SUMMARY

This chapter summarizes the reflections and discussion of four Professional Judgment panel meetings that occurred in November 2015 (and discussion at a Vermont ASBO meeting). Over 80 panelists were nominated and invited and 71 attended panel meetings in four locations across the state. In addition, some 50 school business officials attended the Vermont ASBO meeting and discussion. The panels consisted of educators, approximately half of whom were teachers and the rest school site administrators, special educators, and/or central district administrators and board members.

Overall, the panels offered a number of important and helpful suggestions. In five areas – core nurses, school administrative staffing, some professional development elements, activities, and some elements of compensation – panel recommendations led us to recommend Vermont-specific changes to the EB model. Although we did not modify the EB model in response to suggestions in four other areas, the capacity to do so through the simulation model we provided to the state will enable policy makers to understand the costs of these suggested changes as well, should the state choose to adopt them.

For most of the model elements, particularly the instructional-focused elements, there was general agreement among PJ panelists that the EB Model provides adequate resources for all Vermont school children to be given an equal opportunity to meet the state's proficiency standards.

Chapter 5: School Case Studies Cross Case Analysis

INTRODUCTION

This chapter presents findings from an analysis of five Vermont schools that improved student achievement in reading and mathematics from 2009 to 2013.[12] The analysis investigated the resources and strategies that the schools employed to produce these effects and compares these resources and strategies to those embedded in the Evidence-Based (EB) model. The purpose of this analysis was to determine the extent to which successful schools in Vermont employed strategies that align with the EB model. Findings from these case studies, in conjunction with the findings from the professional judgment panels described in Chapter 4, generally confirm that the elements of the EB model, with minor modifications, are appropriate for Vermont. Findings from the cases also confirm the appropriateness of Vermont-specific model changes described in Chapter 4, particularly those changes related to nurses and assistant principals.

SELECTION OF CASE STUDY SCHOOLS

This section describes the performance data used to select schools and the school selection process.

Assessment Data

In September 2015, members of the study team met with representatives from the Vermont Legislative Joint Fiscal Office and the Vermont Agency of Education and received New England Common Assessment Program (NECAP) reading and mathematics data for students in grades 3 through 8 as well as students in grade 11.

A subset of Vermont schools took the Smarter Balanced Assessment Consortium (SBAC) exam instead of the NECAP exam in 2013-14, and all schools in the State of Vermont transitioned from the NECAP to the SBAC exam for reading and mathematics in 2014-15. Given the change in state assessment, the study team decided that the most recent year of state assessment data that would be used in school selections would be 2012-13, because that was the last year that we would be able to compare all schools in the state using the same assessment system. The study team also determined that we would compare schools' 2012-13 results to their 2008-09 results in order to identify schools that demonstrated improvements in the percentages of students who scored at or above the proficient level on state assessments over a five-year period.

A member of the study team calculated a variety of statistics for each school in the state, including changes in reading and mathematics average scale scores between 2008-09 and 2012-13, changes in percentages of students at the proficient level in reading and mathematics between 2008-09 and 2012-13, changes in percentages of students at the proficient with distinction level in reading and mathematics between 2008-09 and 2012-13, metrics for students eligible for free

[12] Please see Appendix A of this report to review the individual school reports.

or reduced-price lunch within each school, and school enrollments. These statistics formed the basis of the school selection process, which is described in more detail below.

School Selection

Based on the calculations described in the previous section, the study team selected schools to participate in the case study analysis. In order to select schools for the study, the study team prioritized the following criteria:

(a) The schools had to demonstrate substantial percentage point gains in the percentages of students who scored at the proficient level and proficient with distinction level (in other words, at or above the proficient level) in reading and mathematics and/or the schools had to demonstrate substantial gains in the percentages of students who scored at the proficient with distinction level in reading and mathematics.
(b) The schools had to reflect geographic diversity.
(c) To the extent possible, the schools should enroll substantial percentages of students who were eligible for free or reduced-price lunch.
(d) The schools had to be willing to participate in the study.

The team developed a "semi-final" list of schools that were candidates for the study based on these criteria. Two schools that were part of the "semi-final" list were not able to participate in the study for different reasons. Given the purpose of the analysis, the first criterion was the critical factor in determining a school's fit for the study, and all schools in the final sample met that criterion. The final school sample reflected geographic diversity, with schools from the southern, northern, and western portions of the state. The final sample included schools with a wide range of students eligible for free or reduced-price lunch, and while not all schools in the final sample enrolled high percentages of students who were eligible for free or reduced-price lunch, the majority of the schools had free or reduced-price enrollments that were above the state average.

The five schools in the final sample were:

1. Academy School, Brattleboro, Vermont
2. Colchester High School, Colchester, Vermont
3. Fair Haven Union High School, Fair Haven, Vermont
4. Integrated Arts Academy at H.O. Wheeler, Burlington, Vermont
5. Oak Grove Elementary School, Brattleboro, Vermont

Table 1 provides a summary of each schools' demographic characteristics. Enrollment at the elementary schools ranged from 110 to 386, and enrollment at the high schools were 437 and 727. Across all schools, the percentages of students who were eligible for free or reduced-price lunch ranged from 20 percent to 61 percent. Three of the schools (Colchester High School, Fair Haven Union High School, and Oak Grove Elementary School) enrolled few or no English language learner (ELL) students, whereas 5 percent of Academy School's student population and 28 percent of Integrated Arts Academy's student population were ELLs. The percentages of

students who had special needs ranged from 8 percent at Oak Grove to 23 percent at Colchester High School.

Table 5.1: Characteristics of case study schools, 2014-15

School (City)	Grades Offered	Enrollment	Eligible for Free or Reduced-Price Lunch	English Language Learners	Students with Special Needs
Academy School (Brattleboro)	K-6	386	61%	5%	16%
Colchester High School (Colchester)	9-12	727	20%	‡	23%
Fair Haven Union High School (Fair Haven)	9-12	437	48%	‡	20%
Integrated Arts Academy at H.O. Wheeler (Burlington)	K-5*	267	56%	28%	18%
Oak Grove Elementary School (Brattleboro)	K-6*	110	31%	‡	8%

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school at the time of posting the information.

NOTE: Percentages of students with special needs include students with an IEP or a 504 plan. For Academy School, Colchester High School, Fair Haven Union High School, and Oak Grove Elementary School, these percentages exclude students with an EST plan. For Integrated Arts Academy at H.O. Wheeler, students with EST plans are included in the percentage, due to available data that did not provide information on the percentages of students with EST plans. Integrated Arts Academy and Oak Grove Elementary School are the sites of prekindergarten programs, and the free or reduced-price lunch, English language learner, and special education percentages include prekindergarten students. The prekindergarten programs, however, operate separately from the schools, and the case study reports focused only on kindergarten through grade 5 (for Integrated Arts Academy) and kindergarten through grade 6 (for Oak Grove Elementary School).

Source: Vermont Agency of Education School Reports, 2014-15.

CASE STUDY SITE VISITS

Visits to case study schools occurred in October and November 2015. After school selection, a member of the study team contacted the superintendents to secure district- or supervisory union-level approval for participation in the study. After initial approval from the superintendent, a member of the study team emailed the principal of each school in order to schedule a site visit and to collect preliminary documents. In an effort to reduce data-collection burden on participants, research team members asked for documents that already existed in electronic form. Examples of requested documents included school improvement plans, delineations of school goals, listings of all school staff, daily or weekly schedules, and documents that explained the curricular and instructional approaches used in the school.

Members of the study team visited each school for one day and conducted individual and focus group interviews with a variety of school personnel, including building administrators, general

education teachers, special education teachers, teachers of English for speakers of other languages (ESOL), elective teachers, and para-educators. At Academy School and Oak Grove Elementary School, the study team also spoke with personnel from the central office. Interview topics came from a semi-structured interview protocol.

Based on analysis of documents and interview data, a member of the research team drafted a report for each school. Each report included sections on the schools' socio-demographic context, student performance, staff, goals and organization, curriculum, instruction, assessments, academic interventions, behavioral and social-emotional interventions, professional development, and culture. All of the reports also outlined key similarities and differences between the schools' practices and the EB model.

All five school reports underwent a multi-stage review process, which included the following steps:

- After initial development, the study team leads reviewed each school report.
- The author of the school reports revised the drafts based on the feedback of the study team leads.
- The drafts underwent a member check, wherein the author of the school reports submitted the drafts to the school principals.
- The author of the school reports updated each draft based on the feedback of the school principals.
- The author of the school reports submitted each draft for final review to the study team leads and made final revisions based on feedback.
- The study team leads approved the drafts and included them in the final report.

This chapter presents cross-case findings from the individual school reports. The five cases are included in Appendix A. The remaining sections of the chapter outline commonalities across the study sites and ways in which practices at the study sites, taken as a whole, were similar to or different from the EB model.

COMMONALITIES AT THE STUDY SCHOOLS

Several findings and themes emerged from analysis of the five successful Vermont schools. First, the schools' staff compositions contained several similarities. Second, across schools, educators were committed to common curricula, especially for core subjects. Third, all of the schools provided academic as well as behavioral and social-emotional supports for struggling students. Fourth, at all of the schools, teachers were organized into collaborative teams and valued the opportunity to work with their peers on matters of curriculum and instruction. Fifth, when it came to decisions regarding curriculum and instruction, all of the schools relied on student performance data to drive choices. Finally, community involvement and support were evident at the schools, and elementary schools in particular built time into their schedules each week to welcome parents and other community members to their schools.

STAFFING

As noted in Chapter 2 of this report, talent matters, and having the resources to maintain sufficient numbers of high-quality personnel is crucial for school improvement. In many ways, the case study schools had staffs that included these key personnel. This section of the report details patterns in the study schools' staff compositions. In this section of the report, all mentions of staffing levels are based on full-time equivalent (FTE) numbers.

Instructional Staff

As shown in Table 5.2, the average core class size in the elementary schools ranged from 15.7 to 22, and the average core class size in the secondary schools were 18.2 and 20.2, all of which are similar to the Vermont EB model. In elementary schools, elective teachers ranged from 23.5 percent of core teachers to 25.7 percent of core teachers, and in the two secondary schools, elective teachers were 25.8 percent of core teachers and 41.2 percent of core teachers.

As discussed in Chapter 3, the EB model provides resources for staffing schools with sufficient numbers of core and elective teachers to allow for (a) appropriate core class sizes, (b) elective offerings that promote students' access to a high-quality, comprehensive liberal arts curriculum, and (c) scheduling the school day so that teams of teachers are able to meet with each other in collaborative working groups. The issue of study schools' alignment with the EB model is discussed in more detail in the next section of this chapter, but, generally, study schools did have sufficient staff members to allow for the scheduling of collaborative work time within the contract day. The only exception is Colchester High School, which has a lower percentage of elective teachers than would be provided by the EB model.

Table 5.2: Numbers of Core and elective Teacher FTEs, Average Core Class Sizes and Percent of Electives Relative to Core Teachers

School	Core Teacher FTEs	Elective Teacher FTEs	Average Core Class Size	Percent of Elective Relative to Core Teachers
Elementary Schools				
Academy School	21.0	4.94	18.4	23.5%
Integrated Arts Academy	12.0	4.0	22.0	25.0%
Oak Grove Elementary School	7.0	1.8	15.7	25.7%
Secondary Schools				
Colchester High School	36.0	9.3	20.2	25.8%
Fair Haven Union High School	24.0	10.0	18.2	41.2%

Source: Vermont Agency of Education, Enrollment Reports, 2014-15, and personal communication with school staff, 2015-16.

In addition to the core and elective teachers, the schools' staffs included other educators in the main instructional program who served in a variety of roles, as explained in more detail in the following paragraphs.

Instructional Coaches

The only school that had school-level core instructional coaching was Colchester High School, but the instructional coach position did not add up to a full FTE. The remainder of the schools did not have school-level instructional coaches in English language arts or mathematics. Although Academy School and Oak Grove Elementary School had modest access to instructional coach support from the supervisory union, they had no instructional coaches at the school site. Furthermore, Integrated Arts Academy had an arts integration coach at the school level and had access to district-level curriculum coaches, but it did not employ school-level instructional coaches for English language arts or mathematics. Fair Haven Union High School had no non-teaching instructional coaches. At all study schools, resources for core-subject instructional coaches were lower than EB model resource levels.

Tier 2 Interventionists

Most of the study schools employed credentialed Tier 2 interventionists; the only exception to this rule was Colchester High School, which did not have these types of educators on staff. The extent to which the study schools' numbers of Tier 2 interventionists aligned with the EB model resources varied; of those schools that had credentialed Tier 2 interventionists, some schools employed more interventionists than would be provided by the EB model, whereas some employed fewer than would be provided by the EB model.

Special Educators

All of the schools employed special educators. In general, the numbers of special educators at the study schools were higher than what the EB model would provide, though numbers of Colchester High School special educators were only slightly higher than what would be provided by the EB model.

ESOL Teachers

Only some of the schools employed ESOL teachers. Specifically, Academy School and Integrated Arts Academy had full-time ESOL teachers, and Colchester High School had 0.4 FTE of an ESOL teacher. The presence of full-time ESOL teachers only at Academy School and Integrated Arts Academy is reasonable, because of the case study schools, only Academy School and Integrated Arts Academy enrolled significant numbers of ELL students (Table 1). At both elementary schools, the numbers of ESOL teachers was higher than what the EB model would provide.

Library Media Specialists

All of the schools employed a full-time library media specialist. In most cases, this practice aligns with EB model resources. For instance, in Academy School, Fair Haven Union High School, and Colchester High School, a full-time library media specialist aligns with EB model resource allocations. Integrated Arts Academy, with a kindergarten through grade 5 enrollment of just under 300 students, would receive funds for just under one FTE of a library media specialist in the EB model. Oak Grove Elementary School, with a kindergarten through grade 6 enrollment of just over 100 students, would receive funds for approximately one-third of an FTE of a library media specialist in the EB model.

Administrative Staff, Instructional Support Staff, and Pupil Support Staff

Joining the main instructional program personnel were administrative, instructional support, and pupil support staff. All of the study schools had several staff members who served in these capacities.

Administrators

Only two of the schools (Oak Grove Elementary and Integrated Arts Academy, both with enrollments less than 300) had an administrative staff that contained only a principal. The other three schools' administrative staffs were larger than what would be provided under the EB model. These schools had at least one assistant principal, and Colchester High School had two assistant principals. The two high schools also had athletic directors and 504 plan coordinators, and Colchester High School also employed a director of student support services.

Administrative Assistants

Two of the elementary schools in the study (Oak Grove Elementary and Integrated Arts Academy) employed only one administrative assistant, and the third elementary school (Academy School) employed two administrative assistants, about what the EB model would provide. The high schools employed higher numbers of administrative assistants, which exceeded those in the EB model, but closer to the EB recommended changes in Chapter 4 . Colchester High School had six administrative assistants, and Fair Haven Union High School had five. Both high schools' administrative support staff included a bookkeeper, an attendance secretary, and administrative assistants, and Fair Haven's administrative support staff included a registrar.

Para-educators

All of the schools employed para-educators. The smallest school, Oak Grove Elementary, employed just under 10 FTE para-educators (5.7 FTEs in the main instructional program, three in the self-contained special education program, and one in the behavior room). Integrated Arts Academy employed eight in the main instructional program, two in an intensive language acquisition program, one in the behavior room, and 0.5 as a library aide. Academy School

employed 16 para-educators in the main instructional program and six in a separate behavioral support program. Fair Haven Union High school employed 10 para-educators, and Colchester High School employed 21.6 para-educators in the main instructional program, one para-educator as a library aide, and two para-educators in the alternative education program. Para-educators in all schools exceeded what the EB model would provide.

School Counselors

All of the study schools employed school counselors. Oak Grove Elementary and Integrated Arts Academy each employed one school counselor, and Academy School employed 1.4 school counselors. Both high schools had three school counselors. These numbers align with the EB model's allocations for core school counselors and additional pupil support personnel triggered by schools' counts of students who are approved for free or reduced-price lunch and ELL services.

Nurses

All of the study schools employed at least one nurse. Oak Grove Elementary and Integrated Arts Academy each employed one nurse, and Academy School employed a nurse and a 0.5 FTE nurse assistant. Colchester High School employed a nurse and a 0.8 FTE nurse assistant, and Fair Haven Union High School employed one nurse and one nurse assistant. Generally, these resource levels are higher than what would have been provided by the original EB model recommendations (Chapter 3), but are more in line with Vermont-specific recommendations (Chapter 4).

Social Workers, Psychologists, and Mental Health Clinicians

All of the schools had school-based pupil support staff such as social workers, psychologists, and mental health clinicians. Many of these staff members' salaries were paid by external agencies, particularly in the case of social workers. For instance, Oak Grove Elementary and Academy School each had one social worker and one behavior specialist or other behavior support, and Integrated Arts Academy had 1.2 social workers/mental health clinicians and one psychologist. Colchester High School had 2.8 social workers and a behavior specialist, and Fair Haven had 1.2 social workers, a drug and alcohol counselor, and a school resource officer.

FOCUS ON CURRICULUM AND INSTRUCTION

All schools organized teachers into collaborative groups, and used a common approach to curriculum and instruction that emerged from ongoing decisions over student data.

Teacher Collaboration

To help develop the common curriculum and a more systemic approach to instruction, all of the study schools organized teachers into collaborative teams. At Oak Grove Elementary, the teams were vertical teams (since, as a single-section school, only one teacher taught each grade). At

Academy School and Integrated Arts Academy, teachers were organized into grade-level teams. At Fair Haven Union High and Colchester High, teachers were organized into department teams as well as interdepartmental teams (at Fair Haven) and collaborative working groups (at Colchester).

While all schools organized teachers into collaborative teams, the amount of time that teachers were required to meet or able to meet voluntarily varied across the schools. Some schools had protected collaboration during the school day. Specifically, Academy School and Fair Haven High School scheduled teachers such that members of collaborative groups had common planning time, and the schools required that teams meet at least once per week. At both schools, educators reported that they often met more frequently. Other schools held collaborative meetings after school. Specifically, Oak Grove vertical teams and Colchester High School department teams met after school every other week, and Integrated Arts Academy professional learning communities met after an early student dismissal once per week. Finally, while Colchester High School teams did not necessarily have common planning time during the school day, teachers reported that they often requested common planning time and that some teams met as frequently as every other day within the school day in order to engage in collaborative activities.

Common Curriculum

In many of the study schools, teachers of common subjects or grades made conscious efforts to implement common curriculum, particularly in core subject areas. The schools prioritized consistency across sections of the same course as well as coherence across sequences of courses. Educators in these schools valued the opportunity to capitalize on collective expertise to decide what curriculum units, lesson plans, and assessments were appropriate for their students.

For instance, at Academy School, educators made a conscious decision to abandon a whole-language approach to English language arts instruction and adopt a phonics-based approach. They required that all teachers subscribe to the new approach, and all classrooms of the same grades shared common curriculum. While Oak Grove Elementary School is a one-section school – whose teachers cannot share curriculum units across classrooms due to having only one class per grade – teachers at Oak Grove joined with their colleagues throughout Windham Southeast Supervisory Union (including teachers at Academy School) in adopting a phonics-based approach to English language arts instruction. Both schools similarly relied on common curriculum in mathematics, especially prior to the switch from Vermont standards to the Common Core State Standards, when teachers consistently used the Investigations curriculum.[13] The other elementary school in the study, Integrated Arts Academy, relied on a common curriculum in mathematics.

[13] Supervisory union and school personnel note that, in the immediate wake of the transition to the Common Core, some degree of variation existed in mathematics curriculum. The purpose of this variation was to determine what mathematics curriculum would align well with the Common Core and work well for their students. The goal was that this period of variation would lead to a choice of a common curriculum that would eventually be implemented throughout the supervisory union. At the time of data collection, most educators in the study schools relied on Engage New York materials for mathematics.

At both secondary schools, teachers worked together to develop common curriculum units that they shared across sections of the same course. They also reported that they created and shared lesson plans, assignments, and assessments. This pattern of collective creation of curriculum and related materials was consistent both across and within schools, and teacher teams at both schools and across core subject areas[14] reported that they strove to create high-quality curriculum and ensure that teachers across the departments had access to and support for implementing the common, teacher-developed curriculum.

Data-Based Decision-Making

As a key element of the approach to using a common curriculum and a more uniform deployment of effective instructional practices, across all study schools, teachers used collaborative time (described above) as well as other meetings, such as faculty meetings, to analyze student performance information and use these analyses to inform decisions about curriculum and instruction. In many ways, the use of data to drive instruction occurred at all schools, and data meetings – both short meetings and day-long meetings – were common. Some instances of data use to drive decision-making at the study schools were especially noteworthy. For instance, around 2006-07, Academy School staff began to make several major changes to their school, including transformations of the vision of the school, the school curriculum, the organization of students for instruction, and the use of physical space. According to school staff, all of these changes were driven by review of extant research as well as analysis of student performance at Academy School. Another notable instance is in the case of Colchester High School, where educators prioritized differentiated instruction. According to teachers at Colchester High, teachers continually had to review student data, particularly formative assessment data, in order to differentiate lesson plans to fit students' varied readiness levels and interests.

INTERVENTIONS FOR STRUGGLING STUDENTS

To varying degrees, all of the schools provided interventions for struggling students, both academically and behaviorally.

Academic Interventions

On the academic side, the study schools employed a number of strategies to provide supports for students who faced challenges mastering material in the Tier 1 environment.

First, and most consistently across the study sites, schools set aside time for the interventions to occur within the school day. Colchester High School and Oak Grove Elementary School evidenced the highest amount of protected intervention time. Colchester High School

[14] The EB model includes world languages as a core subject at the secondary level. Neither high school in this study required that students take credits in world languages in order to graduate. In this sentence, reference to core subject areas is reference to English language arts, mathematics, science, and social studies.

implemented the Academic Acceleration, Access, and Advising Time (AT) program daily, and every student was required to attend the daily 30-minute AT period. Oak Grove Elementary School implemented 35-45 minute Tier 2 intervention periods four to five times per week. Academy School also prioritized time for interventions, and it held an intervention period three times per week. Integrated Arts Academy offered protected intervention time for students in grades 1 through 3. Although Fair Haven Union High School did not set aside specified time for interventions for all students, school staff reported that when students struggled to master course content, they often had an extra guided study hall added to their schedule, during which time they received supports in the area in which they struggled.

Second, as noted above in the section on staffing, most of the schools employed credentialed Tier 2 interventionists to assist struggling students. These teachers worked with small groups of students and implemented strategies and/or programs aimed at helping students access the core subject material.

Third, several of the schools provided opportunities outside of the school day for students who needed extra tutoring help. For instance, Academy School and Integrated Arts Academy both had after-school programs. Fair Haven High School, too, offered an after-school program, and Colchester High School offered a before-school program.

Behavioral and Social-Emotional Interventions

As noted above in the section on staffing, all of the study schools had personnel who supported students' behavioral and social-emotional development. In some cases, particularly in the case of school counselors and (when they were present) behavior specialists, these personnel were paid by the school, and in other cases, particularly in the case of social workers and mental health clinicians, these personnel were paid by external agencies. Regardless of the compensation source, all of the schools had several staff members who focused on the social-emotional wellbeing of students.

Especially at the elementary school level, the study schools allocated resources toward the promotion of positive behavior. Both Oak Grove and Integrated Arts Academy used the Positive Behavioral Interventions and Supports (PBIS) program, and they both also implemented character education curricula. Academy School promoted school-wide positive characteristics, and it implemented an intensive behavior support program aimed at keeping students who struggle extreme behavior challenges in the mainstream environment. While the high school programs did not offer character education programs, both schools offered alternative programs for small numbers of students who had problems with severe behavior or discipline issues.

COMMUNITY INVOLVEMENT

Generally, staff members in the study schools noted that community involvement was important to them, and the elementary study schools set aside time each week to hold formal parent and community engagement activities. Specifically, Academy School and Oak Grove Elementary School both held weekly All School Sing assemblies, and Integrated Arts Academy held Monday

morning meetings as well as Friday town meetings. In all three cases, school personnel reported that many parents and community members regularly attended the events.

ALIGNMENT WITH THE ELEMENTS OF THE EB MODEL

As outlined in Chapter 2 of this report, schools whose practices align with the EB model engage in ten activities:

1. Analyze student data in order to understand the schools' strengths and weaknesses
2. Set high goals
3. Adopt a new curriculum and identify effective instructional practices
4. Invest in on-going professional development, with instructional coaches
5. Provide multiple and timely interventions for struggling students
6. Focus class time more efficiently
7. Empower leaders to support instructional improvement
8. Create professional learning communities
9. Take advantage of external expertise
10. Manage talent

As noted above in the previous section, the study schools evidenced a number of these key elements. This section provides more detailed discussion of the alignment of the case schools' practices and the EB model in three key areas: investing in on-going professional development, with instructional coaches, providing multiple and timely interventions for struggling students, and creating professional learning communities. Additionally, this section of the report highlights two areas where insights from the study schools align with findings from the professional judgment panels (see Chapter 4).

Investing in On-Going Professional Development, with Instructional Coaches

As noted above, only one of the study schools had a core-subject instructional coach at the school level, and the school had lower levels of coaching support than would be supplied through the EB model. Another school had an arts integration coach and access to curriculum support from the district, and two other schools had core-subject instructional coach assistance from the supervisory union. The final study school had no non-teaching instructional coaches.

As noted in Chapter 3 of this report, evidence suggests that the presence of instructional coaches in the school building who provide sustained and ongoing professional support to teachers during the school day can be critical. Accordingly, the EB model provides resources for instructional coaches for every school. While the study schools' practices diverged from this aspect of the EB model, we did not make changes to the Vermont-specific model in this area, given our professional judgment about the critical nature of instructional coaching support for the success of sustained, school-level professional development.

Providing Multiple and Timely Interventions for Struggling Students

All of the schools in the study provided academic interventions for struggling students. Most of the study schools had Tier 2 interventionists on their staffs, but not all did. Of the schools that did have Tier 2 interventionists, some had higher numbers than would be provided by the EB model and others had lower numbers than would be provided by the EB model. Additionally, all of the schools employed several para-educators who worked in a variety of capacities, including providing additional support to struggling students. The goal of the EB model, as outlined in Chapter 3, is to ensure that every school has the resources to hire credentialed teachers to provide Tier 2 interventions to students within the school day. Therefore, we make no changes to the model's inclusion of Tier 2 interventionists at each school, and, given the focus of staffing schools with credentialed personnel, we make no increases to the EB model's allocation for non-credentialed staff.

Additionally, as noted above, all of the study schools provided students a variety of behavior and social-emotional supports. In addition to school counselors, all of the schools' staffs included additional pupil support staff such as social workers or other mental health clinicians. This finding resonated with findings from the professional judgment panels (see Chapter 4), which indicated that many students in Vermont face challenges that require the services of social workers and other support personnel. The EB model not only provides for core school counselors, but also provides additional pupil support staff based on poverty and ELL student counts. It is noteworthy that many of these school-based social workers in case schools were not employees of the school but rather received compensation from outside entities. This practice aligns with recommendations in Chapter 4, which recognize the need for Vermont students to receive physical and mental health services but also recommend that the responsibility for supporting these services needs to be shared among other agencies beyond the education sector.

Creating Professional Learning Communities

All of the study schools valued professional collaboration, and all schools organized educators into teams. Still, still the amount of time that the schools required teachers to meet in their collaborative groups was less than the amount of time that the EB model resources provide for these meetings. Providing resources for regular collaboration allows teachers to receive consistent support from school-level instructional coaches, to analyze student data use the data to make decisions about curriculum and instruction, to work together to create lesson plans, and to debrief after the lesson to determine which elements of lessons worked well and which need improvement. Therefore, we make no changes to EB model recommendations for consistent and ongoing opportunities for professional collaboration.

CHANGES TO THE EB MODEL

As noted in Chapter 4, the EB model has been revised to fit the Vermont context by providing additional resources for nurses and assistant principals, and a higher minimum for instructional coaches. Findings from the study schools support these changes. As noted above, all of the study schools had nurses, and while the updated EB model recommendations would not necessarily allow for a full-time nurse at every study school, the increased EB resources for nurses is in line with providing ample resources for nursing services at every school.

Additionally, Fair Haven Union High school had one assistant principal, and Colchester High School had two. Under the original EB model, Fair Haven would not have had a full-time assistant principal, and Colchester would not have had two assistant principals. The revised EB model provides resources that are more in line with these schools' staffing patterns with respect to assistant principals. And as noted, the EB model provides what it considers a key component of effective school improvement – instructional coaches with a minimum of one for the smallest school prototype.

SUMMARY

This chapter presents findings from analyses of five effective schools in Vermont. The study team selected these schools on the basis of improvements in the percentages of students who performed at or above the proficient level on state assessments from 2008-09 to 2012-13. The schools included both elementary and secondary schools, were located in different geographic areas throughout the state, and demonstrated a range in percentages of students eligible for free or reduced-price lunch such that the majority of the schools had higher percentages than the state average.

The study schools evidenced an array of curricular and instructional practices that aligned with the EB model. In general, the findings in this chapter confirm that the practices embedded within the theory of action behind the EB model align with the practices that have occurred at these successful Vermont schools. The findings in this chapter also confirm that the study team's changes to the EB model, as outlined in Chapter 4, are reasonable and in line with practices at successful Vermont schools.

Chapter 6
Comparative States Analysis

INTRODUCTION

The first section of this chapter offers the reader an understanding of how Vermont and the other New England states have defined an "adequate" education. This comparison of other states' definition of an adequate education was a requirement of the state's original "Request for Proposal." In the process of conducting our study we were also asked to provide information on how other states fund facilities and pupil transportation. The second and third sections of this chapter provide an overview of how other states fund both programs.

Comparative States

During our visits to Vermont several individuals stated to us that the state's unique size, history, demographics and cost factors make fifty-state comparisons of little use. It was expressed to us that a more focused review of other New England states would prove to be more useful then a fifty-state comparison. The statistics bear this argument out – as can be seen in Table 6.1 the average size of a district in the in Non-New England states is over twice that of districts in New England and the average spending per pupil in New England is more than 30 percent above the states outside of New England. Because of this we have decided to focus our comparisons on states in the New England region – while still including some information on the national level for sake of context.

Table 6.1 School Finance and Student Demographic Information – 2012-13

	Enrollment	Average District Size[15]	Spending Per Pupil
United States	48,299,727	3,560	$10,700
Non-New England States	46,260,855	3,729	$10,517
New England States	2,038,872	1,756	$14,840
Connecticut	517,812	3,064	$16,631
Maine	184,682	779	$12,147
Massachusetts	922,848	3,813	$14,515
New Hampshire	187,703	1,055	$13,721
Rhode Island	136,401	4,263	$14,415
Vermont	89,426	295	$16,377

Source: Enrollment and spending per pupil from the United States Census and the number of school districts from the National Center for Educational Statistics.
Note: New England and Non-New England States Average Spending Per Pupil is based on weighted averages of the respective states.

Data Sources

There are three primary sources that are used when comparing school funding data across states: the United States Census annual report (US Census), the National Center for Education Statistics' Common Core of Data publication (NCES) and the National Education Association's Rankings & Estimates publication (NEA). The data from both the US Census and NCES tends to be two to three years old where the information from the NEA is often from the current fiscal year. Because the NEA data are often more up-to-date it is more commonly used in cross-state comparisons. However, during our 2012 study of the Vermont funding system POA found that the state does not participate in the NEA surveys that are used to construct their annual report – thus the data shown for Vermont are often estimates. This means that while the data from the U.S. Census and NCES are often older then the information from the NEA it is viewed as being more accurate on its spending and revenue data for Vermont. Because of this POA has chosen to use data from the U.S. Census and NCES for this multi-state comparisons instead of data from NEA.

