Chapter 1
Introduction

What if you had exactly the right recipe to make your education technology/information communications technologies (ICT) program successful? What if you could transform learning in your school or state or country? What if you could build a sustainable, long-term budget to pay for technology? What if you could impact the future success of students and communities?

What if you could change the world?

There is a recipe for success—the Project RED Design.™ This global toolkit will provide you with the research, ingredients, and resources to help you achieve groundbreaking results from your education technology/ICT program [Figure 1].

Let's start with the background. Project RED: Revolutionizing Education is a national research and advocacy plan to investigate how technology can help re-engineer our education systems. Since 2009, this initiative has used a cost-benefit analysis to determine which education technology programs and devices have the most cost-effective impact on schools, students, parents, states, provinces, and countries. In 2010, Project RED conducted the first large-scale national study to identify and prioritize the factors that make some K-12 technology implementations perform dramatically better than others. While this research study was conducted in the United States, the outcomes are of a universal nature, and clearly apply to success in education transformation **globally**.

As a global society we face challenges of immense proportions in healthcare, education, the environment, clean water supply, and more. It is our challenge to prepare our students with the skills to succeed in the workforce and contribute to finding and inventing solutions to solve our world's grand challenges. The process of transforming education leads to global prosperity and economic development locally. Learn more about the other global grand challenges here: United Nations Millennium Development Goals.

In this toolkit, we unveil the Project RED research key findings and offer ideas for how they can be applied to centralized and decentralized education systems around the world.

FIGURE 1

For the purposes of this document, we will use the terms "education technology" and "information and communications technology (ICT)" interchangeably. Technology is a cornerstone of education transformation, providing the tools to enhance learning and teaching, and support student-centered learning environments. Effective eLearning environments use powerful mobile PCs, relevant education software and content, broadband Internet access, and an infrastructure with robust servers.

Comparisons of national education systems are increasingly common. What does Sweden do differently than the U.S. or Singapore or Malaysia or Chile? Measures of success include not only test scores, but also students' career and higher education preparedness, which drive innovation, entrepreneurship, and economic development. Governments are demanding greater return on education investments, and expectations for educational expediencies, efficiencies, and outcomes permeate the global landscape.

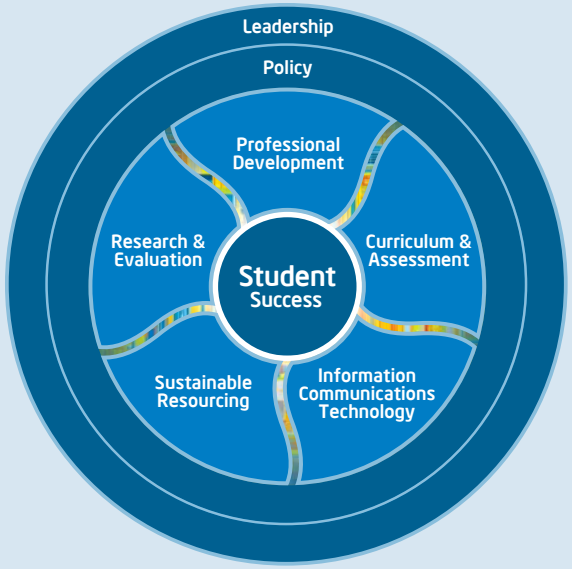
Resource: Become a member of the free online Project RED Community (www.projectred.org). The web site provides resources around leadership, project planning, transformational change, inquiry-based instruction, as well as a professional learning community through participation in RED Hub and the Project RED forums.

Today's schools must prepare students with the skills to be lifelong learners and contributors to the global economy. As nations prepare students, it is essential to recognize the substantial amount of change that will happen in students' lifetimes. Many of the fastest growing jobs today didn't exist 10 years ago, and the McKinsey Institute estimates that by 2020 there will be a global shortage of 85 million skilled workers.

The above facts were top of mind for co-authors of Project RED as they pursued their research. The Project RED key findings are significant to fueling a nation's knowledge and policies around 21st century teaching, learning, tools, and practices.

This toolkit was designed to provide quick access to the Project RED research, strategies, and tools so practitioners can successfully develop, design, and implement robust education ICT programs, and specifically 1:1 models (one computer per student). You can adopt this roadmap as a guide to student success and economic development as a whole, and use it as a reference guide to access specific tools and information as you move through the transformation process. Or you can adapt the individual elements and tools that you require to complement or enhance your current model for systemic school change.

