

**A Study of  
Maine's More Efficient Public Schools**

**Report to  
The Joint Standing Committee on Education & Cultural Affairs  
Maine State Legislature**

**Prepared by  
David L. Silvernail  
Erika K. Stump  
Richard Barnes  
Kenneth Kunin  
Sarah E. Wintle**

**Maine Education Policy Research Institute  
University of Southern Maine**

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K-5 Schools :	Bowdoin Central School Bowdoinham Community School Carmel Elementary School Dr. Levesque Elementary School Winthrop Grade School
K-8 Schools:	Great Salt Bay Community School Kingfield Elementary School Strong Elementary School
Middle Schools:	Mattanawcook Jr. High School William S. Cohen School Windham Middle School
High Schools:	Gorham High School Hampden Academy Marshwood High School Presque Isle High School Scarborough High School

Without the assistance of these schools the study would not have been possible. Thank you.

## Executive Summary

American K-12 public education all across the nation is at a difficult but critical crossroads. In Maine, despite a three-fold increase in education spending over the last four decades, student performance has not significantly changed. In fact, high school graduation rates, as well as student achievement have remained relatively flat. We are at a time when keen global competition underscores the need for exceptional performance in our primary and secondary schools, yet state and federal governments face unprecedented budget deficits and limited resources for the foreseeable future.

But even in the toughest of economic times, the role of state government in ensuring that every child receives a first-rate education is not diminished. Rather, despite these particularly tough times, public education is challenged to do even more with less: to raise student performance, to raise it for **all** students, and to do so in more efficient ways.

To this end, the Maine Education Policy Research Institute (MEPRI), the Center for Education Policy, Applied Research and Evaluation (CEPARE) at the University of Southern Maine, and the Nellie Mae Education Foundation (NMEF) have joined together to conduct a multi-faceted, multi-year study of Maine's K-12 education system.

What can we learn by studying Maine's schools? More accurately, what can we learn from studying Maine's higher performing and more efficient schools? How are these schools different from others? Do these schools use their resources differently? If so, how do they do it? What strategies do these schools use to improve both performance and spending—in essence, to become what we might call a More Efficient school? To begin to answer these questions, this report describes the findings from an initial descriptive analysis of over 500 of Maine's public schools and case study research on a sample of these schools. Specifically, this study was designed to achieve three key objectives:

1. Develop a definition of what it means to be a More Efficient Maine school.
2. Develop profiles of Maine's public schools, in terms of student performance and return on spending.
3. Identify distinguishing characteristics of More Efficient Maine public schools.

In reviewing the information in Tables 3-6 several findings are noteworthy. These include:

1. More Efficient schools, for the most part, come in all sizes. There are some with larger student enrollments, and some that are smaller.
2. The ranges of poverty found among More Efficient schools tend to mirror the ranges in poverty found among all Maine's elementary and middle schools.
3. In the case of high schools, the poverty levels found among More Efficient schools do not mirror the state average. The average poverty level in More Efficient high schools is considerably lower (15% vs. 44%).

4. High school graduation rates for More Efficient schools are approximately 10% higher than the state average.
5. More Efficient schools are spending anywhere from \$166 to \$1023 less per student than state averages.

Twenty-five of Maine's schools were selected for further study. Sixteen of these schools were selected because they were designated as "More Efficient," and nine schools were classified as "Typical" schools. Typical schools were schools with mixed results, in terms of student performance, in their profiles. The nine typical schools were included in the case studies because it was important to determine what distinguished a More Efficient school from a Typical school. For example, do More Efficient schools have characteristics simply not found in Typical schools, or is it a matter of the degree to which these characteristics are present?

Once the schools were selected and participation agreements had been established with the district superintendents, the research team began the process of gathering data from the twenty-five schools. Teams of two or three researchers conducted site visits of 2-2 ½ days in duration. Each team included a teacher and an administrator, both of whom had extensive knowledge and experience working in and with public schools in Maine. Three schools were visited by a research assistant in addition to these teams, and one large school was visited by five field researchers.

The initial analysis of the case study evidence confirmed many findings reported in other higher performing school studies. As described in the individual school-level reports from our case studies, More Efficient schools were more consistent in their high expectations and high standards for all members of the school community, as well as in implementing a more rigorous curriculum through engaging instruction. In addition, More Efficient schools had good leadership, supportive school cultures, and many of the other characteristics found in our literature review. But a deeper analysis of the evidence also revealed that in the More Efficient schools these features came together to form a distinctive culture: a culture that is more than the sum of the individual parts, and consists of features that cut across and encompassed the categories of characteristics found in earlier studies. What we found to be unique among the More Efficient schools is a singular, sustained focus that places students and their intellectual development at the center of all of the work.

**The pervasive culture of More Efficient schools is *a learning community systemically:***

- A) *engaging in focused intellectual work,*
- B) *implementing rigorous curriculum and intellectually engaging instruction informed by assessment,*
- C) *sustaining pervasive high standards and high expectations focused on intellectual work in the culture and community of the school*
- D) *being led by teachers and leaders who serve as intellectual agents and believe they have the moral responsibility to help children become intellectual thinkers who can contribute to the greater good of society*

***E) using available resources efficiently to maximize learning opportunities for students and staff.***

These five features come together in the More Efficient schools to create a learning community that is student-focused and systematically engaged in intellectual inquiry. We found that in these schools, all students are demonstrating progress in their intellectual development and academic achievement. These schools are also promoting and supporting this intellectual development in cost efficient ways. They are providing their community, parents, and students a higher return on spending, and are getting “a bigger bang for their buck.”

Patently, the More Efficient schools we studied are having considerable success in helping students master core academic subject knowledge, and they are having success helping students to develop intellectually so as to be able to understand, transform, and share their learning. Thus, we conclude that More Efficient schools are accomplishing this as *emerging student-centered schools* that are taking significant steps toward preparing students for the 21<sup>st</sup> Century. The central focus is on students and helping them learn and develop intellectually. Plus, all students have access to a wide variety of learning experiences throughout the school day, including remediation and enrichment. There is ample evidence of high expectations and high standards and the use of multiple assessments in assessing progress in learning. Teachers and leaders are actively engaged in creating a school culture that helps students acquire more and more responsibility for their own learning.

There is no surefire recipe for being a More Efficient school. There are numerous combinations of ingredients, and the resulting culture is greater than its individual pieces. We believe this culture must develop over time and develop uniquely within each school. Schools who wish to become More Efficient may do well to begin by examining their own culture and engaging in self-assessment. School faculties and their communities may start at many different points, but we suggest one way might be to begin conversations around three questions:

1. How many examples can we think of where one or more of the five key characteristics are present in our school?
2. How systemic or pervasive are these characteristics throughout our school?
3. What are the barriers to these characteristics becoming more systemic in our school?

By seeking answers to these questions, individual schools may develop their successful paths for becoming a More Efficient school.

We have found that More Efficient schools in Maine have created a pervasive culture within the school community that produces important results, that is, students and professionals who are deeply steeped in intellectual work and development. The good news is that this work is not extremely expensive, it does not require out-of-state experts, and it is already being done in schools of all types here in Maine. Maine educators, students and educational leaders across the state are already pioneering all aspects of improving Maine’s educational opportunities and profession. There are concrete practices, habits of mind, and strategies we can begin to implement and evaluate immediately. But it is hard work, and it is steady work. Thinking deeply

and innovatively requires time, practice and support. Intellectual work requires us to challenge some fundamental aspects of our beliefs and practices. It requires us to transform our schools and expand our definition of learning communities. However, it is with this work that we can more effectively fulfill our moral imperative to educate Maine's youth.

## Maine's More Efficient Public Schools:

### Learning Communities Systematically Engaged in Intellectual Work

David L. Silvermail

Erika K. Stump

#### Overview

American K-12 public education all across the nation is at a difficult but critical crossroads. In Maine, despite a three-fold increase in education spending over the last four decades, student performance has not significantly changed. In fact, high school graduation rates, as well as student achievement have remained relatively flat. We are at a time when keen global competition, including increased competition from “the rise of the rest” countries such as Brazil, Russia, India, and China (Zakaria, 2011) underscores the need for exceptional performance in our primary and secondary schools, yet state and federal governments face unprecedented budget deficits and limited resources for the foreseeable future. As noted by the Center for American Progress (2011),

*The economic downturn has dramatically changed the fiscal climate for schools and districts, and our education system is about to enter a time of profound fiscal austerity. Schools will be pressed to stretch their education dollars further for years, perhaps decades. (p.13)*

Petrilli and Roza (2011) put it this way:

*After years of non-stop increases...our schools now face the near certainty of repeated annual budget cuts for the first time since the Great Depression. In some states and districts, reductions will be dramatic—well into the double digits. And these new revenue-trend-levels are likely to be semi-permanent... (p.1)*

And in describing this situation, Patrick and Sturgis (2011) conclude:

*The increased global competition and economic pressures are of particular importance at the national and state level. Resource constraints are demanding that we find more cost-effective methods to educate our children. With the economic crises causing state budgets to tighten, the United States must find a way to do more with fewer resources, especially in K–12 education. (p.8)*

But even in the toughest of economic times, the role of state government in ensuring that every child receives a first-rate education is not diminished. Rather, despite these particularly tough times, public education is challenged to do even more with less: to raise student performance, to raise it for **all** students, and to do so in more efficient ways.

To this end, the Maine Education Policy Research Institute (MEPRI), the Center for Education Policy, Applied Research and Evaluation (CEPARE) at the University of Southern Maine, and the Nellie Mae Education Foundation (NMEF) have joined together to conduct a multi-faceted, multi-year study of Maine’s K-12 education system. The mission of the Nellie Mae Education Foundation is:

*To stimulate transformative change of public education systems across New England by growing a greater variety of higher quality educational opportunities that enable all learners—especially and essentially underserved learners—to obtain the skills, knowledge and supports necessary to become civically engaged, economically self-sufficient lifelong learners. (2011)*

In keeping with the NMEF mission of promoting transformative change, the overarching goal of this work is to identify strategies that Maine schools may embrace, which will lead to significant improvement in student performance and accomplish this goal in more efficient ways.

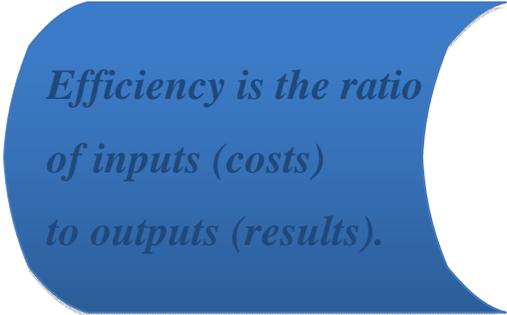
What can we learn by studying Maine’s schools? More accurately, what can we learn from studying Maine’s higher performing and more efficient schools? How are these schools different from others? Do these schools use their resources differently? If so, how do they do it? What strategies do these schools use to improve both performance and spending—in essence, to become what we might call a More Efficient school? To begin to answer these questions, this report describes the findings from an initial descriptive analysis of over 500 of Maine’s public schools and case study research on a sample of these schools. Specifically, this study was designed to achieve three key objectives:

1. Develop a definition of what it means to be a More Efficient Maine school.
2. Develop profiles of Maine’s public schools, in terms of student performance and return on spending.
3. Identify distinguishing characteristics of More Efficient Maine public schools.

The report that follows describes how these three objectives were accomplished in this study and includes an analysis of a sample of Maine’s More Efficient schools.

### **Defining a More Efficient School**

The first objective of the study was to develop a definition of what it means to be a More Efficient school. Efficiency may be defined in a variety of ways, but unfortunately many times it is defined only in terms of cost. For example, in the case of education, when one hears a claim like, “Our schools need to be more efficient,” all too often it means, “Our schools should cost less.” But, as defined by the American Heritage Dictionary, efficiency means “*the ratio of the effective or useful output to the total input in a system.*” In other words, efficiency should be defined as the relationship between costs (inputs) and results (outputs). Accordingly, for purposes of this study, school efficiency was defined in terms of: (1) academic performance on statewide achievement tests, and (2) the return on spending schools achieve for this improved performance. Thus, a More Efficient school is one that is receiving a higher return on spending in terms of higher student performance on statewide tests.



*Efficiency is the ratio of inputs (costs) to outputs (results).*

What does “higher” mean in this case? First, it means a majority of students in a school should be performing well. They should be performing (1) above the state average, and (2) better than expected given students' characteristics and students' academic performance in earlier grade levels. Additionally, more students in the school should be achieving proficiency or be well on their way to achieving proficiency than the state average rate of proficiency. Thus, more students in a school should be (3) meeting the state proficiency standards, and more students should be (4) making significant progress toward meeting the state standards. For high schools, there should also be a graduation standard. A More Efficient high school should be one in which its (5) high school graduation rate is above the state average.

But higher performance alone does not make a school more efficient. A school’s performance may be higher than other schools, but it may not be using its resources very effectively. For a school to be considered More Efficient, it should be achieving a higher return of spending; it should be getting a “better bang for its buck.” Thus, school spending per pupil

should yield higher academic performance, and (6) the return on spending should be better than the state average, and (7) better than may be expected given prior student performance and community characteristics. In essence, the schools should be what are called “value-added” schools. The schools, their programs, and personnel are adding value to the development of students and contributing more to the development than might be expected given the background and previous achievement of the students. For a school to be designated as being a More Efficient school, it had to meet **all** the criteria.

**The specific criteria for defining school efficiency used in Phase I of the study were:**

1. Two-year school wide *composite Scale Scores on Maine’s state assessments, compared to statewide average composite scale scores.*
2. Two-year school wide average percent of students *Meeting or Exceeding the state proficiency standard, compared to the state average.*
3. Two-year school wide average percent of students at least *Partially Meeting or better than the state proficiency standards, compared to state average.*
4. Two-year school wide *composite Scale Scores on Maine state assessment, compared to a school’s predicted composite scale score.*
5. For high schools, *the school’s graduation rate compared to the state average.*

Two additional criteria were used to classify a school in terms of its spending, more accurately, a school’s return on spending. These criteria were:

6. *A school’s return on spending ratio compared to the state ratio*, where a Return on Spending Ratio was defined as the percent of students in a school who meet or exceed state proficiency standards, divided by the school’s per pupil operating expenditure.
7. *A school’s return on spending ratio compared to a school’s expected ratio*, where the expected ratio takes into account school and community characteristics.

Accordingly, in this study, school efficiency was defined by this set of six (or seven) criteria, four based on two years (2007-2009) of student academic performance (and a fifth one for high schools), and two based on multiple years (2007-2009) of per pupil instructional spending. In order to meet a criterion, the school's score had to be greater than a comparison score.

For both criteria 6 and 7, per pupil operating expenditures were defined to include those expenditures most closely tied to delivering instruction. So, for example, they included teaching staff and other educational staff (e.g., teacher aides, counselors, principals, etc.), classroom instruction costs, summer school, professional development, technology, etc. They did not include expenses such as transportation, operation and maintenance of buildings, and debt service.