[15] Average district size was calculated by using the U.S. Census 2012-13 student enrollment numbers and the number of regular school districts in a state in the 2011-12 school year from the National Center for Education's Digest of Education Statistics. Accessed on the web: http://nces.ed.gov/programs/digest/d13/tables/dt13_214.30.asp

DEFINITION OF EDUCATIONAL ADEQUACY

In the seminal 1972 court case *San Antonio Independent school district v. Rodriguez* the United States Supreme Court stated that "*Though education is one of the most important services performed by the State, it is not within the limited category of rights recognized by this Court as guaranteed by the Constitution.*" This court decision left the power of defining an adequate - or even basic - public education with each state. There are multiple ways that a state can define an adequate education including defining it in the state constitution, defining it through the state courts or having it defined by the state's legislature. It should be noted that while there are multiple ways that a state can define an adequate education, not all states have established a definition of what an adequate education is. This section of the paper assesses each of the New England states to determine if, and how, they have defined what an adequate education should be.

State Constitutional Definition

All fifty states' constitutions contain language that addresses the issue of public education, however, most state's constitutions do not provide a clear definition of the free public education that their citizens are entitled to. For example the Connecticut constitution simply states that that the state will provide "Free public elementary and secondary schools in the state." Other states like Massachusetts and New Hampshire have much more detailed language about public education. (For a full outline of the educational language used in each of the New England states' constitutions (see Table 6.2). However, none of the New England states, or for that matter the non-New England states, clearly defines what an adequate public education must consist of within their constitution. Because of a lack of clarity in constitutional language it is up to state legislatures and/or the courts to define both the components of an adequate education and its cost.

Table 6.2 State Constitutional Language Dealing with Public Education

State	Constitutional Language
Connecticut	"Free public elementary and secondary schools in the state" *(Article 8, Section 1)*
Maine	"A general diffusion of the advantages of education being essential to the preservation of the rights and liberties of the people; to promote this important object, the Legislature are authorized, and it shall be their duty to require, the several towns to make suitable provision, at their own expense, for the support and maintenance of public schools" *(Article VIII, Section 1)*

State	Constitutional Language
Massachusetts	"To cherish the interests of literature and the sciences, and all seminaries of them; especially the university at Cambridge, public schools and grammar schools in the towns; to encourage private societies and public institutions, rewards and immunities, for the promotion of agriculture, arts, sciences, commerce, trades, manufactures, and a natural history of the country; to countenance and inculcate the principles of humanity and general benevolence, public and private charity, industry and frugality, honesty and punctuality in their dealings; sincerity, good humor, and all social affections, and generous sentiments among the people? *(Chapter 5, Section II)*
New Hampshire	"To cherish the interest of literature and the sciences, and all seminaries and public schools, to encourage private and public institutions, rewards, and immunities for the promotion of agriculture, arts, sciences, commerce, trades, manufactures, and natural history of the country; to countenance and inculcate the principles of humanity and general benevolence, public and private charity, industry and economy, honesty and punctuality, sincerity, sobriety, and all social affections, and generous sentiments, among the people" *(Part 2nd, Article 83)*
Rhode Island	"Promote public schools and public libraries, and to adopt all means which it may deem necessary and proper to secure to the people the advances and opportunities of education and public library services" *(Article XII, Section 1)*
Vermont	"… a competent number of schools ought to be maintained in each town unless the general assembly permits other provisions for the convenient instruction of youth" *(Chapter II, Section 68)*

Sources: State constitutions

Court Defined Adequacy

In the case of *Brigham v. State*, Vermont's supreme court stated that "To keep a democracy competitive and thriving, students must be afforded equal access to all that our educational system has to offer." In its rulings the court made clear that it is the state's responsibility to provide all of the state's students with an adequate and relatively equitable public education. For much of the past two decades the results of this litigation has shaped the way that the state has funded its public school system. Three other New England states have had state court rulings that have shaped their state's school funding systems, they are Connecticut, Massachusetts and New Hampshire. Below are descriptions of each of these states court rulings along with a description of how they have shaped school funding in their state.

Connecticut

The Connecticut case was *Connecticut Coalition for Justice in Education Funding v. Rell (2008).* After two years of deliberation the state supreme court ruled in 2010 that the state is required to provide each student with an education that includes "… *minimally adequate physical facilities and classrooms, instrumentalities of learning such as reasonably current textbooks, reasonably up to date basic curricula such as reading, writing, mathematics, science and social studies, and "sufficient personnel adequately trained to teach those subject areas.*" Because of this court ruling the state changed the way that it funds schools with the hope of meeting this court mandate. However, the state courts have yet to rule if the state's current funding system meets its definition of an adequate education.

Massachusetts

The Massachusetts case was *McDuffy v. Secretary of the Executive Office of Education (1993).* In this case, the state's supreme court ruled that the state is required to provide students in their state with a minimally adequate education. The court defined this adequate education in the following way "…[*a]n educated child must possess 'at least the seven following capabilities:*

1. sufficient oral and written communication skills to enable students to function in a complex and rapidly changing civilization;
2. sufficient knowledge of economic, social, and political systems to enable students to make informed choices;
3. sufficient understanding of governmental processes to enable the student to understand the issues that affect his or her community, state, and nation;
4. sufficient self-knowledge and knowledge of his or her mental and physical wellness;
5. sufficient grounding in the arts to enable each student to appreciate his or her cultural and historical heritage;
6. sufficient training or preparation for advanced training in either academic or vocational fields so as to enable each child to choose and pursue life work intelligently; and
7. (vii) sufficient level of academic or vocational skills to enable public school students to compete favorably with their counterparts in surrounding states, in academics or in the job market."

The state legislature used the courts detailed ruling to reshape the way that it funds public education in the state. The state's funding formula has now been in place for over two decades.

New Hampshire

The case was *Claremont School District v. Governor (1993, 1997 and 1999).* In this case, the court ordered the state to follow a four-part remedy: define a constitutionally adequate education; determine the cost of such an education; fund an adequate education throughout the state; and ensure its delivery through an accountability system. The state legislature has defined the components of an adequate education in legislation (See Chapter 6 Addendum for the full

definition). Using their definition of an adequate education the legislature determined the cost of providing an adequate education to a general education student is $3,450 with additional adjustments for students who qualify for ELL services ($675), special education services ($1,856) or free/reduced price lunches ($1,725)[16]. The legislature also provided additional funding for students who do not qualify for any additional state funding but tested below the proficient level on the state's third grade reading test ($675). These amounts are all in 2009 dollars and are adjusted annually by an inflation amount.[17]

Legislatively Defined Adequacy

In any state that is not under a court ruling it becomes the sole responsibility of the state legislature to define what constitutes an adequate education and what that education should cost. Many states choose not to define the components of an adequate education within legislation and even when they do they can simply delete or change this definition when they choose. Rhode Island is one state that has chosen to define and cost out an adequate education within their state legislation.

Rhode Island

In 2004 legislation created a joint legislative committee that was charged with creating a new school funding formula for the state.[18] The committee was mandated to determine the cost of an adequate and equitable education for students. The legislature used the committee's report to develop a new school funding formula. This state's new formula that went into affect in 2012 provides that the "core instructional amount" per general education student should be equal to the average expenditures in Connecticut, Massachusetts and Rhode Island for "*…instruction and support services for students, instruction, general administration, school administration and other support services.*"[19] While the state has determined that this amount is adequate it is difficult to determine how the committee came to this decision and what level of education this funding amount will provide to students.

Using Research to Define Adequacy

Some states have made use of research studies to assist them in defining both the components and the cost of an adequate education. While multiple New England states have commissioned adequacy studies it is difficult to determine if these studies have influenced state policy. While it appears that a 1991 study in Massachusetts[20] may have influenced some changes to the states funding formula, other studies in Connecticut,[21] New Hampshire[22] and Rhode Island[23] appear to

[16] New Hampshire Department of Education, Division of Program Support "FY 2016 Estimated Adequate Education Aid", November 15,2014. Accessed on the web: http://education.nh.gov/data/documents/fy2016_explained.pdf
[17] New Hampshire legislative code, Title XV, Section 198:40-a.
[18] Rhode Island Education Equity and Property Tax Relief Act, Chapter 16-7.2.
[19] Rhode Island Education Equity and Property Tax Relief Act, Chapter 16-7.3(1).
[20] Massachusetts Business Alliance for Education, "Every Child a Winner", July 1991.
[21] Augenblick, John, Robert Palaich, et al, "Estimating the Cost of an Adequate Education in Connecticut", Augenblick, Palaich and Associates, Inc. June, 2005.

have had little influence on state policy due to the fact that the state did not change their funding system after the publication of each report. A 2013 study in Maine[24] may lead to changes in the way that the state funds schools, however, it is too early to determine that. While adequacy studies can provide states with guidance on how to define an adequate education it remains up to the states legislature to make and final determination.

Conclusion

If, and how, an adequate education is defined varies greatly within the New England states. In Connecticut, Massachusetts, New Hampshire and Vermont the definition of an adequate education has been shaped by court rulings. In Rhode Island the state legislature defined an adequate education within state law without being prodded to do so by the state courts. Maine currently has no clear definition of an adequate education but recently commissioned a study to provide them with guidance about a possible definition. Even when the courts have directed the state to define what constitutes an adequate education these definitions often vary greatly. The difference in definitions is due to multiple factors including current student achievement, educational expectations, the cost of providing an education and the variance in constitutional language from state-to-state. While states can gain some understanding of what constitutes an adequate education by reviewing information from other states the determination of an adequate education remains a very state specific exercise.

PUBLIC SCHOOL FACILITY FUNDING

In the 2012-13 school year, the most recent year data are available, states and school districts expended just under $47 billion on school facility projects. This means that approximately $973 per student was expended on constructing or renovating school buildings in the United States. In New England this amount varied from $257 per student in Rhode Island to $1,039 per student in Massachusetts (See Figure X.3 for a full breakdown). This money was in addition to the educational funding that was expended in for the operation of schools that was shown in Table 6.3. While the amount of facility expenditures in Vermont varied between the 2011 and 2013 school years it was consistently below that of the National and New England averages during this time period.

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[22] John Augenblick, et al, "Alternative Approaches for determining a base figure and pupil-weighted adjustments for Use in a School Finance System in New Hampshire", Augenblick & Myers, November 30, 1998.
[23] Wood, Craig, Steve Smith, et al, "State of Rhode Island Education Adequacy Study", R.C. Wood & Associates, March 2, 2007.
[24] Picus, Lawrence O., Allan Odden, et al, "An Independent Review of Maine's Essential Programs and Services Funding Act", Lawrence O. Picus & Associates, April 1, 2013.

Table 6.3 Per Pupil Expenditures for K-12 Facilities

State	Year		
	2010-11	2011-12	2012-13
National Average	**$1,084**	**$1,041**	**$973**
New England Average	$881	$1,058	$983
Connecticut	$974	$1,220	$941
Maine	$882	$702	$381
Massachusetts	$884	$1,257	$1,039
New Hampshire	$1,090	$839	$387
Rhode Island	$314	$245	$257
Vermont	$732	$521	$624

Source: United States Census

Current State Funding Programs

How, and if, the state funds school facility projects varies based on perceived district need and availability of state dollars. While states tend to be consistent in their funding of school district operations they often vary in their funding of facilities based on the availability of funds. An example of this is the fact that Vermont has currently suspended its school facility-funding program. Prior to its suspension the state program provided districts that could demonstrate an urgent need for construction and could not reasonably address this need by other means with a grant equal to 30 percent of the cost of the project. Each of the other five New England states provides districts with some from of facility funding, however, the level of funding and the way those funds are distributed varies greatly from state-to-state. Below are descriptions of how each of the New England states funds school facility projects.

Connecticut[25]

The state school construction grant program pays 20% to 80% of the eligible costs of refurbishing/updating a school building. For new construction projects the state reimbursement rate changes to 10% to 70%. The percentage that the state will pay for a project is based on a school district's relative wealth. (Chapter 173, Section: 10-285a of state legislation).

Maine[26]

The state of Maine has three different programs for funding school facility programs. The Major Capital School Construction Program that provides districts with funding for large capital

[25] Chapter 173, Section: 10-285a of state legislation and from the Connecticut Department of Education, "*School Construction Grant Guide*". Accessed on the web at: http://www.ct.gov/dcs/cwp/view.asp?a=4217&q=507552

[26] Maine Department of Education, School Facilities and Transportation. Accessed on the web at: http://www.maine.gov/doe/operations/facilities.html

projects, the School Revolving Renovation Fund that provides loans to districts for facility maintenance or construction, and the Leased Space Program that provides funding to districts for temporary facility needs. Below is a full description of each program.

Major Capital School Construction Program

Under this program districts apply for funding and the department of education then reviews each proposal and rates them based on need and cost. The Department then forwards a list of requested project to the State Board of Education that then can fund projects with available state dollars. It should be noted that this program has not funded a new project since 2011.

School Revolving Renovation Fund

According to the Maine Department of Education: "*This fund provides loans to SAUs to finance project expenditures. A portion of each loan is considered a grant and is forgiven. The forgiveness rate ranges from 30 percent to 70 percent and is based on the percentage of State subsidy paid to the local SAU. The remaining balance of the loan is paid back over either five or 10 years at a 0 percent interest rate. The loan repayments revolve back into the SRRF and are then used to fund other approved projects. The maximum loan that can be provided is capped at $1 million per priority, per school building within any five-year period."*

Leased Space Program

The state subsidizes districts for approved temporary interim leased space at a maximum rate of $8 per square foot. Districts can receive this support from the state for a maximum of five years. In the 2015-16 school year the state provided $87,331 to districts for temporary interim leased space. This program also provides funding to districts to convert temporary space into permanent space – to do this the state provides an annual grant to districts for up to 10 years. In 2015-16 the state provided $28,937 to districts under this program.

Massachusetts[27]

In 2004 the state legislature created the Massachusetts School Building Authority (MSBA) to distribute state capital funding to school districts. The MSBA works with districts to design and fund school buildings. To determine a district's school building needs the MSBA conducts needs surveys – the first was conduced in 2005 and a follow-up survey was conducted in 2010. These need surveys reviewed each of the state's public school buildings – over 1,750 in all - to determine the condition of the buildings. The MSBA then uses information from this survey to determine which projects will be funded each year. Once the MSBA approves a project it then provides districts with funding for that project. As a requirement for MSBA funding, a district must provide information to the organization so it can track both the spending on each project and the quality of the building. The MSBA will provide facility grants to districts of almost $796

[27] Massachusetts Department of Education, School Finance – School Building Issues. Accessed on the web at: http://www.doe.mass.edu/finance/sbuilding/

million in the 2015-16 school year – the program has provided over $11 billion to districts since its creation.

New Hampshire[28]

The state provides facility funding to school districts through the "School Building Aid" program. Funding for this program is under a competitive basis. The scoring criteria include life/safety issues (100 points), overcrowded conditions (25 points), space deficiencies (35 points), building operation deficiencies (35 points) and percent of students in the district who qualify for free/reduced price lunch. In addition, districts can receive bonus points for their projects if the project will be a historical preservation project (10 points); districts can also lose up to 20 points if they do not have an adequate building maintenance program. Once a project has been approved, the state provides the district between 30 percent and 60 percent reimbursement based on the districts medium family income and equalized property value per pupil. In the 2015-16 school year this program will provide districts with $40.4 million in grants.

Rhode Island[29]

The state provides facility funding to districts through its "Housing Aid Program". Under this program districts apply to the state for funding for specific school building projects. If the Department of Education approves a school facility project then the district receives state funding based on its relative wealth – with the state reimbursing at least 35 percent of the cost of the project. In the 2015-16 school year the state has approved over $66.8 million dollars in total facility aid to districts.

STATE TRANSPORTATION FUNDING

The federal Individuals with Disabilities Education Act (IDEA) requires that school districts and states provide all disabled students with appropriate transportation. However, the requirements for providing and funding transportation for general education students is left to state and district policy. In the 2012-13 school year, the most recent year data are available, school districts expended over $23.4 billion on transporting students, which equates to $485 per enrolled student. (For a full breakdown see Table 6.4). Vermont spent $555 per enrolled pupil in the 2012-13 school year, which was above the national average of $485 but was less than any of the other New England states.

[28] New Hampshire Department of Education, School Building Aid and School Facilities guidelines. Accessed on the web: http://education.nh.gov/program/school_approval/school_build.htm
[29] Rhode Island Department of Education, School Building Authority. Accessed on the web: http://www.ride.ri.gov/FundingFinance/SchoolBuildingAuthority/HousingAidProgram.aspx

Table 6.4: State K-12 Transportation Funding – 2012-13

	Total Expenditures	Expenditures Per Pupil
United States	$23,412,240,000	$485
New England	$1,452,601,000	$712
Connecticut	$457,700,000	$884
Maine	$120,026,000	$650
Massachusetts	$606,399,000	$657
New Hampshire	$116,013,000	$618
Rhode Island	$102,871,000	$754
Vermont	$49,592,000	$555

Source: United States Census

Current State Funding Programs

Vermont provides school districts with reimbursements equal to 50 percent of allowable transportation expenses. If school district funding requests exceed available state transportation dollars. then grants to districts are reduced proportionately. Because of this clause, state dollars do not always cover 50 percent of a district's allowable transportation expenses. The state legislature allocated $17.7 million for transportation grants in the 2015-16 school year. Two New England states (New Hampshire and Rhode Island) provide no transportation funding to districts. Maine does not provide districts with any grants for transportation operations but does have a small grant program for updating school buses. Connecticut and Massachusetts both provide grants to districts to operate their school transportation programs. A description of each of the latter three state's programs is below.

Connecticut[30]

Connecticut reimburses districts for their transportation costs based on each districts relative wealth. The state Department of Education ranks all 169 school districts in the state based on their relative wealth. The 13 wealthiest districts in the state receive no transportation funding and the other districts receive a percentage of not less than zero and not more than sixty based on a continuous scale. In the 2015-16 school year the state allocated $23.3 million for this program.

Massachusetts[31]

Massachusetts reimburses districts for 66.43 percent of their approved transportation expenses. Approved transportation expenses include the expense of transporting "*All children in grades*

[30] Lohman, Judith "State School Transportation Requirements and Funding", State Department of Education, February 6, 2012.
[31] Massachusetts Department of Education, School Finance – Transportation. Accessed on the web: http://www.doe.mass.edu/finance/transportation/

kindergarten through six who reside more than two miles from the school they are entitled to attend and the nearest school bus stop is more than one mile from their residence and all children residing in regional school districts in grades kindergarten through twelve. Exceptions to this policy may be made when road conditions do not provide for the physical safety of the children and when the health of students make this service essential."

Maine[32]

Maine does not provide funding to districts for student transportation costs. The state does provide school districts funding for replacing school buses. In the 2015-16 school year this program allocated just under $55,000 to 17 different school districts.

[32] Maine Department of Education, Transportation and Facility funding. Accessed on the web: http://www.maine.gov/doe/operations/facilities.html

CHAPTER 6 ADDENDUM

New Hampshire Definition of a and Adequate Education
Title XV, Section 193-E:2-a of State Legislative Code

I. Beginning in the school year 2008-2009, the specific criteria and substantive educational program that deliver the opportunity for an adequate education shall be defined and identified as the school approval standards in the following areas:

(a) English/language arts and reading.
(b) Mathematics.
(c) Science.
(d) Social studies.
(e) Arts education.
(f) World languages.
(g) Health education.
(h) Physical education.
(I) Technology education, and information and communication technologies.

II. The standards shall cover kindergarten through twelfth grade and shall clearly set forth the opportunities to acquire the communication, analytical and research skills and competencies, as well as the substantive knowledge expected to be possessed by students at the various grade levels, including the credit requirement necessary to earn a high school diploma.

III. Public schools and public academies shall adhere to the standards identified in paragraph I.

IV. The school approval standards for the areas identified in paragraph I shall constitute the opportunity for the delivery of an adequate education. The general court shall periodically, but not less frequently than every 10 years, review, revise, and update, as necessary, the standards identified in paragraph I and shall ensure that the high quality of the standards is maintained. Changes made by the board of education to the school approval standards through rulemaking after the effective date of this section shall not be included within the standards that constitute the opportunity for the delivery of an adequate education without prior adoption by the general court. The board of education shall provide written notice to the speaker of the house of representatives, the president of the senate, and the chairs of the house and senate education committees of any changes to the school approval standards adopted pursuant to RSA 541-A.

V. The general court requires the state board of education and the department of education to institute procedures for maintaining, updating, improving, and refining curriculum frameworks for each area of education identified in paragraph I. The curriculum frameworks shall present educational goals, broad pedagogical approaches and strategies for assisting students in the development of the skills, competencies, and knowledge called for by the academic standards for each area of education identified in paragraph I. The curriculum frameworks shall serve as a guide and reference to what New Hampshire students should know and be able to do in each area of education. The frameworks do not establish a statewide curriculum. It is the responsibility of

local teachers, administrators, and school boards to identify and implement approaches best suited for the students in their communities to acquire the skills and knowledge included in the frameworks, to determine the scope, organization, and sequence of course offerings, and to choose the methods of instruction, the activities, and the materials to be used.

VI. In this section, "school approval standards" shall mean the applicable criteria that public schools and public academies shall meet in order to be an approved school, as adopted by the state board of education through administrative rules.

Chapter 7
Estimating an Adequate Level of PK-12 Public School Funding For Vermont

Our Evidence Based estimate of an adequate level of funding for Vermont's schools for 2014-15 is $1.56 billion, approximately $163.8 million less than we estimate was spent for public PK-12 education in that school year.

This chapter explains how we reached this estimate and includes a detailed discussion of the operation of the *Vermont School Finance Adequacy Model* – a tool that allows alternative conceptions of adequacy and estimates the cost of those alternatives. The chapter is divided into four sections. The first section provides an overview of our methodology, explaining how the parameters of the "core" EB model are used to estimate PK-12 public education costs. The section presents, in effect, a flow chart showing how we convert the resources identified by the EB model into school and district level costs and offers our core EB estimate using existing schools combined into current Supervisory Unions (SUs).

Section two of this chapter outlines our estimates of current Vermont PK-12 education expenditures and compares those expenditures with our EB cost level. The chapter describes our efforts to minimize the impact of duplicated expenditures on the total, as well as our treatment of multiple complexities that result from the complex governance structure and finance formulas used to fund the state's schools.

Section three of this chapter describes the different types of simulations that are available through the Vermont School Finance Adequacy Model. These simulation options allow policy makes and education stakeholders the capacity to consider a range of options. There are three specific simulation options available:

1. The ability to compare the core EB model[33] with current expenditures for Vermont school districts using current school and SU structures. Users will be able to modify the resource components of the model (i.e. the staffing ratios, per pupil dollar expenditures and other components) and see how the modifications compare both to the core EB model and to current expenditures.[34] In these simulations, we do not modify the structure of schools/districts or Supervisory Unions (SUs), although we do treat the SU as a single district (conceptually a Supervisory District) for the purpose of computing central office costs. Expenditure comparisons are only available at the SU level.

2. The ability to assign existing schools to alternative Supervisory Districts (SD). In this simulation, schools/districts are not changed, but they can be assigned to any combination of SDs the user wants to consider and the total costs of the new system can be estimated.

[33] The core EB model is the resource allocations for each element of the EB model as developed by Picus Odden & Associates and modified for Vermont based on the feedback from the professional judgment panels, public hearings and case studies conducted as part of this study, as indicated in Table 7.1.

[34] It is important to note that because of Vermont's unique and complex school funding formula and education governance structure, we are not able to provide a perfect comparison of EB costs with current expenditures. The complexity of these comparisons, and the potential variation in expenditures that exists are described in Chapter 7.

Because the new SD boundaries will differ from current districts and SUs, comparisons of estimated EB costs with current expenditures at the SU or school/district level are not possible.

3. The ability to combine schools/districts into one unified school and, in a second step, assign the newly formed schools/districts to Supervisory Districts. As with the second simulation option, comparisons of estimated EB costs with current expenditures at the SU or school/district level are not possible.

The discussion in section three will show the flexibility of the model and how it allows the State to compare current education expenditures with the EB model's estimated costs. Using this model, the State has the ability to simulate alternative formula and ratio specifications for every element in the EB model, and to view results in comparison with the core EB model (our EB model as we modified it for Vermont) and with current expenditures to the extent available Vermont data allows us to do so.

The fourth section of this chapter summarizes our findings and the possible future use of the model.

OVERVIEW OF THE VERMONT SCHOOL FINANCE ADEQUACY MODEL

This report is accompanied by an Excel Workbook that does the computations to estimate the adequate level of funding for Vermont schools, and provides the capacity to simulate options. This section of the report describes how we estimate the core EB cost levels for each school and Supervisory District. The EB model is conceptualized at the school level and most of the elements of the EB model are estimated based on the enrollment of each school and the characteristics of the students in that school. To that figure we add estimated costs for the operation of a central office.

It is important to note that our central office computations are based on the enrollment of the SUs across the state but with the operating assumption that each central office is operating as a Supervisory District (SD), which in Vermont terms means that the administrative staff at the SD operates as if the schools are all part of one district, rather that multiple districts.

Table 7.1 summarizes the elements of the EB model. It is similar to Table 3.1 above, but we have added two columns. The third column summarizes the model changes recommended by the PJ panels and the fourth column of the table indicates whether or not we incorporated those suggestions in the core EB model. Our rationale for those decisions is explained in detail above in Chapter 4.

There are six steps in estimating total EB costs for Vermont.

- Determine base school level costs through the use of prototypical schools
- Determine additional school level funding for struggling students

- Determine the per pupil central office costs based on the enrollment of each SU and add those per pupil costs back into each school's total
- Sum the school totals
- Add additional estimates costs for:
    - Students with severe disabilities
    - The additional costs of operating Career and Technical Centers as separate facilities
- Add to this total the non-modeled costs which represent current school district expenditures for all functions that are not specifically included in the EB model – these include student transportation, food services, capital expenditures, etc.

This total estimated EB cost is then compared to the current expenditures in Vermont. Estimating current expenditures in Vermont is complicated by the state's school governance structure and funding system, and our approach to estimating expenditures and the limits of our estimates are described in the second section of this chapter. Each step is described below.

Table 7.1: Elements of the "Core" EB Model

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
STAFF RESOURCES FOR CORE PROGRAMS			
1a. Full-day Preschool	Preschool classrooms are staffed at a class size of 1 teacher and 1 aide for every 17 students.	General agreement with EB recommendations	N/A
1b. Full-day Kindergarten	Full-day kindergarten program. Each K student counts as 1.0 pupil in the funding system.	General agreement with EB recommendations	N/A
2. Core elementary class sizes/Core teachers	Grades PreK-3: 15 Grades 4-5: 25 Grade PreK-5,6 average: 17	General agreement with EB recommendations	N/A
3. Secondary class sizes/ Teachers	Grades 6-12: 25, reduced to 20 per Vermont class size guidelines	General agreement with EB recommendations	N/A
4. Elective teachers	Elementary Schools: 20% of core elementary teachers Middle Schools: 20%	General agreement with EB recommendations	N/A

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
	of core middle school teachers High Schools: 33 1/3% of core high school teachers		
5. Instructional Coaches	1.0 Instructional coach position for every ~200 students, with a minimum of one in smallest school prototype	General agreement with EB recommendations	N/A
6. Core Tutors	One tutor position in each prototypical school (Additional tutors are enabled through the at-risk and ELL student counts in Element 22)	General agreement with EB recommendations	N/A
7. Substitute Teachers	5% of core and elective teachers, instructional coaches, tutors (and teacher positions in additional tutoring, extended day, summer school and ESL resources)	General agreement with EB recommendations	N/A
8. Core Guidance Counselors and Nurses	1 guidance counselor for every 357 grade PreK-5 students, changed to 1 per 300 Prek-5 students per Vermont standards 1 guidance counselor for every 250 grade 6-12 students, changed to 1 per 200 GR 6-12 students per Vermont standards. 1 nurse for every 750 PreK-12 students, changed to 1 per 500 Prek-12 students per Vermont standards. (Additional student support	Change title of guidance counselors to "school counselors in line with current terminology and the role these individuals play today PJ panels recommended additional counselor positions PJ Panels recommended	Yes No

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
	resources are provided on the basis of student at-risk and ELL students in Element 23)	resourcing therapist positions Change nursing staffing ratio to one for every 250 students	No Yes
9. Supervisory Aides	1 for every 178.5 elementary students 1 for every 225 middle school students 1 for every 200 high school students	One PJ Panel recommended additional Supervisory aides PJ panels recommended school resource officers for security	No No
10. Library Media Specialist	1.0 library media specialist position for each prototypical school down to 300 students, then prorated down with a minimum of 0.5 for smaller schools. 1.0 library aide prorated up from 300 to 600 students.	General agreement with EB recommendations	N/A

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
11. Principal/Assistant Principal	1.0 principal for the 357-student prototypical elementary school and down to the 119 student elementary school. 1.0 principal for the 450-student prototypical middle school and down to the 150 student middle school. 1.0 principal and 1.0 assistant principal for the 600-student prototypical high school, with the assistant principal eliminated at 300 students but a principal down to the 150 student high school.	Add an assistant principal at the 450 student middle school, prorated down to 0.33 FTE at the 150 student middle school Add an additional assistant principal at the 600 student high school, to provide a total of two APs, prorated down to a half time assistant principal position at the 150 student high school.	Yes Yes
12. School Site Secretarial Staff	1 secretary position for every 178.5 elementary students 1 secretary position for every 225 middle school students 1 secretary position for every 200 high school students	Change title to administrative assistant and provide additional positions at schools	No
DOLLAR PER STUDENT RESOURCES			
13. Gifted and Talented	$40 per student	General agreement with EB recommendations	N/A
14. Professional Development	10 days of student-free time for training built into teacher contract year $125 per student for trainers (In addition to instructional coaches (Element 5) and time for collaborative work	Add five days to the teacher contract for professional development	Yes

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
	provided by Element 4)		
15. Instructional Materials	$190 per student for instructional and library materials	General agreement with EB recommendations	N/A
16. Short Cycle/Interim Assessments	$25 per student for short cycle, interim and formative assessments	General agreement with EB recommendations	N/A
17. Computer Technology and Equipment	$250 per student for school computer & technology equipment	General agreement with EB recommendations	N/A
18. Career Technical Education Equipment	$10,000 per CTE teacher for specialized equipment	General agreement with EB recommendations	N/A
19. Extra Duty Funds and Student Activities	$300 per student for co-curricular activities including sports and clubs	$50 per pupil for elementary students, $300 per pupil for middle school students and $600 per pupil for high school students	Yes
CENTRAL OFFICE FUNCTIONS			
20. Maintenance and Operations	Separate computations for custodians, maintenance workers and groundskeepers, and utilities.	General agreement with EB recommendations Use $315.39 for utilities	N/A Yes
21. Central Office Staffing	A dollar per student amount for central office staffing and non-personnel resources is computed based on the district's total enrollment.	General agreement with EB recommendations	N/A
RESOURCES FOR STRUGGLING STUDENTS			

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
22. Tutors	1.0 tutor position for every 125 non-ELL free and reduced price lunch eligible students, and 1.0 tutor position for every 125 ELL students (in addition to the one core tutor position in each prototypical school). These positions are provided additional days for professional development (Element 14) and substitute days (Element 7).	General agreement with EB recommendations	N/A
23. Additional Pupil Support	1.0 pupil support position for every 125 non-ELL free and reduced price lunch eligible students, and 1.0 pupil support position for every 125 ELL students.	General agreement with EB recommendations	N/A
24. Extended Day	1.0 FTE teacher position for every 120 at risk and ELL students.	General agreement with EB recommendations	N/A
25. Summer School	1.0 FTE teacher position for every 120 at risk and ELL students.	General agreement with EB recommendations	N/A
26. English Language Learner Students	1.0 teacher position for every 100 identified ELL students. This provision is in addition to tutoring, additional pupil support, extended day and summer school resources. These positions are provided additional days for professional development (Element 14) and substitute	General agreement with EB recommendations	N/A

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
	teachers (Element 7).		
27. Alternative Schools	One assistant principal position and one teacher position for every 7 alternative school students.	General agreement with EB recommendations	N/A
28. Special Education	7.1 teacher positions per 1000 students for services for students with mild and moderate disabilities and the related services of speech/hearing pathologies and/or OT PT. This allocation equals approximately 1 position per 141 students. 1.0 psychologist per 1,000 students to overview IEP development and ongoing review. Full state funding for students with severe disabilities, and state-placed students, minus the cost of the basic education program and Federal Title VIB, with a cap on the number covered at 2% of all students. Provided at the District or Supervisory Union level.	Additional Special Education Staff	No
ADDITIONAL ISSUES			
29. Staff Compensation	Average of previous year salaries For benefits:	Provide benefits in the estimated costs of compensation for non-	Yes

EB Model Element	Current EB Formula, Ratio or Dollar per Pupil Figure	PJ Panel Recommended Change	Included in Core EB Model
	Retirement or pension costs: 0, fully paid by the state Social Security: 6.45% up to a maximum of $118,500 Medicare: 1.2% with no maximum Workers' Compensation: 0.82% Unemployment Insurance: $102 per employee Health insurance fixed amount at $13,090	certified employees	

Estimating Base School Level Costs

Chapter three describes our approach to developing prototypical schools as the basis for estimating school level costs in the EB model. Base school level costs include elements 1-19, plus the costs of custodians, in Table 7.1. We use separate prototypes for Elementary (PK-5), Middle (6-8) and High Schools (9-12). Table 7.2 summarizes the prototypical school sizes used for Vermont.