A Holistic Model for Education Transformation



To be successful and sustainable, education transformation requires a comprehensive approach that brings together all the elements you see in this diagram. Intel developed this model based on educational research and more than a decade of work with governments, education systems, and NGOs around the world. It provides a systematic framework that considers all aspects of a national education system. It addresses the need for leadership, policy reform, curriculum, standards and assessment, sustained professional learning efforts, ICT, and ongoing research and evaluation to support continuous improvement.

Intel's work with educators and governments to transform education is based on research and the belief that sustainable change requires more than just great devices. It requires a comprehensive, systemic approach that is focused on student success and economic development. Each element of the model plays a part in a successful transformation that prepares students for the challenges they will face today and in the future.

When these elements are successfully integrated and implemented, real education transformation can take place. You can deliver a 21st century education and achieve sustained educational excellence. You can also increase competitiveness, improve social cohesion, and support broader objectives, such as increasing school participation, reducing the gender gap, improving digital literacy, and preparing a higher-skilled workforce and entrepreneurs.

Click here for more information on Intel's holistic model for transformation: Intel's Education Transformation Model.

Intel is the top sponsor and advocate for the Project RED research and the second phase of Project RED: Research into Practice. Intel also sponsored the book, *Revolutionizing Education through Technology, The Project RED Roadmap for Transformation*, produced by International Society for Technology in Education (ISTE).

To buy the book from ISTE,, click here.

Overview of Project RED: Turning Research into Practice

Through examining nearly 1,000 schools that were representative of most U.S. schools, from 49 states and the District of Columbia, Project RED found that schools employing a 1:1 student-to-computer ratio and Key Implementation Factors (KIFs) outperformed other schools. The project also revealed significant opportunities for improving education return on investment (ROI). These improvements in achievement and ROI, however, are only possible by transforming teaching, learning, and the learning environment.

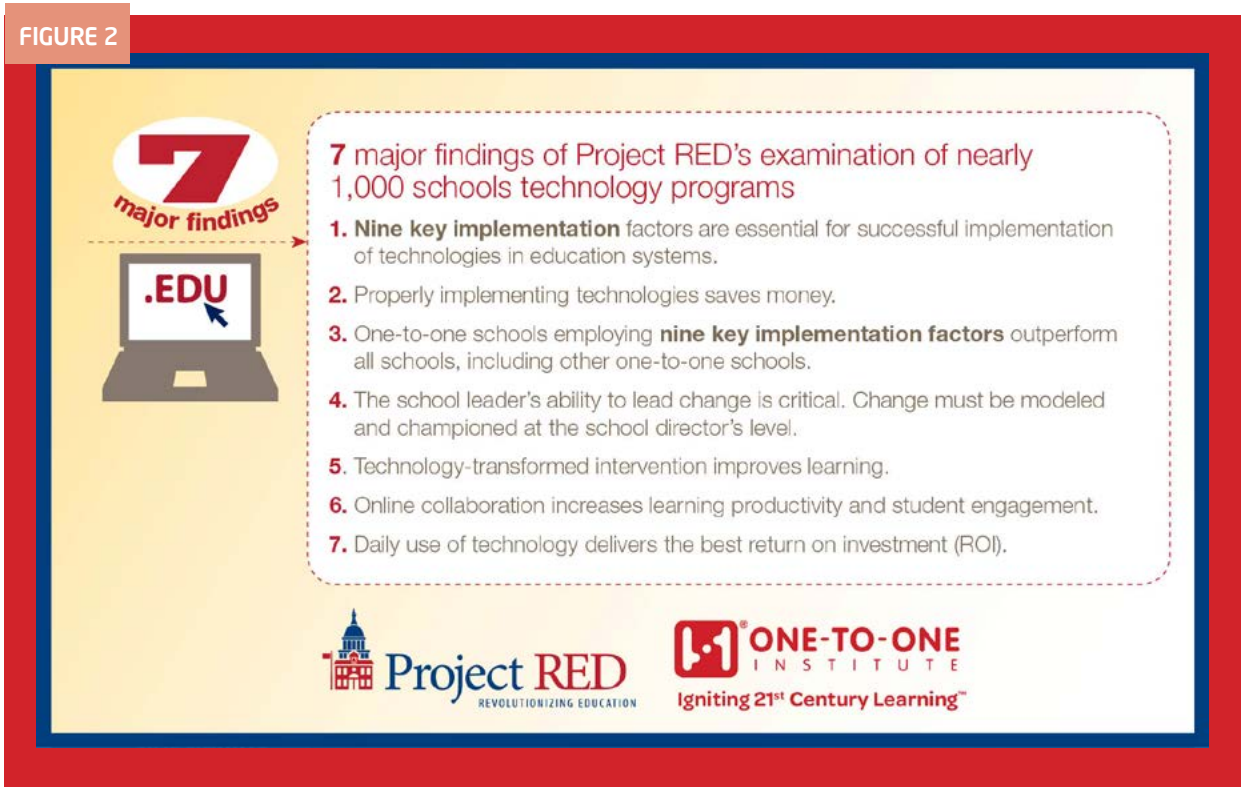
As shown in the graphic, an analysis of the Project RED data revealed **seven major findings** [Figure 2] for countries and schools embarking on or already administering a technology implementation.

