Overview

Among those who have successfully transformed their school districts through the use of technology, it is widely accepted that leadership is by far the most important factor contributing to success. Leadership is important at all levels of an organization. Leaders provide vision. They make or cause a group to make decisions. They are problem solvers. Distributed leadership enables all levels and stakeholders to put on the hat of the leader. This includes school boards, the superintendent, their staff, principals, lead teachers, and really all stakeholders in or outside the organization. Without effective leadership, the other segments Project RED deems important, such as professional learning, curriculum and instruction, and financial sustainability will all suffer. As Doug Reeves points out, real leading is tied inextricably to succeeding. Although this brief focuses on superintendents and principals, who were the primary focus of the Project RED study and research, all stakeholders are important.

Given the potentially disruptive nature of moving to a technology infused curriculum, a critical job for leaders is to lead the change process. In their landmark research on school leadership, Marzano, Waters, and McNulty identified 21 characteristics of effective leaders—with seven of the characteristics specifically linked to creating Second Order Change (i.e. innovation that is a dramatic departure from the status quo). Key among
the seven are the need (1) to be a change agent by consciously challenging the status quo and being willing to lead change initiatives that operate at the edge versus the center of the school’s competence, (2) to provide staff with intellectual stimulation on cutting-edge research and processes, and (3) to effectively process, share, and demonstrate ideals and beliefs that lead to growth.

In his book, From Leading to Succeeding: The Seven Elements of Effective Leadership in Education, Reeves provides a synopsis of 21st century learning that points to seven key elements for leading education change. Many of these elements, extracted from diverse research methods and perspectives, overlap the research of Marzano et al. Reeves identifies as critical: 1) Purpose, 2) Trust, 3) Focus, 4) Leverage, 5) Feedback, 6) Change, and 7) Sustainability.

Unless every stakeholder agrees with the urgency, and buys in, the desired changes occur slowly, if at all. The manifestations of resistance to change are many. For example, teachers and staff may be perfectly happy to wait out this latest initiative and parents may be reluctant to change if they are sure their school is among the best in the country. Leaders at many levels are called upon to address many common elements:

- Establishing the urgency – The burning Piper Alpha oil drilling platform analogy is the classic example.5

- Collaboratively setting the vision6 – Ensuring that resources are aligned to fulfill the vision (spelled out as "Resources" and "Order" by Marzano et al.; mentioned as "Leverage" by Reeves)

- Implementing change leadership by starting at the top (as mentioned by Reeves, leaders must personally embrace "Change," whether or not it is messy)

- Ensuring that the organizational structure is optimum (called out as "Order" and implied as a top seven characteristic "Optimizer")

- Staffing the organization with people possessing the proper skills and experience (also included in "Order")

- Developing capacity in the organization (included in "Resources")

- Ensuring quality and fidelity (referenced as a top seven characteristic "Monitoring and Evaluating," plus "Visibility" by Marzano et al.)

- Developing a culture of continuous improvement (also referenced by Marzano et al., as "Culture")

- Benchmarking against the world versus against neighboring school districts7

- Creating long-lasting, sustainable change, that will endure the loss of talented subordinates, financial downturns, changing legislation, changes in school boards, and the inevitable change in superintendents (the sum results of Reeves's first six elements lead to number seven, "Sustainability")
Meanwhile these leaders are facing challenges and may not even be aware of them. Challenges may include, but are not limited to:

- The urgent need for change is not recognized or acknowledged.
- The complexity of the problem being faced and that it is beyond complicated.
- The recognition that in times of rapid change, experience is your worst enemy.

This leads to a situation where leaders who are highly qualified in the educational challenges of yesteryear are not prepared to handle changes they face right now. Examples include:

- District leaders may feel that things are going well. Perhaps the district’s performance is comparable to its peers.
- District leaders may be unfamiliar with technology implementation. A superintendent may have decades of experience with traditional school operation, such as the adoption of new textbooks, but they may have no training in the nuances of adopting digital instructional materials.
- Support of technology is mission critical. A few years ago a computer was something a science teacher purchased with bake sale money, and the science teacher handled all technical support. Now, technology must be a standard operating budget line item.
- Teachers are expected to personalize learning. For centuries the teacher was the sage on the stage and the class moved in lock step. If a student missed a key learning outcome, too bad. Now, we are moving to fully personalized learning. We expect every student will master every topic.

