2012

More Efficient Public Schools In Maine: Learning Communities Building the Foundation of Intellectual Work

David L. Silvernail
University of Southern Maine, davids@maine.edu

Erika K. Stump
University of Southern California, erika.stump@maine.edu

Richard Barnes

Kenneth Kunin

Sarah Wintle

More Efficient Public Schools In Maine:

Learning Communities Building the Foundation of Intellectual Work

David L. Silvernail
and
Erika K. Stump

In Collaboration with
Richard E. Barnes
Kenneth E. Kunin
Sarah E. Wintle

Maine Education Policy Research Institute
University of Southern Maine

UNIVERSITY OF
SOUTHERN MAINE
**Center for Education Policy,
Applied Research, and Evaluation**

Published by the Maine Education Policy Research Institute (MEPRI) an institute in the Center for Education Policy, Applied Research, and Evaluation (CEPARE) in the School of Education and Human Development, University of Southern Maine.

CEPARE provides assistance to school districts, agencies, organizations, and university faculty by conducting research, evaluation, and policy studies.

In addition, CEPARE co-directs the Maine Education Policy Research Institute (MEPRI), an institute jointly funded by the Maine State Legislature and the University of Maine System. This institute was established to conduct studies on Maine education policy and the Maine public education system for the Maine Legislature.

Statements and opinions by the authors do not necessarily reflect a position or policy of the Maine Education Policy Research Institute, nor any of its members, and no official endorsement by them should be inferred.

This study and report were funded by the Maine State Legislature, The Nellie Mae Education Foundation and the University of Southern Maine.

Photos are courtesy of Creative Commons.

Table of Contents

Acknowledgements

The research teams would like to thank the schools and staff members who participated in this study. Conducting case studies of these twenty-five schools was essential to uncovering the unique characteristics of More Efficient Schools. School administrators, teachers, and staff in each school gave freely of their time and expertise. It was heartening and affirming to see the dedication of these educators to providing an exceptional education to Maine's students. The schools that participated in the study are:

K-5 Schools:

*Bowdoin Central School
*Bowdoinham Community School
Brown Elementary School
*Carmel Elementary School
*Dr. Levesque Elementary School
Martel School
*Winthrop Grade School

Middle Schools:

*Mattanawcook Junior High School
Memorial Middle School
Samuel L. Wagner Middle School
Sanford Junior High School
*William S. Cohen School
*Windham Middle School

K-8 Schools:

Appleton Village School
Fort Kent Elementary School
*Great Salt Bay Community School
*Kingfield Elementary School
*Strong Elementary School

High Schools:

*Gorham High School
*Hampden Academy
*Marshwood High School
Mattanawcook Academy
*Presque Isle High School
*Scarborough High School
Windham High School

*Denotes More Efficient schools in the study.

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

The research teams would also like to thank the Maine Legislature, and in particular the members of the Joint Standing Committee on Education and Cultural Affairs, and the Nellie Mae Education Foundation for their financial support of this research study.

Executive Summary

American K-12 public education all across the nation is at a difficult and critical crossroads. 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.

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 public PK/K-12 education system. The goal of the study has been to identify strategies that may be embraced to significantly improve student performance in efficient ways by schools, communities, and policy makers in Maine, New England, the United States, and even worldwide.

In this study, **More Efficient Schools** were defined as schools that exhibit higher student academic performance *and* a higher return on spending, as well as achieving both of these standards regardless of the economic and social conditions found in the local community. We consider these schools More Efficient because they are helping all students achieve more, and they are using their resources wisely to accomplish this goal.

Academic and fiscal criteria were used to identify More Efficient Schools. For a school to be classified as **Higher Performing**, it had to first meet a threshold of strong academic performance by:

- achieving higher than average student performance on statewide achievement tests at selected grade levels,
- maintaining higher than expected performance based on student demographics and prior academic performance,
- demonstrating academic proficiency for a majority of students, or making significant progress toward achieving this goal, and
- in the case of high schools, attaining a graduation rate above the state average.

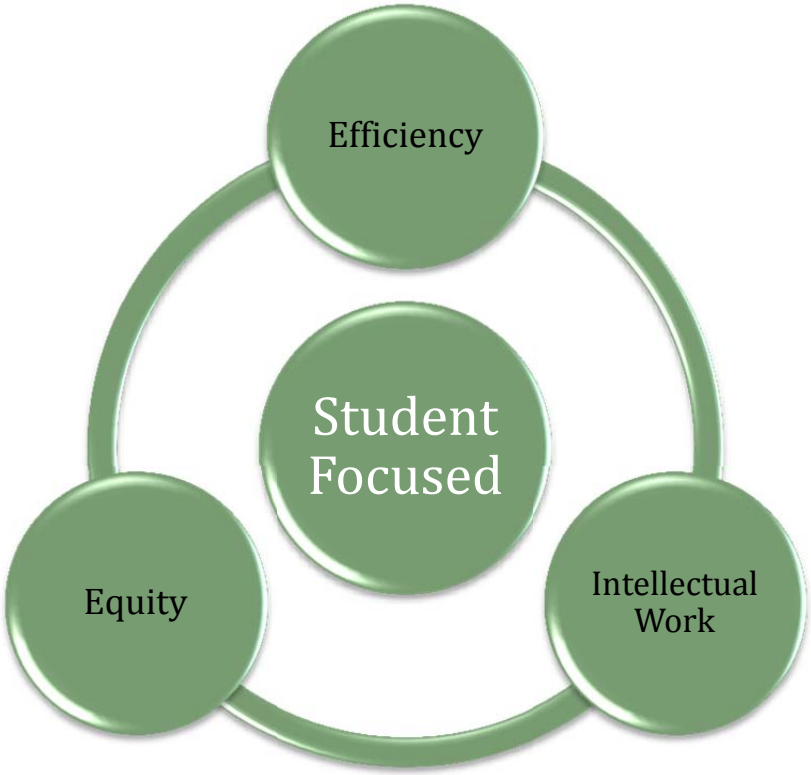
To then be further identified as **More Efficient**, the higher performing school had to be achieving a higher return on their spending than found statewide and found in other communities with similar demographics.

Twenty-five of Maine's schools were selected for concentrated 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 student performance results in their profiles.

The initial analysis of the case study evidence confirmed many findings reported in other national and international studies of higher performing schools. More Efficient Schools were more consistent in their high expectations and high standards for all members of the school community and implemented more rigorous curricula with engaging instruction. In addition, More Efficient Schools had good leadership, supportive school cultures, and many of the other characteristics found in our literature review.

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 work.*

Three Distinctive Features of More Efficient Schools



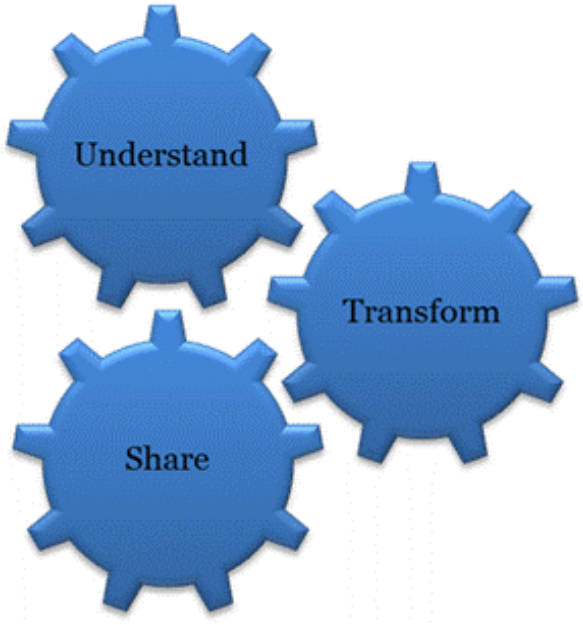
More Efficient Schools are student-focused learning communities in which there is systemic evidence of:

A) Intellectual Work:
- **i. Students engage in intellectual work that involves academic knowledge and skills as well as social and behavioral learning.**
- **ii. Adults engage in intellectual work to create instructional practices, curricula, professional learning programs, and leadership roles that improve student performance and are informed by assessment and experience.**

B) Equity:
- **i. Teachers and leaders believe they have a moral obligation to focus on the intellectual development of students as a means towards a better world.**
- **ii. High standards and high expectations are held for <u>all</u> members of the school community.**

C) Efficiency:
- **i. Human and financial resources are used efficiently to maximize learning opportunities for students and staff.**

These three features come together in the More Efficient Schools to create a learning community that is student-focused and systemically engaged in intellectual inquiry. We found that in these schools, all students are demonstrating progress in their intellectual development and academic achievement. The central focus in these schools is on students and helping them learn and develop intellectually. Therefore, we are defining this educational process as incorporating **Three Key Elements of Intellectual Work: Understanding, Transformation, and Sharing.**



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 cognitive thinking to work with information and concepts in order to create innovative solutions.
- ⇒ **Share**: clear communication of invigorating conclusions that enhance existing ideas.

