Ignore These Findings at Your Peril

Despite a few flashes of brilliance, the educational establishment at large remains in the dark about how to realize the transformative power of education technology to dramatically improve student achievement and to rein in the ever increasing cost of education. In the past, well-founded confusion and concern has surrounded this issue.

The stakes have never been higher. In many states, more than half of students are performing below acceptable levels. A lifetime of psychological distress for the roughly 100 million citizens that did not do well in school is conveniently ignored. Change in our society is occurring at an exponential rate. As a nation, we are unprepared to deal with the workforce requirements of a decade ago. How will we deal with the world a decade from now when the current crop of students graduate? How will parents feel when their sons and daughters are competing poorly in the job market against Artificial Intelligence controlled robotic employees taking an ever increasing share of jobs?

Building on seven years of research and now a household word to more than 1,000 districts, Project RED III brings a wealth of new research-based evidence on what really works and what does not.
Project RED III Results

Summary

Detailed discussion of the findings will be presented in a series of Project RED Briefs that will be made available to the public during the Spring and early Summer of 2017. The briefs have been divided into five main focus areas: Leadership; Communication; Instruction, Pedagogy, and Data; Professional Learning; and Finance. Embedded within the focus areas are a number of important implementation elements such as change leadership, formative assessment, and fidelity of implementation, that are supported by both the original Project RED study and the current Signature District study. Provided here are also the key “takeaways” that the Project RED Team believes are the most profound findings from Phase III.

Leadership Brief

The Leadership Brief will focus on the crucial importance of distributed leadership and change management in transforming instructional practice, driving meaningfully integrating technology, and ultimately raising student achievement. The original Project RED research identified two Key Implementation Factors related to leadership:

- Change management leadership by principal as indicated by principals providing time for teacher professional learning and collaboration on a regular and ongoing basis
- Principal training in the components of change leadership such as ensuring teacher buy-in, a shift to technology transformed learning, and other best practices

The Signature District study garnered similar results. Although there was some correlation between the principals using change management strategies and improved student outcomes, results were not uniform across all districts or content areas. This brief also discusses typical challenges districts face that may inhibit some administrators from effectively implementing change management strategies and moving toward a model of distributed leadership.

Communications Brief

Effective communication is essential to the success of any endeavor involving more than one person. The effects are multiplied when dealing with the complex changes required for a 1:1 program to be successful. In the Signature District study, evidence of effective communications can be inferred by a district indicating they did a good job of planning for the 1:1 program, that teachers had a clear understanding of the purpose of the program, and through high levels of community support for the program. Although no clear relationship between effective communications and improved student outcomes could be established, the negative relationship between poor communication and implementation struggles is clear.

Instruction, Pedagogy, and Data Brief

The K-12 education field has been swept up by the idea of personalized learning for the past several years. Although the concept may be sound, there are numerous options available.
definitions, and countless ideas, about what belongs under the personalized learning label, and what constitutes the most effective implementation. The fact is that the pedagogy, or pedagogies espoused by personalized learning advocates, are actually not new, and most are still teacher developed and directed. The idea of each student co-creating their goals, curriculum path, and mode of operation seems ideal, but poses a number of challenges to traditional beliefs about learning and the structures in place in most school environments.

The Signature District study seems to indicate there may be something more important than personalized learning. It is not that personalization is inherently good or bad, as goes for other popular instructional strategies, such as flipped learning, inquiry-based instruction, or even direct instruction. It is simply that, according to the study, matching the appropriate pedagogy to the desired learning yields better outcomes.

According to the Signature District data, however, the most important factor in improving student outcomes seems to be the effective use of ongoing formative assessment data. When students have a digital system that automatically collects data throughout their learning process, and provides actionable information to each student and the teacher in real time, it is possible that improvements in student outcomes could be exponential.

Professional Learning Brief

Professional learning was important to the success of the districts studied in the original Project RED research, as well as in the Signature District study. In the current study, it is important to note that there was a major shift from a traditional approach to professional development (episodic training for teachers), to more job-embedded, ongoing professional learning experiences. This brief discusses Communities of Practice, and other job-embedded approaches that are leading to positive changes in student outcomes.

As was the case in the Project RED Team’s investigation of instructional practices, the use of formative data is essential to the effectiveness of the learning process. These data allow the district’s instructional leaders to individualize training for teachers and provide feedback to teachers about their potential areas of weakness. A stream of ongoing formative data on each student’s progress is also incredibly valuable to teachers as they investigate the effectiveness of their own practices. According to the Signature District survey responses, however, the ability of the district to collect ongoing formative data, and to be able to turn these data into actionable information, still remains a challenge.