### **Developing Profiles of More Efficient Maine Public Schools**

Once a More Efficient school was defined, the second phase of the study involved developing efficiency profiles for Maine schools and identifying which Maine schools met all the academic performance and return on spending criteria. That is to say, which Maine schools should be designated as More Efficient?

However, before describing how these schools were identified, a cautionary note is in order. The criteria described above were used to identify *higher* performing schools that were achieving a *better* return on spending. *Higher* and *better* are relative terms. Even schools designated as More Efficient need to continue to improve. This is clearly documented in a recent report entitled [Increasing Maine's High School Graduation Rate: Necessary But Not Sufficient](#) (Silvernail, Walker, & Batista; 2011). Although Maine's high school graduation rate is improving, too many students still graduate lacking reading and mathematics proficiency. Further, the evidence shows that the seeds of this problem start in the earlier grades where a large percentage of students lacking proficiency at one grade level still have not reached proficiency

### **School Efficiency Profiles**

[www.usm.maine.edu/cepare](http://www.usm.maine.edu/cepare)

Profiles of over 500 Maine public schools have been developed and may be viewed at the website listed above under a link in the right hand column titled "Maine Public School Efficiency Profiles."

two or three years later. Thus, even More Efficient schools need to improve and continue to find ways to help *all* children succeed.

Given this important caveat, how were More Efficient schools identified? First, to the extent possible, Maine’s schools were classified into one of four categories, representing different grade configurations and school levels: 1) K-8 schools, 2) elementary schools (grades K-5), 3) middle schools (grades 6-8), and 4) high schools (grade 9-12). Second, school performance and spending were examined in terms of the 6 (or 7) criteria, and school efficiency profiles were developed for 524 of the 664 Maine public K-12 schools. Profiles could not be developed for 140 Maine schools, primarily due to missing data or because the school’s grade configuration did not include 4<sup>th</sup>, 8<sup>th</sup>, or 11<sup>th</sup> grade, which were the grades used for the profiles. The 2007-2009 Maine Education Assessments (MEAs) were used for the 4<sup>th</sup> and 8<sup>th</sup> grade measures, and the Maine High School Assessment (MHSA) was used for 11<sup>th</sup> grade.

Table 1 summarizes the numbers of Maine’s 524 public schools identified as Higher Performing (met the academic performance criterion) and those identified as More Efficient (met both the academic performance criterion AND the return on spending criterion), based on the 2007-2009 data. As indicated in the table, approximately 23% of the Maine schools evaluated were classified as Higher Performing, and 17% of the schools evaluated were classified as More Efficient (i.e., higher academic performance AND higher return on spending).

**Table 1: Higher Performing and More Efficient Maine Schools\***

School Level	Schools Evaluated	Higher Performing	More Efficient
K-8	96	16 (16.8%)	10 (10.5%)
Grade Schools (K-5)	228	67 (27.8%)	54 (23.6%)
Middle Schools (6-8)	93	22 (23.7%)	17 (17.9%)
High Schools (9-12)	107	14 (13.3%)	9 (8.6%)
<b>Total</b>	<b>524</b>	<b>119 (22.7%)</b>	<b>90 (17.2%)</b>

\* Designations based on two-year averages (2007-2009)

Of particular note is the fact that approximately 75% of the higher performing schools were also getting higher returns on their spending (i.e., they were More Efficient).

In terms of school levels, more K-5 schools were classified as More Efficient than other grade configurations, but it should be noted that for some of these schools the efficiency designation is implicitly shared by two schools. If the school included in the analysis only contains grades 3-5, for instance, some of its efficiency may be attributed to a K-2 feeder school. Of the four categories, high schools have the lowest percent of More Efficient schools; less than 1 in 10 high schools were classified as More Efficient.

Table 2 provides a profile of the 119 higher performing schools and the 90 schools classified as More Efficient schools, by the nine superintendent regions in Maine. As may be seen from the table, there are higher performing and more efficient schools in all nine regions. There are more designated as such in some of the regions, but some regions have fewer schools in total in a particular school configuration.

**Table 2: Higher Performing and More Efficient Maine Public Schools by Superintendent Region**

Regions	K-8 School			Grade School (K-5)			Middle School (6-8)			High School (9-12)		
	Total Schools	HP	HPME	Total Schools	HP	HPME	Total Schools	HP	HPME	Total Schools	HP	HPME
Aroostook	11	1	1	13	3	3	3	0	0	14	1	1
Penquis	9	2	0	36	13	12	20	8	7	16	2	1
Washington	20	4	4	12	0	0	0	NA	NA	6	0	0
Hancock	23	2		2	1	1	2	1	1	5	0	0
Mid-coast	10	4	2	24	9	4	7	2	0	8	1	0
Western Maine	10	2	2	38	4	4	13	1	1	15	0	0
Cumberland	1	1	1	44	16	11	21	8	7	15	7	6
Kennebec	10	0	0	40	9	8	15	0	0	16	0	0
York	2	0	0	29	12	11	12	2	1	12	2	1
<b>Total</b>	<b>96</b>	<b>16</b>	<b>10</b>	<b>228</b>	<b>67</b>	<b>54</b>	<b>93</b>	<b>22</b>	<b>17</b>	<b>107</b>	<b>14</b>	<b>9</b>

Turning to a closer examination of these schools, Tables 3-6 provide some basic descriptive information about the More Efficient schools, as compared to all other schools. In the case of K-8 schools, the information in Table 3 indicates that the demographics and staff characteristics of the More Efficient schools mirror in many ways the same attributes of all K-8 schools: school sizes are similar, as well as poverty levels and the percent of special needs students; teacher education and experience are also similar. The major differences are in average per pupil expenditures, where the More Efficient K-8 schools are spending approximately 13% less per pupil, but getting higher student performance. This difference may in part be explained by differences in teacher-student ratios and teacher aide-student ratios. For example, the student-teacher ratio in the More Efficient schools is 0.8 FTE (full-time equivalent) higher than the state average for K-8 schools.

**Table 3: Descriptive Statistic of More Efficient K-8 schools**

Maine Public K-8		
Variable	More Efficient = 10 Average (Range)	State = 96 Average (Range)
Average Enrollment	166 (41 – 383)	173 (20-497)
Free and Reduced Lunch	47.6% (25.4% - 67.0%)	46.9% (11.5% - 77.8%)
Special Education	15.3% (9.2% - 22%)	15.7% (0.0% - 31.7%)
Teacher student ratio	12.5 (10.7 - 13.7)	11.7 (5.9 - 18.9)
Ed Tech student ratio	52 (13.7 – 174.5)	46.6 (12.3 – 174.5)
Teacher - Masters or Higher	31% (0% - 62%)	30% (0% - 88%)
Years Teaching in SAU	13.3 (8.3 - 16.1)	12.9 (3.8 - 26.7)
Per Pupil Operating Expenditure	\$7,647 (\$6,406 - \$8,931)	\$8,708 (\$5,332-\$18,425)

Grade K-5 More Efficient schools are also similar in many ways to the state averages for schools with similar grades, but More Efficient schools begin to look different in some critical areas. As shown in Table 4, More Efficient elementary schools have slightly fewer students who are eligible for free or reduced lunches (10% less), slightly fewer students with identified special needs, and on average are spending only approximately 4% less than other elementary schools.

**Table 4: Descriptive Statistic of More Efficient K-5 schools**

<b>Maine Public Elementary Schools (Grades K-5)</b>		
<b>Variable</b>	<b>More Efficient = 54 Average (Range)</b>	<b>State = 228 Average (Range)</b>
Average Enrollment	253 (42 – 673)	247 (13 – 842)
Free and Reduced Lunch	36.2% (2.9% - 68.9%)	46.7% (2.9% - 97.6%)
Special Education	14.1% (0.0% - 22.9%)	15.5% (0% - 29.8%)
Teacher student ratio	14.6 (8.6 - 24.1)	14 (5.9 - 24.1)
Ed Tech student ratio	81.4 (16.4 - 668)	71 (12.7 - 668)
Teacher - Masters or Higher	40% (0% - 81%)	36% (0% - 83%)
Years Teaching in SAU	13.3 (5.9 - 21.7)	13.3 (2.2 - 23.1)
Per Pupil Operating Expenditure	\$7,247 (\$4,794 - \$11,006)	\$7,475 (\$3,821 - \$17,835)

The differences between More Efficient schools and other schools become more pronounced at the middle school and high school levels. As shown in Table 5, More Efficient middle schools are larger, have fewer pupils in poverty and with special needs, and have more teachers with advanced degrees.

**Table 5: Descriptive Statistic of More Efficient Middle schools  
Maine Public Middle Schools (Grades 6-8)**

<b>Variable</b>	<b>More Efficient = 17 Average (Range)</b>	<b>State = 93 Average (Range)</b>
Average Enrollment	468 (268 – 807)	373 (74 – 906)
Free and Reduced Lunch	24.3% (3.5% - 56.2%)	39.8% (3.5% - 71.0%)
Special Education	14.8% (9.6% - 21.5%)	16.8% (8.1% - 27.9%)
Teacher student ratio	14.4 (12.6 - 18.1)	13.5 (9.9 - 18.3)
Ed Tech student ratio	136 (30.9 - 384)	128.1 (20.3 - 635)
Teacher - Masters or Higher	44% (22% - 74%)	37% (9% - 74%)
Years Teaching in SAU	12.5 (9.1 - 17.9)	12.6 (7.3 - 19.7)
Per Pupil Operating Expenditure	\$7,528 (\$6,023 - \$8,711)	\$8,062 (\$3,616 - \$10,762)

The largest gap between More Efficient schools and all other schools is at the high school level. The data in Table 6 reveals that More Efficient high schools are considerably larger, with many fewer students in poverty and having special needs. The difference in student-teacher ratios is only 0.5 FTE, and expenditures are only 2-7% less than other schools. There is, however, a large difference in teacher aide-student ratios, and approximately 20% more of the teachers in More Efficient high schools have earned a master's degree or higher.

**Table 6: Descriptive Statistic of More Efficient High schools**

<b>Maine Public High Schools (Grades 9-12)</b>		
<b>Variable</b>	<b>More Efficient = 9 Average (Range)</b>	<b>State = 107 Average (Range)</b>
Average Enrollment	679 (262 – 1053)	523 (84 – 1,374)
Graduation Rate	93.3% (90.0% - 98.0%)	83.3% (66.0% - 98.0%)
Free and Reduced Lunch	15.2% (3.3% - 44.8%)	44.0% (3.3% - 77.2%)
Special Education	12.1% (8.6% - 16.9%)	16.2% (8.6% - 31.7%)
Teacher student ratio	14.4 (12.9 - 17.0)	13.9 (7.6 - 17.6)
Ed Tech student ratio	227.1 (46.8 - 857)	150.6 (16.6 - 857)
Teacher - Masters or Higher	60% (42% - 75%)	40% (0% - 75%)
Years Teaching in SAU	10.7 (8.5 - 12.9)	11.3 (3.3 - 18.3)
Per Pupil Operating Expenditure	\$8,843 (\$7,071 - \$10,876)	\$8,962 (\$6,235 - \$14,978)

To summarize, in reviewing the information in Tables 3-6 several findings are noteworthy. These include:

1. More Efficient schools, for the most part, come in all sizes. There are some with larger student enrollments, and some that are smaller.
2. The ranges of poverty found among More Efficient schools tend to mirror the ranges in poverty found among all Maine's elementary and middle schools.

3. In the case of high schools, the poverty levels found among More Efficient schools do not mirror the state average. The average poverty level in More Efficient high schools is considerably lower (15% vs. 44%).
4. High school graduation rates for More Efficient schools are approximately 10% higher than the state average.
5. More Efficient schools are spending anywhere from \$166 to \$1023 less per student than the state averages.

### **Distinguishing Characteristics of More Efficient Schools**

The tables above provide insight into some of the distinguishing characteristics of More Efficient Maine schools, but it is very limited. It tells us something about how the schools differ from others, but it does not tell us *why* and *how* these schools distinguish themselves. The third phase of the study was designed specifically to uncover this *why* and *how*. It consisted of conducting cases studies of a sample of Maine’s More Efficient schools.

### Case Study Research Methodology

Twenty-five of Maine’s schools were selected for further study. Sixteen of these schools were selected because they were designated as “More Efficient,” and nine schools were



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classified as “Typical” schools. Typical schools were schools with mixed results, in terms of student performance, in their profiles. The nine typical schools were included in the case studies because it was important to determine what distinguished a More Efficient school from a Typical school. For example, do More Efficient schools have characteristics simply not found in Typical schools, or is it a matter of the degree to which these characteristics

are present?

In selecting schools for the case studies, consideration was given to school size, grade-level configuration, student poverty levels, and geographic distribution across the state, thereby providing a diverse representation of Maine schools. The study included schools in rural as well as non-rural areas, schools educating more economically disadvantaged students and those with relatively low levels of student poverty, as well as schools with enrollment ranging from approximately 130 to over 1,050. The case study schools included seven PK/K-5 schools, five K-8 schools, six middle or junior high schools, and seven high schools. A breakdown by type of school appears in Table 7.

**Table 7: Case Study Schools**

School Level	Type of School	
	More Efficient	Typical
K-8 Schools	3	2
Elementary Schools	5	2
Middle Schools	3	3
High Schools	5	2
<b>Total</b>	16	9

The study described in this report utilized a mixed-methods approach in conducting the research; that is, it employed both quantitative and qualitative research strategies. Phases I and II of the study used quantitative methods to define and identify More Efficient schools and to describe and contrast their quantitative characteristics with state averages. Phase III involved using qualitative methodologies to study the sample schools in more depth. As described by Johnson and Onwuegbuzie in Mixed Methods Research: A Research Paradigm Whose Time Has Come (2004),

*The goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies. (p.14)*

One of the first steps in conducting the case studies was to determine what to look for, what to observe and what to analyze. Classic qualitative research theory would suggest we start *de novo*. In other words, we should begin our observations and site visits with a blank slate and let the distinguishing characteristics surface. But there already exists over forty years of national and

international research on higher performing schools. Thus, our study was designed to be more “confirmatory” rather than “emergent.” As described by Miles and Huberman (1994),

*The conventional image of field research is one that keeps pre-structured designs to a minimum. Many social anthropologists and social phenomenologists consider social processes to be too complex, too relative, too elusive, or too exotic to be approached with explicit conceptual frames or standard instruments...*

*Highly inductive, loosely designed studies make good sense when experienced researchers have plenty of time and are exploring exotic cultures, understudied phenomena, or very complex social phenomena. But if you're new to qualitative studies and are looking at a better understood phenomenon within a familiar culture or subculture, a loose, inductive design may be a waste of time. Months of field work and voluminous case studies may yield only a few banalities. As Wolcott (1982) puts it, there is merit in open-mindedness and willingness to enter a research setting looking for questions as well as answers, but it is "impossible to embark upon research without some idea of what one is looking for and foolish not to make that quest explicit."*

*Tighter designs are a wise course, we think, for researchers working with well-delineated construct. In fact, we should remember that qualitative research can be outright "confirmatory"—that is, can seek to test or further explicate a conceptualization. (p. 157)*

Our task in this study was to extend the conceptualization of higher performing schools and determine if such distinguishing characteristics may also exist in More Efficient schools, and if so, to what extent.