Other crucial practices we identified in More Efficient schools included all students having access to a wide variety of learning experiences throughout the school day, including remediation and enrichment. There is also ample evidence of high expectations and high standards and the use of multiple assessments in assessing progress in learning. As well, teachers and leaders are actively engaged in creating a school culture that helps students acquire more and more responsibility for their own learning. 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."

The good news is that this work is not extremely expensive, it does not require external experts, and it is already being done in all types of schools in Maine. Educators, students and educational leaders across the state of Maine are pioneering all aspects of improving educational and professional opportunities. There are concrete practices, habits of mind, and strategies practitioners, leaders and policy makers 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 current 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 our nation's youth.

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.

More Efficient Public Schools in Maine: Learning Communities Building the Foundation of Intellectual Work

David L. Silvernail Erika K. Stump

Overview

American PK-12 public education is at a difficult but critical crossroads. 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. At the same time, state and federal governments face unprecedented budget deficits and limited resources for the foreseeable future. In Maine, despite a three-fold increase in education spending over the last four decades, student performance has not significantly changed. In fact, Maine high school graduation rates, as well as student achievement have remained relatively flat.

Patrick and Sturgis (2011) describe what states and the nation are facing in this way:

> *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)*

"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."

-- Boser (2011)

But even in these toughest of economic times, the role of society 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.

How can this be accomplished? One way is to learn from schools that are defying the odds. To that 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 public PK-12 education system. The Nellie Mae Education Foundation mission 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 was to identify strategies that schools, communities and policy makers in Maine, New England, the United States and even worldwide may embrace to significantly improve student performance in efficient ways.

This report describes the methodology used to identify Maine schools that were outperforming expectations and reports the results from conducting case studies of a representative sample of these and other Maine schools. Through these case studies, we were able to uncover what the schools were doing that set them apart from other schools and what other schools may wish to emulate as they work to build the foundation for improvement within their own schools.

Methodology

Defining a More Efficient School

What does it mean to be a Maine school that is defying the odds? In this study, it is defined as a school that exhibits higher student academic performance *and* a higher return on spending, as well as achieving *both* of these standards regardless of the economic and social conditions found in the local community. We call these schools **More Efficient Schools**. We consider these schools more efficient because they are helping all students achieve more, and they are using their resources wisely to accomplish this goal.

We used separate academic and fiscal criteria to identify these More Efficient Schools. Each of these criteria are defined in more detail in Appendix A, but in summary, for a school to be classified as **Higher Performing**, it had to first meet a threshold of strong academic performance by:

- achieving higher than average student performance on statewide achievement tests at selected grade levels,
- maintaining higher than expected performance based on student demographics and prior academic performance,
- demonstrating academic proficiency for a majority of students, or making significant progress toward achieving this goal, and
- in the case of high schools, attaining a graduation rate above the state average.

To then be further identified as **More Efficient**, the higher performing school had to be achieving a higher return on their spending than found statewide and found in other communities with similar demographics. Through this two-tiered method, only schools that had strong academic results could be considered More Efficient; schools that had lower operating costs but weaker student performance did not qualify for this identification.

Identifying More Efficient Maine Public Schools

How many Maine schools met all the criteria described above? To answer this question, we examined the statewide assessment data and per pupil expenditures for over 75% of Maine's schools. Using aggregate data for two years (2007-2009), we examined all schools that had complete and useable data for both student performance and spending. Table 1 summarizes the results of these analyses and reveals that 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%)
Total	**524**	**119 (22.7%)**	**90 (17.2%)**

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

Of particular note is the finding that approximately 75% of the higher performing schools were also getting higher returns on their spending (i.e., they were More Efficient). More details, descriptive demographic, and performance statistics of these schools appear in Appendix B.

Case Studies

Selecting Case Study Schools

What are the distinguishing characteristics of these More Efficient Schools? To answer this question, we conducted in-depth studies of a sample of these schools, along with a sample of Typical Schools in Maine. We wanted to learn **how** and **why** the More Efficient Schools attain their results.

Twenty-five of Maine's schools were selected for more in-depth study. Sixteen of these schools were More Efficient and nine schools were classified as "Typical Schools." Typical Schools had mixed student academic performance results. 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. Do More Efficient Schools have characteristics simply not found in Typical Schools, or is the distinction 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 enrollments 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:

Table 2: Case Study Schools by Grade Level

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
Total	16	9

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 while there is scant research evidence on return on school spending, there already exists over forty years of national and international research on higher performing schools. As described by Miles and Huberman (1994),

> *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 a 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)*

Thus, our study was designed to be more "confirmatory" rather than "emergent." 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 prominent 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 (Fullan & Stiegelbaur, 1991; Levine & Lezotte, 1990).
- Strong school culture (New Leaders for New Schools, 2008; Craig, 2005: McGee, 2004).

To this list of nine characteristics we added a tenth, and more exploratory, characteristic for our study:

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

There is 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. As this is an added emphasis not explored in prior studies of high performing schools, researchers adopted a more exploratory approach in seeking evidence in this area.

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. The categories may guide the collection and analysis of evidence, but should not limit it. Effort to look beyond these categories for additional themes is very important, and caution was taken by the research teams not to limit their search to "finding what we were looking for." Our 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 Methodology

A complete description of the case study methodology can be found in Appendix C. In summary, two-day site visits were conducted at each of the twenty-five case study schools. Prior to

A total of 1,676 classroom observations were recorded by researchers in real time using GoogleDocs.

the site visits, researchers reviewed documents about and from the school, and conducted an initial interview with the school principal. Each visit included individual and focus group interviews with teachers, education technicians, school nurses, librarians, guidance counselors, support 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, student ability groupings and subject areas. A total of 371 interviews were conducted and recorded over the course of the study, and a sample of focus group questions can be found in Appendix D.

Each site visit also included numerous three-minute to five-minute observations of classes in progress throughout the school day, and a sample copy the classroom observation protocol appears in Appendix E. A total of 1,676 observations were made at the case study sites. Researchers also recorded notes on 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, during and after school over the course of the two-day site visit.

Table 3 reports the number and types of these on-site activities:

Table 3. 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
TOTAL:	**25**	**1,676**	**371**

Once the site visits were completed, the research team turned their attention to the analysis of the large body of evidence collected in the case studies. Several steps were taken in analyzing the qualitative data. In essence, after the evidence was coded, the research team analyzed the data, identified emerging themes, tested the strength of these themes against the data, and formulated a list of distinguishing characteristics of More Efficient Schools.