Financial Brief

Project RED financial modeling revolves around three seminal areas:

1. Understanding the total cost of implementation and how to maximize a district’s current situation
2. Capturing savings through digital efficiency that can be redeployed to offset technology expenses
3. Identifying the long-term financial
benefits of improved student outcomes by lowering costs associated with things such as course repetition, disciplinary actions, dropout rates, etc.

Signature District survey data focused primarily on capturing savings through digital efficiencies. To this end, many of the districts seem to have struggled with making a complete digital conversion. Adding to the cost of implementing 1:1 technology, while maintaining the status quo (e.g., paper-centric practices, such as printing assignments to be turned in to teachers; copying content, quizzes, and tests to be administered using paper and pencil) can send costs skyrocketing. Although the survey data provides an incomplete picture, districts seem to still struggle to eliminate copy and printer expenses, and in some cases, even the purchase of traditional textbooks.

When looking at the overall results of the Signature District study, the Project RED Team has gleaned the follow key takeaways:

- **It is very difficult to ensure fidelity of implementation when dealing with complex human systems, but without it, the implementation is guaranteed to fail.** Fidelity of implementation continues to be an issue, even in the recognized high-performing Signature Districts. There are hundreds of points where things can break down, and the Project RED Team witnessed many of them in our Signature Districts.

- **Using formative data effectively is essential for dramatic improvements in learning and for continuous improvement of the overall initiative.** An educationally meaningful effect size was found related to the school’s systematic collection of data about a variety of student outcomes associated with 1:1 programs. This finding was consistent with responses to the surveys. Systematic data collection positively impacts student achievement as compared to state levels. This was found from Year 1 to Year 2 and from Year 2 to Year 3. Specifically, in Signature District high schools, having a written plan inclusive of systematic data collection from teachers was positively correlated to increased reading and math scores as compared to state scores. Unfortunately, there are not quality digital products on the market that are easy to use, can be used in all content areas, and meet a district’s need for flexibility.

- **Using formative data to drive learning activities facilitates student progress.** This is a consistent professional development finding and is most profound when teachers work collaboratively in examining learners’ work, artifacts, progress, and unique needs.

- **To maximize outcomes, it is essential to match the appropriate pedagogy to the desired learning.** This seems obvious, but unfortunately, is rarely practiced. One simply needs to visit almost any high school in America to know this. Direct instruction, with lecture and practice, is still the most
widely used instructional method in secondary schools worldwide. However, piles of research on the subject are clear and show that direct instruction is not the most effective way for students to build conceptual understanding. Direct instruction is important, just as is student voice and choice, student inquiry, and a host of other methods. The key is to pair the most effective and appropriate methods to the desired learning and outcomes.

**Beginning The Revolution**

Project RED began as a dialog between three organizations: The Greaves Group, The Hayes Connection, and One-to-One Institute. All three organizations were concerned about criticism of high profile 1:1 programs and their inability to improve student achievement. The Greaves Group and The Hayes Connection had been publishing their America’s Digital Schools (ADS) reports on the use of technology in education and were finding similar results. In 2006, for example, ADS revealed that only 17% of districts with 1:1 programs considered improvements in academic achievement significantly related to the implementation of technology. The percentage improved by 2008, but the authors reported that only 33% reported a significant relationship to technology implementation.

In contrast to what was being published, One-to-One Institute, The Greaves Group, and The Hayes Connection believed that if technology was used appropriately, it could have a positive effect on student achievement. They had experienced the benefits of technology integration first-hand, and even had verified academic improvement results. Michigan’s Freedom to Learn (FTL) program, the forerunner of One-to-One Institute, for example, reported academic and 21st century skill improvements in a number of areas.

In the 2005-2006 study conducted by the University of Memphis Center for Research in Education Policy, researchers found that across all problem-solving areas, the FTL means scores were higher or equal to those of the control group. FTL program students exhibited significantly higher abilities in understanding academic problems and in identifying what needs to be known to solve these problems.

More specifically, researchers studied school-level Michigan Education Assessment Program (MEAP) scores in English, math, reading, and writing. They compared scores in math paired schools using a series of 2x2 chi-square frequency analyses. In seven of the eight pairs, FTL schools outperformed their peers in non-FTL schools in math and writing, and three FTL schools also outperformed in English. Where FTL schools did not outperform, the schools still matched the performance of their non-FTL counterparts.

The researchers concluded that FTL students have greater advantages than non-FTL students with regard to developing the knowledge and skills needed to achieve success in the 21st century workforce. The researchers also concluded that FTL students have equal to or enhanced advantages for increased learning and increases in traditional state assessments.