Based on a review of the salient literature on higher performing schools, a list of some common characteristics were identified as useful in guiding our case studies. This list includes characteristics such as:

- High standards and high expectations (e.g., McFadden, 2009; Silvernail, 2007; Dolejs, 2006).

- Effective leadership (e.g., EdSource, 2010; Almanzan, 2005; Craig, 2005; Davis & Thomas, 1989).
- Rigorous curriculum and instruction (EdSource, 2010; McFadden, 2009; Silvernail, 2007).
- Effective teachers (EdSource, 2010; Craig, 2005; McGee, 2004).
- Student engagement (Carini, Kuh & Klein, 2006; Marks, 2000).
- Continuous assessment (Ascher, 2007; Silvernail, 2007; Dolejs, 2006; Newmann and Associates, 1996).
- Effective professional development (McFadden, 2009; Almanzan, 2005; McGee, 2004; Darling-Hammond, 1996).
- Community and parent involvement ( Education Trust, 1999; Fullan & Stiegelbaur, 1991; Levine & Lezotte, 1990).
- Strong school culture (New Leaders for New Schools, 2008; Craig, 2005; McGee, 2004).

To this list of nine common characteristics we added a tenth characteristic for our study:

- Efficient use of resources (Mourshed et al, 2010; Boser 2011; Standards & Poor's, 2007; Perez & Socias, 2008).

There is very little literature on effective school resource use as we defined it (i.e., tying student performance to per pupil expenditures), and the same may be said of the research on what makes a school more efficient. But in light of the challenge of tough economic times and the need to improve student performance, this was a key factor we wanted to examine in this study.

The ten characteristics were used to create an *a priori* coding scheme, what Miles and Huberman (1994) call a “start list of codes prior to fieldwork” (p.58) that served as the initial framework for conducting the field site case studies and analyzing the evidence. *A priori* coding involves using categories developed before data collection begins to guide the collection and analysis of evidence. The categories should be used as guides, but not to limit data collection and analysis. Effort to look beyond these categories is very important, and caution was taken by the research teams in this study not to limit their search to “finding what we were looking for.” The research teams attempted to determine to what extent the *a priori* list of characteristics existed in the schools while looking for other distinguishing characteristics as well.

## Case Study Methods

An initial step in conducting the case studies involved selecting the twenty-five schools to study in more depth. An initial sample of twenty-five schools was invited to participate in the study. Conversations were held with the superintendents of each school district, and once the superintendent agreed to participate in the study, researchers conducted preliminary interviews with building level principals. Two superintendents declined to participate in the study because of significant changes taking place in their schools. Two alternate schools were identified, and the same procedure was repeated with these school superintendents and principals. The alternate schools were selected to mirror demographic characteristics of the original sample schools.

Once the schools were selected and participation agreements had been established with the district superintendents, the research team began the process of gathering data from the twenty-five schools. Teams of two or three researchers conducted site visits of 2-2 ½ days in duration. Each team included a teacher and an administrator, both of whom had extensive knowledge and experience working in and with public schools in Maine. Three schools were visited by a research assistant in addition to these teams, and one large school was visited by five field researchers.

Two More Efficient schools were selected as pilot sites. Conducting the case studies and site visits in these schools an opportunity to test the study protocols and



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procedures, and to refine the study instruments. The two schools were from the same school district and in close physical proximity to each other so that both research teams could debrief together after each visitation day. The research teams were provided with feedback from members of the “pilot” schools’ community, clarifying questions from members of the research team who did not visit the schools, and guidance from a research team member with extensive experience in observations and site visits. These insights led to a few refinements in the site visit

protocols and field practices. Because the changes were mostly procedural in nature, the pilot schools and their data were retained as part of the study sample.

Prior to each site visit, researchers collected and analyzed documents relevant to the school (e.g. curriculum maps, course schedules, school handbooks, district policies, assessments, student work, school and district websites, related community publications, etc.). An interview with the building principal was then conducted to gather preliminary school information and develop a working schedule for the school site visit. During the site visits, multiple individual and focus group interviews and observations were conducted. Table 8 summarizes the number and sites of these interviews and observations.

**Table 8. Case Study Site Visits**

School Grade Level	Number of Schools	Number of Observations	Number of Interviews
K-5	7	431	102
K-8	5	325	74
Middle School	6	465	95
High School	7	455	100
<i>TOTAL:</i>	25	1,676	371

Each visit included individual and focus group interviews with teachers, education technicians, support staff (cafeteria, custodial and office staff), administrators, parents and students. Schools were responsible for inviting and organizing the focus groups, so the population varied but included teachers of all grade levels, ability groupings and subject areas. A total of 371 interviews were conducted and recorded over the course of the study, with an approximate average of 15 group interviews per site visit. Interviewers asked members of the focus group to discuss what they felt made their school successful as well as share specific strengths and struggles of their school’s policies, curriculum, use of time, leadership, professional learning opportunities, social atmosphere, etc.

Each site visit also included on-going three- to five-minute observations of classes in progress, observations of teacher planning or common time, staff meetings, front office exchanges, transportation drop-off and pick-up procedures, as well as observations of hallway behavior, playground practices, and lunchroom habits. These observations included time before and after school, as well as throughout the duration of the school day during the two days of the

*A total of 1,676 classroom observations were recorded by researchers in real time on GoogleDocs, which organized data entries into nine categories.*

site visit. These procedures allowed for the inclusion of observations of programs within as well as immediately before and after the school day, such as homework help sessions, disciplinary detentions, intervention courses, co-curricular club meetings, etc. For the classroom observations, researchers identified the grade level, content area, student-adult ratio, and classroom procedure time (beginning, middle, end or transition).

Notes were also taken with regards to student engagement, higher-order thinking skills (using Bloom's Taxonomy), use of technology, and teacher role (coaching/conferencing, facilitating, monitoring, presenting, or working independently). During the course of the site visits, these formal observations were recorded via GoogleDocs, which organized the data entries by identified categories: date/time, school name, school grade level, content area and grade level of observation subject, level of Bloom's Taxonomy, student engagement level, technology use, teacher role, and student-adult ratio. Sample copies of the interview protocols and a copy of the classroom observation protocol appear in Appendix A. A total of 1,676 observations were made at the case study sites.

Researchers also kept copious notes throughout the site visits regarding their informal observations, spontaneous conversations, and focus group discussions. This data was referenced and shared among the researchers throughout the visit to identify areas or subjects that needed further information, which was often gained in the focus groups or observations of the second day of the site visit. All focus group discussions and formal interviews were recorded in audio form.

Also during the site visit, the research team members debriefed with each other at the end of the first day to compare evidence and to identify those areas that would benefit from further observation or inquiry on the second day of the site visit. These debriefing sessions were used to

revise schedules for the second day of the visit as well as to identify needed follow-up conversations to triangulate information or to learn more about specific school practices.

Following the site visit to each of the case study schools and before the researchers began the formal analysis of the data, the teams prepared 10-12 page descriptive reports for each school. These reports were designed to provide the school's staff with a summary of what the teams observed during their site visits. This information was designed to be descriptive in nature and to provide feedback on evidence found regarding the ten characteristics. These reports were shared with school and district administrators, with encouragement to use it as one tool for evidence-based reflection and discussion in each school's ongoing work.

Once all the case study site visits were completed, the researcher teams turned their attention to analyzing the data. Individual case study files were created for each of the schools included in the study. These files included site documents, recorded interviews, observation protocol data, field notes, internal memos, and other artifacts. In some cases, additional data was accumulated or clarified with extended research of school documents or brief follow-up conversations with school leaders.

The formal observation data was compiled and summarized comparing quantitative findings from Typical and More Efficient schools as well as in a cross-case analysis by grade level. The categorized data used for the school-level reports was also compiled, and filters were created for school name, grade level, and school category (i.e., Typical or More Efficient school). This organization of the database allowed researchers to filter the data within certain subgroups or characteristics. Such organization aided the analysis as well as identified specific examples of practices.

Following the compilation and organization of field study data, all field researchers reviewed the data individually and began to identify what appeared to be developing themes or features of the schools in each category. The researchers then met multiple times face-to-face to discuss the preliminary findings using a cross-case analysis of their notes, anecdotal evidence and observed overall trends. This analysis of both quantitative and qualitative data from the field research led to establishing a preliminary list of recurring themes and distinguishing features of More Efficient schools. These preliminary themes and features were then tested through triangulation of the findings by applying filters and re-coding each piece of data based on its application to a specific theme or feature and comparison across the two types of schools. Data

that did not fit the preliminary themes or features was also identified and re-analyzed. A validity check on the data analysis was imposed by having a non-research team member review the raw data and research team's analyses for a sample of the case study files.

Using all the analysis techniques mentioned above, researchers then developed internal memos for each of the distinctive themes and/or features found in the More Efficient schools. This process led to the identification of five broad features that distinguished the More Efficient schools. The five broad features were then refined and supported with specific sample practices found in the More Efficient schools in the study.

### Case Study Findings

The initial analysis of the case study evidence revealed many findings similar to those reported in other higher performing school studies, as mentioned previously. As described in the individual school-level reports from our case studies, More Efficient schools were more consistent in their high expectations and high standards for all members of the school community, as well as in implementing a more rigorous curriculum through engaging instruction. In addition, More Efficient schools had good leadership, supportive school cultures, and many of the other characteristics found in our literature review. But a deeper analysis of the evidence also revealed that in the More Efficient schools these features come together to form a distinctive culture: a culture that is more than the sum of the individual parts and consists of features that cut across and encompassed the categories of characteristics found in earlier studies.

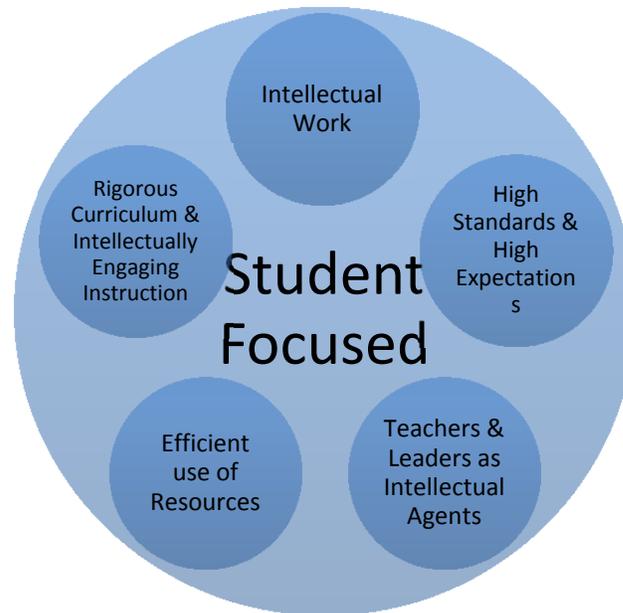
What we found to be unique among the More Efficient schools is a singular, sustained focus that places students and their intellectual development at the center of all of the work.

**The pervasive culture of More Efficient schools is *a learning community systemically:***

- A) *engaging in focused intellectual work,***
- B) *implementing rigorous curriculum and intellectually engaging instruction informed by assessment,***
- C) *sustaining pervasive high standards and high expectations focused on intellectual work in the culture and community of the school***
- D) *being led by teachers and leaders who serve as intellectual agents and believe they have the moral responsibility to help children become intellectual thinkers who can contribute to the greater good of society***
- E) *using available resources efficiently to maximize learning opportunities for students and staff.***

Figure 1 depicts this singular student focus and distinctive features.

Figure 1. **Distinctive Features of More Efficient Schools**



The key to the success of this model is the collective accountability and interaction of the whole sphere. While many Typical schools demonstrated progress towards this model and even strong practices in one or two isolated features, the distinguishing characteristic of More Efficient schools was the *sustained, pervasive nature of all of these features working simultaneously*. This culture of learning permeated throughout the school community in More Efficient schools, including parents, custodians, support staff and community volunteers in addition to teachers, administrators and students. “In such schools...students, teachers, and principals all respect academic achievement and work for success...academic press is a collective characteristic of the school; it refers to the normative and behavioral environment of the school.” (Hoy, Sweetland and Smith, 2002) In addition, the work to maintain and improve upon this foundation was constant and thorough. As one teacher from a More Efficient school said, “Okay, we’ve done this well. How can we do it better next time?” Another staff member indicated, “No one wants to be the weak link.”

While these features are interwoven among each other, there is evidence in practices demonstrated by the More Efficient schools in our study that can be traced back to the thread of an individual feature. First, what do we mean by *engaging in focused intellectual work*? It is

difficult to describe precisely what this fundamental characteristic is because it is multi-dimensional and, again, more than the sum of its parts. Fred Newmann and his colleagues (1996) have constructed a description of “*authentic intellectual work*” that comes closest to defining this feature. It is work that entails the “...construction of knowledge, through the use of disciplined inquiry, to produce discourse, products, or performances that have value beyond school” (p.14). In the words of Newmann et al.,

*[Authentic intellectual work] involves original application of knowledge and skills, rather than just routine use of facts and procedures. It also entails disciplined inquiry into the details of a particular problem and results in a product or presentation that has meaning or value beyond school. (1996)*

The Nellie Mae Education Foundation calls this type of intellectual work,

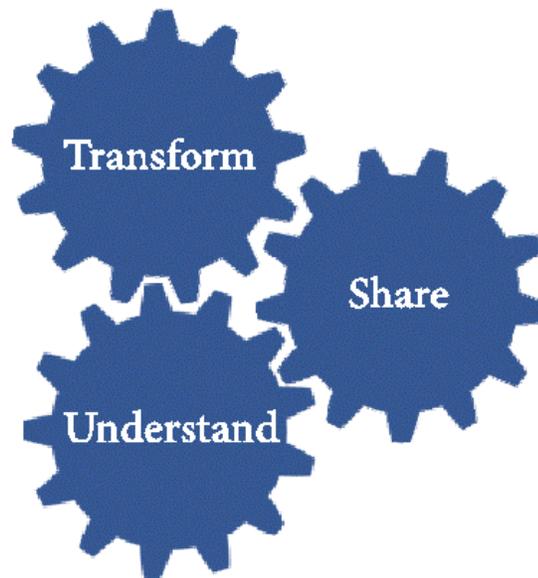
*deep learning...[that goes] beyond acquiring information through memorization, and presents opportunities to analyze and think critically, write and speak effectively, and solve complex problems...It gives students opportunities to engage in complex, meaningful projects that require sustained engagement, time for reflection, research and collaboration, and to develop performances or products.(2011)*

In these More Efficient schools, the school community engages in a pervasive, consistent practice of focused study that is “fun *because* it is hard rather than *in spite* of being hard.” (Papert, 2002). Even in terms of Benjamin Bloom’s levels of intellectual behavior, known well as Bloom’s Taxonomy, students and teachers in More Efficient schools were observed to be more deeply and more frequently engaged in working at higher levels on the taxonomy than their counterparts in Typical schools . Typical schools, for the most part, were focused on creating polite, organized environments. Sara Lawrence Lightfoot describes schools in this developing phase, “The institution has begun to emerge as stable and secure, but attention to the intellectual development and growth of students will require a different kind of focus, new pedagogical skills...” (1983, p.37). More Efficient schools appeared to be beyond this phase and were indeed maintaining an academic focus that developed the intellectual skills of students and teachers.