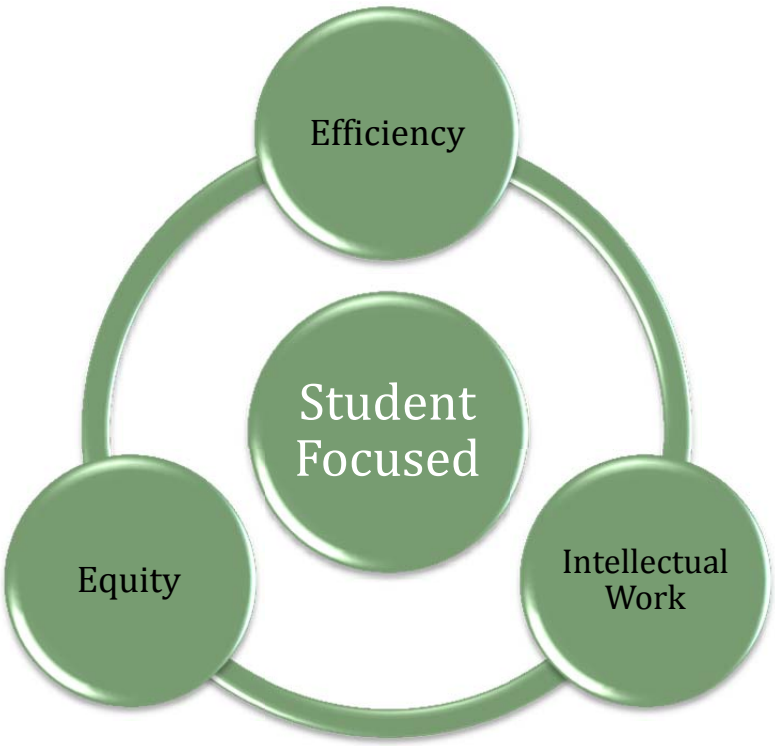
Research Findings

The initial analysis of the case study evidence revealed many findings similar to those reported in other national and international studies of higher performing schools, as expected. More Efficient Schools were more consistent in their high expectations and high standards for all members of the school community and implemented more rigorous curricula with 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.

Intellectual Work

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.** These schools had created a strong foundation from which they continued their work to improve the education of all students.

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



More Efficient Schools are student-focused learning communities in which there is systemic evidence of:

A) Intellectual Work:
- **i. Students engage in intellectual work that involves academic knowledge and skills as well as social and behavioral learning.**
- **ii. Adults engage in intellectual work to create instructional practices, curricula, professional learning programs, and leadership roles that improve student performance and are informed by assessment and experience.**

B) Equity:
- **i. Teachers and leaders believe they have a moral obligation to focus on the intellectual development of students as a means towards a better world.**
- **ii. High standards and high expectations are held for <u>all</u> members of the school community.**

C) Efficiency:
- **i. Human and financial resources are used efficiently to maximize learning opportunities for students and staff.**

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 areas, 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?"

Defining Intellectual Work

These features distinguishing More Efficient Schools are interwoven, and many of the practices and qualities observed in More Efficient Schools touch upon more than one category. A common thread of **intellectual work** can be seen in each. Because, in More Efficient Schools, this concept is embodied in the culture and lays the foundation for further measures to improve the education of all students, we include this section to describe the theoretical underpinnings of "intellectual work."

The concept of intellectual work is multi-dimensional and, like the overall culture of More Efficient Schools, 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 the characteristics we observed. This 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. (1996),

> *[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.* (p. 14)

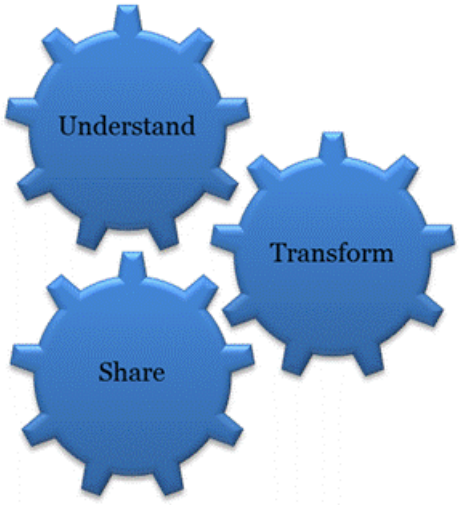
The Nellie Mae Education Foundation calls this type of intellectual work,

> *[D]eep 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). Benjamin Bloom's levels of intellectual behavior (1956), known well as Bloom's Taxonomy, and the cognitive dimensions of Robert Marzano's and John Kendall's New Taxonomy of Educational Objectives (2000), also exemplify the continuum of intellectual work. 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 using Bloom's or Marzano's frameworks.

The intellectual work construct builds on theory related to knowledge transfer, which describes the underlying cognitive processes learners use in acquiring knowledge (National Research Council, 2000; Schwab, 1961; Perkins, 1992). Learners must deeply **understand** content materials, which include facts, concepts and skills as well as the broader theoretical and practical relationships and structures within a content area. 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 cognitive thinking to work with information and concepts in order to create innovative solutions.

⇒ **Share**: clear communication of invigorating conclusions that enhance existing ideas.

Identifying Intellectual Work

This type of intellectual work was exhibited in many ways in More Efficient Schools, by a vast majority of the members of the school community. Students and teachers in More Efficient Schools were observed to be more deeply and more frequently engaged in working at more complex levels on the taxonomy than their counterparts in Typical Schools. This was measured through:

- Student engagement level (defined simplistically as on-task behavior) and level of thinking (rated using Bloom's taxonomy) that were identified by researchers during classroom observations;
- Higher-order thinking skills demonstrated in student work products and student interviews;
- Staff and leadership decision-making processes regarding policies and strategies understood through teacher and administrator interviews;
- Academic and social standards as well as curriculum goals, outlined in guiding documents, that require students and teachers to engage with learning materials and each other in ways that demonstrate all cognitive levels.

Typical Schools, for the most part, were instead 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 "stable and secure" phase and were indeed maintaining an academic focus that developed the intellectual skills of students and teachers. This focus provided a foundation upon which other specific school reforms, improvement measures and other transformational work (such as standards-based progression and reporting, student-centered learning experiences, and/or professional teaming) could build upward and be more successful.

Intellectual Work for Students

Students in More Efficient Schools engaged in intellectual work that involved academic knowledge and skill as well as social and behavioral learning. While some of the Typical Schools showed promise in isolated areas, and not every More Efficient School was exemplary in all of these areas, the overall picture presents a decidedly higher level of student intellectual development in the More Efficient Schools.

Academic Content Knowledge and Skills

Students in More Efficient Schools often **explicitly discussed and clearly demonstrated their academic content knowledge and skills**. 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. The teacher also modeled and asked the children to explain non-examples, thereby conducting the cognitive task of "error analysis" (Marzano, 2000). Through developing, demonstrating, and explaining their solutions and non-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 sharing with 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 in real situations, it also provided repeated, invigorating engagement with the concept's structure to deepen all students' understanding of "half."

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 a list of several reliable websites to find the definition of "anarchy." Using individual, school-provided laptops, the students each independently wrote a definition compiled from the sources and read it aloud to the class. Each student received brief verbal teacher feedback about his/her definition. Then, in small groups organized by the teacher, student groups developed a written description of a model anarchist society. The small groups shared their descriptions with the whole class and defended or revised their construction based on peer and teacher questions and comments. These definitions were then used throughout the unit to categorize, identify and analyze various historic events.

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. After extensive lecture, discussion and classroom activities providing a thorough knowledge of both the art and literature of that cultural time period, students created a culminating assessment that had been collaboratively developed by the Art and English teachers. Students crafted a visual 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 description written by the student of how his/her application related to the themes of the unit and the time period.

Photo Credit: Creative Commons - Flickr Pepino1976

Social and Behavioral Learning

Often, the result of this intellectual work is visibly integrated into various elements of the 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 a classroom activity (Goldsmith 1995; Boud, Keough & Walker 1985). One full-time teacher in a More Efficient high school monitored the school-wide three-hour Friday night detention. He 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.

In More Efficient Schools, the consistent practice of using the intellectual work process of understanding, transforming and sharing created a strong, common foundation for the academic and social/behavioral work in which students were engaged. This process was not only taught explicitly in classroom lessons and activities; adults in the school community also modeled the process and contributed to the systemic practice of intellectual work found in More Efficient Schools.