Key Implementation Factors for Successful ICT Programs

Project RED identified nine Key Implementation Factors (KIFs)—as shown in the second graphic [Figure 3]—that were linked most strongly to creating successful education technology programs: Click here for more details: ProjectRED Research Findings.

Integration of curriculum and instruction with technology is a pivotal concern for effective 21st century learning environments. The KIFs are substantive practices for assuring the success of any 1:1 implementation.

FIGURE 2



Technology tools are catalysts for powering up knowledge, skills and students' demonstration of learning. Teachers' abilities to meaningfully integrate technologies with the instructional program is crucial to student achievement and revenue positive results.

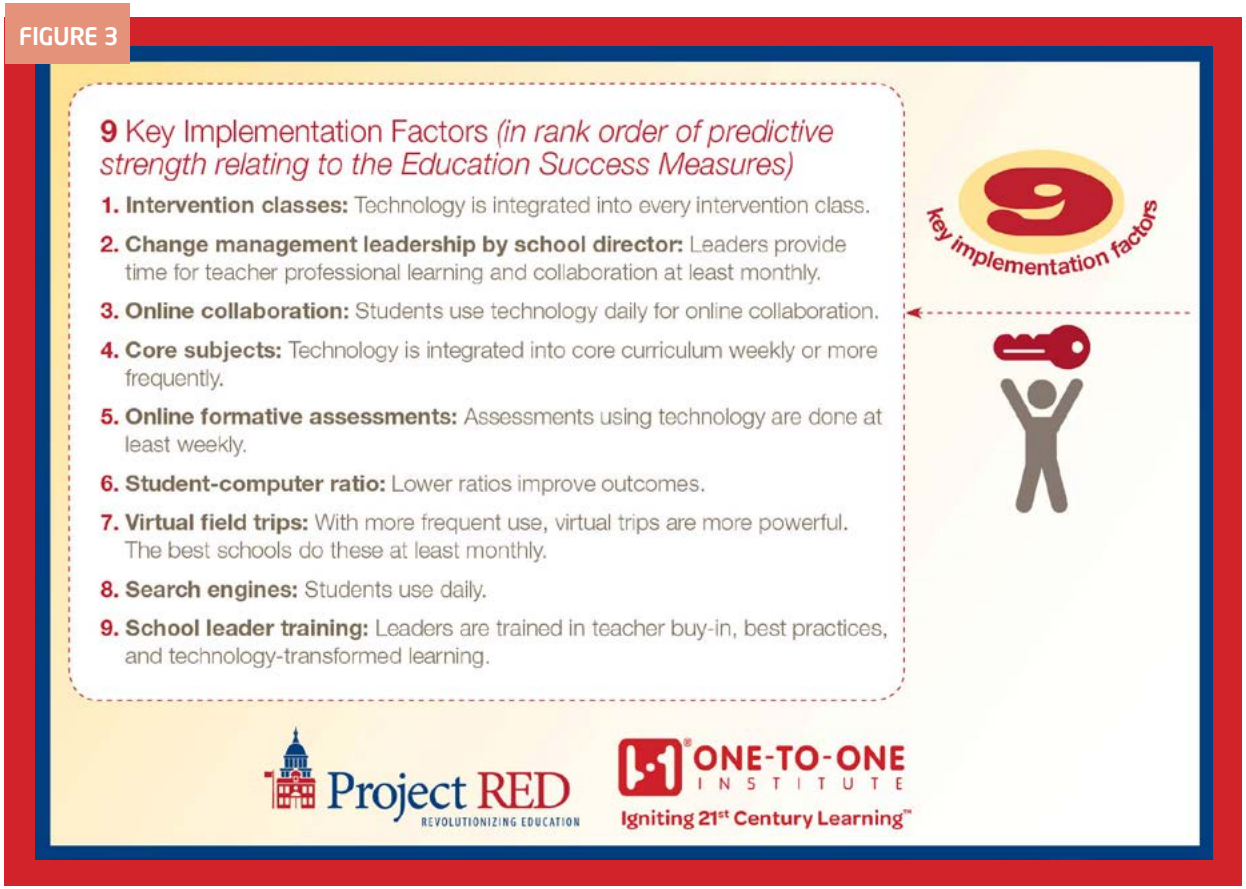
The Importance of Communication

Effective communications are the cornerstone for support and success when implementing education technologies. A communications plan must be in place that articulates goals, research, and the purpose for implementation. The plan should also include feedback loops so that stakeholders can contribute to discussions, provide observations and suggestions, and know that their voices (or the voices of their organizations) are heard. It is also crucial for stakeholders to receive consistent updates regarding program progress—successes and caveats. The feeling of inclusion in the process helps stakeholders commit to and feel part of the bigger program, which helps garner more support along the way from the people who matter the most in making the ICT program a success.

Stakeholder groups vary by region. Examples of groups to be included in communications processes are:

- School boards and boards of directors
- School directors, superintendents, principals, school leaders, and curriculum/instruction and technology leaders
- Parents/caregivers and students
- Teachers and all staff
- National, state, regional, and local media outlets
- Business and industry partners
- State, federal, regional, and local elected officials and education agencies
- Funding agencies
- Faith-based leaders and related organizations

FIGURE 3



Communication Strategies

It is imperative to develop key messaging for implementation. All those involved must be "on message" to ensure understanding and purpose among constituencies. Some practical recommendations to incorporate within the message:

- Embed supporting research—the reasons "why" you are implementing
- Develop clear communications channels that are:
  - Ongoing
  - Honest (successes, caveats, and adjustments)
  - Updated
  - Inclusive of feedback loops from key audiences
  - Engaging stakeholders in the planning and implementation process

To download this global toolkit, resources, and learn more about Intel's support of the Project RED work, please visit intel.com/projectred