While “intellectual” pursuits are too often seen as vague ideas, as we are defining this type of work, it is actually a concrete process that can be observed, evaluated and aligned with distinct benchmarks or standards. This intellectual work requires learners to deeply **understand** content materials, which includes facts, concepts and skills as well as the broader theoretical and

practical relationships and structures within a content area (Schwab 1961). This allows learners to **transform** their understanding into active illustrations or representations that can travel to a new context and provide unique, stimulating ideas. It is also crucial for the learner to have the skills to clearly and eloquently **share** those ideas with other learners in a manner that augments further study across disciplines and learning venues.

Figure 2. **Elements of Intellectual Work**



In More Efficient schools, members of the school community demonstrated intellectual work through their ability to:

- ⇒ **Understand**: focused, sustained and thorough academic (content knowledge and fundamental skills) and social/behavioral (interpersonal relationships, social trends, cultural norms, etc.) learning.
- ⇒ **Transform**: constant inquiry using various reasoning processes and all levels of higher order thinking to work with information and concepts in order to create innovative solutions.
- ⇒ **Share**: clear communication of invigorating conclusions that enhance existing ideas.

This type of intellectual work was exhibited in many ways. For example, students often explicitly discussed and clearly demonstrated their intellectual work. In one kindergarten class observed in a More Efficient school, the teacher was presenting the concept of “half.” She gave a brief verbal definition illustrated with folding a piece of paper in half. She then asked the class to count off and determine how many students were in the class. All students then were asked to stand up, and she put them in two equally numbered groups to demonstrate separating the class in half. Students were asked to give other physical examples of half and explain how their examples demonstrated the concept of “half.” Several students demonstrated examples and spoke about how their examples met the definition. Then, the teacher had all students physically repeat those demonstrations, such as: bending in half at the waist, ripping a piece of paper in half, standing at the halfway point in the whiteboard, running halfway across the room, etc. Through developing, demonstrating, and explaining their solutions, students were showing their understanding of the concept of “half,” transforming it into a new medium or applying it to a new venue, then verbally engaging their peers in various explanations of the concept’s definition and its relationship to their daily world. This intellectual activity not only allowed individual students to apply and share their knowledge, it also provided repeated, invigorating engagement with the concept’s structure to deepen all students’ understanding of “half.”

A similarly interactive activity was used in a different More Efficient school to teach pronunciation rules to a second grade class. The teacher verbally explained the rules for the consonant of “hard c” and illustrated with verbal and visual (flashcard words) examples. All students were then asked to make up a word (not a known word) using the “hard c” and write it down on a blank flashcard. They all then shared their words by dictating the word, showing the flashcard and giving their made up verbal definition.

A collaborative effort between Art and English teachers in one More Efficient high school resulted in intellectual work by ninth grade students’ and their teachers through their study of the Harlem Renaissance. For a culminating assessment, students created a visual product that represented the themes of that period. Lecture, discussion and activities provided students with a thorough knowledge of the cultural period. Following these lessons, students created a visual



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image (graphic, paint, pastel, etc.) on paper that represented a theme of the Harlem Renaissance. Using a digital camera, the images were documented. Then, the students physically deconstructed (cut or ripped) the original image to create a collage reflecting the medium of Harlem Renaissance artist Romare Bearden and illustrating the emotions or ideas of a selected poem from that period. The final product was accompanied by a brief description written by the student of how his/her application related to the themes of the unit.

This process of intellectual work was also seen in a More Efficient middle school where sixth grade students in a Social Studies class were learning about anarchy. The teacher gave the students several reliable online sites to find the definition of “anarchy.” Using individual laptops, the students each independently wrote a definition compiled from the sources and read it aloud to the class. Then, in small groups organized by the teacher, students developed a written description of a model anarchist society. The small groups shared their descriptions with the class and defended or revised their construction based on peer questions and comments.

In another More Efficient high school, biology students demonstrated intellectual work while groups of 2-3 students worked together through a computer simulation of various genetic problems. The students worked out numerical elements of the problem by hand (on the table top with chalk or on individual white boards) and put their calculations into the computer program to progress through the simulation, having to revise their calculations if the output was not desired. Students then shared their thinking process and results in a written lab report assessed by the teacher. Model reports were distributed and reviewed by students prior to a whole class discussion about the various methods for approaching this problem.

Often, the result of this intellectual work is visibly integrated into various elements of the



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school, including specifically “authentic” aspects of the children’s learning, such as contributing to everyone’s awareness of world citizenship and how the understanding of social trends, cultural norms and other elements of social learning is a key aspect of this work. When learning is a process involving such “authentic” activities and familiar environments, the

student displays greater levels of confidence and more readily develops crucial problem-solving skills (Bruner, 1966). For example, one More Efficient school’s Service Learning Coordinator

used a Maine Agriculture in the Classroom grant to develop a "Children's Garden" in an elderly housing community built and maintained by the students, who also harvested and cooked with the foods they had grown. Another More Efficient school's assistant principal had earned a Learn and Serve America grant. The grant funded related grade-level projects, including an eighth grade unit that involved creating multi-media presentations for an Oxfam Hunger Banquet. The banquet was presented to over 75 community members and raised money and awareness regarding issues of world hunger.

In addition to a deep understanding in the academic and social realms of learning, this intellectual work develops behavioral learning through aspects such as the understanding of interpersonal relationships and self-reflection. One More Efficient high school highlighted the importance of this sustained practice through a quote by Aristotle incorporated into the principal's letter introducing the school's Program of Studies handbook and cited by teachers in two different meetings:

***“We are what we repeatedly do.  
Excellence, therefore, is not an act but a habit.” -- Aristotle***

So, in More Efficient schools, personal interactions and reflection are also approached as an intellectual challenge to help students improve their lives. Reflection can be important in education as a cognitive process (Dewey 1933; King and Kitchener 1994; Schon 1983) and an explicit lesson (Goldsmith 1995; Boud, Keough & Walker 1985). One full-time teacher in a More Efficient high school who monitored the school-wide three-hour Friday night detention worked with the assistant principal, the school resource team and other outside agencies to counsel repeat offenders. “Students make choices. Sometimes they make bad choices, sometimes they make good choices. That doesn't make them good or bad students...They're in detention, they made a bad choice. And we try to help them learn from those choices and move in a different direction and make better choices.” In another More Efficient school, a first grade classroom teacher asked students to make connections between the class-developed expectations posted on the wall and the actions of the characters in a story being read aloud as a class; these connections were later referenced by the teacher in a one-on-one conversation with a student regarding his behavioral choices. Another More Efficient school's fifth grade class began the school day following the classroom teacher's absence with a discussion of the positive and

negative aspects of their work with the substitute teacher. Their discussion included a candid conversation about elements the substitute described in her note to the classroom teacher as well as elements of the day that the substitute had not shared.

Through the lens of intellectual work, More Efficient schools are also continuing their work on the more often identified elements of school performance, such as curriculum and instruction. Thus, a second overarching feature of these learning communities is that they engage in focused intellectual work to develop *rigorous curriculum and intellectually engaging instruction* informed by assessment. For example, educators and school leaders maintain a concentration on understanding, transforming and sharing ideas regarding their own current practices in curriculum, instruction and assessment. Independently and collaboratively, key members of the school community 1) research methods for ongoing improvement, 2) collect and analyze data (gathered from external experts as well as internally developed formal and informal assessments), and 3) develop focused, invigorating improvements relevant to their students' needs. This collective expertise and process uses research and data results in curriculum goals and daily instructional practices (school wide, both inside and outside the classroom) that involve students and educators in intellectually engaging work, which also incorporates focused interventions for students struggling to meet the established standards.

The distinguishing feature of More Efficient schools implementing rigorous curriculum and providing intellectually engaging instruction is exemplified in practice by the school's capacity to sustain a common, concise focus that incorporates intellectual skills regarding curriculum development and professional learning, often surrounding literacy (reading, writing and numeracy). It is important to note that this literacy focus includes the areas of visual and/or performing arts. While maintaining this arts programming, a significant concentration of curriculum, student interventions and professional development reaches deeply into the fundamental skills of literacy and numeracy in order to further promote the previously mentioned pervasive culture of intellectual learning at More Efficient schools. In these schools, literacy is not a mundane set of core skills but rather a tool to fight social, educational and political inequity (Freire, 1970). To this end, several More Efficient schools developed their own literacy programs to specifically address the needs of their students. For example, one More Efficient elementary school created a "Best of the Best" literacy curriculum after their Learning Lab teachers raised a concern that past programs were not working consistently from classroom to classroom. As one

teacher said, “Things just needed a little tightening up.” All teaching staff and administrators participated in a concerted effort, using all aforementioned elements of intellectual work, to research various literacy programs then develop their own school-wide program. Their current, self-titled literacy program included Balanced Literacy Best Practices, Houghton Mifflin Guided Reading level books in grades 1-5, literature circles, 6+1 Trait Writing method, Words Their Way and individualized spelling lists. For example, while the kindergarten teachers had some very individualized elements of their classroom, they did all implement a common word of the week, “You do see consistency. It is ‘n’ week in Kindergarten and next week will be ‘o.’” In More Efficient schools, this practice of focusing and continuing professional learning around a common goal often resulted in a school-developed (not just a purchased or packaged) curriculum comprising of various tools and methods that provided autonomy and collaboration at appropriate times and levels. In another More Efficient school, teachers noted repeatedly that curriculum is not textbook driven but “outcome driven” to maintain a level of academic rigor appropriate to the individual students in their current classes, not a theoretical student or benchmark given by the textbook company. In fact, in that school, a significant unit to understand the structural elements of and bias within textbooks was taught in

*“We are not going out and buying something; we are building it from within.”*



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all classes at beginning of year and continually reinforced in lessons thereafter. Students confirmed that they explicitly learn and re-learn how to locate information and read their textbooks, indicating that textbooks are used only as one of many resources in their classes. As the principal said, “We’re not going

out and buying something; we are building it from within.”

Data about student performance in literacy across the curriculum, especially in terms of vocabulary, was a common tool of accountability and impetus for improving lessons and units in many More Efficient schools. As one science teacher said, “We have made a concerted effort to develop literacy across the curriculum. There are certain practices we do now that we didn’t do before: frontload vocabulary, create vocabulary walls, text previewing before we ask kids to read

then talk about what they see in the text.” In a More Efficient junior high school, a common reading of Ruby Payne’s *Framework for Understanding Poverty* by all educators led to a

***“There is a  
common  
vocabulary across  
classrooms here.”***

rigorous school-wide program to increase vocabulary: educators developed an annual 15-word list of content and general vocabulary appropriate to each grade level; the lists were distributed to all school staff and students’ families; educators and building administrators explicitly taught the vocabulary to students; and school staff was expected to learn and use the

words as much as possible throughout the school year...and beyond. Our observations and conversations in that school reflected that many staff members (custodians, principal, teachers, etc.) did indeed use these words in their daily interactions and, as one teacher said, “there is a common vocabulary across classrooms here.”

This work on curriculum involving literacy is made possible within embedded professional learning time utilized efficiently by educators and leaders. More Efficient schools of all grade levels had various teams and/or committees comprised of teaching staff who earned stipends or used regular (daily or weekly) common meeting periods within contractual time (professional development days, early release/late arrival, common planning periods, and staff meetings, etc.) to analyze assessment data, research findings, propose improvements and guide implementation. Maine’s More Efficient schools exemplified the national finding that teacher collaboration increases student achievement (Goddard, Goddard and Tschannen-Moran, 2007). For example, most More Efficient schools had daily common planning times for teachers, which were often used to develop curriculum and assessments. At one More Efficient high school, all teachers were given release time for collaborative scoring and analysis of results of a school-wide SAT writing prompt. Another More Efficient school used assessment data surrounding reading, writing and numeracy to guide curriculum discussions in district-wide vertical content meetings during district professional days. Some More Efficient schools had a school-wide Literacy Team (teachers, literacy specialist, district special education director, building administrator) that was responsible for collecting, analyzing and disseminating relevant literacy data to inform curriculum development. As one principal of a More Efficient high school said, “I was more articulate about the plan” to use embedded professional time for curriculum and unit development.

Building upon the strong foundation of their rigorous curriculum, More Efficient schools also provide contractual time for sustained, data-informed intellectual work by educators and leaders that develops intellectually engaging instructional practices. It is evident that “for both beginning and experienced teachers: sustained teacher learning connects directly with student results” (Renyi, 1996). Our observations indicated that this professional time was organized, focused and used effectively in More Efficient schools. One More Efficient high school’s principal described the school’s team leaders’ goal for professional learning as allowing educators to “work on the work” of better practices. For example, many site visits at More Efficient schools included observations or teacher conversations that referenced focused and relevant use of faculty meeting time. This showed, according to one teacher, “balanced leadership focused on instruction more than anything else.” One More Efficient elementary school developed time for teachers to meet district-wide after a new math program was implemented. Teachers in this school were able to share successes



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and struggles with implementing the practices as well as improve their instruction, thereby improving the students’ math experiences. One teacher from a More Efficient high school indicated, “In our department meetings we have meaningful conversations about instruction: what is good instruction, what is not.” A More Efficient junior high school includes frequent teacher sharing sessions on “works in progress” surrounding instruction and assessment strategies. Several More Efficient schools included classroom observations as a means to providing teachers with feedback about instruction. One new teacher noted, “It’s easy to lose track of what’s going on in your own room without somebody else’s feedback on it.” And a high school principal indicated, “I think the action is to get teachers in each other’s classrooms. That’s where the real improvement is going to happen...and talking about student work.”

In order to share, develop and evaluate the efficacy of these instruction practices, educators at More Efficient schools are provided with—and effectively use—significant time within their professional day to engage in individual and collaborative intellectual work. For example, one More Efficient high school had a Walkthrough Team of teachers, guidance

counselors and administrators that regularly conduct classroom observations and then compile and analyze their findings. As an example, in a review of their findings with the whole faculty of this school, there was a collective conclusion that higher order thinking skills needed to be integrated into their practices and instruction more frequently. Therefore, staff and leaders engaged in further professional learning opportunities and observations focused on this goal. Upon sharing our observation data from this case study with the school (including a recording of the level of Bloom's Taxonomy), members from this school's Walkthrough Team were happy (but still not satisfied) to see a slight improvement in this area from their earlier recorded results.