Intellectual Work of Adults

Like the students, the **adults in More Efficient Schools are also engaged in intellectual work to create instructional practices, curricula, professional learning programs, and leadership roles that improve student performance and are informed by assessment and experience.**

Instructional Practices

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 (not computer, film, workbook or textbook) instruction** that was provided to the whole class, small groups or individual students. Very few observations in these schools indicated that the class activity was orchestrated by a non-human (computer, television, workbook, etc.). At times, this direct interaction between teacher and student occurred via technology (e.g., using GoogleDocs to monitor and conference with students about their writing in real time) or in combination with technology (e.g., 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 about the same frequency in Typical Schools as in More Efficient 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 more often to 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 student 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, More Efficient classrooms at these grade levels showed **educators using technology to supplement direct human instruction instead of replace it**.

In accordance with the Maine Learning Technology Initiative, all 7th and 8th 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 indicated technology was being used in the classroom in middle 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 as a tool to achieve curriculum or learning goals 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, 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 rather than being allowed to remain in use as a potential distraction.

Intellectually engaging direct instruction at all grade levels was more pervasive in More Efficient Schools. For example, one teacher in a first grade class asked students to demonstrate their cognitive 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 materials, and the teacher explained the possible ways the composition or state of their substance could change. Each student then verbally identified the type of mixture he/she had created and explained why it could not be categorized as another type; some students explained how adding more of one certain type of matter would further change the state of their sample. The teacher used various methods to guide students to further inquiry if their initial identification was not accurate: follow-up open questions, additional modeling and categorizing, or extended one-on-one interaction with struggling students.

Photo Credit: Creative Commons ND Strupler

There were also numerous examples of intellectually engaging direct teacher instruction at the middle and high school level as well as at the elementary level. Teachers were seen involving their students in "good information processing" (Pressley, Borkwski, and Schneider, 1989). Our observations in More Efficient Schools included 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 and supported analytical essays surrounding current issues and sophisticated literature. Students also used vigorous rubrics to critique their own and their peers' writing. We also observed several activities in art and science, in which students engaged in intellectual work while teachers provided insightful instruction to guide the process, solidify content knowledge, and push students to engage with the material in new, thought-provoking 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 challenging question by the teacher and responded to the question with supporting evidence from each text in an informal written reaction. Then, the teacher grouped the student responses into four general categories posted in the four 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.

On one hand, these examples of intellectually invigorating instruction from More Efficient Schools demonstrate the individual and collaborative work being done by teaching professionals who have engaged in professional learning experiences to improve their practice. This work reflects the ongoing intellectual work of the educators in the development of the lesson, implementation of instructional strategies, and deep knowledge of the content. On the other hand, these examples also illustrate the intellectual work of students engaged in gaining academic skills, extending content knowledge, as well as learning and utilizing complex cognitive skills. It is the interaction of both the

educator and the student within this intellectual process that creates a crucial, deep bond of learning. Therefore, while we separate adult and student learners for the sake of explanation in this report, in the culture of More Efficient Schools, the intellectual work of each person is inextricably linked to the other.

Curriculum

Another characteristic of these More Efficient learning communities is that they engage in focused intellectual work to **develop rigorous curricula informed by student 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 using 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.

"We are not going out and buying something; we are building it from within."

This distinguishing feature of More Efficient Schools as learning communities that have rigorous curriculum and provide intellectually engaging instruction is exemplified in their 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. To this end, several More Efficient Schools developed their own literacy programs to specifically address the needs of their student population. 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, they taught a significant unit to understand the structural elements of and bias within textbooks in all classes at the beginning of year and continually reinforced in lessons thereafter. Students confirmed that they explicitly learned and re-learned how to locate information and analyze 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."

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

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). 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." 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. Teachers and education technicians 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 is a More Efficient high school that used school-wide professional time (early release, staff 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 9th grade "academies," which provided teachers of 9th 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 as well as initiating an alternative education program that incorporated a rigorous academic curriculum with the same standards as other grade-level courses but provided a more intimate and physically 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."

Professional Learning

Many professionals in More Efficient schools frequently demonstrated 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. This process was demonstrated in professional tasks, such as developing individual and collaborative classroom curriculum and assessment tools, or dealing with student discipline (Renyi, 1996).

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 within the contractual day 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.

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 results in improved student performance. 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 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." During professional days and faculty meetings, a More Efficient junior high school frequently highlighted teacher presentations regarding instruction and assessment strategies. In order to share, develop and evaluate the efficacy of their instruction practices, educators at More Efficient Schools were provided with and effectively used 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 conducted classroom observations and then compiled and analyzed their findings. Several More Efficient Schools included classroom observations as a means of 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." 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 More Efficient Schools, there is a **collective expertise in gathering data, understanding data and using knowledge to improve student learning.** External accountability, especially the U.S. Department of Education's 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 United States are still struggling to develop accessible, usable data tools for practitioners. However, this study 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

Photo Credit: Creative Commons - Flickr user Ron Cogswell

(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 North West Evaluation Association online assessments, New England Common Assessment Programs assessments, SATs, Advanced Placement content 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." In More Efficient Schools, significant, consistent professional time was dedicated to ensuring that all educators interacting with students were trained to understand and use relevant data in a manner that was student focused, efficient and improved student performance.

Education technicians were very evidently treated as professional educators in More Efficient Schools. In these schools, the duties of education technicians were classroom-based and student-involved, and not clerical. One education technician indicated that "the teacher's role is to give the lesson, our role is to give one-on-one support." Another education technician spoke of being "provided with a lot of professional development opportunities" (including early release professional meetings, book studies and course reimbursement). These professionals were 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 curricula, worked directly with small groups as well as whole classes and provided valuable one-on-one instruction to both students identified as special education and those students not identified.

This intellectual work often naturally spread beyond the contractual day into other aspects of the lives of the school's professionals because they held 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."

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. More Efficient Schools encouraged and supported this type of individual intellectual work that was

linked to the school goals and resulted in improved student performance. One science teacher at a More Efficient high school partnered with a local university professor to design an improved variation on the classic fruit fly genetics lab that allowed students to work with generations of flies and thereby test for heritability of characteristics. Her work not only modeled incredible intellectual inquiry outside the classroom, it also enhanced student learning and made the practice more efficient within her classroom.

Leadership

Our research shows that a key element to sustaining intellectual work throughout a school was the presence of **focused, collaborative and guiding leader** who facilitated and practiced intellectual work him/herself. Again, these leaders often exhibited their own sense of moral responsibility (Fullan, 2003) to provide children with an intellectual experience as well as collaborate with the school community (Rubin, 2009). These 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. Some elementary building administrators read aloud to students on a regular basis, while high school principals participated in intramural athletic leagues with students and staff. Teachers indicated that such involvement led to valuable conversations and relevant feedback about what had been observed while also building a positive relationship between leaders and students. One high school teacher at a More Efficient School said, "Letting teachers have

Various school leaders, in addition to principals and assistant principals, demonstrated intellectual work in More Efficient Schools.

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 a 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."

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 in addition to managing the school. Both administrators worked at developing the school vision with extensive community 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 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 followed through on these change efforts, "Something is set in motion, and they keep going back and back." Teachers said there were very few "naysayers" because of how the work was approached: school leaders "prepare staff for upcoming changes" so they were better "able to adapt" and did "not always have to change completely." The principal said changes often had "a new name but they are usually something we already use and do for kids." He said he knew teachers understood state/district/federal mandates were "not going to go away, so [our staff] say, 'How do I make it fit?'" Following this process of intellectual work, the school leaders involved the whole school community, modeling the method for further practice.

"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, and then analyzed by administrators and school leaders who give constructive feedback and utilize the material when it is found valuable. One teacher indicated that it was critical to "have administrators who…value us as professionals and let us know that."