Various communication means are available and unique to each nation, state, region, and local entity. Some examples include:

- National, state, regional, and local web sites (this is a critical source of information in today's technology-based world)
- Newsletters
- National, state, regional, and local newspapers
- Media outlets
- Listserv or other virtual discussion areas
- School open houses and community forums
- Press releases
- Social networks
- Web 2.0 tools (online user groups, learning communities, wikis, collaborative documents, blogs, etc.) can become standard means of communicating and modeling the expectation that the education community will become adept in the use of technology and benefit from its efficiencies.

Overview of Centralized and Decentralized Education Systems

Nations vary in method of governance and how education decisions, resources, and directions are made and implemented. Centralized education systems have a standardized curriculum for all students, in all subject areas. Decentralized education systems rely on individual territories, states, regions, provinces, or districts to develop and implement curricula expectations. And sometimes it's a combination of both.

The United States is a current example of mixed governance because they are implementing national Common Core State Standards within a decentralized decision-making model. Britain's Programme of Study is another example of a country that has implemented national standards with localized implementation with great success.

Nations will benefit from strong, consistent communications regarding purpose, supporting research and overarching goals of a 1:1 national program. Most agree that a primary goal of such programs is to transform education to be relevant and robust, and assure that students are career and college ready. The overarching result is student success and contributions to global and local economies.

Example of Centralized Education System

Macedonia, a monarchy, is located in the northeastern part of the Greek peninsula. The country has a long-standing need to connect nationally and around the globe.

Macedonia's Computer for Every Child initiative has sparked dramatic progress for their education, society and government systems. The initiative is empowering tomorrow's leaders with the country's bold vision of putting a PC into every primary student's hands—110,000 in all—as computers are used in daily double shifts by students.

The primary impact of the initiative:

- Social inclusion includes digital literacy and universal computer access for the upcoming generation, with a bright future of technology leadership in the Balkan region.

The initiative's secondary impact:

- Education transformation is lighting student imaginations with nearly 110,000 students who are collaborating with one another throughout the country in 1:1 eLearning. More than 7,000 teachers are now proficient with the technology.