Were these results anomalies, or could
technology integration really provide the educational benefits that their advocates touted? The Project RED Team posited that if academic achievement improved in some 1:1 schools that there must be factors that are leading to these achievement gains, and that there could be factors that are preventing others from achieving those same gains.

The second major national education concern in 2009 was the state of education finances. Education budgets lagged behind the national economy. The financial crisis of 2008 hit schools hard. The 50-year trend of educational spending increasing at twice the rate of inflation came to a screeching stop. The U.S. Department of Education Educational Technology Advisors made it crystal clear that schools needed to find a way to do more with less. At the time, there was much focus on the cost of educational technology, but almost none on the direct and indirect financial benefits at the state, federal, or district level. Earlier research by One-to-One Institute, The Greaves Group, and The Hayes Connection showed these benefits could be significant. Thus, Project RED (denoting Revolutionizing EDucation) was born.

Over the next two years, the Project RED Team would examine the following hypotheses:

1. Properly implemented educational technology can substantially improve student achievement.

2. Properly implemented educational technology can be revenue positive at all levels—federal, state, and local.

3. Continuous access to a computing device for every student leads to increased academic achievement and financial benefits, especially when technology is properly implemented.

In 2009, Project RED embarked on a mission of unprecedented scope, depth, and breadth to find the keys to raising student achievement and cost effectiveness when integrating technology in American schools. The team studied:

- 997 schools, representative of the U.S. school universe, and 49 states and the District of Columbia
- 11 diverse education success measures
- 22 categories of independent variables with many subcategories
- Comparison of findings by student-computer ratios (1:1, 2:1, 3:1, etc.)
- Comprehensive demographic data correlated to survey results

Given the array of factors and variables, a variety of analysis techniques were required, including regression analysis, principal component analysis, and predictive modeling. The description of the methodology can be found in Appendix B of Project RED’s first research report: *The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*.

**Initial Findings**

The findings from the initial Project RED study were groundbreaking. Project RED was the first large-scale national study to identify and prioritize the factors that make some technology implementations perform
dramatically better than others. The data revealed that schools employing a 1:1 student-computer ratio along with Key Implementation Factors (KIFs) outperformed other schools. The data also revealed significant opportunities for improving education return on investment (ROI) by transforming teaching and learning. Dispelling a widely accepted myth, the data showed that student-computer ratios did matter. Schools with a 1:1 ratio outperformed schools with a 2:1 ratio on all 11 measures. Furthermore, schools with a 2:1 ratio outperformed schools with a 3:1 ratio and so forth down the line.

The study identified the nine KIFs that are linked most strongly to the education success measures that were studied.

Upon completion of the study, it became evident that there was a technology implementation crisis in America’s schools. Fewer than 1% of schools with 1:1 programs demonstrated the use of all nine KIFs and 67% were using fewer than half of them.
The Project RED Team also understood that education leaders would need more than a research report to fundamentally change practices and realize the potential of ubiquitous technology.

**Project RED Phase II**

In response to the need for more clearly defined 1:1 implementation guidance, the Project RED Team explored ways to operationalize the research findings. The Project RED Team believed that education leaders would need a practical protocol and a variety of other support and resources to effectively lead the digital transformation of their schools, districts, or states. It was also clear that these leaders would benefit greatly from working with others doing similar work. In response, the Project RED Team created a number of resources. One of these resources was a web-based hub where educators could learn from the experiences of others and collaborate with other districts doing similar work.

The centerpiece of the website is the RED Design™ which is the framework to ensure proper implementation and results. The framework includes:

**Materials**

- Webinars in key implementation areas that provide participants with research and implementation strategies
- Information and guidance regarding transformational change, including roles and responsibilities for teachers, technology directors, principals, finance directors, curriculum directors, and superintendents

**Tools**

- Sample Implementation Timeline
- Cost Comparison Tool
- Cost Savings Calculator
- Readiness Assessment
- Sample Project Plan

**Collaboration Platform**

- A forum organized by district role where superintendents, for example, can share and ask questions of other superintendents, principals can share with other principals, etc.
- A social media platform called REDHub where educators can connect in a more personal way with other educators facing the same challenges. REDHub also allows each educator the ability to personalize their profile and presence in the community.

As of January 2017, [www.projectred.org](http://www.projectred.org) has been actively used by more than 6,000 education leaders, representing nearly 1,000 U.S. school districts. The Project RED Team has presented at nearly every national education and education technology conference in the country, and the findings and resources also provided guidance for statewide programs in Nevada and Utah.