Table 7.2: Vermont Prototypical School Sizes

Category	School Enrollment		
	Elementary (PK-5)	Middle (6-8)	High School (9-12)
Very Large			600
Large	357	450	450
Medium	238	300	300
Small	119	150	150
Very Small	Fewer than 57 students		

The Vermont Cost Model Uses these prototypes to estimate the cost of elements 1-19 at each enrollment level and school type. Table 7.3 summarizes our cost estimates for prototypical schools at each school level and enrollment.

Table 7.2: Estimated Prototypical School Costs Using the Core EB Model

Category	Elementary (PK-5)	Middle (6-8)	High School (9-12)

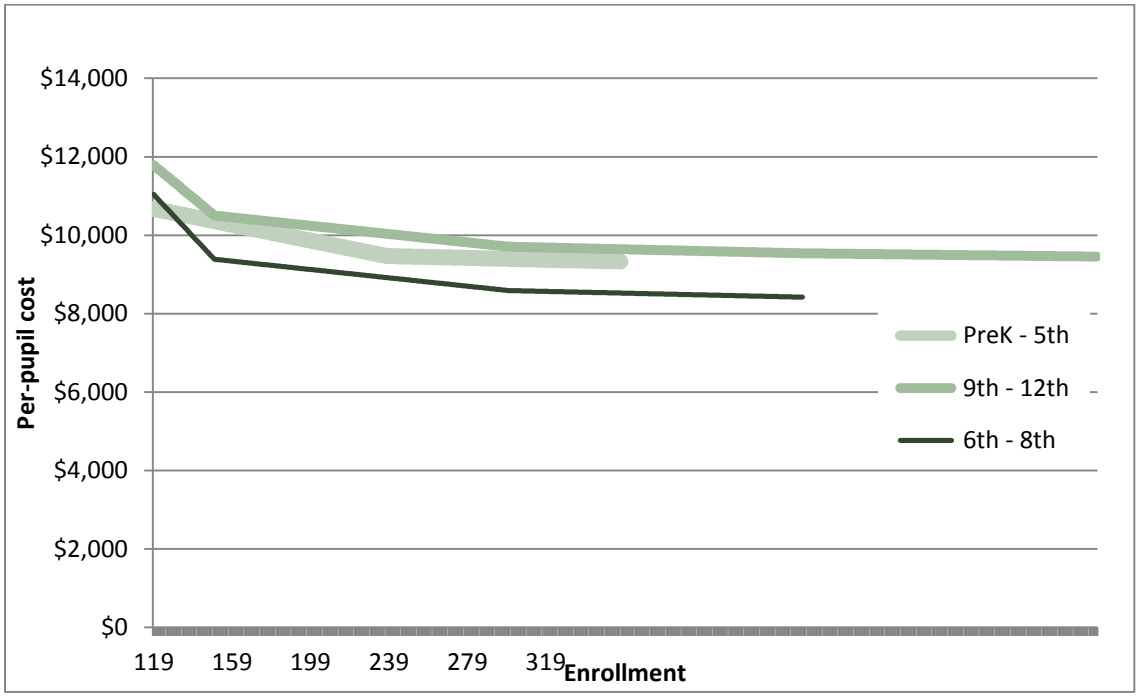
	Enrollment	Estimated Cost ($)	Enrollment	Estimated Cost ($)	Enrollment	Estimated Cost ($)
Very Large					600	$9,455
Large	357	$9,332	450	$8,421	450	$9,539
Medium	238	$9,470	300	$8,589	300	$9,707
Small	119	$10,671	150	$9,387	150	$10,500
Very Small (<57 ADM)	Cost based on one assistant principal, one teacher per 7 students, and other elements based on student enrollment and characteristics					

Obviously, few schools actual enrollments match the prototype school sizes. To determine each school's EB costs, we use the actual enrollment of the school and do a straight-line interpolation between the two prototype levels where the school's enrollment falls. Figure 7.1 shows how school level per pupil costs vary with enrollment by school level.

As Tables 7.2 shows, the per pupil costs also vary based on school type. Many Vermont schools include grade spans that differ from the Elementary, Middle and High School grade spans used to estimate prototypical school costs. To accommodate this variation, we use the interpolated cost estimate for each appropriate grade span based on the total enrollment of the school. For example, if a school serves grades K-8 with enrollments of 200 K-5 students and 75 6-8 students, the model uses the per pupil PK-5 cost estimate for 275 students multiplied by 200, and the per pupil 6-8 cost estimate for 275 students multiplied by 75. These two figure are then added together to get the total estimated EB school level cost for the school. The one exception to this approach is for an elementary school where the highest grade is the 6th grade. In that case, the entire school is treated as an elementary school for the purpose of estimating school level costs.

For schools with enrollments above the largest prototype, we use the cost estimate of that largest prototype. For schools with fewer than 57 students, we use the alternative approach of one assistant principal, one teacher per 7 students, and other elements based on student enrollment and characteristics.

Figure 7.1: Estimated Core EB Costs Per Pupil by School Type



Estimating the Costs for Struggling Students

As described in Chapter 3, we estimate additional costs based on the characteristics of the students in each school. Specifically we provide additional resources for Special Education, ELL students and non-ELL students who qualify for free and reduced lunch. Our approach for funding services for these students is described in detail in Chapter 3.

Special Education

Special education is funded on a census basis. The Vermont EB Cost Model estimates that special education costs for children with mild and moderate disabilities is $684 per pupil enrolled in the school. Thus we add $684 to the school levels costs for each student enrolled in each school. Recall that services for children with severe disabilities are fully funded by the state (minus Federal resources and the base funding level for each student). We estimate that expenditures for students with severe and profound disabilities consume close to one-third of Vermont's approximately $300 million total special education expenditures.

ELL and Non-ELL Free and Reduced Lunch

Costs for ELL students and non-ELL free and reduced lunch students include resources for tutors, additional pupil support, extended day, summer school and in the case of ELL students, ESOL services. Table 7.4 summarizes these costs, which are then added to the school level costs

of each school based on the number of ELL and non-ELL free and reduced lunch students in each school.

Table 7.4: Estimated EB costs for ELL and non ELL Free and Reduced Lunch Students

	Estimated EB Costs ($)	
Expenditure Category	**ELL Students**	**Non-ELL Free and Reduced Lunch Students**
Tutors	656	656
Additional Pupil Support	662	662
Extended Day	683	683
Summer School	683	683
ESOL	818	
Total	3,502	2,685

Estimating Central Office Costs

The EB model estimates central office costs on the basis of SU enrollments, but assumes that staffing and other resource needs are generated as if all of those students are in one Supervisory District rather than several independent districts. Per pupil costs for central administration are derived from the data on central office costs and maintenance and operation costs described in elements 20 and 21 in Chapter 3.

Central office staffing is based on district enrollments of 250, 500, 1,000, 2,000 and 4,000 students. For enrollments between these categories, per pupil costs are estimated with a straight-line interpolation similar to that described for base prototype school costs. The estimated per pupil cost for central office staffing is added to the estimated costs of maintenance and grounds keeping and to the estimated per pupil costs of non-personnel resources for the central office. This figure is then used to estimate per pupil costs for central administration at each school and added to each school's total.

Salaries and Compensation

The largest component of school/district costs is the compensation of employees. Chapter 3 describes how we estimated compensation for all the staff positions in the Vermont EB Cost Model. The average cost of each employee category is multiplied by the estimated number of employees in that category to derive total compensation costs for each school/district. These figures are used in determining the prototype costs as well as other personnel costs in the model.

COMPARING CURRENT EDUCATION EXPENDITURES TO THE EB CORE COSTS

The Core EB model's estimate of PK-12 public school costs is some $253.5 million lower than our estimate of current Vermont expenditures. Unfortunately, we cannot provide a specific difference due to the payment of the number of complicated tuition payment agreements among

school districts and because schools pay SUs for a variety of services depending on the particular SU. Moreover, the EB model does not include all of the expenses typically incurred by schools. As we have done in other states, we estimate the total expenses that are not included in the EB model as non-modeled costs so that we can compare total costs under the EB model to total expenditures.

Non-Modeled Costs and Duplicated Expenditures

The process for determining the non-modeled costs and for eliminating duplicated expenditures is complex in Vermont due to the SU structure and the practice of a number of school districts to pay tuition to other school districts (sometimes to districts in other states and sometimes even to private schools). This results in duplicated expenditures, that is funds are raised in district A, reported as a tuition expenditure when tuition is paid to district (or other entity) B, and then reported again as expenditures by district B.

The challenge with this structure is tuition dollars paid to a public school district should only be counted once in the estimate of total expenditures. We have attempted to include these tuition dollars in the expenses of the district where the student attends school, not in the district paying the tuition.

The process is different for students attending private schools or schools in other states. Tuition paid by the students' home district is an expense that will only appear on state expenditure reports once, and consequently must be reported as an expenditure for our comparison purposes.

We worked with both the Vermont Agency for Education and the Joint Fiscal Office to find the best approach to Vermont School district expenditures. In the end, we settled on the FY 2013-14 *Summary of the Annual Statistical Report of Schools* (SASRS). The report for 2014-15 was not available when this report was prepared (January 2016), so we inflated the 2013-14 expenditures by the U.S. State and Local Government NIPA Chain Weighted Deflator as found on the JFO website at http://www.leg.state.vt.us/jfo/education/2015-10%20Relevant%20Inflation%20and%20Other%20Economic%20Measures.pdf. This resulted in an across the board increase of the 2013-14 expenditures by 0.7% to make them comparable to our 2014-15 EB estimates.

Special Education for Children with Severe Disabilities

As described in Chapter 3, the EB model assumes that the costs of special education for children with severe disabilities are funded entirely by the state (minus Federal funding and the estimated based cost per student). Data on special education expenditures for the group of children we define as having severe disabilities are not available. We have estimated these costs to be one-third of the total costs of special education or approximately $100 million. This figure can be modified easily in the cost model. We note that the total EB resources for Special Education total $158 millions, some $142 million less than is currently spent for special education in Vermont.

Federal Funds

The EB model is computed under the assumption all sources of revenue are available to meet the resource requirements of the model thus the SASRS estimates include Federal funds.

Career and Technical Centers

Vermont has a system of 17 career and technical centers (CTE). Most of them are stand alone schools, although 3 are located in comprehensive high schools and two are private academies. In all instances, school districts send students to the CTE centers and make tuition payments. In estimating the costs of these centers, we have assumed that as student can only attend school in one location at a time, that is the FTE student count at the CTEs can be assigned to the home districts. We have done that and assumed the generation of teacher and other cost resources is done at the home school and that only the additional costs of operating a CTE center are estimated for those centers. Specifically based on the enrollment of the CTE, we use the high school pupil/teacher ratio in the EB model to estimate the number of core and elective teachers at the CTE, and provide $10,000 per teacher for specialized equipment. The compensation for the teachers is included in the estimated costs of the home high school, even if the teacher works at the CTE center.

The use of the Vermont School Finance Adequacy Model and the estimates it provides is described in the next section of this chapter.

USING THE VERMONT SCHOOL FINANCE ADEQUACY MODEL

The Excel workbook that computes the estimated EB costs is an integral part of this report. A copy of the model has been provided to the Vermont Legislature's Joint Fiscal Office. The discussion that follows describes the use of the model and its simulation capacity. We begin with estimation of the core EB model and the ability to modify parameters of that model without changing the structure of Vermont's school districts or the assignment of schools/districts to SUs. These assumptions are relaxed later in this section although as will be obvious, less detailed comparisons are available through those simulations.

The Core EB Model (Maintaining Current School and District Structure)

Once you have opened the Vermont School Finance Adequacy Model be sure to press the <control> <r> keys at the same time. This must be done to ensure the computations represent the latest options chosen for the EB model.

Overall Summary

Total resources

When the model is opened, navigate to the red "Vermont Summary" tab to see the estimated core EB model estimated expenditures and the comparison with current expenditures. This summary

is also used to compare the core EB model with any changes users make to the parameters of the EB model (without changing the structure of schools). The first panel of this summary provides a state summary of the model.

Column B displays estimated Vermont education expenditures as described in the section above.

Column C displays the estimated core EB model. This is the estimated EB model cost using the parameters defined in Table 7.1 above.

Column D summarizes the difference between current expenditures and the core EB model. This column shows that for the components of the EB model, the core EB costs are about $273 million lower than current expenditures in Vermont. Display and calculation of the non-modeled costs does not change this estimate because it is included in the current expenditures and has to be added to the EB total to account for costs not part of the EB model. Teacher retirement is treated the same way.

However there is about $110 million in estimated other expenditures that reduce the difference between the EB model and current expenditures. This includes the nearly $10 million allocation to the CTE centers, and our estimate of $100 million in Special Education costs for children with severe disabilities.

These adjustments bring the difference between the core EB model and current expenditures to $163.9 million. The range of this difference would be dictated by our assumptions about special education.

There is one other issue that could close the gap between expenditures and the core model. The EB model provides $684 for each of the state's 85,200 students to be used for special education for children with mild and moderate disabilities (above the $100 million estimated for children with severe disabilities). This amounts to $58.3 million, leaving total special education costs in the core EB model at $158 million or about half of the $294 million current spent for special education in Vermont. This difference is important. Part of it is based on the fact that we use a special education identification rate of 12%, which is four percent lower than the current rate in Vermont of 16%. If we assumed a rate of 16%, special education costs for students with mild and moderate disabilities, estimated special education costs would rise to $77.7 million reducing the difference by another $20 million.

Another explanation for the lower special education costs for children with mild and moderate disabilities is that the EB model provides substantial tier 2 resources (tutoring, extended day, summer school and extra pupil support) for students, which we argue in Chapter 3 would reduce the need for some of the special education costs.

Prototypical School Cost Comparisons

The second panel on the red Vermont Summary tab compares the per pupil costs of the core EB model with any changes uses make in the parameters of the EB model. When the model is first

opened, the difference displayed are zero as we have provided the model with the core EB model as the simulated option.

To change parameters of the model, users should go the yellow Model Inputs tab. It is here that all of the EB elements can be changed to consider alternative scenarios. For example, if the class size for grades PK through 3 were decreased to 15 (accomplished in column C rows 6-10), the costs of the model would change. This is shown in the top panel in the red Vermont Summary tab in columns E, F and G. Column E displays the simulated EB cost while Column F compares the simulated EB to the core EB and Column G shows the difference. In this case, we have increased the cost of the EB model by $24.3 million and reduced the difference between the simulated EB and current expenditures to $229.2 million.

All parameters of the EB model can be similarly changed to estimate the cost of individual changes or a combination of changes.

Comparisons by SU and District

The third panel of the red Vermont Summary tab provides a detailed comparison of the simulated EB model costs with current expenditures for each SU in the state.

The fourth panel in the red Vermont Summary tab provides a summary of the simulated EB model on a district-by-district basis. This summary does not compare the EB model with current expenditures because it is impossible to allocate SU expenditures back to school districts accurately.

The simulations described to this point only allow the user to consider changes within the current structure of schools, school districts and SUs. Below we describe how the simulation can provide, at the state level, an analysis of the costs of the EB model while changing school/district assignments to SDs and combining schools together and assigning them to alternative SDs.

The Core EB Model (Varying Current School and District Structure)

The blue Alt. Simulation Summary contains two panels that summarize EB model costs under two alternatives. In the first, existing schools can be assigned to alternative (and self-named SDs) and total costs of the EB model estimated and compared to current expenditures, and in the second schools can be combined and then in a second step, the schools can be combined into SDs as assigned by the model user.

Option 1: Alternative SD Assignments

To assign schools/districts to alternative SDs, navigate to the yellow SD Simulation Assignments Tab. In column E (which is highlighted), assign each school to an SD using unique SD names of your choice. You will see we have used designations AA, BB, etc. to start.

Once the schools/districts have been assigned to the SDs, press the <control><cmd><r> keys at the same time to compute the new total costs of the simulated EB model. Note that any parameters you have changed in the yellow Model Inputs tab will be maintained in this simulation, and the costs of your new model will be compared to the core EB model using existing school/district and SD configurations. The top panel in the blue Alt. Simulation Summary summarizes the new simulated totals and differences.

In the version that appears with the model before any changes are made, we established SDs with at least 4,000 students. We did this because at that enrollment level, the per pupil costs for the central office are flat, that is they don't have further marginal decreases. Consequently, the $32.6 million difference displayed in column E, row 26 represents our estimate of the maximum amount of money that could be saved under the EB model, if all existing schools were combined into larger SDs, but actual school/district configurations were not changed.

Option 2: Combining Schools/Districts and Assigning them to SDs

We suspect that additional efficiencies are possible if schools are unified as well as SDs. Our second (and more complicated) simulation option allows the model user to combine schools/districts and then assign the combined schools/districts into user defined SDs.

To accomplish this users should first navigate to the yellow District Simulation Assignments tab. In this tab, the user can assign unique school names to any combinations of districts desired. One the assignment has been made it is important to press the <control><cmd><r> keys before doing anything else.

The next step is to navigate to the blue Dist. Simulation Pivot 1 tab. In this table the user can assign SDs to the new list of schools/districts. Once this is done, the costs of the EB model for all of the new school/district and SD combinations will be displayed in the lower panel of the blue Alt. Simulation Summary tab. And as before the EB model parameters selected in the yellow Model Inputs tab will be maintained.

SUMMARY

This chapter has described how the EB model was operationalized in an Excel worksheet. It describes how each component of the EB model is included in the core EB model and core EB model costs are compared to current expenditures of Vermont schools. In addition, this chapter describes how to do the following types of simulation of the EB model:

1. Modify the parameters of the EB model itself maintaining current school/district and SU assignments.
2. Change the SD assignment of schools/districts using either the core EB parameters or alternative, user chose EB parameters.
3. Combine schools and assign schools/districts to user defined SDs.

Summaries of each alternative are provided through the model.

Glossary of Funding Model Elements

Model Element	Page Number	Definition
Core Teachers	25,26	Core teachers are the grade-level classroom teachers in elementary schools and the core subject teachers in middle and high schools (e.g., mathematics, science, language arts, social studies and world language, including such subjects taught as Advanced Placement in high schools).
Elective Teachers	27	Elective teachers are all teachers for subject areas not included in the core, including such classes as art, music, physical education, health, and career and technical education, etc. However, some career technical classes can substitute for core math and science classes.
Instructional Coaches	28	Instructional coaches-- sometimes called mentors, site coaches, curriculum specialists, or lead teachers -- coordinate the school-based instructional program, provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to improve their instructional practice, do model lessons, and work with teachers in collaborative teams using data to improve instruction.
Tutors	30, 71	Tutors, or Tier 2 Interventionists, are licensed teachers who, during the regular school day, provide 1-1 or small group (no larger than 5) tutoring to students struggling to meet proficiency in core subjects.
Extended-day Programs	76	Extended-day programs provide academic extra help to students outside the regular school day before and after school.
Summer School	78	Summer school includes all programs provided during the summer months, i.e., outside the regular school year, largely focusing on academic deficiencies of students but includes a wider array of classes for high school students.

Model Element	Page Number	Definition
At risk Students	70	The unduplicated count of students eligible for free and reduced meals (FARMS) who are not ELL students. The resources triggered by at risk student counts include all resources for tutors (Tier 2 Interventionists), summer school, extended-day programming, and additional pupil support.
English Language Learner services	80	ELL students are those who come from homes where English is not the native language and who perform at Levels 1, 2 and 3 in English; in addition to the at risk resources of tutoring, extra pupil support, extended day and summer school, the model also provides resources to provide English as a Second Language or other extra help services for ELL students. The model provides resources for all ELL students regardless of Free and Reduced Price Meal eligibility.
Special Education	85	Programs for all students with disabilities.
Alternative Schools	82	Alternative schools provide services, usually outside of the regular school environment, to students who have some combination of significant behavioral, social and emotional issues, often including alcohol or drug addiction. These students are different from at risk students and require a different set of services.
Gifted, Talented	39	Gifted and talented students are those who perform in the very top levels of performance, and can handle much more than a year of academic work in a regular school year.
Substitute Teachers	34	These are regular substitute teachers.
Student Support, School Counselors, Nurses	34, 74	These include school counselors, social workers, psychologists, family outreach workers, nurses, etc. School counselors and nurses are provided for all students, and additional student support staff are provided in the struggling student section.
Duty/Supervisory Aides	36	These are non-licensed individuals who help students get on and off buses, monitor the hallways, doors and playgrounds, and

Model Element	Page Number	Definition
		supervise the lunchroom.
Library Media Specialists	36	These are regular school librarians.
Principal, Assistant Principal	37	These are regular school principals and assistant principals.
Professional Development	42	Professional development includes all training programs for licensed staff in schools, including professional development for implementing new curriculum programs, sheltered English instructional strategies for ELL students, gifted and talented, etc. It also includes assistance to teachers working in collaborative groups and ongoing coaching of teachers in their individual classrooms. Resources include instructional coaches, 10 pupil-free days for training, and additional per pupil funds for trainers and other expenses.
School-Based Technology and Equipment	51	These include within school technology such as computers, servers, network equipment, copiers, printers, instructional software, security software, some curriculum management courseware, etc.
Instructional Materials	45	These include textbooks, consumable workbooks, laboratory equipment, library books and other relevant instructional materials.
Interim-, Short-Cycle Assessments	47	These include benchmark, progress monitoring, formative, diagnostic and other assessments teachers need in addition to state accountability assessment data.
Student Activities	61	These include non-credit producing after-school programs, including clubs, bands, sports, and other such activities.
Central Office Administration	64	Resources for central office staff including administrative and classified personnel charged with managing the instructional programs and operations of the school district.
Operations and Maintenance	62	Covers functions such as custodial services, grounds maintenance and facilities maintenance, and minor repairs.

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(Those with an asterisk * refer to randomized controlled trials.)

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Appendix A:
Case Studies of Improving Schools

Academy School
Colchester High School
Fair Haven Union High School
Integrated Arts Academy
Oak Grove Elementary School

Academy School

EXECUTIVE SUMMARY

Academy School is located in Brattleboro, Vermont, which is in the southern part of the state, close to the borders of New Hampshire and Massachusetts. The school is the largest of three elementary schools in the Brattleboro Town School District and is also part of the Windham Southeast Supervisory Union. The school enrolls a student body that is socioeconomically diverse: in 2014-15, over half of the school's 386 students were eligible for free or reduced-price lunch. Sixteen percent of students had special needs and five percent of students were English language learners. Over three-quarters of the students at Academy School were White, though the school also enrolled small percentages of students who were Asian American or Pacific Islander, Black or African American, Hispanic or Latino, and more than one race or ethnicity.

In recent years, Academy School has demonstrated noteworthy gains in student achievement. For instance, from 2009 to 2013, the percentage of Academy School students who scored at either the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) increased by 19 points in reading, from 61 percent to 80 percent, and 15 points in mathematics, from 53 percent to 68 percent. Additionally, the percentage of students who scored at the proficient with distinction level increased by 22 points in reading, from 8 percent to 30 percent, and 13 points in mathematics, from 12 percent to 25 percent. These school wide gains in student achievement were mirrored or even surpassed for some subgroups of students. According to Academy School personnel, the school's accomplishments are "doable by any school," and school staff share the attitude that "to a significant degree, [school staff] have control over student outcomes."

This report describes the context in which these gains occurred. At Academy School, the following conditions permeate the school:

Strong building leadership. School staff consistently describe the principal as a strong leader who ensures that teachers have the resources they need to do their work and who holds teachers accountable for student performance. The principal encourages teachers to use curricular and instructional strategies that are supported by research or student outcome data, focus time on core subjects, and assume that all students can achieve to high levels.

Common curriculum. In recent years, educators at Academy School and throughout the Windham Southeast Supervisory Union have made changes in their curricular approach, especially in English language arts and mathematics. Specifically, Academy School educators adopted a common school-wide curriculum, with a phonics emphasis in English language arts and problem-solving focus in mathematics.

Consistent focus on student outcome data. Teachers at Academy School take student data seriously, and they have access to multiple resources that allow them to rely on student performance information as a key driver of curricular and instructional decisions. First, they have access to a wide range of assessments (and the resulting student data) because of the

supervisory union's dedication to assessment. Second, they have access to real-time data management systems that allow them to review student information at any time. Third, they are able to analyze student data and interpret the results – abilities they gain through professional development, practice, and support from a data coach.

Culture of responsibility for student outcomes. Administrators and teachers at Academy School assume that all students can achieve to high levels and that, in the words of one educator, "to a significant degree, [school staff] have control over student outcomes." When student outcome data suggest that students are struggling to achieve to high standards, educators at Academy School seek to identify the problem and take steps to address it.

Collaboration among staff members. At Academy School, teachers are organized into grade-level teams, whose members have common planning time. Grade-level teams meet at least once per week, and teachers report that they often meet more frequently. During common planning time, these collaborative teams of teachers analyze student data to assess the effectiveness of instruction and to plan instructional strategies.

Use of time as a valuable resource. Staff at Academy School have deliberately scheduled their time such that they (a) focus on core instruction and (b) allow for teacher collaboration. Specifically, teachers at Academy School are required to spend significant time each day on instruction in English language arts and mathematics, and interventions for struggling students supplement rather than supplant these large blocks of time. Additionally, teachers collaborate in grade-level teams during the school day and in whole-school meetings regularly outside the school day.

Support from the supervisory union. Academy School teachers receive consistent support from the supervisory union. Much of this support comes from coaches, particularly a literacy coach who is able to devote full-time effort to the role and who will observe teachers and provide feedback on lessons and instruction and is often at the school at least once per week. The supervisory union also provides support for a common curriculum and allows access to multiple assessments.

INTRODUCTION

This report is one of five cases of improving schools that are part of a study of the cost of an adequate education in Vermont. The study is being conducted for the Vermont Legislature by Picus Odden & Associates and their partner consultants. The objective of the study is to identify a level of funding that is adequate for all schools to deploy strategies that give every student in Vermont an equal opportunity to achieve to Common Core college and career ready standards. This case describes how the improvements in student performance in the case school took place. The following sections of this report describe the school's socio-demographic context, student performance levels, staff, goals, schedule, curriculum and instruction, assessments, interventions, professional development, and culture. The report draws upon information from two main sources: (a) review of documents provided by school officials or available online and (b) individual and focus group interviews with 19 members of the school and supervisory union staff (school administrators, instructional staff, and support staff) that occurred in October 2015.

Socio-Demographic Context

Academy School is located in Brattleboro, Vermont, which is in the southern part of the state, close to the borders of New Hampshire and Massachusetts. The school is the largest of three elementary schools in the Brattleboro Town School District and is also part of the Windham Southeast Supervisory Union (WSESU), which includes nine schools and a regional career center. According to school staff, the families that send their children to Academy School are economically diverse, and parents work in a range of occupations, from healthcare to the service sector. The school also has diversity in terms of family ancestry, and the school community includes a number of families in which grandparents, parents, or the students themselves were born in other countries. Students at the school live in homes with a variety of family structures; some students live at home with two parents, others live in homes with one parent, and others live in homes where their grandparents are the primary caregivers.

Information from the Vermont Agency of Education outlines that, in 2014-15, Academy School enrolled 386 students. The school has three class sections per grade. Table 1 provides an overview of the average number of students in each classroom by grade.

Table 1: Academy School Average Class Sizes, 2014-15

Grade Level	Average Class Size
K (3 classes)	17.7
1 (3 classes)	18.7
2 (3 classes)	19.7
3 (3 classes)	16.3
4 (3 classes)	17.7
5 (3 classes)	18.7
6 (3 classes)	20.0
All grade average	18.4

Source: Vermont Agency of Education, Enrollment Report for Windham County: 2014-15, and personal communication with school staff.

Eighty-three percent of the students at Academy School were White in 2014-15, though the school also enrolled students who were Asian, Black or African American, Hispanic or Latino, and more than one race or ethnicity (Table 2). More than half of the students (61 percent) were eligible for free or reduced-price school lunch and 16 percent of students had special needs. Academy School is the elementary school in Brattleboro that provides services for English language learner (ELL) students; in 2014-15, five percent of the student body was ELL students. According to school staff, these ELL students' families represent speakers of more than 10 different languages.

Table 2: Academy School Student Characteristics, 2014-15

Student Characteristics	Percentage of Student Population (%)
Race/ethnicity	
American Indian/Alaska Native	‡
Asian	5
Black/African American	2
Hispanic/Latino	4
Native Hawaiian/Pacific Islander	‡
Two or more races	5
White	83
Eligible for free or reduced-price lunch	61
English language learners	5
Students with special needs	16

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
Note: The percentage of students with special needs includes students with an IEP or a 504 plan. It *excludes* students who have an EST plan.
Source: Vermont Agency of Education, School Report for Academy School: 2013-14.

STUDENT PERFORMANCE

Academy School has demonstrated impressive improvement in student performance from 2009 to 2013.