Equity

Equity is the second distinguishing characteristic of More Efficient Schools and reflects a feature often cited in research literature about higher performing schools: high standards and high expectations. In More Efficient Schools, a vast majority of the members of the school community—from students to parents, teachers to leaders, as well as support staff and community members—are expected to and consistently do uphold the vision of the school. The distinction is found in the focus around intellectual and academic work throughout the culture and community of the school that is driven by professionals who feel this work is crucial to making our world a better place.

"I really became a teacher for social justice reasons."

Moral Obligation

Teachers and leaders in these schools believe they have a moral obligation to focus on the intellectual development of students as a means towards a better world. One educator said, "We have high expectations of our kids but we have high expectations of ourselves as teachers." Adults in the school community who engage in educational situations with students include numerous people in the school, within and beyond the classroom. The core of the adult learning community includes school leaders, lead classroom teachers and teaching education technicians. In these schools, educational interactions extend beyond the work in classrooms. 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, or current and past academic performance. 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 learning experiences with all of their students as a significant means to building a better individual, community, state, nation and world.

In More Efficient Schools, literacy is not a mundane set of core skills but rather a tool to fight social, educational and political inequity (Freire, 1970). A prior example cited a school's creation of their "Best of the Best" literacy curriculum, based on selecting practices that were research-based and had worked well for their students. The school embarked on that curriculum development because they had noted inequitable student outcomes, and wanted to ensure all students received the same opportunity to learn. In a More Efficient junior high school, a common reading of Ruby Payne's *Framework for Understanding Poverty* by all educators led to a 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."

High Standards and High Expectations for All

High expectations and high standards for all members of the school community were thoroughly evident in More Efficient Schools within student work, curriculum, instruction, professional development and leadership practices as mentioned in previous sections of this report. 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."

Many schools we visited, Typical and More Efficient, 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 counselors 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 benefitted 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. So, many of the 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.

Even during important breaks from academic work, intellectual work continued in the form of constant inquiry, social interactions, behavioral teachings, etc. Reflecting Maria Montessori's philosophy that "play is the child's work," many More Efficient Schools, especially at the elementary level, modeled this in their use of non-academic time (recess, lunch and snack) by providing intellectually invigorating physical and social activities modeled and overseen by an educator. 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.

Photo Credit: Creative Commons - playgroundology

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 presented academic policies and expectations first and foremost 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 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 curriculums through discussion of class books, mathematical logic problems, 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 5th 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 were promoting this center in conversations as well as various methods of more formal public awareness. These academic 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. 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, as well as 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 did this was 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 education 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 area 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 academically engaged with students were intimately familiar with the 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 access relevant, intellectually invigorating professional learning opportunities, synthesize 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 were highly visible, accessible, and involved in the intellectual work being done in their schools.

Building leaders in More Efficient Schools were 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 learning of 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 collective 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."

This sense of active involvement built an atmosphere of collective accountability in which building leaders supported and expected all teaching staff to be "in a constant state of rejuvenation." Leaders fostered this state by demonstrating their dedication to and support for the work needed to fill this moral obligation. The leaders demonstrated 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.

In More Efficient Schools, building leaders conducted this relationship of high expectations and high standards with school staff, students, students' families and the townspeople. **Structured communication and support systems were also used with the community at large to maintain focus on student learning**. More Efficient 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. 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.

Thus, community and volunteer interaction maintained, rather than distracted from, the intellectual and academic focus of the school. Work outside the classroom 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 as well, for whom high standards and high expectations to maintain eligibility were held. 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 More Efficient Schools were very aware of these expectations. "In this office, we are in the academic business," said one athletic office administrative assistant.

"My kids have expectations of me as a parent, and I have expectations of them as students."

Students and their families are also part of the conversation regarding student learning. "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 student focused practices such as 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 investment of *all* members of the school community in the improvement in student learning that makes these More Efficient Schools distinctive.

Efficiency

A closer examination of these More Efficient Schools in terms of their return on spending reveals the third overarching feature found in More Efficient Schools: **efficient use of available human and financial resources to maximize learning opportunities for students and staff**. This feature is crucial to sustaining intellectual communities even during challenging fiscal times. Building and sustaining intellectual communities can be a short-term fiscal challenge in these times of economic belt-tightening, but these communities doing intellectual work are especially crucial to maintaining and improving student achievement. This investment can yield beneficial long-term academic and financial results.

In examining some of the educational demographics of More Efficient Schools, it does appear that one strategy for using resources more efficiently is in staffing patterns. Table 4 provides some descriptive statistics of More Efficient K-8 schools. Similar statistics for other grade configurations appear in Appendix B. In the case of these K-8 schools, student to teacher ratios and student to educational technician ratios are slightly higher than the state average. For example, in More Efficient Schools average one teacher for every 12.5 students, whereas there is a statewide average of one teacher for every 11.7 students. The same general pattern is found at other grade levels, although the average percentage of students who qualify for free or reduced lunches at these other grade levels is higher statewide.

Table 4: Descriptive Statistics 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)

In terms of personnel at More Efficient Schools, **all staff is trained and held accountable for implementing strategies that result in 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." 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 and productive manner, the school schedule was efficient, and teachers were trained in effective class time transitions providing for more direct instructional time. In a majority of the More Efficient Schools, fewer educators were working with more students and providing an effective education program. It was not a great deal lower, but enough to result in lower overall instructional per pupil expenditures. We found that efficiency in More Efficient Schools was not achieved by simply reducing staff numbers, cost cutting or budget reduction. Efficiency was more evident in prevalent practices providing relevant, productive investments that enhanced student learning. Many schools, both Typical and More Efficient, were engaging in important steps to increase savings and fiscal efficiencies in the physical operation of their school buildings, such as purchasing new boilers and better lighting systems, pursuing grant funding, and sharing the cost of services with their communities or neighboring schools. However, the distinguishing characteristic of More Efficient Schools was that their systems of professional development, scheduling, staffing were more effective.

Professional development in More Efficient Schools was aligned to school priorities. 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 teachers simply self-selecting 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 compensated hours of Therapeutic Crisis Intervention training for all education technicians who would then be re-certified in this practice each summer. Education technicians also received compensated 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 de-escalated situations before they were out of control and helped children with special needs to be more successful in mainstream classroom. 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 a local professional learning opportunity regarding physical activity in 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 was some amount of collegial pressure to participate in professional development opportunities because everyone wanted to make sure they stayed current, knowledgeable and engaged in order to keep their jobs. In one More Efficient high school, teachers indicated they felt 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 a course surrounding the text, *The Skillful Teacher* (Saphier, Haley-Speca and Gower, 2008).

Over the course of the PK-12 school experience, students in More Efficient School districts could gain over six months more learning time than their peers at other schools.

Equally important, our study identified an efficiency characteristic that is not always directly evident in the per pupil expenditure amounts but yields greater gains in students' academic performance for the investments in their education: increased learning and instructional time during the school day. A few strategies were employed to focus time on learning. For one, little time was used for transitions that did not incorporate some type of intellectual engagement, and 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 schedule and actual passing time between classrooms or class activities 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 PK-5 school, differentiated instruction was being

implemented in the classrooms in the form of leveled grouping, push-in support from in-house 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.

In fact, one More Efficient elementary school responded to an observed loss of instruction time in 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 case study focus group interviews at More Efficient Schools, teachers referenced professional training regarding improving transition time between classroom activities. 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, 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 directly 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 students using an educational tool, which in turn did not improve student performance. As mentioned above, educators in More Efficient schools

Photo credit: Dan Callahan

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." 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 were very savvy in their pursuit of grants that directly connected to their academic focus and their use of community resources to 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 and a performing band that 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 few hours of the school day were

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 art-based 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 maintained a strong academic and intellectual focus, was collaborative, and worked smoothly within the student's school day.

Summary

In summary, these three features of intellectual work, equity and efficiency come together to create a gestalt in the More Efficient School, a learning community that is student-focused and systemically engaged in intellectual inquiry. We have found that, in these schools, the students and their intellectual development are at the core of the work. 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.