An instructional distinction of the More Efficient schools identified in our observations was that a large majority of students were engaged in academic work involving direct teacher instruction that was provided to the whole class or individual students. Very few observations in these schools captured class activities that were orchestrated by non-humans (computer, television, workbook, textbook, etc.). At times, this direct interaction between teacher and student occurred via technology (for example, using GoogleDocs to monitor and conference with students about their writing in real time) or in combination with technology (for example, a whole class discussion involving a PowerPoint presentation), but it still constituted immediate communication between the student and the educator.

Interestingly, technology was being used with approximately the same frequency in Typical schools (37% of observations in Typical schools and 34% of observations in More Efficient schools reflected teachers and/or students using technology), so the success seemed to be coming from *how* technology was being used, not just that it was present in the classroom. For example, in Typical schools, technology seemed to more often replace the teacher in the form of students engaging independently with educational software programs requiring no teacher interaction other than monitoring. And, technology was actually more frequent in Typical school observations at the K-5 level (23% of observations in Typical K-5 schools and 14% of observations in More Efficient K-5 schools showed teacher and/or students using technology) and high school level (55% of observations in Typical and 34% of More Efficient high schools showed teachers and/or students using technology). Whereas, as mentioned above, More Efficient classrooms at these grade levels showed educators using technology to supplement direct instruction instead of replace it.

In accordance with the Maine Learning Technology Initiative, all 7<sup>th</sup> and 8<sup>th</sup> grade students have been provided laptops since 2002. This has resulted in a significant increase of computer use in most middle and junior high schools in Maine. Our observations confirmed this practice by showing that schools with grade levels including grades 6-8 had the highest overall use of technology (49% of observations included technology use in the classroom in middle



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schools, including grades 5-8, while high schools showed 39%, K-8 schools showed 31% and elementary schools showed 18%). However, one limitation of this study is that researchers only identified if students were using technology, usually making no distinction between relevant use of technology and use for unrelated tasks such as social networking, gaming or web surfing not connected to learning goals. In fact, this situation of “chronic open laptops,” can often be seen in the qualitative observation notes accompanying the quantitative data surrounding middle school use of technology in this study. Such comments were more frequent in Typical schools, while More Efficient schools at all grade levels, including middle school, more often used technology purposefully as a learning tool. In More Efficient schools, technology tools were more likely to be put away and replaced with human interaction or focused independent work that directly supported the learning goals instead of being allowed to remain in use as a distraction.

Intellectually engaging direct instruction at all grade levels was more pervasive in More Efficient schools. For example, one teacher in a More Efficient elementary school integrated prior learning into a reading of Eric Carle’s *The Lonely Firefly*, asking first grade students probing questions about previous art lessons and projects the students had created involving Carle’s artistic medium of paint and collage as well as past science activities about fireflies. Many students answered verbally and others showed examples of their own work and the work of other artists and scientists (classmates and professionals) they found in the classroom in response to the teacher’s questions. In another More Efficient school, a first grade class demonstrated their higher order thinking skills in a science experiment. Each child was given a container of various types of matter (dirt, water, moss, wood, etc.). The teacher asked students to

demonstrate previously learned vocabulary, identifying “solids” and “liquids.” The students then mixed the elements, and the teacher explained the possible ways the state of their matter could change.

There were numerous examples of intellectually engaging direct teacher instruction at the middle and high school level as well where teachers were involving their students in “good information processing” (Pressley, Borkowski, and Schneider, 1989), including our observations of thought-provoking one-on-one writing conferences in which students were asked to synthesize ideas from various sources, evaluate theories of experts in a field and write thorough, supported analytical essays surrounding current issues and sophisticated literature, as well as use vigorous rubrics to critique their own and their peers’ writing. We also observed several stimulating activities in art and science that demonstrated not only students engaging in intellectual work, but also teachers providing insightful instruction to guide the process, solidify content knowledge, and push students to engage with the material in new ways that used higher order thinking skills. This was seen in the facilitation of whole class discussions, individual conferencing and the coordination of group work. For example, one sophomore English teacher at a More Efficient high school orchestrated an activity responding to a short non-fiction essay that related to a longer fiction text they were reading as a class. Students were asked a provoking question by the teacher and responded to the question with supporting evidence from each text in an informal written reaction. Then, the teacher posted four general categories in the corners of the room and told students to stand in a place in the room that best represented their response. The teacher then called upon students to verbally explain their position (without reading from their written response). Eventually, all students responded, and most students spoke very eloquently and thoroughly about their point of view. Some students even moved around the room reflecting a change in their opinion after some students spoke, and the teacher asked them to explain their move.

More Efficient schools also did significant work surrounding curriculum and instruction to provide sustained, early and focused interventions to promote intellectual work from all students, including those who performed below standards or benchmarks. The value of an effective identification and intervention system can be found in increased retention and graduation rates (Balfanz, Herzog & MacIver, 2007). For example, one More Efficient elementary school used Running Records, DIBELS, Observational Survey and formative

classroom assessments that demonstrate students' mastery of skills and knowledge. They analyzed this data and current instruction practices during grade-level meetings. If their analysis found it necessary to "change it to fit the [students'] needs," such changes were discussed with leadership and implemented. Another example, cited previously to illustrate a different concept, is the More Efficient high school that used school-wide professional time (early release, staff

*Grade level teams and departmental committees developed the 9<sup>th</sup> Grade Academies, which provided common time and common student rosters for teachers to address issues unique to this group of students.*

days and faculty meetings) to train all teachers in all content areas to score student writing samples from a school-wide SAT writing prompt given twice each year. During professional days and content-area meeting times, these results were categorized into various student groupings (grade level, past student performance, content area, gender, etc.).

Then the results were analyzed and discussed in order to focus embedded and explicit writing instruction that was appropriate for all content areas. A different More Efficient high school developed new intervention initiatives after identifying high failure and high absenteeism rates in data from the freshmen students. They worked in grade-level teams and departmental committees to develop 9<sup>th</sup> grade "academies," which provided teachers of 9<sup>th</sup> grade courses common time and common student rosters to address issues unique to this group of students. This work also led to developing a "Freshman Focus" literacy course required for students performing below standard in reading and/or writing. It also spurred initiation of an alternative education program that incorporates a rigorous academic curriculum with the same standards as other grade-level courses but provides a more intimate and active daily agenda. Very little fanfare surrounded this change in the organization of students, as the principal indicated, "We didn't name teams. Our big goal was to increase teacher collaboration and communication."

In addition to the intellectual work done by teachers and students in More Efficient schools, there is a collective expertise surrounding data collection, gaining knowledge from data and acting upon that knowledge. External accountability, especially from the No Child Left Behind Act, has required schools to use data more thoroughly in their improvement efforts. However, many schools and state governments across the nation are still struggling to develop accessible, usable data tools for practitioners. However, we found that in More Efficient schools

formative and summative assessment results were used to guide curriculum discussions district-wide as well as within the school. A key seemed to be that teachers and administrators were not driven blindly by overwhelming data, but comprehensively analyzed significant information to improve their schools (Mangin & Stoelinga, 2008). For example, several More Efficient schools were involved in PK-12 vertical content area meetings to develop and refine curriculum using student performance data from NWEAs, NECAPs, SATs, AP exams, and classroom summative assessments. In one More Efficient high school, teachers in all content areas met to discuss continual improvement of the “writing rubric and oral presentation rubrics...to be broken down into smaller steps, grade level expectations.”

Students and their families are also part of the conversation surrounding data. “The learning rubrics must be written in ‘kid-friendly language’ so that the goals and expectations are clear to the students. The specific competency expectation is written to say ‘I can’ so that kids know that we expect them to perform at this level.” In More Efficient schools, both children and parents could speak descriptively about specific rubrics, content-area standards and school-wide reporting systems. A veteran education technician said, “Kids reflections are so much more precise than they used to be.” It was evident in these schools that assessment materials and performance data was regularly shared with students, parents, educators and administrators. For example, many courses in More Efficient schools incorporated study guides for tests that were developed collaboratively by students and teachers. Many of these schools also held student-involved conferences with students, teachers and parents actively participating in discussions about summative and formative assessments as well as standardized test results. Again, it is the collective investment of all members of the school community in the improvement in student learning that makes these More Efficient schools distinctive.

*“At [this high school], you’re going to go towards academics because with that comes the school spirit.”*

A third overarching feature often seen in literature about higher performing schools is their pervasive *high standards and high expectations*. In More Efficient schools in Maine, this is also true, and the distinction is found in the focus around intellectual work throughout the culture and community of the school. As previously discussed, high expectations and high

standards are thoroughly evident in More Efficient schools within student work, curriculum, instruction, professional development and leadership practices. However, another distinctive feature of More Efficient schools is that these high expectations and high standards flood into many other aspects of the school's culture to create an evident academic focus. This academic focus is one important characteristic of schools with strong student achievement (Wentzel, 1991). Many Typical schools were working to improve selected aspects of their school's culture and had succeeded in some cases to develop strength in some areas. However, in More Efficient schools, there is a pervasive academic and intellectual focus evident in all corners of the school. As one high school student said, "At [this high school] you're going to go towards academics because with that comes the school spirit." A sixth grader echoed this sentiment by saying, "The rule in this school is academics come first."

Many schools we visited had organized their daily schedule to provide embedded time for students to access academic support, but the distinguishing characteristic in More Efficient schools was that these opportunities were utilized by a range of the student population, including students performing below grade level as well as students accelerating well beyond grade level. For example, one More Efficient high school had a Study Center staffed throughout the entire school day by two full-time, certified teachers (Math and English) who were familiar with content curriculum and course assessments. Students, teachers and guidance said there was little to no stigma surrounding the Study Center, which was utilized daily by students who were assigned study time there as an intervention and students who dropped in voluntarily. Students benefited by having "basically a free tutor for any level" and "spontaneous peer coaching." The school's policies and schedule also reinforced the use of these resources. For example, some of the five More Efficient high schools we visited no longer offered open campus or early release, scheduling students instead for structured study halls, peer tutoring, or additional courses.

*Students described the Study Center, staffed by two full-time, certified teachers, as "basically a free tutor for any level."*

Even during important breaks from academic work, intellectual work continued in the form of constant inquiry, social interactions, and behavioral teachings. Reflecting Maria Montessori's philosophy that "play is the work of the child," many More Efficient schools,

especially at the elementary level, modeled this in their use of non-academic time by providing intellectually invigorating physical and social activities modeled and overseen by an educator during recess, lunch and snack. For example, in various More Efficient schools eating during lunch and snack time was accompanied with reading aloud to the students or listening to orchestral music. As well, recess in PK-8 was often seen as an opportunity for educators to purposefully model good social behavior, investigate the outdoor world with children, promote good sportsmanship, and engage students in healthy competition or collaboration.

The high expectation within a culture of positive learning was continued inside the school as well. In More Efficient schools, this positive culture was built through the common goal of intellectual work. In many Typical schools, the focus of handbooks and behavior documents was discipline or rules, whereas most More Efficient schools first and foremost presented academic policies and expectations in the Student Handbook. In these More Efficient schools, there was a school-wide, common “practice [of] behaviors in the classroom and use [of] consistent language” to communicate the goals of their intellectual community. Leadership supported this by dealing with issues of concern before they escalated to cause significant disruption to learning. Also, training and support was provided for teachers, families and students. One district we visited with two More Efficient elementary schools worked



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closely with a local anti-bullying expert from the county Children’s Task Force. This expert worked with teachers and students in classrooms to develop a school-wide “Pledge of Respect” signed by teachers, students and parents, and she remained on-call to re-visit classes with issues of concern. This behavioral work was integrated with the intellectual work in curricula through discussion of class books, problems of logic in math, debates surrounding historical and social issues in Social Studies, etc.

The involvement of so many members of the school community also embodies the high standard of a culture in More Efficient schools of collective responsibility and accountability among members of the school community to stay focused on intellectual work. According to Hargreaves and Fink, in order to sustain successful practices, leadership must be “a shared

responsibility that does not unduly deplete human or financial resources, and that cares for and avoids exerting damage on the surrounding educational and community environment” (2003). In More Efficient schools, students, parents, educators and administrators shared the responsibility and accountability for sustaining their practices. For example, in one More Efficient K-8 school, all students arrive 30-60 minutes before the official start of the school day. Monitored physical activity, usually outdoors, is provided, but a large percentage of the middle school students participated in the before-school academic help sessions. In fact, a culture of peer accountability was evident in this school in a casual conversation overheard between two 5<sup>th</sup> grade students during a math class:

“Did you finish your homework?”

“No.”

“Then why weren’t you in the study hall before school this morning? I was there.”

Students from another More Efficient school started a Writing Center to provide peer editing and conferencing by students who had been thoroughly trained by educators. It was the students who promoted this center, as well as various methods of more formal public awareness. These expectations seemed to be upheld during conversations in which students K-12 could descriptively explain their various course standards and assessments (formative, summative, standardized, etc.) in relation to their individual performance and academic goals.

*“My kids have expectations of me as a parent  
and I have expectations of them as a student.”*

In fact, in some More Efficient schools, students were explicitly taught how to speak about their work and had an opportunity to do so in student-involved conferences, student-led IEP meetings, and in their classrooms.

Building leaders in More Efficient schools frequently spoke of the expectation that they uphold the school’s high standards and high expectations. One way they do this is to build and oversee explicit, diligent professional time for educators to collaborate, research and develop course materials during their contractual time. One distinction of More Efficient schools was that this time for professional intellectual work was provided not only to lead classroom teachers, but to educational technicians as well. In these schools, the education technician’s primary role was

to support classroom teaching, not provide administrative or secretarial assistance. Therefore, these members of the staff were involved in curriculum development, classroom management, literacy, content areas, and other relevant professional learning opportunities with the teachers they supported. According to educators, this allowed for a greater common language and expectation among all teaching staff and meant all people engaged in curriculum were intimately familiar with its standards and content. It also provided lead classroom teachers the opportunity to work with small groups or individual students while education technicians could provide informed direct instruction.

Therefore, in More Efficient schools, administrators and educators expected each other to all access relevant, intellectually invigorating professional learning opportunities, synthesize

*During the monthly faculty meetings, 29 out of 33 teachers had presented an expert share activity related to the school wide academic goal surrounding literacy.*

their learning with current practices, and then share their ideas with colleagues. One More Efficient school used their monthly faculty meetings to have teachers provide an expert share related to the school wide academic goal surrounding literacy; at the time of our spring visit, 29 out of 33 teachers had presented so far that school year. In other More Efficient schools, building leaders orchestrated staff meetings to include

ten-minute technology tips, vocabulary lesson ideas, student of the month discussions, staff survey reviews, etc. However, they used very little of time in these meetings to talk *at* staff or relay administrative information that could be shared via email or newsletters.