In *reading* (Table 3), from 2009 to 2013, the percentage of Academy School students who were at either the proficient or the proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by:

- 19 points for all students,
- 20 points for students who were eligible for free or reduced-price lunch,

- 6 points for English language learner (ELL) students,[35]
- 32 points for students with special needs,
- 18 points for White students, and
- 30 points for African American or Black students.

Additionally, the percentage of students at the proficient with distinction level in reading increased by:

- 22 points for all students,
- 12 points for students who were eligible for free or reduced-price lunch,
- 12 points for ELL students,[36] and
- 23 points for White students.

[35] Because scores were not reportable for ELL students in 2009, this percentage point difference is from 2010 to 2013.
[36] Because scores were not reportable for ELL students in 2009, this percentage point difference is from 2010 to 2013.

Table 3: Percent of Academy School students who performed at the proficient or proficient with distinction levels on the NECAP grades 3-8 reading test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	53	52	53	56	50
Percent proficient with distinction	8	22	25	22	30
Total at proficient level or above	61	74	79	78	80
Students eligible for free or reduced-price meals					
Percent proficient	43	53	54	55	52
Percent proficient with distinction	6	14	16	16	18
Total at proficient level or above	50	67	69	71	70
ELL students					
Percent proficient	‡	64	57	53	57
Percent proficient with distinction	‡	9	0	7	21
Total at proficient level or above	‡	73	57	60	79
Students with special needs					
Percent proficient	13	38	40	62	45
Percent proficient with distinction	0	4	5	6	0
Total at proficient level or above	13	42	45	69	45
White students					
Percent proficient	54	52	53	57	49
Percent proficient with distinction	8	22	27	23	31
Total at proficient level or above	62	74	80	79	80
African American or Black students					
Percent proficient	41	36	50	40	69
Percent proficient with distinction	14	7	5	13	15
Total at proficient level or above	55	43	55	53	85

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.

NOTE: Totals are based on unrounded estimates. Proficiency results are not presented for Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students and students of two or more races due to small numbers of students who took the assessment.

Source: Vermont Agency of Education, All NECAP Data Files.

In *mathematics* (Table 4), from 2009 to 2013, the percentage of students who scored at the proficient or proficient with distinction categories increased by:

- 15 points for all students,
- 19 points for students who were eligible for free or reduced-price lunch,
- 15 points for students with special needs,
- 15 points for White students, and
- 21 points for African American or Black students.

Additionally, the percentage of students who scored at the proficient with distinction level in mathematics grew by:

- 13 points for all students,
- 13 points for students who were eligible for free or reduced-price lunch,
- 12 points for ELL students, and
- 13 points for White students.

Table 4: Percent of Academy School students who performed at the proficient or proficient with distinction levels on the NECAP grades 3-8 mathematics test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	42	54	48	44	43
Percent proficient with distinction	12	15	25	27	25
Total at proficient level or above	53	69	73	72	68
Students eligible for free or reduced-price meals					
Percent proficient	33	54	46	50	39
Percent proficient with distinction	7	9	20	17	20
Total at proficient level or above	40	63	66	67	59
ELL students					
Percent proficient	45	55	43	20	36
Percent proficient with distinction	9	18	14	40	21
Total at proficient level or above	55	73	57	60	57
Students with special needs					
Percent proficient	13	30	27	50	25
Percent proficient with distinction	0	0	8	5	3
Total at proficient level or above	13	30	35	55	28
White students					
Percent proficient	42	53	48	44	44
Percent proficient with distinction	11	15	26	27	24
Total at proficient level or above	53	68	74	72	68
African American or Black students					
Percent proficient	32	‡	50	60	62
Percent proficient with distinction	9	‡	5	13	0
Total at proficient level or above	41	‡	55	73	62

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.

NOTE: Totals are based on unrounded estimates. Proficiency results are not presented for Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander

students, and students of two or more races due to small numbers of students who took the assessment.
Source: Vermont Agency of Education, All NECAP Data Files.

The gains outlined above and displayed in Tables 3 and 4 suggest that the school was successful in not only increasing the percentages of students who moved from the proficient category to the proficient with distinction category but also increasing the percentages of students who moved from below proficiency to the proficient category.

According to Academy School personnel, the school's accomplishments are "doable by any school." The foundational principle that underlies change is the understanding that, "to a significant degree, [school staff] have control over student outcomes." This attitude – which is shared across the staff – drives the work of the school and leads to an environment where the faculty does not look for excuses for low performance but rather seeks to address failure directly.

SCHOOL STAFF

According to the Vermont Agency of Education School Report for 2014-15, the average teacher salary at Academy School was $54,750, which was lower than the average teacher salary for the supervisory union ($57,696) and the state of Vermont as a whole ($56,387).

School staff report that teacher turnover at Academy School is low as of October 2015, the time of data collection. However, a group of teacher leaders explained that approximately nine years ago, after the current principal came to the school in 2006-07, the school went through a number of changes in terms of curriculum, instruction, decision-making strategies, and overall culture, and that staff turnover was higher during that time, in part due to retirements and to educators' decisions to move to other schools. Table 5 provides an overview of staffing at Academy School for the 2015-16 school year.

Table 5: Staffing in Academy School, 2015-16

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
Clerical/Administrative Support	2.0
Main Program	
Core Teachers	21.0
Elective Teachers	4.94
Special Education Teachers	4.5
Special Education Intensive Support Program	1.5
ESOL Teacher	1.0
Library/Media Specialist	1.0
Interventionists	7.0
Aides	
Para-educators	16.0
Para-educators (Intensive Support Program)	5.0
Intensive Support Program Intern	1.0
Pupil Support	
Counselor	1.4
School-Based Clinician/Social Worker	1.0
Nurse	1.0
Nurse Assistant	0.5
Speech Language Pathologist	0.8
Communications Facilitator	1.0
Other Pupil Behavior Support Personnel	1.0
Custodians and Maintenance Staff	3.0

NOTE: Special education and English as a second language (ESOL) teachers are school-based employees of the supervisory union. The school-based clinician is an employee of an external health organization. Tier 2 interventionists work at a slightly reduced rate, such that each of the seven interventionists listed above is technically at a 0.973 FTE.

Source: Personal communication with school staff.

Academy School has one principal, one assistant principal, and two administrative assistants. The school has 21 classroom teacher positions which produce an average class size of 18.4. In addition, the school has almost five FTE electives teachers who offer instruction in enrichment, Spanish, physical education, music, vocal music, band, and art. The school has one library media specialist who sees students for an elective period. Four full-time teachers and one part-time teacher work as special educators, and the school has one ESOL teacher. Academy School has seven Tier 2 interventionists. Generally one interventionist works with each grade, but the school shifts resources as needed so that grades with higher numbers of struggling students have access to more support. Sixteen para-educators support the classroom teachers, special education teachers, and interventionists.

Academy School implements a service strategy for students with severe behavioral needs called Supportive Teams for Educational Progress (STEP). This approach integrates students into the general education setting and provides targeted assistance to help the transition. In addition to the full-time and part-time coordinators of this program, STEP has five para-educators and an intern from a nearby postsecondary institution.

Several staff members support students' wellbeing. The school has a full-time counselor as well as a part-time counselor and a school-based clinician who support students' social-emotional health. Academy School also has a speech language pathologist (0.8 FTE), a full-time nurse, and a part-time nurse assistant.

Five teacher leaders (two for English language arts, two for mathematics, and one for data analysis) have extra responsibilities associated with professional development and curriculum planning. However, these teachers carry full-time teaching loads at Academy School, so their responsibilities as leaders come in addition to their teaching responsibilities. Additional instructional coach support comes from the supervisory union, which employs a full-time literacy coach and a part-time math coach.[37] Especially for issues related to English language arts, where the supervisory union coach is able to devote full-time attention to instructional support, teachers at Academy School frequently ask the coach to observe lessons, model instructional practices, and use research-based models in designing lessons for students.

GOALS AND SCHOOL ORGANIZATION

Goals

[37] As is also noted in the Oak Grove report, the level of instructional coach support from the supervisory union has decreased over time. When the supervisory union had American Reinvestment and Recovery Act funds, the central office had a full-time data coach, a full-time math coach, and a full-time literacy coach, in addition to mathematics and literacy curriculum coordinators. At the time of this report, the supervisory union has a part-time data coach, a part-time math coach, and a full-time literacy coach, in addition to a part-time mathematics curriculum coordinator and a full-time literacy curriculum coordinator.

As is also noted in the report on Oak Grove Elementary School, the Windham Southeast Supervisory Union maintains an action plan with three main goals: (1) have safe and healthy schools; (2) improve student learning; and (3) increase educator, parent, and student leadership in the system. In terms of student learning, WSESU has a goal to "decrease [the] achievement gap by 10 points on the NECAP results" and another goal to "increase Special Education student participation in general education classrooms to 80 percent pK-12."

Academy School's action plan aligns with the WSESU plan and provides more targeted action items for Academy School. A school improvement team, which comprises a large faculty council that includes representatives from all grade levels and multiple content areas, creates and monitors progress on the school's plan. This faculty council meets to discuss school goals, and members of the council help communicate these goals to the entire faculty. For the 2015-16 school year, action items on Academy School's plan focus on:

- Ensuring that educators use results of diagnostic and other assessments to inform curriculum and instruction and to target services to students as needed
- Providing students with the tools they need to develop critical thinking skills
- Promoting healthy social-emotional development
- Cultivating relationships with parents and families, and
- Ensuring that educators receive appropriate, job-embedded professional development in the areas of data use, implementation of the multi-tiered system of support (MTSS) model, classroom content, and students' social-emotional development.

Daily Schedule

For students, the school starts at 8:18 a.m. and ends at 2:50 p.m. School staff report that, during a period of change in the school several years ago, faculty members focused energy and attention on the topic of instructional time and made changes regarding what configuration of time would advance student learning. Now, educators are more aware of how they use instructional time and protect time for core subjects. Specifically, each classroom is expected to spend 90 minutes of uninterrupted time on literacy and 70 minutes (60 uninterrupted minutes plus 10 additional minutes at some point during the day) on mathematics. Students have a lunch and recess period that varies across grades from about 55 to 60 minutes. Students have specials periods that also vary from approximately 30 to 45 minutes per day; they rotate through the electives so that they receive each elective one time per week. The remaining instructional time is used for other topics such as social studies and science. In addition to this daily schedule, the school sets time aside for school-wide gathering and celebration; once per week, Academy School holds an all-school assembly called All School Sing that lasts for approximately half an hour.

Teachers' contracted work days are seven hours and 30 minutes long. In addition to having a duty-free lunch, teachers have an average of 30 minutes of planning per day. Teachers' schedules are set such that each grade-level team has common planning time every day during this thirty-minute period. Teachers meet as a team at least once per week during the common planning time; some teachers report that they meet more frequently. During collaborative

planning time, teachers co-plan, go over student data, assign students to interventions, make curricular decisions, and share materials.

CURRICULUM AND INSTRUCTIONAL PROGRAM

The Windham Southeast Supervisory Union attempts to provide guidance and support for its schools in terms of appropriate curriculum and instruction for students across the supervisory union, and it employs curriculum coordinators and instructional coaches to assist with school-level implementation of high-quality curriculum and instruction. Despite support for consistency in curriculum and instruction across the supervisory union, leaders in the central office are open to reasonable change that improves outcomes for students.[38] In a number of cases, changes in curriculum and instruction have come from educators at Academy School, who have led efforts that have impacted teaching and learning not only at Academy School but also throughout the supervisory union.

Curriculum

Prior to the adoption of the Common Core State Standards, Vermont had state standards for multiple content areas, including English language arts, mathematics, social studies, health, science, and foreign language. Vermont has adopted the Common Core; consequently, the Common Core standards serve as the framework for curriculum in English language arts and mathematics. Additionally, Vermont has adopted the Next Generation Science Standards, which now provide a framework upon which science curriculum can be built. In general, curricula for other subjects, such as social studies, align with existing Vermont state standards. The following paragraphs detail how WSESU and Academy School implement these curricula.

Driven in part by efforts of educators at Academy School, WSESU has shifted its English language arts curriculum from a whole-language to a phonics-based approach, which educators believed would more effectively help students in the supervisory union learn to read. In most grades throughout the school, teachers rely on the Fundations curriculum; some teachers report that they supplement this text with materials from the Haggerty Phonemic Awareness curriculum. In grade 5 English language arts, teachers use novels and other grade-level books instead of textbooks.

In recent years, including those over which the school made student performance gains, the school used the Investigations mathematics curriculum, which is a program focused on problem solving. Amid the shift from Vermont state standards to the Common Core State Standards, teachers across grades have recently changed their mathematics curriculum from Investigations

[38] Supervisory union and school personnel note that, in the immediate wake of the transition to the Common Core, some degree of variation existed in mathematics curriculum. The purpose of this variation was to determine what mathematics curriculum would align well with the Common Core and work well for their students. The goal was that this period of variation would lead to a choice of a common curriculum that would eventually be implemented throughout the supervisory union. At the time of data collection, most educators in the school relied on Engage New York materials for mathematics.

to Engage New York. Some teachers in the lower grades still use some Investigations materials, and teachers also report that they use supplementary materials from enVision math.

Academy School does not have set curricula for science or social studies. In science, grades 2, 4, and 5 use a curriculum created by National Geographic. Grade 3 teachers use a curriculum called Seeds of Science/Roots of Reading. In general, while the school does not have a standardized science curriculum, teachers report that they attempt to align their science curriculum with the Next Generation Science Standards. Teachers, working independently or in collaboration with their peers within Academy School or across the supervisory union, create social studies curriculum that aligns with Vermont's social studies standards.

Instruction

As noted above in the section on the school schedule, teachers spend 90 uninterrupted minutes on English language arts and 60 uninterrupted minutes on mathematics. Staff members at Academy School report using a variety of instructional strategies. One of the school's key instructional strategies that is particularly common for English language arts is a Reader's Workshop model, which includes a short whole-group lesson followed by small guided reading groups. A key instructional strategy for mathematics at Academy School is daily exit tickets, or short checks for understanding of the day's lesson. Exit tickets serve a dual purpose; not only are they a key instructional strategy, but also they are useful formative assessments.

Assessments

The Windham Southeast Supervisory Union emphasizes the use of data from multiple assessments to inform instruction.[39] The supervisory union began to focus increased attention on data-based decision-making several years ago, when it used American Reinvestment and Recovery Act (ARRA) funds to hire a full-time data coach. While the supervisory union no longer has the resources to employ a full-time data coach, the groundwork laid by the data coach remains. Based on the work of the data coach and other central office personnel, educators across the supervisory union now have access to a variety of resources, including a data management system (GoogleDocs) that allows for real-time, shared access to student performance data. The supervisory union also maintains an Assessment Toolkit document that outlines the supervisory union's approach to assessment, provides an overview of the suite of assessments that it expects schools within the supervisory union to utilize, and details the timelines and other requirements for assessment of students within the supervisory union.

According to the Assessment Toolkit, elementary grade students take a variety of assessments throughout the academic year, including:

- Multiple types of AIMSWeb literacy assessments,
- the Quick Phonics Screener,

[39] Oak Grove Elementary School, another school in the Windham Southeast Supervisory Union, is another improving school included in this series of reports. The information in this section that pertains to the supervisory union is repeated in that report.

- the Spelling Inventory,
- Phonological Awareness Test,
- Fountas and Pinnell Benchmark Assessment System,
- Running records of student reading,
- End of unit tests in literacy,
- Multiple types of AIMSWeb mathematics assessments,
- Interview-based mathematics assessments (including the Primary Number and Operations Assessment, Assessing Math Concepts; teacher-developed Concrete-Representational-Abstract assessments; the Mathematics Reasoning Inventory; and the Numeracy Project Assessment),
- End of unit tests in mathematics, and
- Summative state assessments (formerly the NECAP; now the Smarter Balanced Assessment Consortium (SBAC) test).

Academy School teachers use many assessments from the district's toolkit to learn about their students' performance. In addition to state summative assessment (formerly NECAP, now the SBAC), some of the assessments that Academy School staff routinely use are teacher-administered AIMSWeb, Fountas and Pinell Benchmark Assessments, the Primary Numbers and Operations Assessment, and the Spelling Inventory. For unit tests, teachers of lower grades primarily use Fundations unit assessments, but staff members report that teacher teams sometimes make their own unit assessments as well. As noted above in the section on instructional strategies, teachers often use daily exit tickets, which provide formative assessment information.

Reliance on data-based decision-making has evolved over time at Academy School. While data use is common now, it was not common at the time that the current principal came to the school. When the current principal first arrived at the school, he committed to data use and chose a book about using data to promote school improvement for the first leadership team book study. According to school personnel, this book study, coupled with multiple professional development sessions aimed at proper use of student data, were influential in helping shift the culture toward one of reliance on student performance information to drive decisions about curriculum and instruction.

Educators at Academy School take assessment use very seriously, and staff members report that they are proficient at analyzing student data and interpreting results of student performance analyses. Staff members have school-level support for data use from a data coach,[40] because the person who holds the part-time data coach position at the supervisory union also works part-time at Academy School as a teacher. Analyses of student data by teachers are regular and ongoing. Academy School teachers meet with central office officials three times per year to review students' AIMSWeb data. Teachers at the school also hold monthly data meetings, where they monitor students' progress toward proficiency. Grade-level teams, which meet at least once per week, rely on information about student outcomes to make decisions about lessons, instruction,

[40] As noted in the section on school staffing, Academy School does not have any non-teaching instructional coaches; instead, the school's teacher leaders also carry teaching loads.

and student grouping. According to staff at Academy School, real-time access to GoogleDoc spreadsheets allows for continuous monitoring of student outcomes, and Academy School teachers review these data both within and outside these aforementioned formal times set aside for data review.

Academic Interventions

Struggling students have multiple opportunities for extra support at Academy School. For instance, Academy School offers an intervention period called skills block three times per week. Students who are struggling in English language arts or mathematics skills are able to access Tier 2 interventions during this time, while students who are not struggling are able to access enrichment material, which they receive from some of the school's elective teachers. The instructional format for skills block varies; teachers employ a mixture of pullout, push-in, and team-teaching during this time.

Like all schools in Vermont, Academy School puts educational support team (EST) plans into place for students who consistently struggle to perform, regardless of whether or not these students have an IEP or a 504 plan. These plans outline the particular resources that individual students will need to ensure that they succeed in the academic environment.

Students with special needs receive pullout instruction from special educators during skills block (and during non-intervention time on days that the classroom does not hold skills block). Special educators also push-in during class time and provide additional support within the general education classroom setting. Co-teaching (one special educator and one general educator teaching the whole class) is not common, but teachers at Academy School have begun to implement this model in limited instances.

In order to maximize the extent to which the ESOL teacher is able to meet with and provide services for ELL students, the school attempts to schedule ELL students into one classroom per grade, when possible. The ESOL teacher is able to meet with ELL students during the skills block period and during class time on the days of the week when they do not have skills block. The ESOL teacher uses a National Geographic Reach for Reading curriculum and also works with the grade 5 teachers so that students can work on reading the books that they are reading in English language arts class.

In addition to supports within the school day and year, Academy School students have access to additional supports. For instance, teachers at Academy School report that the school has an afterschool tutoring program. Additionally, teachers at Academy School tutor students at risk of regressing over the summer for a total of approximately 15 hours over the course of the summer break. The district also holds a summer school that is open to participation from Academy School students; while teachers may recommend summer school to students and their families, attendance at summer school is voluntary.

Behavioral and Social-Emotional Interventions

According to school staff, adults across the school hold similar behavioral expectations for students. These expectations are encapsulated in the school's "STAR" guidelines: Sit up, Track the speaker, Ask and answer questions, and Respect those around you. School staff report that students are familiar with these expectations and hear consistent language regarding their responsibilities to uphold these standards. When students struggle with behavior, they are able to access social-emotional resources offered by the school. For instance, the school has school counselors and a social worker who can help students work through behavior and other challenges. Additionally, like schools throughout the state of Vermont, Academy School creates educational support team (EST) plans for students who struggle academically or behaviorally.

Academy School also created and implements an approach to addressing the behavioral needs of students with severe behavior problems. This approach, called Supportive Teams for Educational Progress (STEP), supports students who have an IEP, a 504 plan, or an EST plan and serves approximately 30 students each year. The school began to implement STEP in 2009 as a program for students with autism spectrum disorder, but the program has evolved to serve a wider range of students. The purpose of STEP is to integrate high-needs students (especially those whose needs manifest themselves in severe, challenging behaviors) into the general education program. STEP personnel encourage positive behaviors through a range of supports, including (a) consulting with classroom teachers to provide strategies for handling disruptive behavior within the classroom setting, (b) working on positive behavior support plans for students, (c) providing support throughout the day for students, (d) performing crisis management when necessary, and (e) supervising the five para-educators who carry out students' plans. They also provide academic support, such as consulting with special education staff, helping general education teachers differentiate lesson plans, and monitoring students' academic progress.

PROFESSIONAL DEVELOPMENT

Professional development at Academy School is a mixture of school-based, supervisory-union-sponsored, and individually-chosen professional development.

Multiple forms of ongoing professional development occur at the school level. First, as noted above in the section on assessments, Academy School staff meet monthly to go over student data. Second, as noted above in the section on the school schedule, teachers are organized into grade-level teams. These teams have common planning time every day, and teams meet at least once per week to engage in collaborative planning. Third, educators at Academy School hold faculty meetings after school every Tuesday. Teacher leaders meet with the principal every two weeks to set the agenda for the faculty meeting, and these meetings focus on substantive issues. In addition to working on plans for the implementation of the MTSS model at Academy School, staff use faculty meetings to focus on a variety of curricular and instructional issues. Starting in the 2015-16 school year, the staff has decided to dedicate a particular week each month to specific activities. The first meeting of the month focuses on student behavior, the second meeting focuses on vertical team meetings, the third meeting is dedicated to teacher-led professional development, and the last meeting of the month is reserved for whole-staff professional development in one content area.

The supervisory union also provides professional development for Academy School teachers. For instance, central office literacy and mathematics coaches hold grade-level meetings twice each year. These meetings provide an opportunity for cross-school collaboration and planning. Additionally, supervisory union personnel offer content-focused professional development across four days each year. Recent content-focused professional development sessions, for example, have included Letrs and Keys to Literacy trainings, among others.

Finally, some resources exist for individual teachers to engage in professional development of their choosing. Teachers have access to funds that equal three credits at the University of Vermont; they can use this money for tuition or they can apply it to other opportunities, such as professional conferences.

SCHOOL CULTURE

Staff members consistently attribute their school's success to the strong leadership of the principal. According to school staff, Academy School underwent a major shift in school culture when the current principal came to the school in 2006-07. At that time, the principal and a core group of teachers worked together to transform the school. This core group made changes to all aspects of the school, from the use of physical space (e.g., they moved classrooms so that teams of teachers could work near each other), to the vision of the school (e.g., adults used to make excuses for lack of student success, whereas teachers now assume there is no excuse for poor performance, and adults throughout the school take responsibility for student performance results), to the organization of students for instruction (e.g., they shifted from a mixture of single- and multi-age classrooms to only single-age classrooms), to curriculum (e.g., they adopted a common curriculum). For all changes, the principal and teachers made decisions based not on personal preference but rather after analysis of extant education research and outcomes for students in their school. They also base decisions on the premise that adults are responsible for student achievement and that all students are capable of achieving to high levels.

Faculty at Academy School describe an "empowering" atmosphere, where teachers have a voice in the operation of the school and students have a voice in their learning. Teachers describe their approach to work as one of problem-solving. They explain that they are not resistant to change and are willing to try different approaches in order to solve a problem. They regularly observe each other's practice, share curricular and instructional materials and lesson plans, and work together to strengthen instruction across the school. They also explain that educators believe that "all kids are all of ours," or that all adults share the responsibility for achievement for every student, regardless of whether or not particular students are members of their classroom.

Finally, staff describe Academy School as a "happy place" filled with adults who actively support and encourage students and each other. Teachers and other instructional staff are not the only staff members who take on the role of creating a positive culture; according to teachers, the school secretaries are "amazing." They help other staff members coordinate games, activities, auctions, and other events for the school community and for the wider community (including

parents and families). School staff report that these types of activities are important to the school culture and school success because "it makes all the difference to play together."

SUMMARY

This report describes the teaching and learning context at Academy School. At this school, the following conditions are evident:

Strong building leadership. School staff consistently describe the principal as a strong leader who ensures that teachers have the resources they need to do their work and who holds teachers accountable for student performance. The principal encourages teachers to use curricular and instructional strategies that are supported by research or student outcome data, focus time on core subjects, and assume that all students can achieve to high levels.

Common curriculum. In recent years, educators at Academy School and throughout the Windham Southeast Supervisory Union have made changes in their curricular approach, especially in English language arts and mathematics. Specifically, Academy School educators adopted a common school-wide curriculum, with a phonics emphasis in English language arts and problem-solving focus in mathematics.

Consistent focus on student outcome data. Teachers at Academy School take student data seriously, and they have access to multiple resources that allow them to rely on student performance information as a key driver of curricular and instructional decisions. First, they have access to a wide range of assessments (and the resulting student data) because of the supervisory union's dedication to assessment. Second, they have access to real-time data management systems that allow them to review student information at any time. Third, they are able to analyze student data and interpret the results – abilities they gain through professional development, practice, and support from a data coach.

Culture of responsibility for student outcomes. Administrators and teachers at Academy School assume that all students can achieve to high levels and that, in the words of one educator, "to a significant degree, [school staff] have control over student outcomes." When student outcome data suggest that students are struggling to achieve to high standards, educators at Academy School seek to identify the problem and take steps to address it.

Collaboration among staff members. At Academy School, teachers are organized into grade-level teams, whose members have common planning time. Grade-level teams meet at least once per week, and teachers report that they often meet more frequently. During common planning time, these collaborative teams of teachers analyze student data to assess the effectiveness of instruction and to plan instructional strategies.

Use of time as a valuable resource. Staff at Academy School have deliberately scheduled their time such that they (a) focus on core instruction and (b) allow for teacher collaboration. Specifically, teachers at Academy School are required to spend significant time each day on instruction in English language arts and mathematics, and interventions for struggling students

supplement rather than supplant these large blocks of time. Additionally, teachers collaborate in grade-level teams during the school day and in whole-school meetings regularly outside the school day.

Support from the supervisory union. Academy School teachers receive consistent support from the supervisory union. Much of this support comes from coaches, particularly a literacy coach who is able to devote full-time effort to the role and who will observe teachers and provide feedback on lessons and instruction. The supervisory union also provides support for a common curriculum and allows access to multiple assessments.

Alignment with the Evidence-Based Model

Resource use at Academy School aligns with the Evidence-Based (EB) model in some ways and does not align in other ways. The following paragraphs outline some key similarities and differences.

Staffing

The number of core teachers at Academy School is slightly lower than recommended by the EB model. That is, average class sizes range from 16.3 students to 20 students, and the overall average class size is 18.4, which is just above than the EB model recommendation of 17 students per class in a K-6 school. Additionally, the number of instructional coaches is lower than recommended (which, given the size of the school, would be almost two positions); in fact, the school has no non-teaching instructional coaches, which it would have the resources to provide under the EB model. Conversely, in a number of ways, staffing levels are higher at Academy School than the EB model recommends. For instance, the numbers of Tier 2 interventionists, para-educators/supervisory aides, nurses, and administration (the assistant principal) are higher than EB model recommendations.

Focus on Core Subject Curriculum and Instruction

Several years ago, Academy School educators decided to dedicate substantial instructional time to English language arts and mathematics, and they adopted rigorous curriculum to use during this time. Now, teachers at Academy School use common phonics based curriculum for English language arts and problem solving focused curriculum for mathematics, and they share a number of instructional strategies, such as guided reading groups and mathematics exit tickets. They dedicate substantial time each day to Tier 1 instruction in English language arts and mathematics and provide multiple opportunities each week for Tier 2 instruction for struggling students. Each of these is supported by the EB model.

Collaborative Teacher Teams and Data-based Decision-making

As the EB model recommends, collaborative teacher teams at Academy School frequently analyze student data and use those data to inform lesson planning, student grouping, and other curricular and instructional decisions. The supervisory union offers a wide variety of

assessments that produce timely student assessment data, which teachers at Academy School can and do use to improve student outcomes. While EB recommendations suggest that comprehensive assessment systems can streamline assessment practices and reduce the need to purchase or administer multiple testing packages, it is noteworthy that teachers within the Windham Southeast Supervisory Union in general and at Academy School in particular have access to regular and real-time student performance information.

Teacher Collaboration

Teachers at Academy School are organized into grade-level teams, and they have the opportunity to work together to create and evaluate lessons, group students, and share materials at least once per week and sometimes more frequently. While the school aligns with the EB model in grouping teachers into teams and providing common planning time, the model recommends meeting more often than once per week. Still, teachers at Academy School do meet regularly after school, and these meetings focus on substantive issues of curriculum, instruction, or professional development.

Strong Leadership

The school principal and teacher leaders have made conscious efforts to improve teaching and learning at Academy School, and they continue to support strong instructional practices throughout the school.

In sum, there are a number of ways in which the staffing numbers at Academy School do not match the EB model, with Academy School numbers both above and below recommended levels in some instances. Despite differences between EB recommendations and staffing levels at Academy School, many elements of the EB model – such as adopting new curriculum and instruction, committing to data-based decision-making, focusing class time more efficiently, providing interventions for struggling students, creating professional learning communities, and having strong leadership that supports instruction – are present at Academy School, and while certain parts of practice at Academy School may diverge slightly from the EB model recommendations, the general spirit of the elements exists.

Colchester High School

EXECUTIVE SUMMARY

Colchester High School is located in Colchester, Vermont, just north of Burlington, and is the only high school in the Colchester School District. School personnel explain that the school draws its 727 students from a variety of backgrounds: some students live in high-income homes, other students live in low-income homes, and others live on the islands of Lake Champlain. In 2014-15, almost all of the students (95 percent) were White. Twenty percent of students were eligible for free or reduced-price lunch and 23 percent of students had special needs (i.e., had an IEP or a 504 plan).

Between 2009 and 2013, Colchester High School demonstrated gains in student performance in reading and mathematics. Specifically, in reading, from 2009 to 2013, the percentage of students at Colchester High who performed at the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by 8 points, from 74 percent to 82 percent. Additionally, the percentage of Colchester High students who scored in the proficient with distinction category increased by 19 points, from 39 percent to 58 percent. In mathematics, from 2009 to 2013, the percentage of Colchester High School students who scored at the proficient or proficient with distinction levels on the NECAP exam increased by 12 points, from 41 percent to 53 percent.

This report describes the context in which these gains occurred. At Colchester High School, the following conditions permeate the school:

A shared language and vision. Educators at Colchester High School share a common vision for the school; they consistently articulate that they want the school to improve each year and they want to provide differentiated instruction to students throughout the school. They use a common language to express their goals and often refer to their efforts to promote "rigor, relevance, and relationships."

Strong leadership and collaboration. Staff members report that the school has strong leadership and a hard-working, collaborative staff. They note that they have multiple opportunities for collaboration both within and outside the school day. Within the school day, educators work with each other to review student data, create and revise curriculum, and plan instruction. Outside of the school day, educators use faculty meetings, department meetings, and in-service days to work with each other in collaborative learning groups (CLGs) and ensure that new initiatives align with Colchester High School norms and goals.