More Efficient Schools and Preparing Students for the 21st 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: 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 21st century? And can we ascertain that once all schools become more efficient, their students will be better prepared to compete nationally and globally and better prepared to compete with "the rise of the rest"?

In answering these questions, two points must be kept 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. Performance in these schools is relative to the performance of other Maine schools. So, 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 these schools, before we can say that *all* students are achieving desired levels of proficiency. A recent report by the Center for Education Policy, Applied Research and Evaluation (CEPARE) at the University of Southern Maine (Silvernail, Walker & Batista, 2011) highlights this need. The CEPARE researchers found that while 8 of 10 high school students in Maine graduate in four years, far too many of these graduates are still lacking proficiency in reading and mathematics. The data for More Efficient Schools is less discouraging, but nevertheless, it is still concerning. Thus, even these More Efficient Schools need to continue to focus on improving.

Second, even if all schools become More Efficient, there is growing evidence that success in the 21st Century requires more than what has traditionally been the content of schooling. Success requires the foundation of intellectual development described above and seen in the More Efficient Schools, but it also requires more and different knowledge, skills, and learning. As described by the Partnership for 21st 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

To help students acquire this knowledge base and skills, many educators and policy 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 policy 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. (page. 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., 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 even more important as we navigate the 21st century (e.g., Burkhardt, et al, 2003; Pink, 2005; Partnership for 21st Century Skills, 2008, Brown, 2008; Friedman & Mandelbaum, 2011).

Additionally, these **transformative changes are not just limited to what students learn. Where they learn it and from whom must also change.** A Nellie Mae Education Foundation report (Halpern, 2012) describes these needed changes, and although the report is directed toward high school reform, the changes are also applicable to schools at all levels. Halpern writes:

In an effort to improve our collective prospects for the future, we need to dramatically increase the number of young people who possess the skills and knowledge needed to succeed in postsecondary education, work and life. Today, too many young people in this country lack access to the kinds of vital, productive learning experiences that should enrich their lives and provide a foundation for adulthood. Part of the problem rests with an over-reliance on one institution – high school – to meet the full range of developmental needs. (p. 3)

Clearly, we face an urgent need to open up the learning landscape in America. Specifically, we need to move away from a standardized vision of learning during the high school years and overcome the tendency to view academic and applied learning in "either-or" terms. To do so, we need to create a richer fabric of learning opportunities for a diverse population of youth. The "we" in this reform extends beyond traditional academic resources. A much broader segment of society needs to collaborate to find the domains and means to engage our young people in meaningful learning. Only then can we provide growth experiences that focus our young people's passion and energy. (p. 3)

Today most learning settings and experiences are decentralized – and thereby are spread throughout the culture, across sectors and settings – making them hard to see and imagine as a coherent enterprise. They also remain largely invisible to public policy. Elevating these learning experiences so

they become an explicit option for middle adolescence will require a concerted effort. Specifically, we need to place individual clusters of experience in a broader societal framework and make them cohesive, organized, accessible and integral to our societal life. (p. 6)

Clearly, the More Efficient Schools studied here in Maine exhibit many of the **fundamental characteristics needed to prepare students for the 21st Century**:

a) They are having considerable success in helping students master core academic subject knowledge.
b) They are having success in helping students to develop intellectually and providing them with supports and tools needed to understand, transform, and share their learning.
c) The central focus is on students and helping them learn and develop intellectually.
d) 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.
e) There is ample evidence of high expectations and high standards and the use of multiple assessments in assessing progress in learning.
f) Teachers and leaders are actively engaged in creating a school culture that helps students acquire more and more responsibility for their own learning.

But even these More Efficient schools still have steady work ahead of them before they are meeting the needs of all students. It is true that the focus is on learning, students have wider ranges of learning experiences than in the past, and many of these experiences are more "authentic." It is also true that some students have opportunities for more field-based activities, peer learning and internships and that student progress is more often judged in terms of competencies and standards. However, learning is still most often confined to the traditional school day and year, and progress continues to be very much governed by traditional course structures and grade-level configurations. Standards are used very often to guide curriculum, instruction, and to measure student progress, but only within existing grade level structures and courses. However, students are still advancing through the grades at the same pace as other students and, consequently, are 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?

It is clear to us that **the foundation for these transformative changes exists in the More Efficient schools, and becoming more transformative and student-centered would seem to be a natural next step in the evolution of these schools**. 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 21st Century. Thus, these schools are poised to become more student-centered, but the teachers, administrators, as well as parents and communities will need substantial support to further transform their schools.

Turning Typical Schools into More Efficient Schools for 21st Century Learning

How can other schools become More Efficient? As we have discussed, the three key features of pervasive intellectual work, equity with high standards and high expectations as well as an efficient use of human and financial resources come together to create a gestalt 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 21st century. An important question then arises: how can a Typical School become a More Efficient School? There is a culture in More Efficient Schools that 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 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. 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 a starting point might be to begin conversations around three questions:

1) How many examples can we think of where one or more of the five key features of More Efficient Schools 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, CEPARE has created a guiding document called "Conversation Tools" that can be obtained by contacting our office.

Final Thoughts

We have found that More Efficient Schools in Maine have created a pervasive culture within the school community that produces important results: 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 external experts, and it is already being done in all types of schools in Maine. Educators, students and educational leaders across the state of Maine are pioneering all aspects of improving educational and professional opportunities. There are concrete practices, habits of mind, and strategies practitioners, leaders and policy makers 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 current 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 our nation's youth**.

References

Almanzan, H.M. (2005). Schools moving up. *Educational Leadership, 62.*

Ascher, C. & Maguire, C. (2007). *Beating the odds: How thirteen New York City schools bring low-performing ninth-graders to timely graduation and college enrollment*. Providence, RI: Annenberg Institute for School Reform at Brown University.

Balfanz, R., Herzog, L. & MacIver, D.J. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. *Educational Psychologist, 42*(4), 223-235.

Bloom, B. (1956).Taxonomy of educational objectives, the classification of educational goals: Handbook I: Cognitive Domain. New York: McKay.

Boser, U. (2011) Return on educational investment: A district-by-district evaluation of U. S. educational productivity. Washington, D.C.: Center for American Progress.

Boud, D., Keough, R. & Walker, D. (1985). *Reflection: Turning experience into learning.* New York: Nichols Publishing Company.

Brown, J. (2008). Student-centered instruction: Involving students in their own education. *Music Educators Journal.* 94(5).

Bruner, J.S. (1966). *Toward a theory of instruction.* Cambridge, MA: The Belknap Press of Harvard University Press.

Burke, M.A. (2001). Recruiting and Using Volunteers in Meaningful Ways in Secondary Schools. *NASSP Bulletin, 85*(627), 46-52.

Burkhardt, G., et al. (2003). *enGauge 21st century skills: Literacy in the digital age.* Los Angeles: North Central Regional Education Laboratory and the Metiri Group.

Carini, R.M., Kuh, G.D. & Klein, S.P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education, 47*(1), 1-32.

Craig, J., et al. (2005). *A case study of six high-performing schools in Tennessee.* Charleston, WV: Appalachia Educational Laboratory at Edvantia.

Darling-Hammond, L. (1996). The Right to Learn and the Advancement of Teaching: Research, Policy, and Practice for Democratic Education. *Education Researcher, 25*(6), 5-17.

Davis, G., & Thomas, M. (1989) *Effective schools and effective teachers.* Boston: Allyn and Bacon.

Dewey, J. (1933). *How we think. A restatement of the relation of reflective thinking to the educative process* (Revised edn.). Boston: D. C. Heath.

_____. (1956). *Child and curriculum and school and society. 1900.* Chicago: University of Chicago Press.

Dojels, C. (2006). *Report on key practices and policies of consistently higher performing high schools.* Washington, D.C.: National High School Center.

Donnelly, R. & Fitzmaurice, M. (2005). Designing modules for learning. In: *Emerging Issues in the Practice of University Learning and Teaching,* O'Neill, G et al. Dublin : AISHE.