Over the last few decades, the education world has moved from one widely viewed as complicated, to one that is known to be complex. Complexity produces a fundamentally different situation from the complicated challenges of the past; complicated problems required great effort but ultimately yielded to prediction. Complexity means that, in spite of our increased abilities to track and measure, the world has become, in many ways, vastly less predictable.

An illustration of complicated versus complex may be useful. Building a new school is complicated. There are thousands of steps to follow. However, there is an overall plan and plans for each section, such as plumbing, electrical, etc. If you follow the plans exactly, you will have a good, functioning school. A complex problem is characterized by many interactions, and constantly changing conditions and relationships. Imagine building a school if the availability of products on the bill of materials changed faster than the design cycle.

Teaching algebra to a classroom full of students is complex. Inherently, we know this, because even good teachers have a high
student failure rate. The problem is complex because the students in every class are different. Each student learns differently and has different base knowledge. The teacher cannot be fully aware of each student’s base condition.

The successful implementation of personalized learning will start with the superintendent. The principal is essential for success as well. Both must be skilled at promoting and supporting new learning paradigms and teacher leaders.

Because educational systems are complex organizations, leadership needs are best met through distributed leadership models. This is a new concept for many superintendents and principals. It is important to recognize that most superintendents, while highly competent to lead a traditional district, are ill equipped to lead a successful digital transformation. They often have not implemented a digital transformation before or perhaps have not seen one. Now, they are called upon to lead the transformation.

What the Research Says

The strategic importance of leadership at all levels has been widely studied and reported. In the original Project RED report, *The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*, the importance of the principal’s role as a leader was shown by its inclusion in two of the nine Key Implementation Factors:

**Factor 2: Change management leadership by principal.** Leaders provide time for teacher professional learning and collaboration at least monthly.

**Factor 9: Principal training.** Principals are trained in teacher buy-in, best practices, and technology-transformed learning.

For Project RED Phase III, the role of the principal as a leader of a 1:1 initiative was studied. Results showed that when a principal used change management strategies to lead the school, students showed a statistically significant and educationally meaningful positive relationship in mathematics proficiency levels. The results from other questions in this area were not statistically significant. Anecdotally, it appeared that the Signature Districts recognized that leadership and change management were important, but for a variety of reasons did not provide sufficient focus on this issue to realize significant positive results.

For middle schools, Phase III survey results showed statistically significant findings and an inverse relationship between improvements the central office saw in the 1:1 technology implementation and academic improvements the middle schools showed on their achievement tests relative to the state. This serious dichotomy of views should not happen with proper leadership. It is likely to happen more often in traditional hierarchical leadership styles than with distributed leadership styles. The existence of such polar opposite views is also an indication of lack of leadership oversight and communications with school leaders. In one illustrative example, during a site visit the superintendent and the principal had a
consistent story describing a transformed classroom experience. However, interviews with multiple students told a different story. Nothing in the classroom had changed from the previous years.

Another consistent and statistically significant finding for reading, mathematics, and science was that involving teachers in the planning of 1:1 professional development opportunities was not leading to improved academic performance in comparison to the state. On the surface, this is counterintuitive. One possible cause might be that the teachers are not afforded opportunities to visit conferences or lighthouse districts to learn what might be most helpful to them. Instead, they are relying on what they are comfortable doing. Given the known importance and value of both professional development and the involvement of teachers—and that this went on for years—it would appear that leadership lacked focus. Districts should reexamine their 1:1 professional development opportunities to ensure that they are enabling the teachers to have effective and innovative use of technology.

On a positive note, statistically significant and positive findings related to proficiency levels for reading and mathematics indicate that a written plan that includes systematic collections of data from teachers has a positive relationship with increasing reading and mathematics scores in comparison to the state. Having a well thought-out plan, collecting data, and acting on what is learned are fundamental principles of continuous improvement. This ties in well to our finding that using formative data effectively is essential for dramatic improvements in learning and for continuous improvement of the overall initiative.