Building leaders in More Efficient schools are highly visible and accessible to staff and students as well as being clearly involved in the intellectual work being done in their schools. Teachers indicated that their building leaders were actively aware of the teaching practices and professional work being done by educators in the school. Although there were mixed reviews about the efficacy of the official evaluation process in many schools, More Efficient schools clearly had a system (formal and/or informal) that built accountability and “makes sure we are using what we are taught.” A new teacher at a More Efficient K-8 school indicated, “There’s a very high expectation to do very well. I wouldn’t call it pressure. We all expect the best of ourselves and our administration expects the best... There are high expectations from the administration but it feels collaborative.” The building leaders, especially principals and assistant

principals, were often in classrooms for brief, informal, impromptu observations. At times, they were even involved in the activities at hand. One principal was observed participating enthusiastically in group races during a kindergarten physical education class. Another principal taught music classes. A couple building administrators read aloud to students on a regular basis, while some high school principals participated in intramural athletic leagues with students and staff. Teachers indicated that this involvement allowed them to have valuable conversations and gain relevant feedback about what had been observed while also building a positive relationship between the leaders and the students.

In More Efficient schools, building leaders conduct this relationship of high expectations and high standards not only with school staff and students, but also with students' families and the townspeople. Structured communication and support systems are also used with the community at large to maintain focus on student learning. Most More Efficient schools had a well-organized system for volunteers that was very student-centric, not volunteer-centered. They did not attempt to fit in all volunteers at any possible time to appease the volunteer's offering. Instead, these schools were aware of specific areas of need and explicitly solicited or designated volunteer services in these areas. These schools understood that it was important to "recruit and actively involve parent and community volunteers at school sites to nurture the academic success" of students (Burke, 2001). One More Efficient elementary school had scheduled parent "readers" during student library time. These volunteers read a book aloud to the class, helped students check out books, and provided additional assistance to the librarian after the students had returned to their classrooms. Another More Efficient elementary school began the school year with a welcome newsletter from each classroom teacher that listed various material needs for the class (such as recycled paper rolls, egg cartons, etc.). Many of these schools had a volunteer coordinator that worked as a liaison so that volunteers could best fit the needs of the school.

*Students referred to a class-created poster of how to "think like a mathematician" when parent volunteers assisted them.*

Additionally, community and volunteer interaction again maintained, not distracted from, the intellectual and academic focus of the school. Work outside the classroom still referenced common academic expectations and language that had been developed by educators and

students. Use of content vocabulary and processes were expected in any intellectual situation, and students in More Efficient schools often took on the role of educator to teach outsiders how their work was connected. For example, while working with volunteer adult writers, students emphasized the value of the many steps of the writing process, and each person shared their own variations of the core process. In another More Efficient school, students referred to a class-created poster of how to “think like a mathematician” when parent volunteers assisted them. This academic focus was also evident in More Efficient middle and high school athletes. High standards and high expectations to maintain eligibility were placed upon student athletes. Most coaches required their athletes to be passing a minimum of five full-credit courses, and many coaches required a weekly academic progress report. The student athletes and staff we spoke to in these schools were very aware of these expectations. “In this office, we are in the academic business,” said one athletic office administrative assistant.

A fourth overarching feature found in More Efficient schools and crucial to the intellectual work done by students, is that *teachers and leaders act as intellectual agents who believe they have the moral responsibility to help children become intellectual thinkers who can contribute to the greater good of society*. One educator said, “We have high expectations of our kids but we have high expectations of ourselves as teachers.” Adults in the school

*“I really became a teacher for social justice reasons.”*

community who engage in educational situations with students include numerous people in the school, within and beyond the classroom. The core of this learning community includes school leaders, lead classroom teachers and teaching education technicians. While most teachers demonstrate a “moral obligation to children and their parents” (Vandenberghe and Huberman, 1999), these educators are not just dedicated and hard-working, but also truly believe in the *intellectual* (again, in terms of academic as well as social and behavioral) potential of every child, regardless of socio-economic status, gender, race, religion, family history, current and past academic performance, etc. One teacher from a more efficient high school said, “I really became a teacher for social justice reasons...I’m not a teacher to be buddies with the kids. I love the kids, but it’s okay with me if I’m not their best friend...I don’t need to hear all their secrets. Although sometimes that comes up, but it’s not the point. The point is that every person in our society, every single kid deserves to be able to do the things in the Common Core Standards.”

Teachers and leaders in More Efficient schools have a collective understanding of the importance in sharing educational experiences with all of their students as one significant means to building a better individual, community, state, nation and world.

Many examples shared so far in this report demonstrate that students in More Efficient schools go through the process of intellectual work to understand, transform and share information and ideas. However, teachers and leaders engaging in intellectual work also provide a key component to building a learning community in which students are systemically engaged in intellectual work (Hill, 2000). In the words of a student from a More Efficient middle school, “Our teachers are good because they give us help, they don’t just give us answers.” How do teachers and leaders engage in intellectual work? We found many examples in the More Efficient schools of the collective professional expectations and accountability for continued learning, as seen in the previously mentioned examples of professional learning that coincide with this feature. One teacher described how she and her colleagues developed their K-5 literacy program using the intellectual process of understanding, transforming and sharing knowledge, “Words Their Way and literacy components were based on that research process: data is collected during implementation of pilots. They’re called pilots until we’ve proved that there is a benefit, and we collect data to make that decision. Then [if it’s beneficial] it’s a must-do.”

As discussed earlier in this report, education technicians were very evidently treated as educators in most More Efficient schools. The duties of education technicians were classroom-based and student-involved, and not administrative assistant duties: “the teacher’s role is to give the lesson, our role is to give one-on-one support.” They were “provided with a lot of professional development opportunities” (including early release professional meetings, book studies and course reimbursement) and expected to be involved in all areas of the school because “knowledge spreads” and “consistency plays a big part” in student success. In one More Efficient school, the teachers said, “ed techs are unbelievably superior,” and parents said, “phenomenal ed tech support” was a key to the school’s success. Our observations in More Efficient schools indicated that education technicians were very familiar with curriculum, worked directly with small groups, whole classes and provided valuable one-on-one instruction to both students identified as special education and those students not identified.

The intellectual process of having a deep **understanding** of the relevant research, conducting their own research and **transforming** their practice, then having the comfort,

responsibility and skill to clearly **share** their findings and recommendations with their leaders and colleagues seemed to be practiced by many educators in More Efficient schools. This process was even demonstrated in more common professional tasks, such as developing individual and collaborative classroom curriculum and assessment tools, or dealing with student discipline (Renyi, 1996). One science teacher at a More Efficient high school improved upon the classic genetics lab using fruit flies by partnering with a local university professor to design a variation on the lab that allowed students to work with generations of flies to test for heritability of characteristics. Many educators in More Efficient schools applauded and upheld the high standard for utilizing provided contractual time for such intellectual work. Thus, teaching staff in these schools were observed engaging in these focused, collaborative efforts during embedded professional learning time. For example, in one More Efficient elementary school, grade 3-5 teachers boasted of the literacy focus of their weekly meetings with grade-level Professional Learning Groups, which incorporated discussions with a visiting master teacher and collective work to set “smart goals” into that time. Similarly, a More Efficient middle school dedicated one of their daily common meetings per month, led by the district technology integrator, to provide content area teachers with training to use and integrate technology tools.



Photo credit: Jeff Fitlow, Rice University

This intellectual process spread “authentic” learning for educators (Little, 1993) outside of their school building as well. Several teachers indicated that they applied the process of **understanding, transforming** and **sharing** to help them to be successful in their continuing education courses. For example, a More Efficient elementary school required all teachers to take an advanced literacy course involving research review then applying transformed ideas to develop, evaluate and implement new formative assessments in literacy. This intellectual work was not limited to educators’ professional time but came from the moral belief that intellectual thought can contribute to the greater good of society (Vandenbergh & Huberman, 1999). One student in a More Efficient high school said,

*“Teachers make their subject interesting because they like it. Teachers are passionate about what they teach...they can relate [the course material] to their lives, which helps us relate it to our lives.”*

For example, in one More Efficient high school, a large percentage of the teachers in the Foreign Languages department were heralded by students as being “engaging” and “interesting” because they had first-hand experience traveling to and/or living in regions of the world where the language they taught was spoken. These experiences were integrated throughout lessons in the form of visual images, personal anecdotes, and a deeper understanding of colloquial variations of the language. As previously mentioned, in More Efficient schools, we observed a greater number of educators fulfilling an active teaching role, guiding students through intellectual inquiry with human (not solely computer or textbook) interaction.

This sense of active involvement builds an atmosphere of moral obligation and collective accountability in which building leaders support and expect all teaching staff to be “in a constant state of rejuvenation.” Leaders fostered this state with the professional modeling and practices mentioned throughout this report, but they also upheld these expectations with explicit oversight and evaluation. “There is a process, and if [teachers] aren’t meeting the grade and continuing to improve, they don’t get re-hired...but the contract is followed. The administration worked with the union in a very collegial manner.” Teachers in More Efficient schools appreciated that the administration was “making sure we are using what we are taught” through observations, conversations, evaluations, and goals for improvement (both formally and informally). This collaborative effort to improve practice and continue learning for students and staff also led to an environment of intrinsic peer accountability in which “nobody wants to be the weak link.” Therefore, as previously mentioned, staff often shared their learning as internal experts, mentored one another, and provided support and high standards for new teachers.

A key element to sustaining this focus on intellectual work throughout the school is focused, collaborative and guiding leadership by a school leader, usually the principal and/or assistant principal, who facilitates and practices intellectual work him/herself. Again, these leaders often exhibit the moral responsibility (Fullan, 2003) of providing children with an intellectual experience as well as collaborating with the school community (Rubin, 2009). One high school teacher at a More Efficient school said, “Letting teachers have professional autonomy fosters intellectual work.” Another teacher in the same school agreed but added that learners, especially teachers, “have to still be curious” to engage in the intellectual process because it really is “hard work.” As one teacher from a More Efficient high school stated, “You’ve got to have a bit of top down pressure to say this is valuable work.”

Staff at another More Efficient school said that the principal and assistant principal have a combined “skill set” for supporting teacher and student learning because they perceive their jobs as driving learning, not just managing the school (though the school also appeared very well-managed as a clean, orderly physical plant with staff and parents reporting good

*“We have administrators  
who value us as  
professionals and let us  
know that.”*

communication). The superintendent indicated that this principal “chose [an assistant principal] who complements” him, and they work well together as a team. The principal said the assistant principal “brings teacher leadership background that is good” because she had taught at that school, and also had advanced, relevant academic studies.

Both administrators worked at developing the school vision with wide ownership by involving all school staff, parents and students. They went into every classroom and led an activity including 7-9 questions about what it would take to make this a school one that everyone would want to be at every day, a school that supported learning. The results of this activity were charted around the gym during an all-staff meeting to share input and craft the vision statement. The administrators said they reference this process and the resulting vision statement to remind folks about why the school is engaging in the selected efforts at ongoing improvement. A number of staff mentioned that the principal and assistant principal follow through on these change efforts, “Something is set in motion, and they keep going back and back.” Teachers say there are very few “naysayers” because of how the work is approached: school leaders “prepare staff for upcoming changes” so they are better “able to adapt” and do “not always have to change completely.” The principal said changes often have “a new name but they are usually something we already use and do for kids.” He said he knows teachers understand state/district/federal mandates are “not going to go away, so [our staff] say, ‘How do I make it fit?’” Constantly following this process of intellectual work, the school leaders involve the whole school community, modeling the method for further practice.

*Intellectual work was demonstrated in More Efficient schools by various school leaders, in addition to principals and assistant principals.*

One More Efficient high school had a district nutrition director who was a certified dietitian and involved in federal and state initiatives to improve school lunches, including the Healthier U.S. Schools Challenge (incorporating Nutrition Education classes and collaborating with Physical Education department to record 50-150 minutes/week of physical activity for all students). The nutrition director spoke at legislative hearings in support of the state proposal to require all districts to have nutrition director. The director also said she involved all kitchen staff in developing a new floor plan layout to provide faster lunch service, using four serving stations instead of one. The staff input provided the impetus to develop various venues for informing students of their options prior to ordering, which increased the amount of food sold and decreased waste according to the director's accounts. "I allow [my staff] to make decisions. I allow them to learn. I take their ideas. I offer ideas."

This working relationship shows that such understanding, transforming and sharing by all members of the school community can lead to a school culture that is More Efficient and more enjoyable. As mentioned, collaborative work focused on the school's academic/intellectual goal was another distinctive element of More Efficient schools and a key goal for the leaders of these schools. School leaders delegated responsibilities to internal experts in numerous roles (teachers, education technicians, guidance counselors, district specialists, etc.). "Leadership takes on a variety of different looks," said one principal. She noted that her role was to connect various groups and their efforts. She described this process by saying, "We are all pulling on the same rope, but we are looking at things from a different angle and that makes it richer." Ideas and materials are often developed in teams and committees, then analyzed by administrators and school leaders who give constructive feedback and utilize the material if found valuable. One teacher indicated that it was critical to "have administrators who...value us as professionals and let us know that."

Finally, a fifth overarching feature, found in More Efficient schools and crucial to sustaining intellectual communities even during challenging fiscal times, is these learning communities are *using available resources efficiently to maximize learning opportunities for students and staff*. As mentioned earlier in this report, efficiency in this study is not necessarily just achieved with cost cutting or budget reductions but more evident in practices that provide relevant, productive investments that enhance student learning. While many schools, both Typical and More Efficient ones, were engaging in important steps to increase savings and

efficiencies in the operation of their schools, such as by purchasing new boilers and better lighting systems, pursuing grant funding, and sharing the cost of services with their communities or neighboring schools, the distinguishing characteristic of More Efficient schools was that their systems of professional development, scheduling, staffing, *and* maintaining the physical plant were more effective.

In terms of personnel, all staff is trained and held accountable for implementing strategies that result in efficient and effective practices. One high school teacher from a More Efficient school believed the success of their school was largely due to the “time built in and an expectation that we are doing good work.” For example, these schools did not necessarily pay teachers less but they got more out of their teachers because students were performing at higher levels, contractual time was used in a focused productive manner, and the school schedule and teachers trained in effective transitions provided for more direct instructional time. As noted earlier, we did find that a majority of the More Efficient schools have lower professional staff to student ratios; that is, fewer educators are working with more students and providing an effective education program. It is not a great deal lower, but enough to result in lower overall instructional per pupil expenditures.

One teacher at a More Efficient high school explained, “We’re held to high expectations, then we turn around and hold the students to high expectations. Collectively we have high expectations of each other.” More Efficient schools often developed this culture of collective professional expectations by frontloading educators with a deep understanding of their craft and providing them with the opportunities to transform their practices. One teacher from a More Efficient high school indicated that a key to professional focus was “to push each other think about what is essential, why are we doing this, what skills do we want kids to walk away with.” For example, one More Efficient junior high school worked to set common instructional expectations for teachers by requiring every teacher to complete a course on effective instruction (Hunter, 1994) and a school initiative using “The Thoughtful Classroom” models involving research-based instructional practices of strategic teachers (Silver Strong Associates and Thoughtful Education Press). In other words, instead of having teachers simply self-select different professional development opportunities, there were common professional development expectations. Staff and students reported that this led to a common set of expectations for both teachers and students, thus saving time in collaborative meetings, improving student engagement

and raising student performance. One More Efficient K-8 school required 32-40 hours of Therapeutic Crisis Intervention training for all education technicians who would then be recertified in this practice each summer. Education technicians also received professional development time during the year to learn appropriate methods for physically restraining a child and how to mediate conversations after an incident. This practice deescalated situations before they are out of control and helped children to be more successful in mainstream classrooms.