Focus on core subjects and use of a common curriculum. At Colchester High School, teachers value rigor and report that they continually review core curriculum to ensure that it aligns with standards. They create common curriculum units and lesson plans, design common assignments, and administer common assessments. Educators at Colchester High also provide multiple opportunities for students to master core content, both within the classroom environment – where they prioritize giving students feedback for continual improvement – and

outside the classroom environment – during daily intervention time that is required for all students.

Dedication to differentiated instruction. Throughout the school, educators are committed to differentiated instruction practices and create lessons with the aim of allowing students with different interest and readiness levels to access the curriculum and achieve to high standards.

INTRODUCTION

This report is one of five cases of improving schools that are part of a study of the cost of an adequate education in Vermont. The study is being conducted for the Vermont Legislature by Picus Odden & Associates and their partner consultants. The objective of the study is to identify a level of funding that is adequate for all schools to deploy strategies that give every student in Vermont an equal opportunity to achieve to Common Core college and career ready standards. This case describes how the improvements in student performance in the case school took place. The following sections of this report describe the socio-demographic context of the school, the school's student performance levels, staff, goals, schedule, curriculum and instruction, assessments, interventions, professional development, and culture. The report draws upon information from two main sources: (a) review of documents provided by school officials or available online and (b) individual and focus group interviews with 59 members of the school staff (school administrators, instructional staff, and support staff) that occurred in November 2015.

SOCIO-DEMOGRAPHIC CONTEXT

Colchester High School is located in Colchester, Vermont, and is the only high school in the Colchester School District. School personnel explain that the school draws students from a variety of backgrounds: some students live in high-income homes on the shores of Lake Champlain, whereas other students live in low-income homes, including homes at a nearby trailer community. Some students come from "the islands" of Lake Champlain (Grand Isle, North Hero, South Hero, Isle La Motte, and Alburg), since those areas do not have their own high schools. Parents of Colchester High students work in many areas including healthcare, manufacturing, retail, construction, and agriculture. Many parents of students at Colchester High work not in Colchester itself but rather in the surrounding communities of Burlington, South Burlington, Milton, Essex, or even in Montpelier.

In 2014-15, Colchester High School enrolled 727 students, which is a decrease from a decade earlier when the school enrolled almost 800 students. Given that the school employs 36 FTE core teachers (see more information below in the section on school staff), the average core class size across grades is 20.2 students (Table 1).

Table 1: Colchester High School students and core class sizes, 2014-15

Grade Level	Enrollment
9	165
10	203
11	183
12	171
Adults without diploma	5
Average core class size across grades	20.2

Source: Vermont Agency of Education, Enrollment Report for Chittenden County: 2014-15, and personal communication with school staff.

In 2014-15, almost all of the students (95 percent) were White, and thus only small percentages of students were Asian, Black or African American, or Hispanic or Latino (1, 2, and 2 percent, respectively; Table 2). One-fifth (20 percent) of students were eligible for free or reduced-price lunch and 23 percent of students had special needs (i.e., had IEP or 504 plans).

Table 2. Colchester High School student characteristics, 2014-15

Student Characteristics	Percentage of Student Population (%)
Race/ethnicity	
American Indian/Alaska Native	‡
Asian	1
Black/African American	2
Hispanic/Latino	2
Native Hawaiian/Pacific Islander	‡
Two or more races	‡
White	95
Eligible for free or reduced-price lunch	20
English language learners	‡
Students with special needs	23

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school at the time of posting the information.
Note: The percentage of students with special needs includes students with an IEP or a 504 plan. It *excludes* students who have an EST plan.
Source: Vermont Agency of Education, School Report for Colchester High School: 2014-15.

STUDENT PERFORMANCE

Between 2009 and 2013, Colchester High School demonstrated gains in student performance in reading and mathematics; gains were especially noteworthy with respect to the percentage of students who fell in the proficient with distinction category in reading.

Specifically, in *reading* (Table 3), from 2009 to 2013, the percentage of students at Colchester High who performed at the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by 8 points for all students. More notably, the percentage of Colchester High students who achieved to the proficient with distinction level increased by 19 points for all students and 11 points for students who were eligible for free or reduced-price lunch.

The gains outlined above and displayed in Table 3 suggest that the school was successful in not only increasing the percentages of students who moved from the proficient category to the

proficient with distinction category but also increasing the percentages of students who moved from below proficiency to the proficient category.

In *mathematics* (Table 4), from 2009 to 2013, the percentage of Colchester High School students who scored at the proficient or proficient with distinction levels on the NECAP exam increased by 12 points for all students and 5 points for students who were eligible for free or reduced-price lunch.

Table 3: Percent of Colchester High School Students who performed at the proficient or proficient with distinction levels on the NECAP grade 11 reading test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	35	39	37	35	24
Percent proficient with distinction	39	46	50	50	58
Total at proficient level or above	74	85	87	85	82
Students eligible for free or reduced-price meals					
Percent proficient	41	42	27	42	16
Percent proficient with distinction	18	24	27	33	29
Total at proficient level or above	59	66	55	74	45
Students with special needs					
Percent proficient	21	20	37	25	5
Percent proficient with distinction	4	7	5	0	5
Total at proficient level or above	25	27	42	25	9

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
NOTE: Proficiency results are not presented for English language learners, African American/Black, Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students due to small numbers of students who took the assessment.
Source: Vermont Agency of Education, All NECAP Data Files.

Table 4: Percent of Colchester High School Students who performed at the proficient or proficient with distinction levels on the NECAP grade 11 mathematics test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	37	47	44	48	47
Percent proficient with distinction	4	7	8	7	6
Total at proficient level or above	41	55	51	55	53
Students eligible for free or reduced-price meals					
Percent proficient	21	28	27	29	26
Percent proficient with distinction	0	0	0	2	0
Total at proficient level or above	21	28	27	31	26
Students with special needs					
Percent proficient	4	6	5	8	5
Percent proficient with distinction	0	0	0	0	0
Total at proficient level or above	4	6	5	8	5

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
NOTE: Proficiency results are not presented for English language learners, African American/Black, Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students due to small numbers of students who took the assessment.
Source: Vermont Agency of Education, All NECAP Data Files.

SCHOOL STAFF

According to the Vermont Agency of Education School Report for 2014-15, the average teacher salary at Colchester High was $64,188, which was lower than the average teacher salary for the district ($65,740) but was higher than the average teacher salary for the state of Vermont as a whole ($56,387).

According to school personnel, teacher turnover at Colchester High School varies year-to-year; some years, the staff will experience very little turnover, and other years, the school may need to replace several educators. School staff members perceive that if teachers leave the school, they do so for personal reasons, not because they are dissatisfied with the school or its environment. Table 5 provides an overview of staff at Colchester High School during the 2015-16 school year.

As shown in Table 5, Colchester High School has a principal, two assistant principals, an athletic director, a director of student support services (who oversees special education and 504 services, the guidance department, and the alternative education program), and a 504 coordinator. Administrative assistance support includes a bookkeeper, an attendance secretary, and four

administrative assistants. Technical support personnel, who are employed by the district, provide on-site technical assistance to educators at Colchester High School.

Colchester High School had 36 FTE positions for instruction in the core subjects of English language arts, mathematics, science, social studies, and world languages, for an average core class size across grades of 20.2 students, very close to the Vermont EB model secondary school core class size allocations. The school has 9.3 FTE elective teachers in the areas of business, health, physical education, driver's education, and fine arts (which includes visual arts and music). Elective teachers are 25.8 percent of core teachers at Colchester High School, which is less than the EB model provides. One library/media specialist works with teachers and students throughout the school. Colchester High School has a part-time instructional coach who works with teachers across disciplines, and five teachers have part-time responsibilities (0.2 FTE each) as team leaders, wherein they meet with school administrators as members of a leadership team.

Several special educators work at Colchester High School in different capacities. Two special educators work with the Crossroads program, which serves students with very high needs, and four special educators work in the general education setting. One special educator works with students who receive out-of-school placements at a technical education center or for employment/internship experiences, and another special educator works with special education students who receive out-of-district placements.

Colchester High School includes the Colchester Alternative Program (CAP), which serves students who face challenges such as those associated with behavior, discipline, or substance abuse issues. This program has its own 3.8 FTE teachers – including a humanities teacher, a math teacher, a science teacher, and a special educator – and additional support staff discussed in the paragraphs below.

Many para-educators and other staffers provide assistance throughout the school.[41] The special education program employs 21.6 para-educators, who work in large group settings, small group settings, and, in a small number of cases, with individual students. The school has one para-educator in the library and another part-time staffer who works with the Math Lab program. Two para-educators work with CAP.

Several personnel work to support students in non-academic ways. Colchester High School has three school counselors, a nurse, and a nurse assistant. The school has 2.8 FTE positions for social workers; one social worker serves CAP and is compensated through the school budget and the remaining FTEs work in the general school setting, are compensated by an outside agency, and are only able to work with students who qualify for Medicaid. Colchester has one behavior intervention specialist and a part-time speech language pathologist. The school staff also includes an athletic trainer, whose salary is paid by an external agency.

[41] While Colchester High School employs several para-educators who work in a variety of functions, the number of para-educator positions is lower in 2015-16 than it had been in previous years. School staff explain that the school reduced the number of para-educator positions in order to increase the number of special educator positions.

Table 5. Staffing in Colchester High School, 2015-16

Category	FTE
Administration	
Principal	1.0
Assistant Principal	2.0
Athletic Director	1.0
Director of Student Support Services	1.0
504 Coordinator	1.0
Administrative Support	6.0
Technical Support*	5.8
Main Program	
Core Teachers	36.0
Elective Teachers	9.3
Library/media specialist	1.0
Instructional Coaches	0.4
Team Leaders	1.0
Special Education High Needs	2.0
Special Education	4.0
Other Special Education	2.0
ESOL Teachers	0.4
Alternative Program Teachers	3.8
Aides	
Special Education Paraprofessionals	21.6
Math Lab Staffer	0.4
Library Paraprofessional	1.0
Alternative Program Paraprofessionals	2.0
Pupil Support	
School Counselors	3.0
Social Workers*	2.8
Nurse/Nurse Assistant	1.8
Behavior Intervention Specialist	1.0
Speech Language Pathologist	0.5
Athletic Trainer*	0.8

* Technical support personnel are employed by the district. The athletic trainer is employed by a rehabilitation center. One social worker is employed by the school while the remaining 1.8 social worker FTEs are employed an outside agency and can only work with students who qualify for Medicaid.

Source: Personal communication with school staff.

GOALS AND SCHOOL ORGANIZATION

Goals

In general, in terms of state summative assessment results, leaders at Colchester High School hope that students will make gains each year so that they outperform their peers from the previous year.[42] The most commonly referenced school goals, however, are broader than assessment results, and school staff share a common language regarding these broader school goals. According to school staff,

R x R x R = LCWRS,

where the *R*s stand for rigor, relevance, and relationships, and where *LCWRS* stands for life, college, work ready students. According to school staff, educators at Colchester High School strive to implement rigorous curriculum and instruction, to make learning relevant to students' lives, and to form strong, positive relationships with students. School staff also explain that the school wants to implement the three *R*s in order to help students achieve six essential expectations, which are to (1) read, (2) write, (3) think, (4) act, (5) communicate, and (6) learn.

School staff endeavor to promote the six essential expectations – through consistent application of the three *R*s – in an environment marked by differentiated instruction (DI). In differentiated classrooms, teachers "engage students in instruction through different approaches to learning, by appealing to a range of interests, and by using varied rates of instruction along with varied degrees of complexity and differing support systems" (Tomlinson 2014; pp. 3-4). The goal of such differentiation in instruction is to allow students at different levels of readiness and with different interests to achieve to high standards.[43] Teachers at Colchester High embrace this perspective; according to the 2014-15 Colchester High School Faculty Handbook, "The curriculum is differentiated for students depending on their readiness, interests, and learning style" (p. 7). Throughout the school, educators stress commitment to DI and explain that their goal is to ensure that each individual student is able to access the rigorous curriculum.

School staff members consistently report that educators throughout the school work to make sure that new initiatives fit the Colchester environment and align with the goals of promoting the three *Rs*, prioritizing the six essential expectations, and aligning with the practices of differentiated instruction. The school's leadership team, which comprises the principal, both of the school's assistant principals, the director of student support services, the instructional coach, the 504 coordinator, and teacher team leaders (one lead teacher from the elective, humanities, science/health, math, special education, and guidance teams), meets every Wednesday during the school day and creates school-level plans for curriculum, instruction, and assessment that align with Colchester priorities. The rest of the faculty, too, engages in collaborative planning (which is discussed in more detail in the section on professional development) regarding how to ensure that new initiatives align with established Colchester goals and norms.

[42] School personnel note that this goal is hard to measure when the state assessment changes, as it did during the shift from the New England Common Assessment Program (NECAP) to the Smarter Balanced Assessment Consortium (SBAC).

[43] Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners.* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Daily Schedule

The student day at Colchester High School begins at 7:45 am and ends at 2:20 pm. The school uses a block schedule with 5-module A and B days; each day has four long blocks of approximately 80 minutes of instruction (with one of the long blocks including just under half an hour for lunch). Each day also has a short, thirty-minute block that the school uses for an intervention period called Academic Acceleration, Access, and Advising Time (AT), which is discussed in more detail below in the section on academic interventions.

Over the course of a set of A and B days, teachers instruct for five of eight long modules and have planning for 2 of eight long modules.[44] One long module is for a duty, which could include supervising in the lunch room or in a study hall, working in the Math Lab, or working in the Writer's Workshop. Therefore, teachers have instructional or duty responsibilities for 6 of 8 blocks and have planning for 2 of 8 blocks.

CURRICULUM AND INSTRUCTIONAL PROGRAM

Curriculum

Students at Colchester High School are organized into the Green House for grades 9 and 10 and into the Blue House for grades 11 and 12. The Green House includes structured curriculum and heterogeneous grouping, whereas students have more flexibility and curricular choice in the Blue House. Across their time in both the Green and Blue Houses, Colchester High School students must obtain 24.5 credits in order to graduate. These credits must include:

- 4 credits of English language arts,
- 3 credits of mathematics,
    - 3.5 credits of science,
    - 3.5 credits of social studies,
- 1 credit of fine arts,
- 1.5 credits of physical education, and
- 0.5 credits of health.

At Colchester High School, English language arts and social studies are together in one humanities department. In the Green House, students take required, team-taught humanities courses that enroll approximately 40 students and cover topics in both English language arts and social studies. The grade 9 humanities course is called Thinkers and Revolutionaries, and the grade 10 humanities course is called the American Experience. Once students enter the Blue House, they are able to choose from a wider variety of humanities courses, including offerings in literature, psychology, philosophy, geography, international politics, modern media, journalism,

[44] More detailed discussion of individual and collaborative planning activities is located in the section on professional development.

and Advanced Placement (AP) English language arts, social studies, and history courses. Students must take credits in essential writings, American history, and civics to graduate.

Teachers in the mathematics department offer a range of courses including algebra I, geometry, algebra II, statistics, precalculus, calculus, astronomy math, consumer math, and college algebra. The school used to offer trigonometry as a separate class, but this year, teachers have integrated trigonometry material into other courses. Some sections of mathematics courses follow the AP curriculum. Students must take credits in algebra I and geometry to graduate, and educators at Colchester High School strongly encourage students to take algebra II.

Teachers in the science department offer courses in earth systems, biology, chemistry, physics, a small number of semester-long science electives, and AP science courses. In order to graduate, students must take earth systems and biology (which they take in the Green House as freshmen and sophomores, respectively), as well as credits in chemistry and physical science.

Students take courses in required and elective subject areas from Colchester High School educators in the humanities, mathematics, science, fine arts, world languages, and other areas (such as driver's education). In addition to the aforementioned courses offered by Colchester High School teachers, students at the school are able to enroll in the Massachusetts-based Virtual High School. Colchester High School has an arrangement with the company whereby a Colchester High School educator teaches a virtual course for use on the platform and, in exchange, 50 seats in a variety of courses are open for Colchester student enrollment. This arrangement allows students at the school an opportunity to take electives courses without requiring the school to hire additional electives teachers.

With the exception of Advanced Placement courses, all curriculum at Colchester High School is teacher-created. In collaborative groups, teachers examine standards (in prior years, standards were state-created, but now these standards include Common Core standards for English language arts and mathematics, Next Generation Science Standards for science, and state standards for other disciplines including social studies), create curriculum units and lesson plans that align with the standards, and design common homework assignments and assessments. Teachers report that they continually review and revise lesson plans and assignments in order to increase curricular rigor, continue the use of effective lessons, and discontinue the use of ineffective lessons.[45]

Instruction

Differentiated instruction is the dominant pedagogical theme of the building. Colchester High educators consistently express a commitment to differentiated instruction; comments from teachers indicate that their lesson plans and rubrics are designed to allow students at different

[45] Throughout the school, educators are working to create curricular documents called "know, understand, and do" (KUD) documents. The purpose of the KUDs is to outline the enduring understandings and essential questions embedded within each lesson and create a repository of high-quality lessons. Staff are also incorporating learning targets into the KUDs, an effort to lay the foundation for proficiency-based grading and personalized learning plans (PLPs) required under Vermont's Act 77 of 2013: Flexible Pathways Initiative.

readiness levels with different interests to access the curriculum. Teachers integrate technology into lessons in order to facilitate instruction; each teacher has a tablet, each classroom has a cart of laptops, and some teachers allow students to use smart phones for instructional purposes. Educators say that they value the opportunity to give differentiated feedback to students. Educators have access to Google classroom software, which allows for teacher feedback, and they also have access to time – either class time or time during AT, which occurs daily – to provide individualized feedback and instruction to students.

Assessments

Educators at Colchester High School routinely rely on student performance information to make decisions about curriculum and instruction. In fact, staff members note that use of student data is necessary to inform differentiated instruction practices, because educators need to assess student progress in order to make adjustments to lessons. This student performance information comes from a variety of sources.

First, Colchester High school staff use results from summative state assessments to give them a high-level picture of student progress at their school. As noted above in the section on school goals, school leaders want to see continuous improvement in the school's state scores and articulate to students that they want each class of students to outperform their peers from the previous year. School staff report that they rely on state assessment data to assess how their school compares to other schools in Vermont and in the nation.

Second, educators use the results of unit tests and other classroom assessments to assess at a more fine-grained level the extent to which students have gained an understanding of course content. Teachers use collaborative planning time to review student course assessment data to learn how to tailor lessons to address students' areas of understanding and misunderstanding. They also collaborate to determine whether the assessments themselves accurately capture students' understanding of content and are properly aligned to standards as well as how to assign consistent and fair grades to student work.

Third, educators regularly use information from formative assessments to track student progress at a micro level, to modify daily lessons based on student readiness, and to determine student grouping practices for each class session. Teachers at Colchester High school use a variety of formative assessments, which can vary based on content area. For instance, mathematics and science teachers report that they regularly rely on concept testing, whereby teachers have short sets of questions that are aligned with segments of course content that they can administer to students throughout the course. Humanities teachers do not use concept testing; rather, they design assignments that allow for multiple rounds of teacher feedback and student revision.

Finally, educators have recently revised assignment, grading, and report card policies to align with their use of both formative as well as summative assessments. The school has defined three distinct categories of assignments: academic achievement assessments (AAAs), practice assessments (PAs), and completion assignments (CAs). While AAAs are summative in nature, both PAs and CAs are formative. Teachers must use all three types of assessments in their

courses, and they are required to base the majority of each course grade on student performance on AAAs. Additionally, beginning in the 2015-16 school year, educators at Colchester High School are required to include not only traditional academic information on report cards but also information on students' learning dispositions (self-regulation, persistence, organization, collaboration, and commitment). The purpose of including assessment of learning dispositions on report cards is to provide students and their parents clear information about student progress in these areas without masking it in an overall academic grade.

Academic Interventions

Educators at Colchester High School provide multiple opportunities for students to receive extra academic support. The foundation of this effort is through the implementation of the Academic Acceleration, Access, and Advising Time (AT) program, but students at Colchester High School have access to other supports as well.

Every student at Colchester High School is required to participate in AT, and students have a dedicated, 30-minute AT period every day. Each Monday, students use the AT period to participate in "homebase," where homebase teachers work with groups of approximately 11 to 15 students and help them identify areas in which they need extra support.[46] On Monday, based on their understanding of their progress in each course as well as guidance from their homebase teachers, students "book" sessions for Tuesday through Friday. Teachers can "pre-book" students if they know that particular students are struggling in one of their classes. Students attend AT periods outside of their homebase rooms on Tuesday through Friday and use that time to get extra support in areas that they are struggling.

While AT is one ongoing source of academic support, Colchester High students have access to a variety of additional supports. For instance, many students have a study hall period in their schedule, which they can use to receive additional support. The school runs a Writer's Workshop, which is staffed by teachers (as noted above in the section on the school schedule), and a Math Lab, which is staffed by both teachers and a part-time math expert.[47] Students who are struggling in mathematics can also enroll in strategic algebra or geometry courses that they take during the same semester that they take the traditional algebra or geometry course. Additionally, Colchester High School also has a before-school homework club for help in any subject that is staffed by a para-educator.

Educators at Colchester High School, like educators throughout the state of Vermont, can also put educational support team (EST) plans into place in order to create formal plans for struggling students, regardless of whether or not the students qualify for special education services or have an IEP. These plans could include a variety of supports, including supports within the school day or before or after school, and remain in place for as long as needed.

[46] With the introduction of PLPs under Act 77, homebase teachers now work to create and implement students' PLPs.

[47] According to school staff, an individual with a Ph.D. in mathematics comes to the school twice a week to work in the Math Lab.

Social-Emotional and Behavioral Interventions

As noted above in the section on school staffing, Colchester High School has a number of staff members who provide social-emotional and behavioral assistance to students, including school counselors, social workers, and a behavior intervention specialist. These staff members serve students in the general education population as well as in the alternative program, so students who face mild or intermittent challenges and students who face severe or ongoing challenges can receive support.

Additionally, if students consistently struggle with social-emotional or behavior challenges, educators at Colchester High School can create ESTs for them, because ESTs can be put into place to address behavioral issues as well as academic issues.

Professional Development

School staff members describe an approach to professional development that is coherent and relevant to the context at Colchester High School. According to school staff, the school administration in general, aided by the school's professional development committee, plan experiences that teachers perceive to (a) advance their professional learning, (b) help them make decisions or plans that directly impact their classrooms, and (c) advance their goals of aligning curriculum to standards or increasing student test scores. In the words of one staff member, "we don't check the box" for professional development but rather "build the box that fits Colchester."

According to school staff, though teachers do sometimes participate in district-wide professional development opportunities, such experiences are rare, and most work occurs at Colchester High School and is targeted toward specific Colchester High School initiatives. Professional development occurs during faculty meetings, department meetings, and in-service days. In recent years, professional development emphases have included grading and assessment policies as well as proficiency-based learning.

After school every other Thursday, educators meet for a faculty meeting. The focus of these meetings is to work collectively on school-wide initiatives, and school staff report that these meetings are serious professional development opportunities. Approximately six to seven times per semester during these meetings, teachers work with their collaborative learning groups (CLGs). CLGs[48] typically contain four to five teachers, though the number of educators per CLG can vary based on the focus of the CLG. The configurations of CLGs change each semester, and, depending on the focus of the CLG, the groups might be departmental or inter-departmental. The school's leadership team determines each semester's focus for CLGs.

Every other Monday, teachers meet in department meetings. While some department meetings may be used for CLG work, most department meetings are a time for teachers to go over student data, revise curriculum, create common lesson plans and assignments, and make assessments.

[48] Colchester High School formerly called these groups collaborative working groups (CWGs) but has shifted to the use of the term CLGs.

During in-service days, the whole faculty meets. While staff sometimes participate in a district-wide event, it is more common that Colchester High faculty meet by themselves. Generally, in-service days are opportunities for the whole staff to engage in higher-level discussions of the same topics of CLG work. In other words, in-service days provide an opportunity to engage in philosophical discussions of what is best for Colchester High School and analyze research on these topics, whereas CLG meetings allow teachers to create concrete plans for implementing desired initiatives.

While formal professional development opportunities occur at faculty meetings, department meetings, and in-service days, teachers often collaborate with each other during the school day. The school does not have a standardized approach to common planning time for teachers, but staff members report that educators value collaborative planning and that such planning occurs frequently in a variety of forms. For instance, some teachers – especially those who co-teach courses in the Green House courses – have structured common planning time and are able to meet every other day to co-create lesson plans. Other teachers – such as those who teach different sections of the same course – can ask administrators to schedule their planning periods at the same time so that they are able to discuss curriculum, instruction, and assessments throughout the year. Teachers report that when they request common planning time with their colleagues, administrators do everything they can to accommodate that request. Additionally, teachers meet with each other before and after school and in the hallways in order to work with each other. School staff report that teachers value the opportunity to collaborate and co-plan with each other and will attempt to create times for collaboration – either by requesting formal common planning time or by making time within or outside of the school day to work with colleagues.

School Culture

School staff report the school struggles each year to pass a budget because the town's voters regularly reject proposed budgets. Despite these challenges, school staff say that the building has strong leadership and a capable, hard-working faculty. School personnel attribute school success to this combination of talented and hard-working administrators and teachers, who share a vision for the school and consistently engage in research- and data-based discussions regarding the best ways to promote that vision. They also describe a working environment that is marked by trust and collaboration between administrators and teachers and among the faculty.

School staff also describe a student-centered culture at Colchester High School. Several members of the staff argued that the driving question behind decisions at the school is what would be best for the students. Staff try to build relationships with students and want to cultivate a culture of "mutual respect" between adults and students. According to teachers at Colchester High, the culture of respect extends beyond teacher-student relationships, and teachers say that students support and respect each other.

SUMMARY

The previous sections of this report outline several characteristics that are central to the teaching and learning context at Colchester High School. These characteristics include:

A shared language and vision. Educators at Colchester High School share a common vision for the school; they consistently articulate that they want the school to improve each year and they want to provide differentiated instruction to students throughout the school. They use a common language to express their goals and often refer to their efforts to promote "rigor, relevance, and relationships."

Strong leadership and collaboration. Staff members report that the school has strong leadership and a hard-working staff. They note that they have multiple opportunities for collaboration both within and outside the school day. Within the school day, educators work with each other to review student data, create and revise curriculum, and plan instruction. Outside of the school day, educators use faculty meetings, department meetings, and in-service days to work with each other in collaborative learning groups (CLGs) and ensure that new initiatives align with Colchester High School norms and goals.

Focus on core subjects. At Colchester High School, teachers value rigor and report that they continually review core curriculum to ensure that it aligns with standards. They create common curriculum, design common assignments, and administer common assessments. Educators at Colchester High also provide multiple opportunities for students to master core content, both within the classroom environment – where they prioritize giving students feedback for continual improvement – and outside the classroom environment – during daily intervention time that is required for all students.

Dedication to differentiated instruction. Throughout the school, educators are committed to differentiated instruction practices and create lessons with the aim of allowing students with different interest and readiness levels to access the curriculum and achieve to high standards.

Alignment with the Evidence-Based Model

Colchester High School aligns with the Evidence-Based (EB) model in many ways and diverges from the model in others. The following paragraphs outline key similarities and differences between practices at Colchester High School and the resource recommendations in the EB model.

Staffing

For most teaching staff, numbers at Colchester High School are in line with the resources that would be provided by the EB model. For instance, the EB model provides resources for 20 students in core classes, and the average core class size at Colchester High School is 20.2 students. Numbers of Colchester High library media specialists, library aides, counselors, and nurses are also the same as or similar to recommendations in the EB model. In other instances, staff numbers at Colchester High School are lower than what would be provided by the EB model. For instance, the EB model would provide resources for elective teacher staff numbers

that are 33 percent of core teachers, whereas Colchester High's elective teachers are 26 percent of core teachers. Additionally, Colchester High School currently has 0.4 instructional coaches and no tutors, compared to the approximately 3.5 coaches and 2 tutors that the EB model would provide. Finally, in some ways, staff numbers at Colchester High School are higher than EB model resources. Specifically, the numbers of administrators, administrative assistants, and para-educators are much higher at Colchester High School than would be resourced by the EB model.

Focus on Core Curriculum

Educators at Colchester High School are very focused on core curriculum. On numerous occasions, staff members explained that they value rigor in curriculum and that they continuously review curriculum to ensure that it aligns with standards (notably, now, with the Common Core standards and the Next Generation Science Standards). The school requires that students take a substantial number of credits in core courses – 4 credits in English language arts, 3 credits in mathematics, 3.5 credits in science, and 3.5 credits in social studies.[49] Educators provide instruction in core subjects in a structured way for students in the Green House and allow for more freedom and choice for students in the Blue House, but students in all grades are expected to pursue an education in the core curriculum.

Interventions for Struggling Students

Educators at Colchester High School want to ensure that all students perform to standards and that each individual student is challenged to excel. To that end, the school requires that every student at Colchester High School participate in AT, which provides a daily opportunity for students to receive academic support. Students receive guidance about what support seek out during AT from their "homebase" teacher, and teachers of any subject initiate an intervention by "pre-booking" a student to spend AT time in their classrooms. Additionally, Colchester High School operates both a Writer's Workshop and a Math Lab, where students can receive additional support in English language arts and mathematics.

Focus on Student Data

Administrators and teachers at Colchester High School value the information provided by student assessment data and report that they require this information in order to pursue their goals of differentiated instruction. Educators look at state summative assessment data, unit tests, and daily formative assessment information to measure student progress, and they revise curricular and instructional plans based on this information.

Collaboration

Colchester High School staff report that their faculty meetings, department meetings, and in-service days are times of genuine collaboration on matters of substance. Teachers at Colchester

[49] Colchester High School does not require students to take world language credits, but the school has world language teachers and this report includes those teachers in the counts of core teachers.

High School also report that they value collaboration and that they frequently collaborate with their peers to create standards-aligned curriculum, to make lesson plans and assessments, and to discuss instructional practices. Some teachers meet every other day during common planning time, and teachers describe that they make time whenever they can to meet with their peers. Collaborative planning time, however, is not consistently built into the school schedule, and some teachers who want to have common planning time with colleagues need to request that time from administrators (requests that, according to teachers, are nearly always granted). While the Colchester High School emphasis on collaboration matches the EB model, the EB model provides resources for formal, scheduled collaborative meeting times three times per week; if Colchester High School provided formal, protected time for collaboration, it would align more closely with the EB model.

Leadership

The EB model calls for "dense leadership," where strong administrators empower educators throughout the school to engage in high-quality curricular and instructional practices. Staff at Colchester High School report that building leaders are consistently engaged in working toward school improvement and have a coherent vision for the school. They also report that the school has a hard-working staff that shares that vision.

In sum, in a few critical instances, resources for staff to support the core instructional program – specifically instructional coaches and certificated tutors – are lower at Colchester High School than would be provided by the EB model. In many ways, however, Colchester High School aligns with the EB model in many ways, especially with respect to its focus on core curriculum, provision of interventions for struggling students, educators' reliance on student progress information to make decisions about curriculum and instruction, use of collaboration, and evidence of dense leadership.

Fair Haven Union High School

EXECUTIVE SUMMARY

Fair Haven Union High School is located in Fair Haven, Vermont, on the border of Vermont and New York. Fair Haven is the only high school in the Addison-Rutland Supervisory Union and draws students from Fair Haven as well as a number of surrounding towns and villages. Almost all of the students at the school are White, but the school is socioeconomically diverse, with 48 percent of the school's 437 students eligible for free or reduced-price lunch in 2014-15. In that year, one-fifth of students had special needs.