Finally, the survey of Signature Districts reported that the use of technology in elementary school core subjects did not show any measurable impact on academic performance. The use of technology did show a positive relationship with proficiency levels for both middle and high school mathematics and science compared to the state. The increased use of technology in core subjects did not show any statistically significant or educationally meaningful relationship with reading proficiency at any of the three levels of schools, even when the core subject area was reading. Unfortunately, the survey did not provide enough additional information to accurately identify the root cause for this issue. One possible cause is variations in fidelity of implementation. There are many data sources pointing to the general lack of fidelity in the implementation of technology and a high correlation between high fidelity and good results.

Distributed Leadership

As discussed previously, moving to high levels of performance is a complex process. Complex processes demand a change from hierarchical leadership styles to distributed leadership styles. This requirement crosses many disciplines. The distributed leadership principles described by Dr. Mark Edwards in the groundbreaking educational leadership book, *Thank You for Your Leadership,* are similar to the principles described by General Stanley McChrystal in *Team of Teams*—a book devoted to leadership in the United States Special Operations
Command. In both cases, very substantial changes in outcomes were accompanied by a move from hierarchical to distributed leadership. What is distributed leadership? As Edwards notes, “Distributed leadership in schools means that every employee, every community member, and every student has the opportunity to lead and is expected to lead—and that leadership is not solely reserved for those at the top” (p. 2).

Creating a culture of distributed leadership is not for the faint hearted. It does not happen overnight. There must be a long-term commitment. Most importantly, distributed leaders at all levels must lead by example. An effective distributed leadership culture is also of huge benefit to sustainability of an initiative. The average life span of a superintendent is roughly half of the time it takes to fully implement a top-to-bottom change in a district. As Edwards points out, an organization practicing distributed leadership is very resilient and can withstand systemic shocks that would destroy a hierarchically led system.

Vision

The development of the vision describing the outcome of an initiative is extremely important and comes very early in the process. Unfortunately, visioning is often incomplete or an afterthought. When one high-performing principal in a Signature District was asked her vision for the school in five years, she responded that she hoped that each fifth grade classroom would have student response units or clickers. When done correctly, the visioning process includes these steps:

- Understanding the current state (There are many good readiness tools available to help, such as Future Ready.)
- Developing five-year roadmaps for solution components
- Defining potential outcomes and benefits
- Building consensus among all stakeholders
- Selecting a vision that is powerful and measurable
- Defining the implementation strategy
- Implementing the strategy
- Following up to ensure the implementation is successful

Recognition of a serious problem, and starting with the right vision, are major steps towards the success of change in an organization.

Fidelity of Implementation

A great vision is just the beginning. Unless the vision is actually implemented, there will be no benefits accrued from a great vision. It is a proven fact that the implementation of a vision is far more difficult than the development of a vision. Prior to the initial Project RED study in 2011, there was only anecdotal evidence of poor fidelity level. Everyone can recite a story of a neighboring district where computers or software are unused in a closet or storage room. Our original work indicated that fidelity was in the 1% level, nationwide.

Since that time, more evidence of abysmal levels of fidelity are emerging. Nationwide, we estimate that fewer than 5% of
technology implementation projects of any size are implemented with fidelity. Regrettably, too many ill-conceived and poorly implemented education technology projects have become colossal failures of a scale that the bad press is ugly and nationwide. This bad press puts the brakes on many projects, some of which could very well have been successful.

There are other enormous implications of low fidelity. Among these are wasted money, lower tax revenues, and the one rarely mentioned—students unnecessarily facing a life of lower than expected incomes, and low self-esteem, because they are “dumb.” However, as a former AASA Superintendent of the Year said, “Low academic performance is rarely the kid’s fault.”

Another unrealized outcome of low fidelity is that, in many people’s minds, technology has limited value. At the macro level, the detractors are right. Most technology implementations have limited positive outcomes. Unfortunately, the spectacular outcomes associated with high-fidelity implementations are not distinguished from poor outcomes associated with low-fidelity implementations.

What can be done to improve fidelity of implementation? Fortunately, this is not hard to do if there is the will to do so. Here are a few of important things to do:

- Make sure the scope of the project is commensurate with available money and staff. Avoid the “eyedropper and the ocean” problem, to quote Utah State Senator Howard Stephenson, a legislator that gets it.
- Take advantage of the Project RED Design Gantt chart. Do not be scared by its complexity. Embrace the Gantt chart and confront the complexity.
- Go heavy on program management and project management. Most districts will need to hire this skill from industry.