This common training and accountability created an environment where, as mentioned previously, educators were held to high standards and supported by the school's formal and informal systems of evaluation and professional learning. One More Efficient elementary school's teachers heralded the importance of the work within their Professional Learning Group (PLG). Their PLGs worked with a literacy coach supplementing a required course in literacy. This combination supported professional learning and provided accountability tools for effective instruction. Staff at a More Efficient middle school encouraged each other to participate in the local professional learning opportunity regarding movement and relation to learning (Madigan, 2004) as a way to help them to work in teams to structure instruction and allow for more movement in a class period. Teachers in another More Efficient elementary school suggested that there is some amount of collegial pressure to participate in professional development opportunities because everyone wants to make sure they stay current, knowledgeable and engaged in order to keep their jobs. In one More Efficient high school teachers indicated they feel ownership in the teacher goal setting "action plans" that were both part of the off-year goal setting process as well as the formal evaluation year. The action plans were developed with and selected by the faculty after a year of studying Robert Marzano's strategies and taking "The Skillful Teacher" course surrounding his work.

Equally important, our study identified an efficiency characteristic that does not show up in the per pupil expenditure amounts: More Efficient schools found ways to increase learning time and save more time for instruction and learning during the school day. For one, little time

*“The focus in this school is on students.”*

was used for transitions that did not incorporate some type of intellectual engagement. For another, more time was spent in focused, purposeful learning integrated into even the traditionally identified "down time" (recess, snack, passing time, etc.) of a school

day. Also, intellectual inquiry and learning was modeled and encouraged in the students' and educators' entire day at school. And so the emphasis was on increased "learning" time, not just increased instructional time. This learning time (school day schedule, class time management, professional meetings, independent study time for students and educators, etc.) is resourcefully organized and orchestrated to provide sufficient opportunities for focused intellectual work. For example, leaders and educators worked consciously to protect academic time by 1) using the intercom or telephone very minimally while students were in the building, 2) keeping passing time between classrooms to a minimum (usually about three minutes in length), and 3) coordinating with special services and extra-curricular activities in a way that enhanced, not disrupted, student learning. As one teacher said, "It's a rule here. We don't pull kids out of academic classrooms." For example in one More Efficient elementary school, differentiated instruction was being used in the classrooms in the form of leveled grouping, push-in support from specialists, and individual attention by special education educators to students with special needs. In More Efficient schools, academic interventions were embedded within the school day in the form of literacy intervention courses, learning labs, help centers and supported study halls. When these schools extended the school day to incorporate interventions, transportation was provided for all students and participation remained high.

***Over the course of the PK-12 school experience, students in More Efficient school districts could gain over two-thirds of a year more learning time than their peers at other schools.***

In fact, one More Efficient elementary school responded to an observed loss of instruction time at the primary grades during the preparation for recess, especially in the winter, not by omitting recess (seen as an important part of the child's physical and mental development) but by transforming one of the two daily recesses into a learning time led by the classroom teacher that included counting steps up a sledding hill, singing educational songs on the swings, consciously observing elements of the natural world and other explicit all-class activities. In another example, one More Efficient junior high school held morning snack time in their classrooms instead of having all students together in a cafeteria or the hallways. Our observations showed that this time continued to allow the students to socialize with peers, but there were also a significant number of thoughtful conversations that included adults as well.

These breaks from academic work provided a bit of physical movement, food, and socialization but continued to model more informal venues for continuing intellectual interactions.

Efficient use of time within classes is important in student achievement as well (Evertson, Emmer & Brophy, 1980). In our study, teachers referenced professional training regarding improving transition time between activities, and our observations confirmed that most transitions in More Efficient schools were purposeful, meaningful and efficient between lessons as well as during the beginning and ending of class times. While observations indicated that in Typical schools transitions between lessons or between “learning” times could be as high as fifteen minutes, most More Efficient schools had transitions that were closer to three or four minutes. In addition, this time was often used by More Efficient elementary schools to integrate physical activity and help the mind to transition from one learning subject to another. The potential value of these savings for learning time becomes apparent when considered over time. If transition time of fifteen minutes between classes or activities was reduced to three minutes, our evidence revealed that the added learning time could be increased by more than two months in high school alone and over the course of thirteen years of schooling, by more than six months.

Another efficient use of learning time comes when educators teach and interact with students, rather than simply monitor students working with computers or textbooks. As mentioned in a previous section of this report, observations in More Efficient schools more frequently showed the classroom teacher actively engaged with students, even if students were using educational tools such as textbooks, laptops or software programs. Therefore, financial investments in effective educators and learning tools were enhancing student performance, making that a more efficient practice than paying an adult to monitor



Photo credit: Dan Callahan

students using an educational tool, which in turn did not maximize student performance. As mentioned above, educators in More Efficient schools had been given adequate time for professional training, collaboration and intellectual work in order to refine their practices. In these schools, our observations of this provided time showed that it was used productively and efficiently. One principal said, “Teachers have really taken it upon themselves. Everybody is committed to that work.” Meanwhile, school administrators also did their part to maintain the

focus of embedded professional time: relegating administrative communications to email or newsletters instead of staff or department meetings, but dedicating a vast majority of their all-staff development time to work surrounding the school's focus. This maximized the educators' time for valuable work, thereby maximizing the financial investment in these professionals.

Especially in these financially challenging times, budget reductions do threaten to affect students' learning opportunities. More Efficient schools are very savvy in their pursuit of grants that directly connect to their academic focus and their utilization of community resources to



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maintain crucial programming. External resources are purposefully selected and integrated to clearly support the school's academic focus and directly enhance student learning. For example, when two More Efficient schools in the same district suffered budget cuts that reduced their music program, a talented community member stepped in and

provided weekly steel drum lessons that were integrated as a class within the daily school schedule while a performing band met as an extra-curricular club outside of the school day. The instructor's work was funded in part by the district and in part by a grant she had attained independently. Another More Efficient elementary school experienced a similar reduction to their arts program and created a school-community collaboration they called "Friday Electives." Every Friday, a portion of the school day was dedicated to activities with local artists and artisans—gardening, painting, weaving, woodworking, etc. Additionally, there were visiting artists (donating their time or funded by community raised monies) who provided workshops that were directly integrated into the regular curriculum throughout the school year. In fact, all of the More Efficient schools in our study (as well as several of the Typical schools) demonstrated a commitment to their highly valued arts programs. As one drama coach said, "The administration supports all aspects of extra-curricular activities. The arts are supported as much as the sports." So, these schools utilized the resources provided by the community in a manner that maintains a strong academic and intellectual focus, is collaborative, and works smoothly within the student's school day.

In summary, these five features come together to create a gestalt in the More Efficient schools, a learning community that is student-focused and systematically engaged in intellectual inquiry. We have found that in these schools, the students and their intellectual development are at the core of the work. And all students are demonstrating progress in their intellectual development and academic achievement. These schools are also promoting and supporting this intellectual development in cost efficient ways. They are providing their community, parents, and students a higher return on spending. They are getting “a bigger bang for their buck.”

### **More Efficient Schools and Preparing Students for the 21<sup>st</sup> Century**

It is clear that the schools described in this study have many distinguishing characteristics. They exhibit many of the characteristics of higher performing schools found in earlier studies. These schools also have a distinguishing characteristic not often identified in many of the earlier studies: that is, they are more cost efficient. They are able to get a higher return on spending while at the same time developing and sustaining higher performing school characteristics.

Can we conclude that these schools are better preparing students for the 21<sup>st</sup> century? And if we can replicate these schools all across Maine, can we conclude that we have been successful in preparing ALL students for the 21<sup>st</sup> century? In answering these questions, two points are important to keep in mind. First, this study has examined what we have called More Efficient schools, and the use of the adjective “more” as a modifier has been intentional. We have identified “higher” performing schools, not “high” performing schools. Performance in these schools is relative to the performance of other Maine schools. While performance in these More Efficient schools is considerably higher than in other schools in Maine, there still is work to be done even in More Efficient schools before we can say that *all* students are achieving desired levels of proficiency. As discussed earlier, a recent report indicates that 8 of 10 high school students in Maine graduate in four years, but far too many graduates are lacking proficiency in reading and mathematics. This fact is less true in More Efficient schools, but it is still a point of concern, nevertheless. Thus, even these More Efficient schools need to continue to focus on improving.

Second, even if Maine succeeded in making all its schools More Efficient, as we have defined it, there is growing evidence that success in the 21<sup>st</sup> Century requires more than what has traditionally been the content of schooling. Success requires the type of intellectual development described above and found in the More Efficient schools, but it also requires more and different knowledge, skills, and learning. As described by the Partnership for 21<sup>st</sup> Century Skills:

*Advanced economies, innovative industries and firms, and high-growth jobs require more educated workers with the ability to respond flexibly to complex problems, communicate effectively, manage information, work in teams and produce new knowledge.*

The Partnership believes that schools should be helping students become:

- Critical thinkers
- Problem solvers
- Good communicators
- Good collaborators
- Information and technology literate
- Flexible and adaptable
- Innovative and creative
- Globally competent
- Financially literate

To help students acquire this knowledge base and skills, many educators and leaders are calling for transformative changes in our schools and changes in how we help students learn.

Wagner (2008) explains:

*...teaching all students to think and to be curious is much more than a technical problem for which educators, alone, are accountable. And more professional development for teachers and better textbooks and tests, though necessary, are insufficient as solutions. The problem goes much deeper—to the very way we conceive of the purpose and experience of schooling and what we expect our high school graduates to know and be able to do. (p. xxv)*

This transformative change is called by many names: performance-based learning, standards-based learning, or student-centered learning. Long advocated by educators, philosophers, and psychologists alike (e.g., Hayward, 1905; Dewey, 1956; Rogers, 1983; Simon, 1999; Donnelly & Fitzmaurice, 2005), student-centered learning is viewed as the development of more independent

learners, problem-solvers, and creative and critical thinkers—types of learners that many people believe are becoming even more important as we navigate the 21<sup>st</sup> century (e.g., Burkhardt, et al, 2003; Pink, 2005; Partnership for 21<sup>st</sup> Century Skills, 2008, Brooks, 2008; Friedman & Mandelbaum, 2011).

The Nellie Mae Education Foundation (NMEF) has described what it believes to be the key principles and attributes of what it calls Student-Centered Learning. The principles are that:

1. Student-centered education systems provide all students equal access to the skills and knowledge needed for college and career readiness in today's world.
2. Student-centered education systems align with current research on the learning process and motivation.
3. Student-centered education systems focus on mastery of skills and knowledge.
4. Student-centered education systems build student's identities through a positive culture with a foundation of strong relationships and high expectations.
5. Student-centered education systems empower and support parents, teachers, administrators, and other community members to encourage and guide learners through their educational journey.

The key attributes are that:

1. Curriculum, instruction and assessment embrace the skills and knowledge needed for success.
2. Community assets are harnessed to support and deepen learning experiences.
3. Time is used flexibly and includes learning opportunities outside the traditional school day and year
4. Mastery-based strategies are employed to allow for pacing based on proficiency in skills and knowledge.

Did the schools in this study exhibit these principles and attributes? Though they are higher performing in terms of performance on statewide achievement tests, are they also student-centered? In being so, are they better preparing students for the 21<sup>st</sup> Century? The answer, in large measure, is “Yes.” In many areas and in many ways, the More Efficient schools embodied

the characteristics of transformative schools. The Partnership describes the skills needed in the 21<sup>st</sup> Century in this way:

*It is important to note that no 21st century skills implementation can be successful without developing core academic subject knowledge and understanding among all students. Students who can think critically and communicate effectively must build on a base of core academic subject knowledge. For this reason, core academic subjects are a bedrock component of the P21 Framework for 21st Century Learning. All 21st century skills can and should be taught in the context of core academic subjects.*

Patently, the More Efficient schools we studied are having considerable success in helping students master core academic subject knowledge, and they are having success helping students to develop intellectually so as to be able to understand, transform, and share their learning. Thus, we conclude that More Efficient schools are accomplishing this as *emerging student-centered schools* that are taking significant steps toward preparing students for the 21<sup>st</sup> Century. The central focus is on students and helping them learn and develop intellectually. Plus, all students have access to a variety of learning opportunities, and a wide variety of learning experiences are available to students throughout the school day, including remediation and enrichment. There is ample evidence of high expectations and high standards and the use of multiple assessments in assessing progress in learning. Teachers and leaders are actively engaged in creating a school culture that helps students acquire more and more responsibility for their own learning.

Given this, why do we only call the More Efficient schools we studied as “emerging” student-centered schools? Because in most cases, the More Efficient schools were exhibiting many of the NMEF principles and attributes of “student-centeredness,” but only within the traditional bounds of schooling. True, the focus was on learning, students had wider ranges of learning experiences than in the past, and many of these experiences were more “authentic.” True, some students had opportunities for more field-based activities, peer learning and internships. Student progress was more often judged in terms of competencies and standards. However, learning was also most often confined to the traditional school day and year, and progress was still very much governed by traditional course structures and grade-level

configurations. True, standards were used very often to guide curriculum, instruction, and to measure student progress, but only within existing grade level structures and courses. Students were still advancing through the grades at the same pace as other students and, consequently, were advancing grade to grade with varying levels of proficiency. In time, will these More Efficient schools, in all likelihood, become more transformative and more student-centered schools? Will learning take place anytime and anywhere? Will learner needs dictate where, how, and from whom students learn? Will time be used more flexibly and will mastery of knowledge and skills be the basis of advancement?

Becoming more transformative and student-centered would seem to be a natural next step in the evolution of these schools, but we are not convinced that these schools will naturally evolve in this fashion. These schools are staffed by teachers, leaders, and others who fundamentally believe they have a moral obligation to help all children develop intellectually and be prepared for the 21<sup>st</sup> Century, but we did not find evidence of a great deal of dissatisfaction on their part with regards to their schools as they presently exist. A majority of the school community members did not have a great felt need to think “outside” the traditional schooling boxes. Thus, these educators, and their parents, and community members will need to be convinced that becoming even more student-centered is better, and will improve their ability to ensure the further intellectual development of their students, resulting in more and deeper levels of learning. Once convinced, teachers and school leaders will need substantial support to further transform their schools.

### **Turning Typical Schools into More Efficient Schools for 21<sup>st</sup> Century Learning**

What about other schools, those that are at present not More Efficient? As we have discussed, the five key characteristics of rigorous curriculum and intellectually engaging instruction, high standards and high expectations, efficient use of resources, teachers and leaders as intellectual agents, and pervasive intellectual work come together to create a synergy in the More Efficient schools. It is a unified whole that is more than the sum of its parts, a learning community that is student-focused and systematically engaged in intellectual inquiry, an entity that is not only helping students master traditional academics but helping them master the type of learning they will need as they navigate the 21<sup>st</sup> century. An important question then becomes: how can a Typical school become a More Efficient school? There is a culture in More Efficient

schools which has developed over time and through a great deal of hard work done by individuals who hold certain fundamental beliefs about learning and learners. How was this culture created?