In recent years, the school has demonstrated remarkable gains in student achievement. For instance, from 2009 to 2013, the percentage of students at Fair Haven who scored at the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam rose by 21 points in reading, from 58 percent to 79 percent, and 18 points in mathematics, from 26 percent to 44 percent. Among those students who were eligible for free or reduced-price lunch, the percentage point gains were 17 points for reading, from 52 percent to 69 percent, and 19 points in mathematics, from 12 percent to 31 percent.

This report describes the context in which those gains took place. At Fair Haven Union High School, the following conditions permeate the school:

A clear focus on improving student performance. Administrators and teachers emphasize student performance and make sure that staff and students alike prioritize assessments. The school principal has encouraged students to take assessments seriously and has made conscious efforts to reward not only students' extracurricular achievements but also their curricular and assessment successes. Teachers lead the effort to use student performance data to inform decisions about curriculum and instruction, and school administrators support that effort. In order to do this work, educators at Fair Haven Union High access resources such as assessments, assessment results, and time.

Emphasis on core subjects. Fair Haven requires all students to take four credits in English language arts, three credits in mathematics, three credits in science, and four credits in social studies. In some cases, students take common courses (e.g., freshman students take the same English language arts, science, and social studies courses). This practice allows teachers to create common curriculum and assessments. Additionally, the school offers a variety of Tier 2 interventions for students who struggle to grasp core content in the Tier 1 setting, and the school also offers an afterschool program – with transportation – so that students can receive additional help outside of school hours.

Teacher collaboration. Within their departmental professional learning communities, teachers work together to tweak curriculum, discuss successful instructional strategies, create common assessments (both rubric-based and exam-based), and discuss student progress. Teachers also work with each other on a monthly basis in interdepartmental teams, where teachers have an

opportunity to collaborate with their non-departmental colleagues on matters of interest to the entire school.

Professional school culture. Fair Haven Union High School has a results-focused, collaborative culture, where administrators and teachers alike recognize and support educator professionalism. Teachers work as a team to develop and implement a common curriculum, with common curriculum units and assessments. Throughout the school, educators employ a common approach to instruction that emphasizes inquiry in all subjects.

INTRODUCTION

This report is one of five cases of improving schools that are part of a study of the cost of an adequate education in Vermont. The study is being conducted for the Vermont Legislature by Picus Odden & Associates and their partner consultants. The objective of the study is to identify a level of funding that is adequate for all schools to deploy strategies that give every student in Vermont an equal opportunity to achieve to Common Core college and career ready standards. This case describes how the improvements in student performance in the case school took place. The following sections of this report describe the socio-demographic context of the school, the school's student performance levels, staff, goals, schedule, curriculum and instruction, assessments, interventions, professional development, and culture. The report draws upon information from two main sources: (a) review of documents provided by school officials or available online and (b) individual and focus group interviews with 23 members of the school staff (school administrators, instructional staff, and support staff) that occurred in October 2015.

SOCIO-DEMOGRAPHIC CONTEXT

Fair Haven Union High School is located in Fair Haven, Vermont, on the border of Vermont and New York. Fair Haven is the only high school in the Addison-Rutland Supervisory Union and draws students from Fair Haven as well as a number of surrounding towns and villages. The school is located in a rural area, and student activities and parent employment trends reflect a rural lifestyle. According to school officials, hunting is a popular pastime among male and female students at the school, and many parents work in agriculture. In addition to agriculture, parents of students at Fair Haven work in manufacturing, in the military, or at a nearby postsecondary institution.

According to information from the Vermont Agency of Education, in 2014-15, the school enrolled 437 students (Table 1). Enrollment at Fair Haven Union High School has declined over time; for instance, 10 years prior (2004-05), 593 students attended the school.

Table 1: Fair Haven Union High School Students and Core Class Sizes, 2014-15

Grade Level	Enrollment
9	111
10	108
11	126
12	92
Average core class size across grades	18.2

Source: Vermont Agency of Education, Enrollment Report for Rutland County: 2014-15, and personal communication with school staff.

In 2014-15, almost all of the students at Fair Haven (97 percent) were White (Table 2). Just under half (48 percent) were eligible for free or reduced-price lunch, and one-fifth of students (20 percent) had special needs (i.e., an IEP or a 504 plan).

Table 2: Fair Haven Union High School student characteristics, 2014-15

Student Characteristics	Percentage of Student Population
Race/ethnicity	
American Indian/Alaska Native	‡
Asian	‡
Black/African American	‡
Hispanic/Latino	1
Native Hawaiian/Pacific Islander	1
Two or more races	1
White	97
Eligible for free or reduced-price lunch	48
English language learners	‡
Students with special needs	20

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
Note: The percentage of students with special needs includes students with an IEP or a 504 plan. It *excludes* students who have an EST plan.
Source: Vermont Agency of Education, School Report for Fair Haven Union High School: 2014-15.

STUDENT PERFORMANCE

From 2009 to 2013, student performance in both reading and mathematics improved at Fair Haven. In *reading* (Table 3), from 2009 to 2013, the percentage of students at Fair Haven who scored at the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam rose by:

- 21 points for all students and
- 17 points for students who were eligible for free or reduced-price lunch.

Additionally, the percentage of students who fell into the proficient with distinction category for reading increased by:

- 19 points for all students and
- 8 points for students who were eligible for free or reduced-price lunch.

The gains outlined above and displayed in Table 3 suggest that the school was successful in not only increasing the percentages of students who moved from the proficient category to the

proficient with distinction category but also increasing the percentages of students who moved from below proficiency to the proficient category.

In *mathematics* (Table 4), from 2009 to 2013, the percentage of students who scored at the proficient or proficient with distinction levels on the NECAP exam increased by:

- 18 points for all students and
- 19 points for students who were eligible for free or reduced-price lunch.

Table 3: Percent of Fair Haven Union High School students who performed at the proficient or proficient with distinction levels on the NECAP grade 11 reading test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	45	50	50	51	47
Percent proficient with distinction	13	27	21	23	32
Total at proficient level or above	58	77	71	74	79
Students eligible for free or reduced-price meals					
Percent proficient	42	53	33	48	52
Percent proficient with distinction	9	17	10	17	17
Total at proficient level or above	52	70	43	65	69
Students with special needs					
Percent proficient	13	25	17	9	8
Percent proficient with distinction	0	0	0	0	0
Total at proficient level or above	13	25	17	9	8

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
NOTE: Totals are based on unrounded estimates.
Source: Vermont Agency of Education, All NECAP Data Files.

Table 4: Percent of Fair Haven Union High School students who performed at the proficient or proficient with distinction levels on the NECAP grade 11 mathematics test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	25	41	27	26	42
Percent proficient with distinction	1	0	1	1	1
Total at proficient level or above	26	41	28	27	44
Students eligible for free or reduced-price meals					
Percent proficient	9	28	15	17	31
Percent proficient with distinction	3	0	0	2	0
Total at proficient level or above	12	28	15	20	31
Students with special needs					
Percent proficient	7	8	6	9	8
Percent proficient with distinction	0	0	0	0	0
Total at proficient level or above	7	8	6	9	8

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
NOTE: Totals are based on unrounded estimates.
Source: Vermont Agency of Education, All NECAP Data Files.

SCHOOL STAFF

According to the Vermont Agency of Education School Report for 2014-15, the average teacher salary at Fair Haven was $50,930, which was higher than the average teacher salary for the supervisory union ($46,844) but lower than the average teacher salary for the state of Vermont ($56,387).

Generally, little staff turnover exists at Fair Haven Union High School, though some exceptions have occurred. For instance, prior to the arrival of the current principal, who has now been at the school for eight years, the school experienced a great deal of turnover in the principal position. Additionally, while the teaching staff at Fair Haven is very stable, the school recently experienced some turnover due to the retirement of a number of teachers. These recent retirees had decades of experience at the school, and some members of the staff (including current teachers at the school) have taught multiple generations of families in the community.

School staff explain that the supervisory union and school's approach to filling teaching vacancies has become more school-focused in recent years. That is, a committee that includes a school board member, the principal, faculty members, and a student representative is responsible for choosing new members of the teaching staff. The hiring process includes review of an application, interview, and a sample lesson. While the principal ultimately has the authority to

make a recommendation from among the qualified candidates, input from all members of the panel – including the faculty and student members – weigh heavily in the decision-making process. The principal recommends the choice to the superintendent and school board, who make a final judgment regarding the new staff position.

Table 5 outlines staff at Fair Haven. In addition to a principal, assistant principal, and athletic director, the school has a number of administrative support personnel, including the principal's administrative assistant, an attendance secretary, a registrar, an accountant, a special education secretary, and two technical support personnel. Several of these personnel – the principal, assistant principal, athletic director, and the principal's administrative assistant – are joined by the head of maintenance and the head of guidance to form an administrative team, which is one of the key decision-making bodies in the school.

Twenty-four teachers are in core subject areas (English language arts, mathematics, social studies, science, and foreign language), which leads to an average core class size of 18.2 students. The school also employs 10 teachers are in elective areas (business, consumer/family science, fine arts, physical education, and driver's education).

Fair Haven has seven special educators, 10 para-educators, and one Tier 2 interventionist, who focuses exclusively on English language arts. The school has no instructional coaches; while several educators serve as department chairs, these teachers have full teaching loads.[50]

Fair Haven operates an alternative program for students who have had to exit the main instructional program because of extreme circumstances (e.g., substance abuse). One teacher works exclusively with this program, and he coordinates with administrators and teachers to help students create high school completion plans. A small number of students participate in this program.

[50] Department chairs receive a stipend for their extra duties.

Table 5: Staffing at Fair Haven Union High School, 2015-16

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
Athletic Director	1.0
504 Plan Coordinator	1.0
Administrative Support	5.0
Technical Support	2.0
Main Program	
Core Teachers	24.0
Elective Teachers	10.0
Alternative Program Educator	1.0
Special Education	7.0
Tier 2 Interventionist	1.0
Library/Media Specialist	1.0
Aides	
Para-educators	10.0
Study Hall Monitor	1.0
Pupil Support	
School Counselor	3.0
Social Worker*	1.2
Nurse/Nurse Assistant	2.0
Drug and Alcohol Counselor*	1.0
School Resource Officer (Law Enforcement)*	1.0
In-School Suspension Support	1.0
Custodians and Maintenance Staff	4.0

*Some school-based personnel are employed by outside entities. Social workers are employed by the state and the drug and alcohol counselor is employed by the state. Local funds provide for the school resource officer.

Source: Personal communication with school staff.

Fair Haven has a large number of pupil support personnel, some of whom are employed by the school and some of whom are school-based employees of outside agencies. The school has three guidance counselors, a nurse and nurse assistant, and an employee who oversees the in-school suspension room. School-based personnel, whose salaries do not come out of the school budget, also include one full-time social worker and one part-time social worker (for a total of 1.2 FTEs), a drug and alcohol counselor, and a school resource officer. Fair Haven Union High School uses local funds to provide for the school resource officer.

GOALS AND SCHOOL ORGANIZATION

Goals

As noted in the section on the school's socio-demographic context, Fair Haven Union High School is located in the Addison-Rutland Supervisory Union (ARSU). The ARSU 2015-16 action plan includes goals in the topic areas of (a) academic and behavioral support, (b) comprehensive assessment, (c) high-quality instruction, (d) school-community collaboration, (e) professional development, and (f) technology use. ARSU's goals include priorities regarding student achievement; according to the action plan, ARSU wants schools to increase overall student performance in reading and mathematics by five percentage points by 2017 and "close the gaps between student subgroups in meeting the state proficiency standards" (p. 3).

School personnel – led by school leadership – have high goals for student performance, and in the words of one staff member, "excellence matters." The principal articulates that his goal is for the school to be the highest-performing high school in the state of Vermont. To that end, school leadership has prioritized excellence in student performance as measured by the state's assessments and has set a culture of high expectations for assessment results, particularly on the state assessment. Educators and leaders have worked hard to encourage students to take the state assessment and other academic accomplishments seriously; they have encouraged students to strive for first-place assessment results and have held assemblies for academic excellence.

The school's goals extend beyond excellence in assessment results. For instance, according to school personnel, all of the school's departments have clearly-articulated skills and proficiencies, and educators at Fair Haven expect all students to attain these skills and proficiencies. Additionally, staff members note that school staff share the goal to graduate all students and to increase the number of students who enroll in postsecondary education. Educators at Fair Haven Union High School also endeavor to promote student inquiry, and they report that they value performance over memorization. Fair Haven staff members say that they want students to be able to pose questions and use resources – including modern technology – to collaborate with each other in researching answers to their questions and to present their findings to others.

Daily Schedule

For students, the school day starts at 8:15 am and ends at 3:10 pm. The day is split into eight periods of approximately 45 minutes;[51] fifth period is longer than the other periods to accommodate lunchtime, which lasts approximately 22 minutes. On average, students take about 6.5 classes per day, and many students have at least one study hall period. Additionally, every Wednesday morning, the school has time for teacher advisory periods. While the length of

[51] The current 8-period configuration can be considered a modified block schedule, with 8 "skinny" blocks instead of 4 90-minute blocks. School personnel report that school staff are currently in the process of rethinking the structure of the day. The goal of schedule changes would be to increase the amount of time students spend in each class. Staff members have not formalized a new schedule plan, but it is likely that the new plan will call for class period lengths that fall between the current length (45 minutes) and a block schedule length (90 minutes). Staff perceive that a class length of approximately 60 minutes will allow educators and students to delve more deeply into class material.

advisory periods has varied from year to year, they last approximately 20 minutes. The purpose of these periods is to build relationships between staff and students, and teachers use advisory periods to mentor students and celebrate accomplishments.

Approximately six years ago, the school decided to increase focus on freshmen and provide these first-year students with extra support as they transitioned from the middle school environment to the high school environment. Part of this increased focus on freshmen included the creation of a freshman academy, and all first-year students are assigned to one of two cohorts within this academy. Students move with each other through core classes in the freshman academy, and all freshmen have a structured study hall period overseen by one of the freshman academy faculty members in addition to core and elective classes.

Teachers' contracted day is seven hours and 45 minutes long and extends from 7:45 am until 3:30 pm. Teachers teach six courses each day. They have one individual planning period and another planning period that is common with others in their department; this common planning time allows for professional learning community (PLC) meetings. The school requires PLCs to meet at least one time per week, but some departments meet more frequently. PLC teams are department-based and include English language arts, mathematics, science, social studies, world language, business, fine arts, special education, and health/wellness (including educators of physical education, family/consumer science, driver's education, and nurses).

While department PLC teams are the main teacher organizational structure, teachers at Fair Haven Union High School are also organized into interdepartmental teams, which meet during faculty meeting time and provide guidance for school-wide decisions. Teachers who work with first-year students are also on freshman teams, which comprise teachers of four core subject areas (English language arts, mathematics, science, and social studies). Freshman teams meet twice per week to create lesson plans, share materials, and discuss student progress.

CURRICULUM AND INSTRUCTIONAL PROGRAM

Curriculum

In order to graduate, students at Fair Haven Union High School are required to take:

- 4 credits of English language arts,
- 3 credits of mathematics,
- 3 credits of science,
- 4 credits of social students and/or history,
- 3 credits of physical education,
- 1 credit in either technology education or family/consumer science, and
- 1.5 credits in fine arts.[52]

[52] Staff at Fair Haven Union High School describe current efforts to implement the personalized learning plans (PLPs) that are required under Vermont's Act 77 of 2013: Flexible Pathways Initiative. PLPs, in conjunction with moves toward proficiency-based grading and other elements of the law, may impact the ways in which educators at

The required freshman and sophomore English language arts classes rely on teacher-developed curriculum, which is shared across all teachers who instruct the courses. The year-long courses cover topics such as folktales, poetry, Shakespeare, epics, legends, and novels. In addition to these required courses, Fair Haven Union High School offers courses in British and American literature (including honors offerings in these topics) and Advanced Placement courses, as well as a variety of semester-long courses on English language arts elective topics. Teachers of English language arts do not rely on textbooks; rather, they choose materials that align with the focus of each course. Teachers work as a team to develop common materials that are shared across sections of the same course, and they also have the same or similar assessments and assignments across course sections. English teachers report that, whenever possible, they use common lesson plans, curricular materials, assignments, and assessments.

Teachers in the mathematics department offer a variety of courses, including prealgebra, algebra I, geometry, algebra II, precalculus, calculus (including AP calculus), and probability/statistics. In previous years, math teachers have used many different textbooks, but during the 2015-16 year, they have shifted to the use of the Engage New York curriculum. While teachers of the prealgebra course do use supplemental materials, teachers of other courses say that they do not supplement as much as they used to and that they mainly use materials from the Engage New York curriculum. Math teachers at the school already share many assessment materials and report that they are currently using PLC time to work toward greater use of common mathematics assessments. They also use PLC time to create and refine lesson plans.

In general, students at Fair Haven Union High School are required to take earth and physical science as freshmen and biology as sophomores. Science educators also offer courses in chemistry, physics, engineering, horticulture, environmental science, and Advanced Placement science classes. Most science teachers in the school use textbooks, though they report that they all supplement texts with outside materials, particularly for laboratory exercises. The teachers describe their curriculum as "lab heavy," and they explain that they all use lab protocols and rubrics that the science department teachers developed together. Science teachers also report that they have increasingly begun to share lesson plans when possible. They use similar curricular materials and teacher-developed assessments (which include both teacher-developed items and textbook items)[53] but allow for teacher-specific variation. Fair Haven science teachers say that they have a curricular "framework" but that "autonomy [is] built into the framework."

Two social studies courses are required for Fair Haven Union High students: United States history until 1877 and modern United States history from 1877 to the present. Social studies teachers offer a range of additional courses in both history (including Advanced Placement history courses) and the behavioral sciences (including courses in psychology and sociology). Curriculum within the social studies department is teacher-created. When possible, teachers share lesson plans, curricular materials, and assessments, but teachers report that sharing is easier

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Fair Haven Union High School and other high schools throughout the state approach curriculum, instruction, and assessment.

[53] According to science teachers, some courses rely on lab projects in lieu of exams.

at the lower levels (especially at the freshman level), where the school offers more sections of the same course.

Instruction

As noted above in the section on school goals, administrators and teachers at Fair Haven Union High School value inquiry and attempt to encourage students to pose questions and perform their own research to answer those questions. Given that shared prioritization of inquiry, many staff members report that they use instructional strategies designed to help students achieve those aims. For instance, some teachers use project-based assignments in order to ensure that students have an opportunity to move from questioning to research to presentation of findings. Additionally, due to resources like a one-to-one computer initiative and a recently-modernized library/media center, many teachers have begun to integrate technology into instruction so that students have the ability to use multiple tools as they engage in their research activities.

Additionally, as is also noted above in the section on school goals, administrators and teachers at Fair Haven Union High School want to see continual improvement in the school's assessment results. Therefore, to varying degrees throughout the different departments in the school, teachers have focused instruction on assessed materials. For instance, for many years, science teachers have made conscious efforts to ensure that their students would be prepared to take the NECAP science exam. Additionally, at the beginning of the 2014-15 school year, English language arts teachers took the Smarter Balanced Assessment Consortium (SBAC) exam themselves at the beginning of the year so that they would understand what the experience would be like for their students, and then they created lesson plans that would help students prepare for the new assessment format and content.

Assessments

Especially since the arrival of the current principal eight years ago, educators have shifted toward an increased awareness of data. School staff describe a teacher-led and administrator-supported effort to analyze data (especially NECAP data) to inform what they should teach and when, what areas of the curriculum needed to be strengthened, and what areas of the curriculum were thorough and did not need further attention. Staff members also describe efforts to encourage students to take the assessments seriously; these efforts include pep rallies focused on assessments and academic achievement as well as discussions among students and school leaders regarding the importance of strong assessment results.

Teachers at Fair Haven Union High School have a variety of resources in their efforts to use data to inform instruction. First, the supervisory union employs a data coach, who helps teachers think through issues of data use, data reliability, and data validity. Second, the teachers have access to the assessments themselves and the resulting student data. Assessments include summative assessments (the NECAP and SBAC), screeners (all incoming students take the Scholastic Reading Inventory and the Scholastic Mathematics Inventory), and benchmark exams (students take the Northwest Evaluation Association Measures of Academic Progress (NWEA MAP) assessments three times a year during their freshman and sophomore years). Teachers use

collaborative planning time to analyze these data, along with information from course-based exams and students' quarterly grades, to make decisions about lesson plans, curriculum, and instruction.

Academic Interventions

Fair Haven Union High School has a wide range of both informal and formal interventions for struggling students.

For instance, in terms of informal interventions, teachers describe that when they notice a student beginning to struggle, they first talk with the student in an attempt to identify the problem. They try to accommodate the student and provide extra resources so the student is able to complete required work. Some teachers hold afterschool homework sessions for struggling students. In addition to individual teachers' homework sessions, the school offers a whole-school after-school homework success program that is accompanied by a late bus service and, when possible, food. This program is open to any student who wishes to participate. Students who participate in an extracurricular activity[54] and are failing two classes or have an average grade below 70 percent are required to participate in the homework success program for at least 10 days before they are able to participate in their extracurricular activity again. School staff report that students take this requirement seriously and that coaches and other extracurricular leaders are supportive of students' participation in the afterschool program.

When students are struggling and these informal and afterschool opportunities do not provide sufficient support, they have access to additional resources within the school day. For instance, struggling students are enrolled in an extra guided study hall period, which is used for Tier 2 interventions. English language arts intervention programs include System 44, Read 180, Wilson reading, and Framing Your Thoughts. Math intervention programs include Do the Math Now, Excel math, Odyssey math, and Math 180. Mathematics instructors also describe the prealgebra class as an intervention for struggling students.

Educators at Fair Haven Union High School, like educators throughout the state of Vermont, can also put educational support team (EST) plans into place in order to create formal plans for struggling students, regardless of whether or not the students have an IEP or a 504 plan. These plans could include a variety of supports and remain in place for as long as needed.

Special educators at Fair Haven attempt to provide necessary services to students without removing them from the general education environment. While educators practice a co-teaching model (i.e., one class that has both a general educator and a special educator) in limited instances, this is not a common approach to the delivery of special education services. Rather, special educators focus on push-in supports and, when possible, they engage in strategic assignment of students so that groups of students are in the same classroom and can receive targeted support from special educators. In a small number of cases, students with high needs require assistance mastering life skills. These students can receive instruction in a wide range of

[54] The school offers between 20 and 30 extracurricular activities, and staff report that a majority of students in the school participate in at least one activity.

skills, from personal hygiene to skills that will help them participate in society (e.g., grocery shopping).

Behavioral Interventions

The assistant principal is responsible for student discipline. The assistant principal, along with many other staff members in the school, prioritizes relationship-building with students and parents and views this effort as the foundation of an approach to behavior management at the school. The goal of addressing behavior issues is to "prepare mature human beings," so the assistant principal wants students to understand the consequences of their decisions within the framework of a relationship built on respect and understanding.

Educators at Fair Haven Union High School have a number of resources to help students with both ongoing and sporadic behavior and discipline challenges. First, when students consistently struggle with discipline, educators can create an EST plan to address behavior issues, because EST plans are not limited to academic issues. Second, the school operates the Annex program, which provides resources for students who have excelled academically as well as allows students who have struggled to succeed in a traditional high school environment an opportunity. Teachers associated with the Annex program make personalized plans for students to help them successfully complete the high school program of study. Finally, the school staff includes a school resource officer, a law enforcement official charged with addressing attendance and behavior issues.

Professional Development

Teachers at Fair Haven Union High School engage in school-based, district-based, and individually-driven professional development.

School-based professional development occurs both within and outside the school day. As noted above in the section on the school schedule, teachers have one common planning period during the school day that they share with departmental colleagues. They use this collaborative planning time at least one time per week to meet in departmental PLCs, and some staff meet more frequently than once per week. Additionally, members of freshman teams engage in collaborative planning at least twice per week. Furthermore, the school holds faculty meetings each Tuesday after school; these meetings are used for a variety of purposes including professional development led by department chairs and meetings of interdepartmental teams, which provide faculty feedback on school-wide initiatives.

District-sponsored professional development mainly focuses on district initiatives, but some district professional development involves opportunities for cross-school curricular collaboration. For instance, a few years ago, the district curriculum coordinators organized opportunities for teachers at all of the district's schools to meet with their departmental colleagues to discuss matters related to curriculum, instruction, assessment, and professional development.

Finally, the district provides teachers resources that they can use to engage in graduate courses and professional conferences, and staff at Fair Haven report that many teachers take advantage of these outside opportunities.

SCHOOL CULTURE

The school has a results-focused, professional, and collaborative culture, where school staff throughout the building work to improve student performance in the classroom and on state assessments. Fair Haven educators work together to develop common curriculum and lesson plans, and teachers employ a common approach to instruction that emphasizes inquiry. According to school staff, recent stability in the principal position has contributed to this positive school culture. School personnel say, too, that school administrators trust the professionalism of the faculty and that teachers have both autonomy and support for their work.

School staff members also report that the school culture encourages students to take control of and responsibility for their learning environment, and that students consistently take ownership of their learning and actively assist their peers. For instance, administrators turned control over school assemblies to students, who now have the authority to select the content and structure of whole-school gatherings. Students chose to widen participation in assemblies to more students and students who otherwise might not have received school-wide recognition for success. Assemblies honor athletes as well as musicians, scholars, and students who value other pursuits (such as meteorology, in one notable case).

The school also has relationships with the surrounding community. Fair Haven Union High School is a multi-generational school; many members of the faculty and staff attended the school. Staff consistently note that the school has excellent community support, which manifests as school pride and fiscal support. Teachers explain that although the community is not wealthy, people will "stretch" to support the school. The community consistently approves the school budget and supports the use of tax dollars for education.

SUMMARY

This report describes the teaching and learning environment at Fair Haven Union High School. At this school, the following conditions exist:

A clear focus on improving student performance. Administrators and teachers emphasize student performance and make sure that staff and students alike prioritize assessments. The school principal has encouraged students to take assessments seriously and has made conscious efforts to reward not only students' extracurricular achievements but also their curricular and assessment successes. Teachers lead the effort to use student performance data to inform decisions about curriculum and instruction, and school administrators support that effort. In order to do this work, educators at Fair Haven Union High access resources such as assessments, assessment results, and time.

Emphasis on core subjects. Fair Haven requires all students to take four credits in English language arts, three credits in mathematics, three credits in science, and four credits in social studies. In some cases, students take common courses (e.g., freshman students take the same English language arts, science, and social studies courses). This practice allows teachers to create common curriculum and assessments. Additionally, the school offers a variety of Tier 2 interventions for students who struggle to grasp core content in the Tier 1 setting, and the school also offers an afterschool program – with transportation – so that students can receive additional help outside of school hours.

Teacher collaboration. Within their departmental professional learning communities, teachers work together to tweak curriculum, discuss successful instructional strategies, create common assessments (both rubric-based and exam-based), and discuss student progress. Teachers also work with each other on a monthly basis in interdepartmental teams, where teachers have an opportunity to collaborate with their non-departmental colleagues on matters of interest to the entire school.

Professional school culture. Fair Haven Union High School has a results-focused, collaborative culture, where administrators and teachers alike recognize and support educator professionalism. Teachers work as a team to develop and implement a common curriculum, with common curriculum units and assessments. Throughout the school, educators employ a common approach to instruction that emphasizes inquiry in all subjects.

Alignment with the Evidence-Based Model

The case of Fair Haven High Union High school illustrates ways in which school practices are similar to the Evidence-Based (EB) model and ways in which practices differ. The following paragraphs highlight several similarities and differences.

Staffing

In many ways, staffing at Fair Haven Union High School is at higher levels than the EB model recommends. The average core class size (18.2 students) is slightly lower than that of the EB model (20 students), which requires more core teachers that the EB model provides. Additionally, the ratio of elective to core teachers is higher than the EB model (41.7 percent vs. 33.3 percent). Moreover, the school has higher numbers of administrators, special educators, school counselors, and para-educators than the EB model. In other ways, however, staffing at Fair Haven is at lower levels than the EB model. For example, the school has no non-teaching instructional coaches, and while the school does have one Tier 2 interventionist, the EB model would provide resources for one more.

High Goals

The EB model recommends that educators set high goals for students – a practice that is clear at Fair Haven. School staff report that they want the school to be the highest-performing high school in the state and that they want every student to graduate, and they consistently make

decisions about curriculum, instruction, and school culture in efforts to bring these goals to fruition.

Focus on Tier 1 and Tier 2 Curriculum and Instruction

In numerous ways, educators at Fair Haven encourage students to get a firm grasp on core material, the key focus of the EB model. First, the school requires that all students take 4 credits of English language arts, 3 credits of mathematics, 3 credits of science, and 4 credits of social students and/or history.

Second, the school has increased its focus on freshmen; first-year students, who often face challenges in the transition from the middle school environment to a high school setting, are organized into one of two cohorts and have targeted resources and support.

Third, educators at Fair Haven invest a great deal of time and energy in the main instructional program. Teachers assist each other in lesson planning. They also share curricular materials, assignment ideas, and items for assessment. Across the school, educators and leaders report that they aim to prepare students to do well on assessments but also to engage in inquiry and to become critical thinkers.

Finally, Fair Haven has a number of resources for students who struggle to master content in a Tier 1 setting. The school uses several interventions in both English language arts and mathematics, which allow struggling students to receive additional instruction during the school day. Fair Haven also leverages extracurricular activities to improve students' academic outcomes; the school has an afterschool program open to all students, but students who participate in extracurricular programs are required to take advantage of the extra help offered at this program if their grades fall below a certain level.

Data-based Decision-making

Educators at Fair Haven are serious about using data to foster school improvement. Staff describe a teacher-led and administrator-supported effort to use assessment information to inform curriculum and instruction and to determine when students need additional support. While the school aligns with the EB model in terms of attitudes toward student performance information and access to many types of assessment data, Fair Haven Union High School could align more closely with the EB model if its educators had access to more formative assessment data.

Collaboration among Staff

Fair Haven teachers have multiple opportunities for collaboration. Teachers in the school are organized into department teams, and teachers within each team have a common planning period and are required to meet at least once per week for collaborative planning. Teachers report that they meet even more frequently than that, which aligns with the EB model, which provides resources for daily common planning time and recommends that professional learning

communities meet at least three times per week. Within departmental teams, teachers share materials, lesson plans, assignments, and assessments with each other. In addition to departmental teams, teachers at Fair Haven are organized into interdepartmental teams, where they work with colleagues after school at faculty meeting times on issues that impact the school-wide community.

Leadership

The EB model calls for "dense leadership," where strong administrators empower educators throughout the school to engage in high-quality curricular and instructional practices. Staff at Fair Haven describe a teacher-led, administrator-supported effort to engage in data-based decision making. This practice clearly aligns with dense leadership and demonstrates that both administrators and teachers take responsibility for instructional improvement.

In sum, while there are ways in which practices at Fair Haven do not completely align with the EB model, educators at Fair Haven Union High School have used resources in ways that align with the EB model. Specifically, staffing at in many areas in Fair Haven is higher than the EB model, but the school's staffing resources are low in two areas deemed critical by the EB model: instructional coaches and Tier 2 interventionists. However, the school's clear focus on core subjects, collaborative teacher work, use of a common curriculum in courses, and responsibility for student performance results is highly aligned with the EB model.