EdSource. (2010). Gaining ground in the middle grades: Why some schools do better. Mountain View, CA: EdSource.

Evertson, C.M., Emmer, E.T. & Brophy, J.E. (1980). Predictors of effective teaching in junior high mathematics classrooms. *Journal for Research in Mathematics Education, 11*(3), 167-178.

Freire, P. (1970). *Pedagogy of the Oppressed.* New York: Continuum, 2007.

Friedman, T. & Mandelbaum, M. (2011). *That used to be us: How America fell behind in the world it invented and how we can come back.* New York: Farrar, Straus and Giroux.

Fullan, M., with S. Stiegelbauer. (1991). *The new meaning of educational change (2nd ed.).* New York: Teachers College Press.

Fullan, M. (2003). *The moral imperative of school leadership.* Thousand Oaks, CA: Corwin Press, Inc.

Goddard, Y. Goddard, M. & Tschannen-Moran, M. (2007) A theoretical and empirical investigation of teacher collaboration for school improvement and student achievement in public elementary schools. Teacher College Record, 109(4).

Goldsmith, S. (1995). *Journal reflection: A resource guide for community service leaders and educators engaged in service learning.* Washington, D.C.: American Alliance for Rights and Responsibilities.

Halpern, R. (2012). It takes a whole society. Quincy, MA: Nellie Mae Education Foundation.

Hargreaves, A. & Fink, D. (2003). Sustaining leadership. *Phi Delta Kappan, 84*(9), 693-700.

Hoy, W.K., Sweetland, S.R. & Smith, P.A. (2002). Toward an Organizational Model of Achievement in High Schools: The Significance of Collective Efficacy. *Educational Administration Quarterly, 38*(1), 77-93.

Hunter, M. (1994). *Mastery teaching.* Thousand Oaks, CA: Corwin Press, Inc.

King, P.M. & Kitchener, K.S. (1994). *Developing Reflective Judgment: Understanding and Promoting Intellectual Growth and Critical Thinking in Adolescents and Adults.* San Francisco: Jossey-Bass Higher and Adult Education Series and Jossey-Bass Social and Behavioral Science Series.

Lightfoot, S.L. (1983). *The good high school: Portraits of character and culture.* New York: Basic Books, Inc.

Levine, D.U. & Lezotte, L.W. (1990). *Unusually effective schools: A review and analysis of research and practice.* Madison, WI: National Center for Effective Schools Research and Development.

Madigan, J.B. (2004). The new recess model. *Instructional Leader.* Texas Elementary Principal and Supervisors Association, September.

Mangin M. M. & Stoelinga, S. R. (2008). *Effective teacher leadership: Using research to inform and reform.* New York: Teachers College Press.

Marks, H.M. (2000). Student Engagement in Instructional Activity: Patterns in the Elementary, Middle, and High School Years. *American Educational Research Journal, 37*(1), 153-184.

Marzano, R., & Kendall, J. (2000). The new taxonomy of educational objectives, Bloomington, IN: Marzano Research Laboratory.

McFadden, L. (2009) Miami's "Zone" teaches lessons about low-performing schools. *Phi Delta Kappan*, *90*(8), 557-562.

McGee, M.R. (2004). *Teacher and school variables associated with the social and academic outcomes of students with special needs in general education classrooms.* Unpublished Ph.D. thesis, University of Toronto.

Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook*. Beverly Hills, CA: Sage Publications.

Mourshed, M., Chijioke, C. & Barber, M. (2010). *How the world's most improved school systems keep getting better*. McKinsey and Company.

National Research Council. (2000). How people learn. Washington, DC: The National Academies Press.

Nellie Mae Education Foundation. (2011, December). *Vision, Mission and History*. Retrieved from <http://www.nmefdn.org>.

New Leaders for New Schools. (2008). *Defining an urban principalship to define dramatic gains, version 1.0*. New York: New Leaders for New Schools.

Newmann, F.M. and Associates. (1996). *Authentic achievement: Restructuring schools for intellectual quality*. San Francisco: Jossey-Bass.

Papert, S. (2002). Hard fun. *Bangor Daily News*.

Partnership for 21st Century Skills. (2008). *21st century skills, education & competitiveness: A resource and policy guide*. Partnership for 21st Century Skills.

Patrick, S. & Sturgis, C. (2011). *Cracking the code: Synchronizing policy and practice for performance-based learning*. Vienna, VA: International Association for K-12 Online Learning, 8.

Payne, R. (2005). A framework for understanding poverty: Highlands, TX: aha! Process, Inc.

Perez, M. & Socias, M. (2008). Highly successful schools: What do they do differently and at what cost? *Education Finance and Policy, 3*(1), 109-129.

Perkins, D. (1992). Smart schools: From training memories to educating minds. New York: The Free Press.

Pink, D.H. (2005). *A whole new mind: Why right-brainers will rule the future*. New York: Riverhead Books of The Penguin Group.

Pressley, M., Borkwski, J.G. & Schneider, W. (1989). Good information processing: What it is and how education can promote it. *International Journal of Educational Research, 13*(8), 857-867.

Renyi, J. (1996). *Teachers take charge of their learning: Transforming professional development for student success*. Washington, D.C.: National Foundation for the Improvement of Education.

Rogers, R.W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. Cacioppo & R. Petty (Eds.), *Social Psychophysiology*. New York: Guilford Press.

Rubin, H. (2009). *Collaborative leadership: developing effective partnerships for communities and schools*. Thousand Oaks, CA: Corwin Press, Inc.

Saphier, J., Haley-Speca, M.A., & Gower, R. (2008). *The Skillful Teacher: Building Your Teaching Skills*, 6th ed. Acton, MA: Research for Better Teaching, Inc.

Schon, D.A. (1983). *The Reflective Practitioner: How professionals think in action*. London: Temple Smith.

Schwab, J. J. (1961). Education and the structure of the disciplines. In Westbury, I. & Wilkof, N. J. (Eds.). (1978). *Science, Curriculum and Liberal Education: Selected Essays of Joseph J. Schwab*. Chicago: University of Chicago Press, 229-272.

Silver Strong & Associates. (2007). Lessons from the thoughtful classroom. Retrieved from <www.thoughtfulclassroom.com>.

Silvernail, D. L. (2007) *The identification of higher and lower performing Maine schools: School profiles and characteristics.* Gorham, ME: University of Southern Maine, Center for Education Policy, Applied Research, and Evaluation.

Silvernail, D. L., Walker, L., Batista, I. (2011). *Increasing Maine's high school graduation rate: Necessary but not sufficient.* Gorham, ME: University of Southern Maine, Center for Education Policy, Applied Research, and Evaluation.

Simon, B. (1999) Why no pedagogy in England? In J. Leach and B. Moors (Eds.). *Learners and Pedagogy.* London: Sage Publications.

Standard & Poor's School Evaluation Services. (2007). *Kansas School District efficiency study. Part one: Efficiency analysis.* New York: Standard & Poor's School Evaluation Services.

Vandenbergh, R. & Huberman, A.M. (1999). *Understanding and preventing teacher burnout: a sourcebook of international research and practice.* New York: Cambridge University Press.

Wagner, T. (2008). *The global achievement gap: Why even our best schools don't teach the new survival skills our children need--and what we can do about it.* New York: Basic Books, Inc.

Wentzel, K.R. (1991). Social competence at school: Relations between social responsibility and academic achievement. *Review of Educational Research, 61*(1), 1-24.

Zakaria, F. (2011). *The post-American world: release 2.0.* New York: W. W. Norton and Company, Inc., 13.

Appendices

Appendix A

Criteria for Identifying Maine's More Efficient Schools

The specific criteria for defining school efficiency as used in 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.

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.

Once a More Efficient school was defined, the second step of the study involved identifying which Maine schools met all the academic performance and return on spending criteria.

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 4th, 8th, or 11th grade, which were the grades used for the profiles. The 2007-2009 Maine Education Assessments (MEAs) were used for the 4th and 8th grade measures, and the Maine High School Assessment (MHSA) was used for 11th grade.