Implications

Local Education Agencies (LEA’s)

The role of superintendent leadership is generally recognized to be critical to success. The McREL School District Leadership study provides deep insights. This was also studied by two Project RED authors in America’s Digital Schools 2006, a survey of the largest 2,500 U.S. school districts. Of the superintendents that responded, leadership was identified as the most important factor contributing to a successful technology implementation, with 76% of the respondents naming it as the top factor.

Educators in general can interact with many peers in neighboring districts, or across the country. They can communicate and collaborate with people above and below
them in the district hierarchy. For superintendents, it is a different matter. Many describe the position as a lonely one. They are reluctant to confide in someone other than another sitting superintendent. In the case of successful digital conversions, there are few, if any role models to seek out and learn from.

There are also a very limited number of other venues for superintendents to gain wisdom. The few that are extant, in many cases, are shallow, and do not address the primary topics of need. To increase the odds of success, a local education agency (LEA) leader must first recognize that the issue is important and acknowledge that they need help. Then, it is a matter of solving the challenge of finding a class, cohort, organization, or study group that has the depth and experience to be helpful. Given the complexity of successfully leading a digital conversion, this is never a quick or easy experience.

Policy Level

It would appear that there is a significant gap between the recognition of the critical nature of leadership, and the implementation of principles, policies, and programs that would lead to improved leadership and change management. If a state, district, or school desires to successfully change the trajectory of academic achievement, the required leadership and support must be present at the top.

There is generally significant focus on LEA and building-level leadership. We believe that the role of state-level leaders is critical as well. Training and coaching are just as important for governors and other key state leaders as they are for LEA leaders. We have seen first-hand the effectiveness of a governor after being mentored regarding implementation of educational technology.

Governors

Governors are the chief executive officers of their state. The state is the primary provider of policy and finances for LEAs. Therefore, it stands to reason that governors would be well advised to be heavily involved in the education systems of their state.

Leader-governors know it takes time to implement meaningful change. At a Democratic Governors Association meeting, a southern state governor stated, “it takes seven years, even on an emergency basis, for an initiative to go from an idea to being fully implemented in all schools in my state.” Since leader-governors are aware of the time it takes to see changes in education, they look to the future to see what problems need to be addressed starting today, to avert a crisis seven to ten years from now. A successful governor is one that can look to the future, identify a problem, and deal with it. A simple example everyone can relate to is dealing with traffic congestion.

Consider two items in the news today:

- Almost half the jobs in the global economy have the potential to be automated.\textsuperscript{15}
- Half of a state’s children are scoring below acceptable levels on state high
Connecting the dots, how will parents react when their children graduate and are told they cannot get a job because a robot took it? This could become America’s “Piper Alpha moment.”

Governors should also consider:

- K-12 education always ranks near the top of public opinion polls.
- The majority of factors that influence businesses to move to a state are education related.
- Education is generally close to 50% of a state’s budget. It deserves a significant portion of a governor’s time and attention.
- The long-term impacts, financial and otherwise, of an inadequate educational system are enormous. They are many times the current education annual spending.
- Properly implemented, a high-quality transformational education system is revenue positive at the state level.

Governors have the opportunity and responsibility to lead the way in improving their educational systems. They would be well advised to surround themselves with highly qualified individuals, rather than political patronage appointments. Governors can:

- Establish robust educational improvement goals, with the emphasis on “robust.”
- Add appropriate spending line items to the budget they submit to the legislature.
- Use their office to strengthen the dialog between education, government, business, and the public.
- Foster work between the legislative and executive branch budgeting offices to identify opportunities to capture and repurpose savings resulting from digital conversions.
- Be the champion and chief spokesperson for the academic improvements and financial savings that can result from properly implemented technology.

Legislators

Similar to governors, legislators have the opportunity and responsibility to properly fund education and provide strategic direction. The five points described above for governors all apply. Today, most legislators look primarily at policy issues and education spending levels. Only a very few are starting to demand accountability, potentially tying increases in spending to improved outcomes, and insisting on fidelity of implementation for the money spent.