There is no surefire recipe for becoming a More Efficient school. There are numerous combinations of ingredients, and the resulting culture is greater than its individual pieces. We believe this culture must develop over time and develop uniquely within each school, though schools may do well to begin by examining their own culture and engaging in self-assessment. School faculties and their communities may start at many different points, but we would suggest one way might be to begin conversations around three questions:

1. How many examples can we think of where one or more of the five key characteristics are present in our school?
2. How systemic or pervasive are these characteristics throughout our school?
3. What are the barriers to these characteristics becoming more systemic in our school?

By seeking answers to these questions, individual schools may develop their successful paths for becoming a More Efficient school. To that end, we have created what we call Conversation Tools, tools to start the conversations. A sample tool appears in Appendix C.

### **Final Thoughts**

We have found that More Efficient schools in Maine have created a pervasive culture within the school community that produces important results, that is, students and professionals who are deeply steeped in intellectual work and development. The good news is that this work is not extremely expensive, it does not require out-of-state experts, and it is already being done in schools of all types here in Maine. Maine educators, students and educational leaders across the state are already pioneering all aspects of improving Maine's educational opportunities and profession. There are concrete practices, habits of mind, and strategies we can begin to implement and evaluate immediately. But it is hard work, and it is steady work. Thinking deeply and innovatively requires time, practice and support. Intellectual work requires us to challenge some fundamental aspects of our beliefs and practices. It requires us to transform our schools and expand our definition of learning communities. However, it is with this work that we can more effectively fulfill our moral imperative to educate Maine's youth.

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## Appendices

## **Appendix A**

### **Case Study Interview Protocols**

#### **1. Administrator Interview Protocol**

##### **Study of Higher Performing, Efficient Maine Schools, 2010-11**

(includes: Principals, Assistant Principals, Superintendents, School Board Members)

Interviewer Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

I appreciate you letting me speak to you today. I'd like to speak to you more about your role as an administrator at your school (in your district). This interview will likely take about 60-90 minutes to complete (depends on subjects role). We're doing these interviews with administrators and other school staff at all of our case study schools in order to better understand what characterizes individual schools but also what commonalities may be identified amongst all of them. The information from these interviews will be pulled together with other interviews, observations, and documents (from your school) to understand the whole picture of what is happening at your school. This interview will only be used for the purposes of this research study and will be confidential and I will not identify you by name in the report. Would you mind if I taped the interview? It will help me stay focused on our conversation and it will ensure I have an accurate record of what we discussed.

Administrator Name: \_\_\_\_\_

Role: \_\_\_\_\_

Years in Role: \_\_\_\_ (**PROBE: previous experience, district experience, teaching experience, educational background**)

**Questions for discussion during the interview (the questions asked of people representing different roles may vary depending on their responsibilities within the school):**

1. There are high standards of achievement and high expectations for all students.  
Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?
2. There is effective and collaborative leadership demonstrated in the school.  
Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?
3. There is a high degree of parent involvement in the school.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

4. Assessment data is examined, shared, and used in the school.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

5. Multiple types of interventions and adjustments are made to insure student needs are met.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

6. Focused, relevant professional development is encouraged and supported in the school.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

7. Student, teachers, staff, and leaders are held accountable in the school.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

8. Students are provided a wide range of learning experiences and multiple pathways to achieve learning standards in the school.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

9. Students are provided a wide range of authentic learning opportunities and assessments for learning.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

10. Student mastery of competencies is assessed with multiple, rigorous, and valid assessments.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

11. Teachers and other adults guide and facilitate student learning.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

12. The school culture fosters strong, respectful, and equitable relationships among students and adults.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

13. The school is supported by the community, school committee, and district leadership.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

14. Technology enhances and expands students' learning opportunities.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

15. Resources are used appropriately to promote student learning.

Is this true for your school? How do you know this is true/happening in your school? What are some examples? Can you tell me more about them?

**Appendix B**  
**Observation Protocol**  
**Study of Higher Performing & More Efficient**  
**Public Schools of Maine**

*Center for Education Policy, Applied Research and Evaluation –  
University of Southern Maine*

*2010-2011*

***Classroom Observation Walk-Through Form***

*Directions: Researchers will inform school leaders and educators of this observation process prior to the school visit. During each day of the site visit, individual researchers will conduct numerous observations that are approximately five minutes in length in various classrooms and other public learning spaces of the school, such as library, cafeteria, hallway, recess and study hall. Observations should be conducted at various times of the school day, various times of the class period, in all subject areas and all relevant grade levels. Immediately after conducting each observation, the researcher will record the following aspects of the activity observed and is encouraged to include “Evidence” notes further describing specific aspects of the observation.*

*Note: For this specific study, researchers recorded data electronically (using smartphones, iPads or laptops) on the Classroom Observation Walk-Through Form via a live form on Google Docs.*

**Identify the following information:**

**School Name:**

**School Grade Level (check one):**

- PK/K-4
- K-5
- K-8
- 6-8
- 7-8
- 9-12

**Observation Grade Level & Content Area:**

**Approximate Number of Students (check one)**

- 0-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26-30
- more than 30

**Number of Adults:**

Include all adults in the room who are engaged with students: lead teacher, special education teacher, education technicians, volunteer, etc.

**Class Procedure Time:**  beginning  middle  end  transition

➤ **Evidence:**

**Teacher Role (check any that apply):**

- Coaching/Conferencing
- Presenting
- Facilitating
- Monitoring
- Working Independently
- Other

**For the following aspect, identify the highest level observed most pervasively within a large majority of students' activity.**

**Bloom's Taxonomy Levels of Cognitive Behavior:**

- |  |                                 |
|--|---------------------------------|
| <input type="checkbox"/> Remember/Understand | <input type="checkbox"/> Create |
| <input type="checkbox"/> Apply               | <input type="checkbox"/> Other  |
| <input type="checkbox"/> Analyze/Evaluate    |                                 |

➤ **Evidence:**

**For the following aspect, identify the approximate percentage of students that appear to be engaged in a relevant learning activity:**

**Student Engagement:**

- |                                 |                                  |
|---------------------------------|----------------------------------|
| <input type="checkbox"/> 0-50%  | <input type="checkbox"/> 91-100% |
| <input type="checkbox"/> 51-75% | <input type="checkbox"/> Other   |
| <input type="checkbox"/> 76-90% |                                  |

➤ **Evidence:**

**Is technology being used in student learning?**

- No  
 Yes

**If yes, who is using the technology?**

- Educator  Student

**If yes, identify the technology tools that are being used in student learning:**

(Examples may include student laptop, teacher desktop, SmartBoard, software program, iPad, internet, etc.)

**Other:**

Researcher may identify other interesting practices or details not mentioned above.

## **Appendix C**

### **Dissemination of Findings – Conversation Tools**

*The complete package of tools provided to schools includes five sections, one for each Distinguishing Characteristic. The sample that follows is the introduction to this tool and section A.*

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element: Sample Illustrations and Practices from More Efficient Maine Public Schools:**

<p><b>A.1 <u>Understand:</u> focused, sustained and thorough academic (content knowledge and fundamental skills) and social/behavioral (interpersonal relationships, social trends, cultural norms, etc.) learning.</b></p>	<p><i>Academic Learning – Content Knowledge</i></p> <ul style="list-style-type: none"><li>⇒ Sixth grade Social Studies class lesson to understand the concept of “anarchy” included an individual student-compiled definition using reliable online resources via their laptops, then small student groups developed a written description of a model anarchist society, which they shared with the class and defended or revised their constructed society model based on peer questions and comments.</li><li>⇒ High school biology students worked through an in-depth unit about genetics utilizing their textbooks, teacher demonstrations, online interactions with local college professor, teacher-selected supplemental texts and lecture to gain the necessary knowledge to complete the culminating lab incorporating a computer simulated genetic problem that was solved by students in small groups using the tools and resources in the classroom.</li></ul> <p><i>Academic Learning – Fundamental Skills</i></p> <ul style="list-style-type: none"><li>⇒ Common language and components are used by all educators in all content areas to teach and assess the writing process;</li><li>⇒ Mathematical order of operations can be clearly explained and demonstrated by students at all levels;</li><li>⇒ Required elements of a fundamental science lab report are common among grade levels;</li><li>⇒ Comprehension and critical reading is explicitly taught with all class texts in all content areas.</li></ul>
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## A. The learning community is systemically engaged in intellectual work.

### Guiding Element:

### Sample Illustrations and Practices from More Efficient Maine Public Schools:

**A.1 Understand: focused, sustained and thorough academic (content knowledge and fundamental skills) and social/behavioral (interpersonal relationships, social trends, cultural norms, etc.) learning.**

#### *Social Learning*

- ⇒ A school with over 65% of students eligible for free or reduced-price lunch studied world poverty through a cross-curricular unit including a summative assessment of a student-created multi-media presentation to be shared during an Oxfam Hunger Banquet sponsored by students and teachers involving community members to raise money and awareness regarding issues of world hunger.
- ⇒ A wintertime discussion of various religious/cultural celebrations including significant conversation surrounding Hanukkah, Kwanzaa, Ramadan, etc. as well as Christmas.
- ⇒ ELL students worked with local adult writers to publish a book of memoirs that was then read and discussed in various classes.
- ⇒ Weekly lunch time during which elderly community members sat among primary grade students to foster multi-generational relationships and conversations.

#### *Behavioral Learning*

- ⇒ First grade classroom teacher asked students to make connections between the class-developed expectations posted on the wall and the actions of the characters in a story being read aloud as a class; these connections were later referenced by the teacher in a one-on-one conversation with a student.
- ⇒ Fifth grade class began the school day following the classroom teacher's absence with a discussion of the positive and negative aspects of their work with the substitute teacher, including a candid conversation about elements the substitute described in her note to the classroom teacher as well as elements of the day that the substitute had not shared.

## **A. The learning community is systemically engaged in intellectual work.**

### **Guiding Element:**

***A.2 Transform:  
Constant inquiry  
using various  
reasoning processes  
and all levels of  
higher order thinking  
to work with  
information and  
concepts in order to  
create innovative  
solutions.***

### **Sample Illustrations and Practices from More Efficient Maine Public Schools:**

#### *Constant Inquiry*

- ⇒ A principal's letter in Program of Studies document cited Aristotle, "We are what we repeatedly do. Excellence, therefore, is not an act but a habit."
- ⇒ Middle school social studies students worked together through a computer simulation of various problems encountered when building a community of people. The students input their leadership decisions to progress through the simulation, having to revise their calculations and actions if the output was not desired. Students then shared their process and results in a written reflection. Students shared their process and revisions verbally with the class, and then discussed the efficacy of various methods for approaching each problem.
- ⇒ Educators constantly used embedded professional time (daily common planning period, weekly department meeting, monthly district-wide content area workshops, etc.) to analyze trends in student work, evaluate curriculum and instruction practices, identify necessary interventions for individual students, and create common rubrics, benchmarks or assignments.

#### *Higher Order Thinking*

- ⇒ After a whole class discussion about the definition of a bridge and viewing various models in a related storybook, primary age students were given a number of materials of various shapes and instructed to independently or collaboratively build their own bridge;
- ⇒ Students in a World Literature course wrote an essay developing their own thesis, synthesizing research from outside sources and analyzing a primary literary text.

## **A. The learning community is systemically engaged in intellectual work.**

### **Guiding Element:**

**A.3 Share: Clear communication of invigorating conclusions that enhance existing ideas.**

### **Sample Illustrations and Practices from More Efficient Maine Public Schools:**

#### *Clear Communication*

- ⇒ Art and English high school teachers collaboratively developed and taught a ninth grade unit to study the Harlem Renaissance in which each student created a thematic visual image on paper that was deconstructed to create a collage illustrating the tone or ideas of a poem after many lessons of in-depth study about that cultural time and place.
- ⇒ Kindergarten students shared kinesthetic, physical demonstrations of “half” (bending in half, running halfway across the room, organizing group of people into two halves, etc.) and verbal explanations of how their demonstration fits the definition previously presented by the classroom teacher.

#### *Invigorating Conclusions*

- ⇒ High school English class discussed a poem by ee cummings, sharing opinions, insights, and incorporating knowledge from prior learning.
- ⇒ Middle school students in a social studies class wrote an analytical essay about historical trends of war; exemplars were posted in the classroom and read aloud by the authors.
- ⇒ High school biology students work in small groups to develop a unique scientific method demonstrating the longevity of genetic characteristics of fruit flies.
- ⇒ Fifth grade students developed their own mathematical operation for solving a given multiplication problem.
- ⇒ Third grade students developed an original solution for improving their interpersonal relationship and avoiding physical aggression in a mediation session with a social worker, building administrator and parents.

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**      **Sample Practices from Your School:**

**A.1 Understand:  
focused, sustained  
and thorough  
academic (content  
knowledge and  
fundamental skills)  
and social/behavioral  
(interpersonal  
relationships, social  
trends, cultural  
norms, etc.) learning.**

*Academic Learning*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

Very systemic

Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**

**Sample Practices from Your School:**

**A.1 Understand:  
*focused, sustained  
and thorough  
academic (content  
knowledge and  
fundamental skills)  
and social/behavioral  
(interpersonal  
relationships, social  
trends, cultural  
norms, etc.) learning.***

*Social Learning*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

Very systemic

Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**

**Sample Practices from Your School:**

**A.1 Understand:  
focused, sustained  
and thorough  
academic (content  
knowledge and  
fundamental skills)  
and social/behavioral  
(interpersonal  
relationships, social  
trends, cultural  
norms, etc.) learning.**

*Behavioral Learning*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

Very systemic

Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**      **Sample Practices from Your School:**

**A.2 Transform:**  
***Constant inquiry using various reasoning processes and all levels of higher order thinking to work with information and concepts.***

*Constant Inquiry*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

Very systemic

Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**

**Sample Practices from Your School:**

**A.2 Transform:  
Constant inquiry  
using various  
reasoning processes  
and all levels of  
higher order thinking  
to work with  
information and  
concepts.**

*Higher Order Thinking*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

Very systemic

Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**

**A.3 Share: Clear communication of invigorating conclusions that enhance existing ideas.**

**Sample Practices from Your School:**

*Clear Communication*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

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Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

**A. The learning community is systemically engaged in intellectual work.**

**Guiding Element:**      **Sample Practices from Your School:**

**A.3 Share: Clear communication of invigorating conclusions that enhance existing ideas.**

*Invigorating Conclusions*

What are some illustrations of this practice you can identify from your school?

How would you describe the extent of the illustrations of this element at your school?

Very systemic

Somewhat systemic

Moderately systemic

Not systemic at all

What do you think are barriers/challenges to making these illustrations more systemic in your school?