Integrated Arts Academy

EXECUTIVE SUMMARY

Integrated Arts Academy at H.O. Wheeler is an arts integration magnet school located in Burlington, Vermont. The school is racially diverse: in 2014-15, almost half of the 267 students at Integrated Arts Academy were White, about one-fifth were either Asian or Black/African American, and less than a tenth were Hispanic/Latino or two or more races. The school is also diverse in terms of students who receive particular services. In 2014-15, over half of the students were eligible for free or reduced-price lunch, just under a third were English language learners, and 18 percent had special needs.

In recent years, Integrated Arts Academy has experienced gains in student achievement in both reading and mathematics. From 2009 to 2013, the percentage of students at the school who scored at either the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by 26 percentage points in reading, from 23 to 49 percent, and 25 percentage points in mathematics, from 16 to 41 percent.

This report describes the context in which those gains occurred. At Integrated Arts Academy, the following conditions permeate the school:

Strong community partnerships. Leaders and educators at Integrated Arts Academy have worked hard to promote community involvement at the school. Increased community involvement has led to community pride and support in the school and its grounds, improved parent involvement, and an infusion of resources (including fiscal resources and other programming support) that has allowed the school to implement both within-school and after-school programs for students.

Collaboration among school staff. Staff members have consciously worked toward increasing collaboration. They have engaged in professional development around the Critical Friends Group approach to professional learning communities (PLCs), and they currently meet in PLC groups once each week. They also have voluntary collaboration time once a week after school, which many teachers use.

Stability in school leadership. After an initial period of high turnover, Integrated Arts Academy has experienced renewed stability in the principal position. This stability is important for building a relationship of collegial support and obtaining year-to-year growth.

A magnet program that addresses student diversity. The school's transition to a magnet school significantly impacted its student body makeup. After the introduction of the magnet enrollment process, the school's student body is more diverse, especially along socioeconomic lines – prior to the reform, almost all students were eligible for free or reduced-price lunch, and after the reform, lower percentages of students qualify for this service. Such changes were expected, since socioeconomic diversity was one of the main goals of the magnet reform.

INTRODUCTION

This report is one of five cases of improving schools that are part of a study of the cost of an adequate education in Vermont. The study is being conducted for the Vermont Legislature by Picus Odden & Associates and their partner consultants. The objective of the study is to identify a level of funding that is adequate for all schools to deploy strategies that give every student in Vermont an equal opportunity to achieve to Common Core college and career ready standards. This case describes how the improvements in student performance in the case school took place. The following sections of this report describe the school's socio-demographic context, student performance levels, staff, goals, schedule, curriculum and instruction, assessments, interventions, professional development, and culture. The report draws upon information from two main sources: (a) review of documents provided by school officials or available online and (b) individual and focus group interviews with 20 members of the school staff (school administrators, instructional staff, and support staff) that occurred in October 2015.

SOCIO-DEMOGRAPHIC CONTEXT

Integrated Arts Academy (IAA) is an elementary school in the Burlington School District, located in Burlington, Vermont's Old North End. According to school staff, many residents of the Old North End live in low socioeconomic households, and refugees from multiple countries have resettled in the area due, in part, to affordable housing. The school, one of two elementary schools in the Old North End, was formerly known as H.O. Wheeler Elementary School. In the 2000s, the district recognized the uneven distribution of students from low-income homes across elementary schools in the district, with H.O. Wheeler and the other elementary school in the Old North End enrolling high proportions of students from low-income homes whereas the other elementary schools in the district did not. The district engaged in discussions regarding remedies for this issue, and, after other alternatives such as redistricting and busing failed to garner stakeholder support, decided to transform the two Old North End elementary schools into magnet schools. With key support from staff from St. Michael's College and the Flynn Center for the Performing Arts, H.O. Wheeler Elementary School became a whole-school arts integration magnet called Integrated Arts Academy in 2008-09.

Students who are new enrollees in elementary schools in the Burlington School District fill out registration forms that rank their elementary school choices. Students are assigned to schools based on the families' proximity to the school, whether or not new enrollees have siblings who attend the school, and, for Integrated Arts Academy and the other magnet school in the district, families' socioeconomic status. School staff estimate that approximately half of the Integrated Arts Academy students live in the neighborhood surrounding the school and half live in a different neighborhood. They also estimate that the student population has shifted from almost all students eligible for free or reduced-price lunch before the introduction of the magnet to approximately 60 percent of students eligible for free or reduced-price lunch after the introduction of the magnet program. According to school staff, the school's community now includes students from a variety of households. Parents of children at the school work in a wide range of occupations, including jobs as professors, lawyers, custodians, and the service sector.

School personnel describe increased interaction with the community since the introduction of the magnet, and they attribute a number of benefits to this increased interaction. First, according to school staff, increased attention to the school grounds as community space has decreased vandalism on campus. Second, increased partnerships with community groups has led the school to secure almost a half million dollars in external funding, which has been a key to the school's ability to integrate arts education into the curriculum and provide arts programming for students.

According to information from the Vermont Agency of Education, in 2014-15, Integrated Arts Academy enrolled 267 students in kindergarten through grade 5. While a preschool program operates on-site, school staff report that it mainly operates separately from the elementary school.[55] In the elementary program, Integrated Arts Academy has two classrooms per grade level; Table 1 indicates average class sizes for each grade level.

Table 1: Integrated Arts Academy Class Sizes, 2014-15

Grade Level	Average Class Size
K (2 classes)	19
1 (2 classes)	21.5
2 (2 classes)	21.5
3 (2 classes)	22
4 (2 classes)	26
5 (2 classes)	23.5
All grade average	22.25

Source: Vermont Agency of Education, Enrollment Report for Chittenden County: 2014-15, and personal communication with school staff.

In 2014-15, almost half (49 percent) of students were White, about one-fifth of students were either Black/African American or Asian (23 and 19 percent, respectively), and less than a tenth were two or more races or Hispanic/Latino (7 and 4 percent, respectively; Table 2). Over half of the students (56 percent) were eligible for free or reduced-price lunch, just under a third (28 percent) were English language learners (ELL), and 18 percent had special needs.

[55] Given that the preschool program mainly operates separately from the elementary school, the majority of this report focuses on issues specific to kindergarten through grade 5.

Table 2: Integrated Arts Academy student characteristics, 2014-15

Student Characteristics	Percentage of Student Population
Race/ethnicity	
American Indian/Alaska Native	‡
Asian	19
Black/African American	23
Hispanic/Latino	3
Native Hawaiian/Pacific Islander	‡
Two or more races	7
White	49
Eligible for free or reduced-price lunch	56
English language learners	28
Students with special needs	18

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report given student privacy considerations, or that data were not available for the school or at the time of posting the information.
Note: Demographic data include information for the prekindergarten program, which is at the school but functions apart from the school. Students with special needs include students with an IEP, a 504 plan, or an EST plan.
Source: Vermont Agency of Education, School Report for Integrated Arts Academy: 2014-15.

STUDENT PERFORMANCE

In recent years, and especially since the school shifted to become a magnet program with new enrollment practices, IAA has demonstrated improvements in student performance. From 2009 to 2013, student performance has improved at Integrated Arts Academy, both overall and in some student subgroups.

In *reading* (Table 3), for example, from 2009 to 2013, the percentage of students who scored at the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by:

- 26 points for all students,
- 11 points for English language learner (ELL) students,
- 16 points for students with special needs,
- 40 points for White students, and
- 18 points for African American or Black students.

Additionally, the percentage of students who fell into the category of proficient with distinction in reading grew by eight points for all students and 12 points for White students.

In *mathematics* (Table 4), for example, from 2009 to 2013, the percentage of Integrated Arts Academy students that scored at the proficient or proficient with distinction levels grew by:

- 25 points for all students,
- 10 points for ELL students,
- 12 points for students with special needs,[56]
- 37 points for White students, and
- 14 points for African American or Black students.[57]

Additionally, the percentage of students who scored at the proficient with distinction level in mathematics grew by eight points for all students and 16 points for White students.

[56] In 2009, mathematics scores for students with special needs were not reportable. Therefore, this percentage point difference reflects the increase from 2010 to 2013.
[57] In 2009, mathematics scores for African American or Black students were not reportable. Therefore, this percentage point difference reflects the increase from 2010 to 2013.

Table 3: Percent of Integrated Arts Academy Students who performed at the proficient or proficient with distinction levels on the NECAP grades 3-8 reading test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	22	28	33	38	40
Percent proficient with distinction	1	1	7	6	9
Total at proficient level or above	23	30	40	43	49
Students eligible for free or reduced-price meals					
Percent proficient	‡	28	33	‡	30
Percent proficient with distinction	‡	1	7	‡	3
Total at proficient level or above	‡	30	40	‡	33
ELL students					
Percent proficient	13	10	16	16	22
Percent proficient with distinction	0	0	0	0	2
Total at proficient level or above	13	10	16	16	24
Students with special needs					
Percent proficient	4	4	11	29	13
Percent proficient with distinction	0	0	0	0	7
Total at proficient level or above	4	4	11	29	20
White students					
Percent proficient	27	35	38	52	55
Percent proficient with distinction	2	1	11	8	14
Total at proficient level or above	29	37	49	61	69
African American or Black students					
Percent proficient	14	13	25	29	30
Percent proficient with distinction	0	3	0	2	2
Total at proficient level or above	14	16	25	31	32

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.

NOTE: Totals are based on unrounded estimates. Proficiency results are not presented for Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students due to small numbers of students who took the assessment.

Source: Vermont Agency of Education, All NECAP Data Files.

Table 4: Percent of Integrated Arts Academy Students who performed at the proficient or proficient with distinction levels on the NECAP grades 3-8 mathematics test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	15	18	32	29	32
Percent proficient with distinction	1	4	7	11	9
Total at proficient level or above	16	22	39	40	41
Students eligible for free or reduced-price meals					
Percent proficient	‡	18	32	‡	23
Percent proficient with distinction	‡	4	7	‡	2
Total at proficient level or above	‡	22	39	‡	24
ELL students					
Percent proficient	7	8	23	25	15
Percent proficient with distinction	0	0	0	0	2
Total at proficient level or above	7	8	23	25	17
Students with special needs					
Percent proficient	‡	4	0	7	13
Percent proficient with distinction	‡	4	5	7	7
Total at proficient level or above	‡	8	5	14	20
White students					
Percent proficient	21	23	34	30	43
Percent proficient with distinction	1	7	12	19	17
Total at proficient level or above	22	30	47	49	59
African American or Black students					
Percent proficient	‡	8	14	17	22
Percent proficient with distinction	‡	0	0	2	0
Total at proficient level or above	‡	8	14	19	22

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.

NOTE: Totals are based on unrounded estimates. Proficiency results are not presented for Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students due to small numbers of students who took the assessment.

Source: Vermont Agency of Education, All NECAP Data Files.

SCHOOL STAFF

According to the Vermont Agency of Education School Report for 2014-15, the average teacher salary at Integrated Arts Academy was $65,275, which was lower than the average teacher salary for the district ($66,610) but higher than the state as a whole ($56,387).

In the years since the adoption of the arts integration magnet focus, the school has experienced staff turnover, first in the principal position and then in the teaching staff.[58] After the introduction of the arts magnet focus, the school had three principals who left after one year or less; the fourth principal, who had been a teacher at the school at the time of the shift to the arts magnet focus, became the principal in the middle of the 2010-11 school year and remains as the leader of the school. For teachers, the turnover was not immediate, but since the introduction of the magnet and eventual stability in the principalship, the school has replaced about half of its classroom teaching staff. Table 5 shows a breakdown of staff positions for the 2015-16 school year.

IAA has 12 classroom teachers (two per grade) and four elective teachers (three of whom - visual arts, music, and physical education/movement – are funded through the school budget, and one of whom – drama – is funded through a grant from an arts agency). The school also employs a library media specialist, who provides instruction to students as an elective. The school has three special educators, three teachers of English for speakers of other languages (ESOL), and two Tier 2 interventionists.[59] The school's staff includes 8 instructional para-educators for the main instructional program;[60] according to school staff, these para-educators work in a variety of capacities, including serving large groups of students, small groups of students, and, in some cases, exclusively with one student. The school does not have any non-teaching instructional coaches for core subjects, though school staff report that the school has many informal teacher leaders and that they have access to district curriculum coordinators for core subjects. Instructional staff are organized into teams which comprise grade-level teachers, special educators, ESOL teachers, and intervention teachers.

In addition to the main instructional program, IAA also houses a self-contained program for children of newly-arrived refugee families. The program, called Studying Toward English Proficiency (STEP), is intended to serve as a one-year transition into school and serves students in grades 1 through 5.[61] Two full-time teachers and two part-time para-educators work with the STEP program.

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[58] The adoption of the magnet focus also led to additional staffing resources. One notable resource is not noted on Table 5, since the position no longer existed in the 2015-16 school year. The school no longer has a magnet coordinator, but for the first six years that the school was a magnet school, the school had a part-time staff member who performed various functions such as managing the enrollment process.

[59] Prior to the 2015-16 school year, the school staff included five special educators for the general education program and no dedicated Tier 2 interventionists. Beginning in the 2015-16 school year, the school staff allocation shifted to include three special educators and two Tier 2 interventionists.

[60] As noted in Table 5, the school also has two classroom volunteers; these volunteers come to the school through United Way and are in addition to the para-educators employed by the school.

[61] The 2015-16 school year is the first year that first and second grade students have been eligible for the STEP program.

Table 5: Staffing at Integrated Arts Academy, 2015-16

Category	FTE
Administration	
Principal	1.0
Secretary/administrative support	1.0
Main program	
Core teachers	12.0
Elective teachers	3.0
Grant-funded elective teachers	1.0
Library/media specialist	1.0
Special education teachers	3.0
ESOL teachers	3.0
Tier 2 interventionists	2.0
Intensive language program (STEP) educators	2.0
Arts integration coach	0.8
Aides	
Instructional para-educators	8.0
Intensive language program (STEP) para-educators	1.25
Library/media room para-educators	0.5
Classroom volunteers*	2.0
Pupil support	
School counselor	1.0
Psychologist	1.0
Social worker	0.4
Mental health clinicians*	0.8
Nurse	1.0
Speech language pathologist	1.0
Planning room para-educator	1.0
Afterschool program staff*	2.0
Cafeteria staff	4.0
Custodians and maintenance staff	2.0

* Classroom volunteers do not receive compensation from the school. Afterschool program staff are employees of the Boys and Girls Club. Two part-time mental health clinicians are employees of an external agency.

Source: Personal communication with school staff.

The school has a number of staff members who focus on students' behavioral, health, and social-emotional issues. These staff members include a school counselor, a school psychologist, one

part-time social worker, and two part-time mental health clinicians. One para-educator works in the planning room, which is a dedicated space for students to go temporarily when they are experiencing behavior issues that make it challenging for them to remain safely in the classroom setting. The school also has one nurse and a speech language pathologist.

Due to the arts magnet focus of the school, Integrated Arts Academy has an arts coach, who facilitates arts integration professional development for IAA educators and works to build relationships with community organizations. Additionally, although they are not listed on Table 5 due to their short-term tenure in the school, Integrated Arts Academy sometimes welcomes artists-in-residence, some of whom work on a whole-school basis and others who take smaller residencies. Whole-school artists in residence typically work at the school for 10 days, whereas smaller, more grade- or subject-specific residencies can take place for approximately 1 to 2 hours per week for 6 week periods. Additionally, the school is in its third year of being a laboratory school for teaching artists from a local college.

GOALS AND SCHOOL ORGANIZATION

The school's leadership team—which includes representation from classroom teachers, specialists, and other educators (such as ESOL and special education teachers)—creates and maintains the school's Continuous Improvement Plan (CIP). The leadership team generally meets once per month, though members meet more frequently early in the academic year. The school's leadership team comprises five committees: (1) arts; (2) diversity and equity; (3) professional development and curriculum; (4) Positive Behavioral Interventions and Supports (PBIS); and (5) parent involvement.

Goals

Integrated Arts Academy's CIP includes multiple goals that illustrate that the school is working to implement a multi-tiered system of support (MTSS) model, which provides academic and social-emotional supports and seeks to engender parent and community engagement. For instance, the school's plan includes goals geared toward increasing time and opportunities for collaboration among general educators, special educators, and other intervention teachers, so that the school as a whole will have an integrated plan for Tier 1 instruction as well as targeted interventions. The school's CIP also includes plans to support educators' professional learning, to implement consistent and school-wide discipline and behavior management strategies, and to improve parent engagement at the school.

In addition to the CIP, Integrated Arts Academy maintains a list of belief statements that include the following ten goals:

- Creating a safe space
- Committing to success for all
- Embracing diversity
- Flourishing through the arts
- Welcoming multiple perspectives

- Building community
- Celebrating our gifts and contributions
- Communicating transparently
- Actively collaborating
- Personalized learning.

School leaders refer to these goals in discussions about the school and hope to advance these goals throughout the school year.

Daily Schedule

The student day at Integrated Arts Academy starts at 8:10 am and ends at 2:50 pm, with one hour for lunch and recess. The structure of the day varies for students at different grade levels, but, generally, students have between 60 and 80 minutes of instruction in English language arts per day and 50 to 60 minutes of instruction daily in mathematics. Arts elective educators and general classroom educators co-teach in grades 2 through 5 twice a week for approximately 45 minutes;[62] often, these co-taught lessons focus on social studies or science content. Classrooms that serve younger students (grades 1 through 3) have designated times for intervention, whereas classrooms that serve the older grades do not have protected intervention times. Students in all grades have elective periods throughout the week, and students in the older grades have 30 minutes of instruction in stringed instruments twice a week.

Twice per week, the entire school community gathers together for whole-school assemblies. At the beginning of each week, the school holds Monday morning meeting, which lasts for approximately 30 minutes and includes a student recognition ceremony. At the end of each week, the school meets for approximately 30 minutes for Friday town meeting, which includes a celebration of the arts. Parents are welcome to attend both events, and school staff report that many parents (typically, between 30 and 60 parents) do.

The teacher contract day is seven hours and 45 minutes. Teachers have approximately 45 minutes of planning time per day, which occurs when their students are at their elective periods. The school sets aside time after school on Mondays for collaborative lesson-planning; though use of this time to meet with colleagues as needed to plan for upcoming lessons is voluntary, many educators co-plan during this time. Every Wednesday, students are dismissed from school early, and teachers use this time for collaboration in professional learning communities (PLCs). Each PLC—which consists of grade-level teachers plus special educators, ESOL teachers, and intervention teachers—has time to meet to discuss matters of curriculum, instruction, and student grouping. Arts specialists sometimes join grade-level groups and other times meet with each other as an arts specialist team.

CURRICULUM AND INSTRUCTIONAL PROGRAM

[62] The 2015-16 school year is the first year that includes second grade in the co-teaching model. In past years, only students in grades 3 through 5 had lessons with general educator and arts educator co-teachers.

This section addresses the schools approach to core curriculum, its instructional focus, assessments, academic interventions, behavioral interventions, professional development and school culture.

Curriculum

Across subjects, curriculum at Integrated Arts Academy is shifting due to the recent adoption of new standards (specifically, the Common Core State Standards in English language arts and mathematics and the Next Generation Science Standards). In English language arts, teachers at Integrated Arts Academy rely on a variety of materials, including a district curriculum and materials from the Reading and Writing Project housed at Teacher's College. For English language arts, teachers provide instruction in word study and spelling, reading, and writing. In mathematics, the school previously used the Bridges curriculum but, amid the change in standards and related assessments, has adopted curriculum from Eureka math. According to the Eureka math website, the curriculum is a prekindergarten through grade 12 series that was developed to meet the requirements of new college and career standards. IAA staff report that science curriculum is teacher-developed, and teachers base selection of materials on the Next Generation Science Standards. Social studies curriculum, too, is teacher-developed and based on the Vermont standards for social studies.

As an arts integration school, Integrated Arts Academy implements many kinds of arts curricula, both within arts specialists' classrooms and throughout the school. Arts specialists generally select their own curriculum for use when students come to their classrooms for arts specials time. Additionally, the school provides common arts education experiences for students. For instance, students in the higher grades participate in a stringed instrument program for 30 minutes twice a week, and the school has also introduced a similarly-structured vocal music program for younger students. With the exception of the dedicated, co-taught arts integration period for older students, the extent to which classroom teachers integrate the arts into their lessons is up to the individual teacher, with assistance from arts education specialists. Staff perceive a high degree of support for the arts integration model across the school.

Instruction

A key instructional strategy at Integrated Arts Academy is to use hands-on arts experiences to teach content in core subject areas. School staff members perceive that the integration of arts curriculum and instruction in core classes helps students access material because it provides multiple ways to understand a concept. Staff also report that arts integration helps students become engaged, excited, and creative.

In addition to instructional strategies that rely on arts integration, teachers at IAA explained that they use a Reader's Workshop model – with a whole-group mini-lesson followed by individual or small group work – for instruction not only in English language arts but also in mathematics. Teachers at the school are not required to use this instructional strategy, but staff perceive that the model is commonly used.

Assessments

Teachers at Integrated Arts Academy use information from a variety of assessments to gauge student performance. In addition to annual state assessments (formerly the NECAP, now the Smarter Balanced Assessment Consortium (SBAC) exam), students at Integrated Arts Academy take benchmark and screening assessments (such as Fountas and Pinnell literacy benchmarks and district mathematics screeners), unit assessments (associated with the Eureka mathematics curriculum or teacher-developed), and more informal formative assessments (teacher-developed). Teachers at Integrated Arts Academy also use teacher-created rubrics to assess student work, especially work in the arts. Teachers look at student data from the suite of aforementioned assessments as well as student discipline data when they meet in PLCs.

Academic Interventions

As noted above in the section on the school schedule, some grades in the school have pre-established time during the day for interventions. Teachers whose grades do not have time set aside for interventions report that, to the extent possible, they make time for interventions for students who struggle to master content from Tier 1 instruction. The school previously used the Reading Recovery program for intervention in English language arts, but it no longer has the resources to do so. It still uses the Fountas and Pinnell intervention. School staff also use the Wilson Reading program for English language arts interventions; according to the Wilson reading website, this program is a "structured literacy program" that focuses on "phonemic awareness, decoding and word study, sight word recognition, spelling, fluency, vocabulary, oral expressive language development, [and] comprehension." In mathematics, IAA uses the Do the Math intervention – which according to the program website, contains modules for addition and subtraction, multiplication, division, and fractions – and the Key mathematics program for special education students. Intervention teachers' work varies across grade levels, due in part to the fact that some grades have more set-aside intervention times than other grades. Generally, the intervention teachers implement programs in pullout settings and also provide push-in instruction during class time.

Educators at IAA, like educators throughout the state of Vermont, can also put educational support team (EST) plans into place in order to create formal plans for struggling students, regardless of whether or not these students have special education plans (i.e., IEP or 504 plans). These plans could include a variety of supports and remain in place for as long as needed.

In addition to these interventions, students with special needs and ELL students receive targeted support. According to school staff, the most common strategy for special education instruction is push-in instruction, though students sometimes receive instruction in pullout settings. ELL students receive a combination of push-in and pull-out instruction, and, according to school staff members, push-in instruction occurs during classroom time in English language arts.

Students at Integrated Arts Academy also have opportunities for learning beyond the school day and school year. The school has an after school program that operates in conjunction with the Boys and Girls Club. Enrollment occurs on a first-come, first-served basis; generally, the

program can accommodate all students from older grades who want to participate, but the program has a waitlist for students in younger grades. Additionally, the district operates a summer school program. Teachers at Integrated Arts Academy can recommend summer school participation, and parents are can choose whether or not to enroll their children based on those recommendations.[63]

Behavioral and Social-Emotional Interventions

In a number of ways, educators at Integrated Arts Academy attempt to foster a positive environment and promote healthy social-emotional development for students. One way is through the implementation of Positive Behavioral Interventions and Supports (PBIS), which rewards students for displays of positive behaviors. The school also celebrates students' positive behavior, promotes social learning, and encourages community building at Monday morning meeting. Additionally, the school implements a character education program called Second Step to teach characteristics like respect and empathy. The school counselor teaches modules on anti-bullying, and classroom teachers implement the remainder of the Second Step curriculum in their classrooms.

Integrated Arts Academy also has a number of resources available to address negative behavior or unhealthy social-emotional development. The section on school staff outlines a number of school personnel who are equipped to assist students who are struggling with behavior issues, and, as noted in that section, the school also has dedicated space for students who need a break from the classroom or who need behavioral assistance. Additionally, as noted above, Integrated Arts Academy implements EST plans. EST plans are not limited to addressing behavioral issues, but school personnel can put them into place when students face behavioral challenges. IAA relies on EST plans to assist students with social-emotional growth issues, and ESTs at the school include staff such as the counselor, psychologist, principal, nurse, social worker, the student's classroom teacher, and others who work with the student (such as an ESOL teacher or special educator).

PROFESSIONAL DEVELOPMENT

Since the introduction of the arts integration magnet focus and increased stability in the principal position, teachers at Integrated Arts Academy have engaged in many professional development sessions focused on either (a) how to create lessons that integrate arts curriculum and core curriculum or (b) staff collaboration (such as through the Critical Friends Group approach to professional learning communities). Some professional development opportunities, such as annual staff retreats, focus on both arts integration and staff collaboration. The school's leadership team has also begun to survey teachers to determine other desired topics of professional development; last year, in response to results from these surveys, the school focused on professional development in English language arts.

[63] Resources for summer school programs are not included in the staff counts in Table 5.

Other formal professional development opportunities exist at the district level, either during in-service days that happen around the beginning and end of the academic year or during meetings that occur during the school day (though attendance at school-time district professional development is voluntary). District-sponsored professional development takes a variety of forms, including cross-school, grade-level team meetings.

Professional development at IAA also occurs in instances of collaboration among educators. One opportunity for professional collaboration occurs each Monday after school, when time is reserved for collaborative planning with colleagues (regardless of whether those colleagues are members of the same PLC). Use of this time, some of which falls outside of teachers' contract hours, is voluntary, but many teachers use this time to work with their colleagues. A second opportunity for professional collaboration occurs each Wednesday, when students have an early dismissal. One Wednesday each month is reserved for teacher-led professional development. The other Wednesdays are reserved for PLC meetings. Primarily, teachers use PLC time to go over student performance data in English language arts and mathematics, but they use one meeting per month for collaborative planning. Teachers report that, during collaborative planning time, they share materials, create lesson plans, and debrief about the strengths and weaknesses of past lessons.

SCHOOL CULTURE

Staff members report that the consistency in staffing, particularly in the principalship, that the school has experienced in recent years has allowed for year-to-year growth. They also describe an environment where teachers share materials and are open to collegial observation of practice. Teachers say that, when they face challenges with curriculum or instruction, they actively problem-solve and are open to trying new and creative strategies for tough issues.

School staff members also describe a camaraderie among staff members, which some attribute, at least in part, to conscious efforts to increase collaboration and support. Educators at Integrated Arts Academy care about each other and are, in the words of one staff member, "like a family."

According to IAA staff, the culture at Integrated Arts Academy is one that is welcoming to parents and open to multiple forms of parent participation. According to school personnel, families and parents try to be involved in school activities such as Monday morning meeting and Friday town meeting. The school also has time after Monday morning meeting for parents to connect with each other over coffee.

Finally, school staff members describe that the relationships the school has with the community as positive. These community relationships take a variety of forms and bring a number of benefits. For instance, a member of the neighborhood has created gardens around the building, which has led to a cleaner and more beautiful campus. As noted in the section on school staffing, partnerships with agencies such as the United Way and the Boys and Girls Club has provided the school with staffing support for important educational supports and programming.

Additionally, financial support from external agencies – primarily arts agencies – has allowed the school to offer arts curriculum and programs that it otherwise would not be able to fund.

SUMMARY

This report outlines several characteristics that are central to the teaching and learning context at Integrated Arts Academy. These characteristics include:

Strong community partnerships. Leaders and educators at Integrated Arts Academy have worked hard to promote community involvement at the school. Increased community involvement has led to community pride and support in the school and its grounds, improved parent involvement, and an infusion of resources (including fiscal resources and other programming support) that has allowed the school to implement both within-school and after-school programs for students.

Collaboration among school staff. Staff members have consciously worked toward increasing collaboration. They have engaged in professional development around the Critical Friends Group approach to professional learning communities (PLCs), and they currently meet in PLC groups once each week. They also have voluntary collaboration time once a week after school, which many teachers use.

Stability in school leadership. After an initial period of high turnover, Integrated Arts Academy has experienced renewed stability in the principal position. This stability is important for building a relationship of collegial support and obtaining year-to-year growth.

A magnet program that addresses student diversity. The school's transition to a magnet school significantly impacted its student body makeup. After the introduction of the magnet enrollment process, the school's student body is more diverse, especially along socioeconomic lines – prior to the reform, almost all students were eligible for free or reduced-price lunch, and after the reform, lower percentages of students qualify for this service. Such changes were expected, since socioeconomic diversity was one of the main goals of the magnet reform.

Alignment with the Evidence-Based Model

In a number of ways, resource allocation at Integrated Arts Academy aligns with the recommendations set forth in the Evidence-Based (EB) model; there are ways, however, in which the school does not align with the model. The following paragraphs highlight key similarities and differences.

Staffing

Class sizes at Integrated Arts Academy range from 19 to 26, with most classes in the low 20s. The overall average class size of 22.25 students is somewhat larger than the EB model, which provides resources for core classes of 17 students. The ratio of elective to core teachers at IAA

(25 percent)[64] is higher than EB model, which recommends that elective teachers comprise an additional 20 percent of core teachers. While IAA's ratio is likely higher, at least in part, due to the arts focus of the school, it does contain higher numbers of elective teachers than would be provided through EB model resources. The school's staffing numbers for ESOL teachers, special educators, and para-educators are also much higher than the EB model provides, but the number of Tier 2 interventionists matches recommended levels. Finally, while the school has an instructional coach for the arts and access to district-level core subject instructional coaches, the school does not have school-level instructional coaches for English language arts or mathematics, which are critical resources provided by the EB model.

Interventions for Struggling Students

Though the implementation of intervention periods vary across grades in the school, Integrated Arts Academy has intervention periods scheduled into the day in some grades and is working toward increased intervention time in other grades. During these intervention periods, educators at IAA are able to employ intervention programs such as the Wilson reading and Do the Math programs; accordingly, struggling students have the opportunity to widen their exposure to English language arts and mathematics curriculum.

Students who struggle with behavior also have opportunities for extra support at Integrated Arts Academy. The school implements PBIS in an effort to promote positive behaviors, and the counselor, in conjunction with classroom teachers, implements the Second Step curriculum to teach character education. Additionally, like at other schools throughout Vermont, students can receive additional resources from an educational support team (EST) for behavioral as well academic challenge.

Collaboration among Educators

Educators at IAA are organized in professional learning communities, and each PLC team has an opportunity to meet once a week. Additionally, the school has set aside after-school time once a week for collaborative planning, and teachers often make use of this time to work with their colleagues to plan lessons and share materials. Collaboration at IAA is moving toward the EB model; the EB model encourages collaboration to occur at least three times a week and resources schools so collaborative teams can meet five times a week for 45 minutes each.

In sum, Integrated Arts Academy represents a school that is on the path toward increased student achievement. Educators at the school are collaborating more with each other and working toward providing students with high-quality instruction. There are ways in which the school could align more closely with the EB model – for instance, in aligning staff numbers more closely with EB levels and in providing more protected time for Tier 2 interventions for struggling students – but this report highlights that steps are underway to promote student success at Integrated Arts Academy.