While access to focused tools is valuable, the Project RED Team knew that most districts needed help to properly implement the tools. Districts that were very serious about starting or expanding 1:1 programs also
emerged and wanted to ensure they did it right. For these reasons, the Project RED Team decided to host regional Project RED Summits.

The Project RED Summits were two-day events designed to engage district leadership in the Project RED Design. District leadership teams received personalized instruction, were given time to discuss each one of the components, and were provided support as their team began outlining their strategic plan.

The Project RED Signature District program also evolved out of a request from districts for more direct support as the Project Red Team enlisted districts in the revolution. In 2012, the call went out to apply for the program. Following a competitive process, 20 districts of varying sizes, demographics, and implementations were chosen to participate. The districts committed, via a memorandum of understanding signed by the superintendent, to follow the Project RED Design, report data annually to the Project Red Team for three years, and be open to other educators looking to learn from their experiences.

**Project RED Phase III**

It became clear to the Project RED Team that the work with the Signature Districts was providing a tremendous amount of new information that would be valuable to the education community. Three years of annually reported data could provide some longitudinal insights, as well as provide an opportunity to validate the findings of the original self-reported research.

Data on Signature Districts were collected in four ways. The districts reported their data through three surveys and researchers pulled the state test score data for the corresponding 1:1 schools within the Signature Districts. The three surveys included a Central Office Administrator Survey, Building Administrator Survey, and a General Implementation Survey. The first two surveys asked very similar questions, much of which is perceptual. The General Implementation survey asked the district to provide hard data that may support the perceptual data but also provide actual expenditures and other financial information.

Many of the Signature Districts also conducted their own assessments and documented challenges and successes that fell outside the scope of Project RED. The Project RED Team believed that by pairing these data with the body of other research in the field that a comprehensive set of best practices could be developed.

The University of Memphis Center for Research in Education Policy (CREP) worked together with the Project RED Team to formulate the research questions and independently conducted the analysis of the survey data.

The following research questions were ultimately addressed through the analysis:

1. To what extent do responses on the three Signature District surveys correspond to the nine factors found to influence the education success measures outlined in the original Project RED study?

   a. Do the same nine factors derived from the three Signature District
surveys also appear to influence education success measures?

b. Which factors on the three Signature District surveys appear to be most strongly related to the education success measures?

2. How does the type of 1:1 implementation impact student outcomes?

   a. Based on the survey data, does the way 1:1 was implemented and the supports districts and schools were getting impact student outcomes?

3. What is the financial impact of implementing 1:1 on overall district expenditures?

   a. Based on the survey data, do the savings from a digital conversion and moving away from paper-based approaches offset the cost of 1:1 computing?

CREP reviewed the three surveys (Central Office Administrator Survey, Building Administrator Survey, and General Implementation Survey) to:

1. Determine what data could be used from each of the surveys to evaluate changes over the three years of program implementation, and

2. Determine which items from the surveys could be used to assess the impact of program participation on student achievement as measured by state assessment scores.

CREP conducted statistical analyses of each of the three surveys to look for changes between Spring 2013 (Year 1) and Spring 2014 (Year 2), and then Spring 2013 (Year 1) and Spring 2015 (Year 3). In addition, CREP provided a descriptive summary of the outcomes of all three surveys for each year.

CREP also conducted statistical analyses of state achievement test data for the available districts in reading, math, and science (as available by subject, grade level, and state). This involved analyzing changes in achievement between Spring 2013 (Year 1) and Spring 2015 (Year 3) in relation to selected questions from the General Implementation Survey that corresponded to the KIFs identified through the original Project RED study. Selected questions from the Building Administrator Survey and Central Office Administrator Survey were also included where appropriate.

The Project RED Team has learned a tremendous amount since the release of their first report, *The Technology Factor: Five Keys to Student Achievement and Cost Effectiveness*. In the same time period the Team, unfortunately, has also witnessed the incredibly expensive and unnecessary failure of high profile 1:1 programs. Upon deeper investigation these difficulties are not surprising considering the obvious breakdown around many of Project RED’s findings and recommendations. Project RED, therefore, organized the Briefs around the most common and important challenge areas. The guidance provided in the briefs, used in tandem with the original findings, and the public domain tools included in the Project RED Design™ finally arm education leaders with the knowledge and action steps...
needed to ensure they are able to avoid the familiar pitfalls, and realize the potential of technology in education. The choice is clear: continue to waste exorbitant amounts of money on technology, and risk the future of 100 million young Americans, or transform learning and teaching through Project RED.

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