Appendix B

Demographics of More Efficient Schools

The descriptive statistics of More Efficient K-8 Schools, appears in the report on page 32. Table 5 provides descriptive statistics of More Efficient K-5 type of schools. These schools are 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. 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 5: Descriptive Statistics of More Efficient K-5 schools

Maine Public Elementary Schools (Grades K-5)		
Variable	**More Efficient =** 54 Average (Range)	**State =** 228 Average (Range)
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 6, More Efficient middle schools are larger, have fewer pupils in poverty and with special needs, and have more teachers with advanced degrees.

Table 6: Descriptive Statistics of More Efficient Middle Schools

Maine Public Middle Schools (Grades 6-8)		
Variable	**More Efficient =** 17 Average (Range)	**State =** 93 Average (Range)
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 data in Table 7 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 7: Descriptive Statistics of More Efficient High Schools

Maine Public High Schools (Grades 9-12)		
Variable	**More Efficient =** 9 Average (Range)	**State =** 107 Average (Range)
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)

Appendix C
Description of Case Study Methodology

An initial step in conducting the case studies involved selecting the twenty-five schools to study in more depth. An original 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 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 3 (page 8) summarizes the number and sites of these interviews and observations.

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 three broad features that distinguished the More Efficient schools. The three broad features were then supported with specific sample practices found in the More Efficient schools in the study.

Appendix D

Sample of Individual and Focus Group Interview Protocols

Teacher Interview/Focus Group Protocol

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

Teacher Name: _____ Date: _____ Time: _____

I appreciate you letting me speak to you today. I'd like to speak to you more about your role as a teacher at your school. This interview will likely take about 30-45 minutes to complete. We're doing these interviews with teachers 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.

Teacher Name: _____

Grade/Subject: _____

Years at School: _____ (PROBE: district, grade levels, voluntary grade, level or content area changes)

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?

Possible Additional Questions:

1. Do you believe that all students can learn, regardless of the obstacles they face?
2. Do you feel as though there is a culture of equity at your school? How is this supported?
3. If new teachers asked you what it is like to work at this school, what would you tell them? (PROBE: student/community, demographics, leadership, staff relationships, accountability, demands, curriculum)
4. How are students placed in their class settings? (PROBE: homogeneous grouping, heterogeneous, leveled, subjects, teacher)
5. Approximately how much time do you spend differentiating for student needs within your classroom?
6. What types of supports are available to students in your class(es) who may be struggling not necessarily academically, but emotionally, behaviorally, or socially?
7. Do you feel as though all teachers are treated equally by the staff members who hold leadership roles? Do you feel as though you're respected by other teachers and staff?

8. Are the administrative-level behavioral expectations of students clearly defined for all members of the school community? Are you able to incorporate those expectations into the behavioral expectations you have in your own classroom?
9. Do you feel as though the administration at your school holds teachers accountable for their performance? Please describe. (PROBE: recognition for performance)
10. Can you describe how you are able to hold students in your classroom accountable for their learning but also for their actions?
11. Do students at your school come prepared to learn?
    a. If so, what makes them prepared?
    b. If not, what are they lacking and how do you help them with the barriers to learning they face?
12. Can you think of an example of a student you may have had who didn't necessarily excel in a conventional way but who thrived in your classroom? What role did you play in the success of that student? Please describe.
13. Do you encourage all of your students to complete some type of training beyond high school?
14. In what ways do you think the leadership at your school might contribute to high levels of student achievement? (PROBE: supportiveness, encouragement of PD, recognition, collaboration, respect of time, instructional leaders vs. managerial leaders, respect and support toward leadership, clear vision, understanding)
15. Does your school have a school improvement plan?
    a. If YES, do you have a copy?
    b. If YES, to what extent does the school use this to guide day-to-day operations of the school? (PROBE: curriculum, instruction, planning, observations)
    c. If YES, do you feel you have an understanding of it?
16. What are the goals of the school?
    a. Are there specific or unique goals that set the school apart?
17. Do you feel as though your opinion and the opinion of other teachers and staff at this school are valued by the leadership? Could you give me an example of a time when the principal/leadership brought people together to gain insight into their opinions?
18. If you needs support from the administration (with a student, a parent, another staff member), do you feel as though he/she is available to provide guidance?
19. Do you feel as though the leadership at your school is respected by the staff? Why or why not?
20. Do you believe that students are the number one concern of the leadership when making a tough decision or do you think the needs of others are weighed equally?
21. What do you think makes your principal a good leader?

22. How are professional development needs of teachers determined? (PROBE: student needs, teacher needs, observations, data analysis, leadership)
23. How is professional development conducted? Do you feel it is effective?
24. How are lessons constructed? (PROBE: teacher collaboration, curriculum use, alignment of standards, curriculum map, required pacing, student-led, technology, inquiry-based)
25. Has the content of what you actually teach been aligned with the district's curriculum? If yes, how was that accomplished? (PROBE: collaborative, individual)
26. How is content generally presented at this school? (PROBE: lecture vs. cooperative learning, individual and small group targeted instruction, in-class support, resources, worksheet use in comparison to project-based and inter-disciplinary activities)
27. Are there opportunities for students to be involved in activities outside of the school day? (PROBE: required, sports, academic, creative)
    a. If so, how are students made aware of the offerings?
    b. If so, how does the school determine what is offered?
28. Does your school offer outside support for students? (PROBE: after school enrichment, remediation/tutorials, transitional support, methods for/process used student identification, effectiveness, alignment with needs of child)
29. How do teachers know they will get the necessary content covered before the state test? (PROBE: curriculum mapping, planning times, integration of various content areas, scheduling)
30. Do you feel as though your instructional time is valued and that as much as possible it is protected by the leadership?
31. To what extent do you use technology in the classroom? Please describe.
32. Has the district curriculum been aligned to the Maine Learning Results? If yes, how was this accomplished?
33. How often are students in your classroom assessed? In what manner?
34. Do teachers here review student assessment data when planning curriculum and instruction? In what ways? How do you know?
35. Do you feel confident in your ability to review data?
36. Do you feel like students coming to your school from different middle schools are equally prepared or do students from some schools not have the skills of other students?
37. In what ways do you think the culture of this school might contribute to student achievement?
38. Do you feel that in most cases, parents are partners with teachers in the learning process? If yes, what specifically do parents do to show that they are engaged in their child's learning?

39. How would you describe the morale at your school? How do you contribute to making it positive?
40. How do you think the majority of students in your school feel about coming to school every day?
41. How do you feel about coming to school/work every day?
42. Do you feel as though your school is a physically inviting space? What do you do to make your school a physically inviting space?
43. Does your school have standards for communication? If so, are they followed by teachers, staff, and students?
44. If you could describe in a couple of sentences what the attitude of your school is, what would you say?
45. To what do you attribute the success your school has had in producing high levels of student achievement?
46. Do you have any concerns that your school will be able to maintain a high level of student achievement? Why or why not?
47. Is there anything I did not ask you that I should know in order to better understand what your school does to produce and maintain high levels of student achievement?

Thank you for your time. If I have any additional questions or need clarification, how and when is it best to contact you?

Appendix E

Sample of Classroom Observation Protocol

Researchers informed school leaders and educators of this observation process prior to the school visit. During each day of the site visit, individual researchers conducted numerous observations that were 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 recorded the following aspects of the activity observed and included "Evidence" notes further describing specific aspects of the observation.

Note: For this specific study, researchers recorded data electronically (using smartphones, tablets, or laptops) via a live form on GoogleDocs.

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:

- ☐ Remember/Understand
- ☐ Apply
- ☐ Other:
- ☐ Analyze/Evaluate
- ☐ Create

- **Evidence:**

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

Student Engagement:

- ☐ 0-50%
- ☐ 51-75%
- ☐ 76-90%
- ☐ 91-100%
- ☐ Other

- **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, tablet, internet, etc.)

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