Legislators should consider:

- Legislation that holds all levels accountable by tying funding to results
- Increasing state department of education budgets to allow proper oversight of technology expenditures
- Requiring timely independent evaluations of all programs funded
primarily by the state legislature

- Providing seed money for truly innovative ideas

**State Board of Education**

The elected state board of education has direct responsibility for the educational systems in a state. Board members control state educational policy and state education budgets, within the bounds set by the legislature. If there is a state-sponsored initiative, the state board of education will likely take a leadership role in the rollout. A successful rollout will require the dedication of sufficient time and resources. It will likely also require the state to seek qualified experts who have successfully implemented large-scale digital conversions from other states, LEAs, or industry, to provide needed guidance and leadership.

**Industry**

Any digital conversion requires industry to be involved in varying ways. A typical digital conversion will incorporate literally hundreds of different products, covering a wide range of user types and applications. Industry should seize the opportunity to develop new categories of products that could truly drive Second Order Change. An example are products that actually exploit the capability of every student to have a device rather than merely accommodating it. Other examples are programs that take advantage of “big data” or dashboarding tools that support Professional Learning Communities or other collaborative groups.

Some industry providers offer minimal help to the LEA. In the words of one executive from a large technology corporation, "I move boxes from my warehouse to the school’s warehouse. Period." Other industry providers are far more consultative. LEAs should consider the full scope of their needs when choosing suppliers. The lowest price solution may not provide the best overall cost-benefit ratio.

Many industry partners provide a range of leadership support. These take the form of seminars, where speakers are drawn from LEAs who have successfully implemented a digital conversion, to participating in, or sponsoring site visits to successful districts as well as conducting comprehensive multi-day training sessions.

Industry executives may have broad and valuable experience, gained by working with multiple LEAs in many states and at many stages of implementation. An LEA would do well to avail themselves of this expertise, if available and appropriate. If industry wants to have sustainable and scalable success stories they should consider providing central office and principal professional learning programs for districts. The costs would be more than offset by follow-on business because the products would actually produce results.

**Pitfalls**

The following are the most commonly observed issues related to leadership and change management in large-scale technology initiatives:

- **No change is needed. We are doing very well, all things considered.**
  Related to the Lake Wobegon effect,
people feel they are doing as well as can be done, all things considered. This is understandable, as they are similar to surrounding districts.

- **Many leaders do not believe they need professional development.** Leaders are biased to believe that they are highly qualified for their job. Of course in many ways they are, but they don’t know what they don’t know.

- **Interlocking variables and dependencies.** Few education leaders understand that steps in a process depend upon other steps. They purchase curriculum software without knowing the required bandwidth per active student. Then, they are surprised when the Internet is slow. They know they need professional development, but they do not budget for substitute teachers, and so forth.

- **Scope.** Many districts have difficulty limiting scope. They believe their community will not support any type of unequal or phased approach. The effect is that districts frequently spread too few dollars over too large a project, with zero to negative academic impact.

- **A “Culture” of ignoring best practices, commonly referred to as “that is the way we do it here.”** Many districts ignore research, or ignore common sense on how to go about change. For example, they may conceive and announce a new initiative that is contrary to established research. Or, they may perform a readiness review such as Future Ready and then ignore

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**Summary**

Leadership and change management are the top two prerequisites for success for any technology based initiative. Leaders must successfully communicate the nature and seriousness of the lack of academic achievement, not only on an individual student basis, but for the district, state, and country.

Once stakeholders accept the need for change, following time tested change management principles will enable the district to move to much higher levels of performance and remain there.

Becoming an effective leader of a results-producing digital conversion requires a significant investment in a leader’s time. Formal training and ongoing coaching and mentoring are essential for success.

To gain access to free Project RED research and resources, sign up at [http://one-to-oneinstitute.org/red-hub](http://one-to-oneinstitute.org/red-hub)
References & Notes

1 Reeves, D. B. (2016). *From leading to succeeding: The seven elements of effective leadership in education*. Bloomington, IN: Solution Tree Press.


7 See, for example, http://www.wsbenchmark.org/


10 See Marzano et al., regarding the importance of principal and superintendent leadership.

11 The original Project RED study was a building-level study. That is why principal leadership was highlighted, and district level or superintendent leadership was not studied and not mentioned.


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