[64] This calculation includes only those elective teachers whose salaries are paid by the school; the grant-funded position is excluded.

Oak Grove Elementary School

EXECUTIVE SUMMARY

Oak Grove Elementary School, part of the Brattleboro Town School District and Windham Southeast Supervisory Union (WSESU), is the smallest elementary school in Brattleboro, Vermont. In 2014-15, the school enrolled 110 students in kindergarten through grade 6. Most of the students at Oak Grove are White, and in 2014-15, thirty-one percent of the students at Oak Grove were eligible for free or reduced-price lunch.

In recent years, Oak Grove has posted remarkable improvements in student achievement in both reading and mathematics. In reading, from 2009 to 2013, the percentage of Oak Grove students who scored at either the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by 21 points, from 70 percent to 91 percent. In mathematics, the percentage of students at Oak Grove who scored at the proficient or proficient with distinction levels increased by 29 points, from 53 percent to 82 percent.

This report describes the context in which these gains occurred. At Oak Grove, the following conditions permeate the school:

Common curriculum. In recent years, educators at Oak Grove and throughout the Windham Southeast Supervisory Union have made changes in their curricular approach, especially in English language arts and mathematics. Specifically, Oak Grove educators adopted a common school-wide curriculum, with a phonics emphasis in English language arts and problem-solving focus in mathematics.

Multiple supports for struggling students. Educators at Oak Grove take implementation of the multi-tiered system of support (MTSS) model seriously and have the resources necessary to implement this model with fidelity. For instance, Oak Grove teachers have access to benchmark data and support in analyzing these data from the supervisory union, and they use this student performance information to place students into skills-based intervention groups. Oak Grove educators also have time to provide students in these groups with sustained interventions; they embed time for intervention into the school day four to five times per week, and struggling students receive Tier 2 instruction from a variety of school personnel, including credentialed tutors.

Teacher collaboration and data-based decision making. All staff meet twice per month to discuss issues that impact the entire school, and teachers meet in vertical teams two times each month to collaborate on matters of curriculum, instruction, and lesson planning. In each of these endeavors, educators rely on student performance data from multiple assessments – to which they have access through real-time data management systems that allow them to review student information at any time – to inform their work.

Consistent and sustained support from the supervisory union. Oak Grove does not have instructional coaches at the school site, but WSESU employs a full-time literacy coach and a part-time math coach in addition to a full-time literacy curriculum coordinator and a part-time math curriculum coordinator. These central office personnel provide coaching and support to Oak Grove teachers throughout the school year; the literacy coach, in particular, is often in the school at least once per week.

INTRODUCTION

This report is one of five cases of improving schools that are part of a study of the cost of an adequate education in Vermont. The study is being conducted for the Vermont Legislature by Picus Odden & Associates and their partner consultants. The objective of the study is to identify a level of funding that is adequate for all schools to deploy strategies that give every student in Vermont an equal opportunity to achieve to Common Core college and career ready standards. This case describes how the improvements in student performance in the case school took place. The following sections of this report describe the school's socio-demographic context, student performance levels, staff, goals, schedule, curriculum and instruction, assessments, interventions, professional development, and culture. The report draws upon information from two main sources: (a) review of documents provided by school officials or available online and (b) individual and focus group interviews with 23 supervisory union and school staff (school administrators, instructional staff, and support staff) that occurred in October 2015.

SOCIO-DEMOGRAPHIC CONTEXT

Oak Grove Elementary School is located in Brattleboro, Vermont, close to the borders of New Hampshire and Massachusetts. Oak Grove is the smallest of three elementary schools in the Brattleboro Town School District and is part of the Windham Southeast Supervisory Union (WSESU), which includes 9 schools and a regional career center. The school's community has families from both high-income and low-income backgrounds, and parents' jobs include careers in education (both in K-12 settings and at the School of International Training, which has both undergraduate and graduate programs), healthcare, trades, and the service sector. Brattleboro is also home to the Brattleboro Retreat, a center dedicated to helping people overcome trauma and drug abuse.

Oak Grove is a neighborhood school, and most of its students can walk or ride their bikes to campus. School staff describe a busy playground before and after school, where parents and children gather to play and spend time with each other.

Oak Grove is a small school with only one class per grade level (Table 1). According to data from the Vermont Agency of Education, enrollment at Oak Grove has declined over time: in 2008-09, enrollment was 146 students and in 2014-15, enrollment was 110.[65] According to school staff, 122 students attend Oak Grove in the 2015-16 school year.

[65] While information from the Windham County enrollment report also provides student counts for a prekindergarten program, the prekindergarten program operates separately from the school.

Table 1: Oak Grove Elementary School class sizes, 2014-15

Grade Level	Class Size
K	13
1	18
2	21
3	16
4	14
5	15
6	13
All grade average	15.7

Source: Vermont Agency of Education, Enrollment Report for Windham County: 2014-15, and personal communication with school staff.

Over three-quarters of the students at Oak Grove are White (Table 2). In 2014-15, thirty-one percent of the students at Oak Grove were eligible for free or reduced-price lunch. A smaller proportion of the school's students had special needs (8 percent). Oak Grove's student population does not include many or any English language learner (ELL) students.[66]

Table 2: Oak Grove Elementary School student characteristics, 2014-15

Student Characteristics	Percentage of Student Population
Race/ethnicity	
American Indian/Alaska Native	‡
Asian	1
Black/African American	3
Hispanic/Latino	3
Native Hawaiian/Pacific Islander	‡
Two or more races	6
White	87
Eligible for free or reduced-price lunch	31
English language learners	‡
Students with special needs	8

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
Note: Demographic data include information for the prekindergarten program, which is included in the school report but functions apart from the school. The remainder of this report focuses

[66] Academy School, also located in Brattleboro, provides services to ELL students. This series of reports on improving schools in Vermont includes a report on Academy School.

exclusively on students in kindergarten through grade 6. Students with special needs include students with an IEP or a 504 plan. It *excludes* students with an EST plan.
Source: Vermont Agency of Education, School Report for Oak Grove Elementary School: 2014-15.

STUDENT PERFORMANCE

Oak Grove has posted remarkable improvements in student performance from 2009 to 2013.

In *reading* (Table 3), from 2009 to 2013, the percentage of Oak Grove students who scored at either the proficient or proficient with distinction levels on the New England Common Assessment Program (NECAP) exam increased by 21 points for all students and 27 points for students who were eligible for free or reduced-price lunch. Additionally, the percentage of students who scored at the proficient with distinction level in reading grew by 19 points for all students and 15 points for students who were eligible for free or reduced-price lunch.

Table 3: Percent of Oak Grove Elementary School students who performed at the proficient or proficient with distinction levels on the NECAP grades 3-8 reading test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	58	49	45	46	60
Percent proficient with distinction	12	18	26	28	31
Total at proficient level or above	70	68	71	73	91
Students eligible for free or reduced-price meals					
Percent proficient	62	57	50	58	74
Percent proficient with distinction	4	7	13	15	19
Total at proficient level or above	66	64	63	73	93
Students with special needs					
Percent proficient	38	7	35	31	‡
Percent proficient with distinction	0	0	0	0	‡
Total at proficient level or above	38	7	35	31	‡
White students					
Percent proficient	58	49	45	‡	‡
Percent proficient with distinction	12	18	24	‡	‡
Total at proficient level or above	70	67	69	‡	‡

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
NOTE: Totals are based on unrounded estimates. Proficiency results are not presented for English language learners (ELLs), Black/African American, Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students, or students of two or more races due to small numbers of these students in the school.
Source: Vermont Agency of Education, All NECAP Data Files.

In *mathematics* (Table 4), the percentage of students at Oak Grove who scored at the proficient or proficient with distinction levels increased 29 points for all students and 36 points for students who were eligible for free or reduced-price lunch. Additionally, the percentage of students in the proficient with distinction category in mathematics increased by 12 points for all students and 15 points for students who were eligible for free or reduced-price lunch.

Table 4: Percent of Oak Grove Elementary School students who performed at the proficient or proficient with distinction levels on the NECAP grades 3-8 mathematics test, by student characteristics: 2009-2013

Performance Level	2009	2010	2011	2012	2013
All students					
Percent proficient	34	39	48	51	51
Percent proficient with distinction	19	17	18	27	31
Total at proficient level or above	53	56	66	77	82
Students eligible for free or reduced-price meals					
Percent proficient	32	47	53	58	52
Percent proficient with distinction	11	7	5	15	26
Total at proficient level or above	43	53	58	73	79
Students with special needs					
Percent proficient	24	7	41	44	‡
Percent proficient with distinction	5	7	0	6	‡
Total at proficient level or above	29	14	41	50	‡
White students					
Percent proficient	37	38	46	‡	‡
Percent proficient with distinction	20	18	19	‡	‡
Total at proficient level or above	57	56	65	‡	‡

‡ Indicates that student subgroup had no members, that the number of members in the subgroup was too small to report, given student privacy considerations, or that data were not available for the school or at the time of posting the information.
NOTE: Totals are based on unrounded estimates. Proficiency results are not presented for English language learners (ELLs), Black/African American, Hispanic/Latino, Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander students, or students of two or more races due to small numbers of students who took the assessment.
Source: Vermont Agency of Education, All NECAP Data Files.

SCHOOL STAFF

According to information from the Vermont Agency of Education, the average teacher salary for Oak Grove in 2013-14 was $54,133, which was lower than the average teacher salary for both the supervisory union ($57,696) and the state of Vermont as a whole ($56,387).

Staff turnover in the Windham Southeast Supervisory Union overall and Oak Grove in particular is relatively low; district and school leaders are "careful about who [is hired], because they stay." While Oak Grove has a new principal for the 2015-16 school year, this leader has had other roles in the district and the staff of the school has been relatively stable across time. Table 5, below, outlines the staff at Oak Grove in 2015-16. As the table and corresponding text illuminate, Oak

Grove has, as one staff member described, "a lot of manpower" to provide instruction and support for students.

Table 5. Staffing at Oak Grove Elementary School, 2015-16

Category	FTE
Administration	
Principal	1.0
Secretary/Administrative Support	1.0
Main Program	
Core Teachers	7.0
Elective Teachers	1.8
Special Education Self-Contained	2.0
Special Education	2.0
Interventionists/Academic Support	3.0
Library Media Specialist	1.0
Aides	
Para-educators (General Education Program)	5.7
Para-educators (Special Education Self-Contained)	3.0
Pupil Support	
School Counselor	1.0
School-based Clinician/Social Worker	0.6
Speech/Language Pathologist	0.7
Nurse	1.0
Behavior Intervention Specialist	1.0
Other Behavioral Pupil Support	1.0
Custodians and Maintenance Staff	2.0

Note: Special education and speech/language staff work at the school level but are employees of the supervisory union. The school-based clinician is an employee of an external health organization.
Source: Personal communication with school staff.

As outlined in Table 5, Oak Grove has seven classroom teachers – one for each grade in the school – and several elective teachers who split their time between Oak Grove and other schools in the supervisory union (which accounts for the partial FTE in the table above). Classroom teachers are organized into vertical teams: one team for kindergarten and grade 1, a second team for grades 2 and 3, and a third team for grades 4, 5, and 6.

These classroom teachers receive support from six para-educators, two of whom work on slightly less than a full-time basis (which accounts for the partial FTE in the table above). A number of the school's para-educators are highly-educated; for instance, some para-educators have teaching

credentials and one is pursuing a master's degree. For the most part, each grade has support from one para-educator, but for the 2015-16 academic year, one para-educator works with grades 4 and 5.

Two special educators provide support for students with special needs who participate in the general education setting, three staff members are dedicated to providing Tier 2 intervention services for struggling students, and one library/media specialist serves the entire school.

Some students at Oak Grove have particularly high needs. While school staff are working on integrating these students into the general education setting more fully than they have been in past years, these students participate in an intensive program that is staffed by two teachers (one for kindergarten through grade 3 and another for grades 4-6) and three para-educators.

Multiple staff members at Oak Grove provide additional pupil support; most of these staff members focus on students' social and emotional health. The school has a counselor, a behavior specialist who is assisted by a behavior support para-educator, a nurse, and a school-based social worker who comes to the school three days per week. A speech and language pathologist also works at the school three and a half days each week.

The school does not have any dedicated, non-teaching instructional coaches. However, the supervisory union has a full-time literacy coach and a part-time math coach, and teachers at Oak Grove report that they can call upon these central office officials (particularly the literacy coach, who is able to dedicate all of his time to coaching work) for instructional support, including help with analyzing and using student data and observation and feedback on lessons.[67] The school also has multi-tiered system of support (MTSS) teacher leaders who have extra responsibilities associated with professional development and curriculum planning. However, these teachers carry full-time teaching loads, so their responsibilities as leaders come in addition to their teaching responsibilities.

GOALS AND SCHOOL ORGANIZATION

Goals

The Windham Southeast Supervisory Union maintains an action plan with three main goals: (1) have safe and healthy schools; (2) improve student learning; and (3) increase educator, parent, and student leadership in the system. In terms of student learning, WSESU has a goal to "decrease [the] achievement gap by 10 points on the NECAP results" and another goal to "increase Special Education student participation in general education classrooms to 80 percent pK-12."

[67] As is also noted in the report on Academy School, the level of instructional coach support from the supervisory union has decreased over time. When the supervisory union had American Reinvestment and Recovery Act funds, the central office had a full-time data coach, a full-time math coach, and a full-time literacy coach, in addition to mathematics and literacy curriculum coordinators. At the time of this report, the supervisory union has a part-time data coach, a part-time math coach, and a full-time literacy coach, in addition to a part-time mathematics curriculum coordinator and a full-time literacy curriculum coordinator.

Oak Grove's Continuous Improvement Plan (CIP) fits within the umbrella of the WSESU action plan and includes the same goals of improved school climate, student performance, and family engagement. At Oak Grove, academic and behavioral goals stem from the MTSS model, whereby the school aims to improve student achievement in both English language arts and mathematics by focusing on data-based decision-making, proper Tier 1 instruction, Tier 2 supports for struggling students, and programs that support positive behaviors for students across the school. Every two weeks, leaders from multiple committees – which focus on topics that range from academics to behavior – meet to discuss progress on school improvement.

Daily Schedule

The student school day at Oak Grove starts at 8:15 am and ends at 2:45 pm. According to WSESU policy, elementary students are expected to receive 90 minutes of English language arts instruction each day and 70 minutes of mathematics instruction (which can be structured as a 60-minute block at one part of the day and a 10-minute block at another part of the day). School staff confirmed that teachers at Oak Grove adhere to the supervisory union's time allocation guidelines and, generally, Oak Grove teachers' English language arts and mathematics lessons last 45 to 60 minutes at a time. Also, students receive approximately 40-45 minutes of electives each day and 50 minutes daily for lunch and recess. Students have skills block, a time for Tier 2 intervention in either English language arts or mathematics, for 35-45 minutes four to five times per week. The amount of time that students receive instruction in social studies and science varies across grades, from approximately 30 minutes three times per week to 45 minutes daily.

The WSESU teacher contract week includes 37.5 hours a week, for an average of seven hours and 30 minutes of teacher contract time each day. Oak Grove teachers start their day between 7:45 am and 8:00 am. Classroom teachers have planning time when their students are at electives, and they have a duty-free period while the para-educators are supervising their students during lunch and recess.

Twice per week, the school allocates time to character education and school-wide community engagement. Each week, all teachers engage the students in their classrooms in Monday morning meeting, where teachers deliver lessons that focus on one of the school's four guiding principles (be respectful; be responsible; be safe; be kind). These lessons range from 20 to 45 minutes. Every Wednesday morning, the school holds an assembly called All School Sing. This assembly, which is frequently attended by parents and other community members, lasts for approximately 30 minutes and is a time for students and staff members to gather together, share accomplishments, and participate in music and dance activities.

CURRICULUM AND INSTRUCTIONAL PROGRAM

The Windham Southeast Supervisory Union attempts to provide guidance and support for its schools in terms of appropriate curriculum and instruction for students across the supervisory union, and it employs curriculum coordinators and instructional coaches to assist with school-level implementation of high-quality curriculum and instruction. Despite support for consistency

in curriculum and instruction across the supervisory union, leaders in the central office are open to reasonable change that improves outcomes for students.[68]

Curriculum

Prior to the adoption of the Common Core State Standards, Vermont had state standards for multiple content areas, including English language arts, mathematics, social studies, health, science, and foreign language. Vermont has adopted the Common Core; consequently, the Common Core standards serve as the framework for curriculum in English language arts and mathematics. Additionally, Vermont has adopted the Next Generation Science Standards, which now provide a framework upon which science curriculum can be built. In general, curricula for other subjects, such as social studies, align with existing Vermont state standards. The following paragraphs detail how WSESU and Oak Grove implement these curricula.

WSESU employs two staff members who coordinate curriculum across the supervisory union: a full-time literacy curriculum coordinator and a mathematics curriculum coordinator who also has mathematics coaching responsibilities. These central office staff attempt to help educators in the district balance autonomy with consistent, high-quality curriculum across the supervisory union.

In English language arts, over the past several years, the supervisory union curriculum has evolved from school-specific whole language approaches to a more standardized phonics-based curriculum. At the time of the shift to a phonics approach, which educators believed would more effectively help students in the supervisory union learn to read, the supervisory union adopted the Fundations text. Recently, it has added Reading Street curriculum as well. Oak Grove teachers rely on these Fundations and Reading Street materials for instruction in English language arts.

In mathematics, schools across the supervisory union previously used the Investigations series, a problem-based curriculum, for kindergarten through grade 5 and Connected Math materials for grade 6. Amid the shift to the Common Core, teachers are experimenting with math curricular materials in an effort to align curriculum with the new standards. Many teachers at Oak Grove have begun to rely on the Engage New York materials for mathematics instruction.

Curricula in social studies and science are more fluid, and school staff report that they do not have standardized texts for these subjects. Teachers find their own materials for these subjects. Because Oak Grove has only one class section per grade, teachers often do not have the opportunity to share materials with each other, but they try to re-use materials, as appropriate, from year to year.

[68] Supervisory union and school personnel note that, in the immediate wake of the transition to the Common Core, some degree of variation existed in mathematics curriculum. The purpose of this variation was to determine what mathematics curriculum would align well with the Common Core and work well for their students. The goal was that this period of variation would lead to a choice of a common curriculum that would eventually be implemented throughout the supervisory union. At the time of data collection, most educators in the school relied on Engage New York materials for mathematics.

Instruction

As noted above in the section on the school schedule, teachers spend 90 minutes on English language arts and 60 minutes on mathematics. Teachers at Oak Grove report that they use a variety of instructional approaches, including combinations of whole-class instruction and independent practice, small-group instruction, and thinking maps and other visual representations of concepts. They also engage in project-based instruction when it is possible and appropriate. Teachers try to integrate technology into lessons, as well: the school has mp3 players for kindergarteners, tablets for students in grade 2, and laptops for students in grades 3 through 6.

Assessments

The Windham Southeast Supervisory Union emphasizes the use of data from multiple assessments to inform instruction.[69] The supervisory union began to focus increased attention on data-based decision-making several years ago, when it used American Reinvestment and Recovery Act funds to hire a full-time data coach. While the supervisory union no longer has the resources to employ a full-time data coach, the groundwork laid by the data coach remains. Based on the work of the data coach and other central office personnel, educators across the supervisory union now have access to a variety of resources, including a data management system (GoogleDocs) that allows for real-time, shared access to student performance data. The supervisory union also maintains an Assessment Toolkit document that outlines the supervisory union's approach to assessment, provides an overview of the suite of assessments that it expects schools within the supervisory union to utilize, and details the timelines and other requirements for assessment of students within the supervisory union.

According to the Assessment Toolkit, elementary grade students take a variety of assessments throughout the academic year, including:

- multiple types of AIMSWeb literacy assessments,
- the Quick Phonics Screener,
- the Spelling Inventory,
- the Phonological Awareness Test,
- the Fountas and Pinnell Benchmark Assessment System,
- running records of student reading,
- end of unit tests in literacy,
- multiple types of AIMSWeb mathematics assessments,
- interview-based mathematics assessments (including the Primary Number and Operations Assessment, Assessing Math Concepts; teacher-developed Concrete-Representational-Abstract assessments; the Mathematics Reasoning Inventory; and the Numeracy Project Assessment),
- end of unit tests in mathematics, and

[69] Academy School, another school in the Windham Southeast Supervisory Union, is another improving school included in this series of reports. The information in this section that pertains to the supervisory union is repeated in that report.

- summative state assessments (formerly the NECAP; now the Smarter Balanced Assessment Consortium (SBAC) test).

In decisions about curriculum and instruction, Oak Grove staff report that they rely, in particular, on data from teacher-administered AIMSWeb, which they get from student assessments that occur three times each year. Other assessments that are commonly used at Oak Grove include unit tests from the Reading Street and Fundations literacy curricula as well as mathematics unit tests, which used to align with the Investigations curriculum but now align with Engage New York materials.

The use of data to inform instruction is important to Oak Grove educators. The school's continuous improvement plan focuses heavily on teachers' use of data, and school personnel meet regularly to discuss student performance. For instance, central office personnel come to school three times a year to engage in intensive analysis of AIMSWeb data. Members of school leadership committees meet twice a month to discuss student data and determine how they should be used in plans for overall school improvement. Additionally, Oak Grove teachers meet weekly at either staff meetings or vertical team meetings (discussed in more detail below in the section on professional development), during which they analyze student performance information.

Academic Interventions

The primary intervention for struggling students at Oak Grove is skills block, which meets four to five times a week for 35-45 minutes. Teachers assign students to English language arts or mathematics intervention groups based on student performance data, especially AIMSWeb data. Multiple educators, including Tier 2 interventionists, classroom teachers, special educators, para-educators, the school librarian, and the speech and language pathologist, work with groups of students to bolster skills in areas that students struggle. The size of intervention groups varies across grade and skill, but groups include about five to six students each. Students who do not require Tier 2 intervention use this time to participate in enrichment groups.

Like all schools in Vermont, Oak Grove puts educational support team (EST) plans into place for students who consistently struggle to perform, regardless of whether or not these students have an IEP or a 504 plan. These plans outline the particular resources that individual students will need to ensure that they succeed in the academic environment.

Students at Oak Grove also have access to a summer school program that takes place at a different school in the supervisory union. Oak Grove teachers can recommend summer school for particular students, but parents have the authority to decide whether or not to enroll their students in summer school.

BEHAVIORAL AND SOCIAL-EMOTIONAL INTERVENTIONS

One way that staff at Oak Grove try to address behavior issues is to promote positive behavior and avoid negative behavior in the first place. To that end, Oak Grove implements the Positive

Behavior Interventions and Supports (PBIS) model. In the past, students received individual PBIS rewards for demonstrating positive behavior, but the school is increasingly moving toward collective (e.g., classroom-wide) rewards for positive behavior. In addition to PBIS, the school allocates time each week for Monday morning lessons, which focus on teacher-developed curriculum centered on the four guiding principles of the school – respect, responsibility, safety, and kindness.

In instances where behavior challenges become an issue, Oak Grove has multiple behavioral supports for students. As noted above in the section on staff, the school has multiple personnel who are qualified to provide social-emotional assistance to students. The school also has a dedicated space that serves as a behavior room, which is a place where students can go when they need breaks from the general education setting or that school staff can utilize when there is a behavior crisis.

Furthermore, the state of Vermont promotes the use of ESTs for students who need additional resources in order to succeed at school. While EST plans can focus on academic issues, as noted above, schools can also put them in place for students who struggle with behavior issues. At Oak Grove, students who face severe behavioral challenges can receive support from an EST, which consists of the principal, the behavior support specialist, the school counselor, the school-based social worker, the school nurse, and a number of educators (including special educators, classroom teachers, and intervention teachers). The ESTs make individualized plans for students and regularly check in on the students' progress toward participating in the school environment in healthy and productive ways.

PROFESSIONAL DEVELOPMENT

Educators at Oak Grove access multiple types of professional development, from meetings offered or coordinated by the supervisory union, to school-based development, to individually-pursued courses.

For instance, multiple types of professional development occur at the school level. Staff members at Oak Grove meet after school every Tuesday. The focus of these meetings rotates week-to-week; one Tuesday is reserved for a school-wide staff meeting and the next is reserved for collaborative planning in vertical teams. These every-other-week vertical team meetings are a time for analyzing student data and using these data to make decisions about lesson plans and student grouping practices. Additionally, three times per year, the supervisory union's literacy and math coaches come to the school to hold all day data meetings, where educators engage in intensive conversations about student performance information and make decisions about curriculum, instruction, and, especially, how to place students in Tier 2 intervention groups.

The supervisory union has four professional development days throughout the year, during which central office personnel offer training to teachers across the supervisory union. Topics for these sessions have included training in the Letrs program, the Keys to Literacy program, and the Collins Writing Program. Supervisory union-sponsored professional development has also focused on how to interpret data and how to use it to inform instruction. In addition to these

trainings, twice per year, the supervisory union holds grade-level meetings so that educators of the same grades can meet with each other and make decisions about curriculum, instruction, and assessments.

Teachers at Oak Grove also have access to resources to pursue their own professional development. Along with teachers across WSESU, Oak Grove educators can either take a three-credit course at the University of Vermont or use equivalent funds to engage in other training or attend a professional conference.

SCHOOL CULTURE

According to school staff, at Oak Grove, educators will not settle for low expectations of students. In the words of one staff member, "our school isn't okay with 'okay.'" Teachers assume that their students are capable of high achievement, and according to a central office official, hold themselves accountable to a culture of learning not only for their students but also for themselves. Furthermore, school staff consistently report that Oak Grove is a "happy school," where the principal supports teachers' decisions, where adults work hard to form relationships with students, and where community and parent engagement is high.

Educators at Oak Grove also describe that the school has positive connections with the community. Parents and children spend time in the playground before and after school, where parents interact with staff members and each other. Parents and community members regularly attend the Wednesday morning All School Sing assemblies. According to school staff members, parents and other community members actively support and have pride for Oak Grove.

SUMMARY

The previous sections of this report outline several characteristics that are central to the teaching and learning context at Oak Grove. These characteristics include:

Common curriculum. In recent years, educators at Oak Grove and throughout the Windham Southeast Supervisory Union have made changes in their curricular approach, especially in English language arts and mathematics. Specifically, Oak Grove educators adopted a common school-wide curriculum, with a phonics emphasis in English language arts and problem-solving focus in mathematics.

Multiple supports for struggling students. Educators at Oak Grove take implementation of the multi-tiered system of support (MTSS) model seriously and have the resources necessary to implement this model with fidelity. For instance, Oak Grove teachers have access to benchmark data and support in analyzing these data from the supervisory union, and they use this student performance information to place students into skills-based intervention groups. Oak Grove educators also have time to provide students in these groups with sustained interventions; they embed time for intervention into the school day four to five times per week, and struggling students receive Tier 2 instruction from a variety of school personnel, including credentialed tutors.

Teacher collaboration and data-based decision making. All staff meet twice per month to discuss issues that impact the entire school, and teachers meet in vertical teams two times each month to collaborate on matters of curriculum, instruction, and lesson planning. In each of these endeavors, educators rely on student performance data from multiple assessments – to which they have access through real-time data management systems that allow them to review student information at any time – to inform their work.

Consistent and sustained support from the supervisory union. Oak Grove does not have instructional coaches at the school site, but WSESU employs a full-time literacy coach and a part-time math coach in addition to a full-time literacy curriculum coordinator and a part-time math curriculum coordinator. These central office personnel provide coaching and support to Oak Grove teachers throughout the school year; the literacy coach, in particular, is often in the school at least once per week.

Alignment with the Evidence-Based Model

The previous sections of this report outline multiple patterns of resource allocation at Oak Grove Elementary School. In many ways, the school's resource allocation aligns with the Evidence-Based (EB) model. However, there are also ways in which the school diverges from the model. The following paragraphs identify key similarities and differences.

Staffing

In some ways, Oak Grove's staffing patterns align with the EB model. For instance, the school's number of core teachers is nearly on point with the EB recommendations – particularly for students in the early elementary grades (kindergarten through grade 3), where the class sizes across these grades average 17 students, which is the EB average for its prototypical elementary schools. Furthermore, across the entire school, the ratio of elective to core teachers (.26) is only just above the EB model recommendations for elementary schools (.2).

In other ways, Oak Grove's staffing patterns do not align with EB recommendations. For instance, Oak Grove is under-staffed with respect to instructional coaches, since the school does not have any personnel filling these positions.[70]

Additionally, Oak Grove has staffing resources that surpass the EB recommendations in a few areas. The school has larger numbers of Tier 2 interventionists and pupil support personnel (especially behavior support personnel) than is included in the EB model. Like many Vermont schools, the number of para-educators at Oak Grove is higher than would be provided by the EB model.

[70] While the Oak Grove does not have any non-teaching instructional coaches, teachers at Oak Grove can receive support from coaches at the supervisory union, which employs a full-time literacy instructional coach and a part-time math instructional coach. Still, the EB model would provide resources for this position at the school-level.

Embrace of an RTI Model with Strong Tier 1 and 2 Approaches to Core Curriculum and Instruction

Oak Grove, along with other schools in the Windham Southeast Supervisory Union, provides instruction under a multi-tiered system of support (MTSS) model. MTSS drives the school's approach to supporting students' academic and behavioral growth. Educators at Oak Grove devote substantial amounts of time each day to Tier 1 instruction in English language arts (90 minutes) and mathematics (70 minutes). During this Tier 1 time, they rely on rigorous curriculum (particularly in English language arts) that they adopted alongside other schools in WSESU. They supplement this Tier 1 instruction with consistent, school wide Tier 2 instruction during "skills block," where students receive small group instruction on specific skills.

As noted above, the MTSS process also applies to students' behavioral growth. At Oak Grove, multiple supports encourage appropriate social-emotional development. For instance, the school implements PBIS, and adults consistently reward students individually and collectively for positive behavior. The school also has multiple support personnel to help students who struggle with behavior, and, like schools throughout Vermont, students can receive educational support team (EST) assistance for behavioral struggles in addition to academic challenges.

Data-based Decision-making

Students at Oak Grove take a variety of benchmark, formative, and summative assessments, and educators at the school take information from these assessments into account when they make curricular decisions, plan instructional approaches, and assign students to Tier 2 skills block groups. The supervisory union is incredibly supportive of this endeavor, and, in addition to the regular school-based collaborative meetings in which teachers discuss student assessment data, supervisory union coaches come to Oak Grove three times a year to engage in a day-long, intensive data meeting.

Collaboration among Educators

At Oak Grove, teachers are organized into vertical teams, which meet twice per month in regularly-scheduled afterschool meetings. Vertical teams use time to discuss student data, group students for instruction, and share curricular materials. Additionally, twice per month, Oak Grove educators meet as an entire staff to collaborate with each other regarding whole-school issues. The school's practice of teacher collaboration would align more fully with the EB model if it occurred more frequently (such as, after the student school day, for instance), since the EB model provides resources for teachers to meet three times a week for 45 minutes each time.

In sum, Oak Grove is a school that has channeled its resources to promote positive outcomes for its students. As is recommended by the EB model, the school privileges staff collaboration, decision-making based on information about student outcomes, and protected time for interventions for struggling students. In these and other ways, staff at Oak Grove demonstrate their commitment to student success.