"It is a great pleasure when the future of Macedonia from an early age commences to use computers in everyday life. Through this investment, the government invests in future of Macedonia."

–Ivo Ivanovski, Minister of Information Society and Administration

For the purpose of this document, we will define centralized and decentralized models of education programs in the following way:

Centralized models of education technology programs include key decisions driven by the government in the countries. They develop nation-wide implementation and procurement plans for education technologies. They have central authority to design and deliver project plans, resources, and support to effectively deploy a 1:1 program. Centralized oversight and support systems can ensure consistency of deployment to realize expectations, ensure a standardized curriculum, and provide professional growth opportunities. Many times it is up to the school to implement the directives of the national government.

School leaders and directors in centralized models must understand the national purpose and goals for technology programs. They need to know standards of success, have resources and guidance in getting it right, and have the ability to implement and manage for achievement of national goals. The KIFs will be tremendously helpful guides for this work.

Decentralized models distribute responsibilities among their variously organized areas such as districts, states, provinces, regions, municipalities, and government agencies. The government can establish, publish, and promote national policies, incentives, recommended curricula, and practices. These can be widely communicated, taught, and expected. However, important decisions along each of those fronts can be made and then executed within the local territory or school system.

States, regions, and provinces will choose their education technology paths. In all cases, the KIFs provide key practices that will ensure successful programs.

The benefits of Macedonia's centralized solution are many:

Education:

- Enhanced collaboration among students and teachers provides experiential learning, giving schoolwork a new immediacy.
- Increased access to computers and Internet connectivity helps prepare students for a technology driven world.
- Improved quality of education is provided by a standardized curriculum, helping give all students equal access to excellent learning materials.

Society:

- Computer literacy among a greater proportion of the population better prepares people to participate in the global economy.
- Future business growth may be encouraged by ICT infrastructure development that leads to technology leadership in the Balkan region.
- Local economic development is spurred as IT and other support industries become more necessary with the increase in computing.

Government:

- Increased visibility of government ministries as a whole helps assert the role of those organizations and individuals as eager promoters of socio-economic development.
- Intra-government collaboration fosters strong relationships between the agencies involved in the project as they work together toward success.
- Effective outreach to the public is provided for government agencies that gain a new means of providing effective educational and economic leadership.

Click here for more information on Macedonia's 1:1 technology initiative.

Example of Decentralized Education System

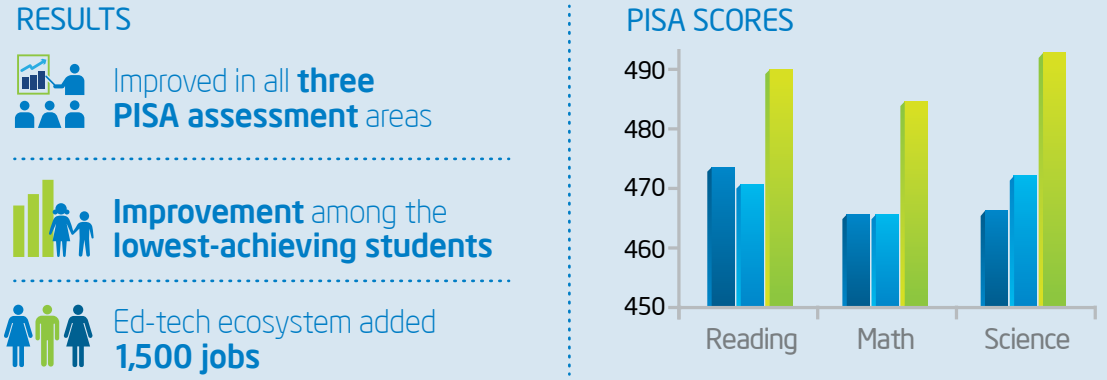
Portugal is known as a decentralized education model. However, operationally, it is a highly centralized system with administrative divisions. Historically, Portugal performed at the bottom of European educational surveys and had a distinct economic divide in its population. In 2008, the government responded with the Magellan initiative, a national technology plan to "consolidate the role of ICT as a basic skill to learn and teach in this new era." The results of their education technology focus are shown in Figure 4.

Turning Research Into Practice: First Steps

Real school transformation is at the heart of the Project RED Design and Intel's holistic model for education transformation. Transformational change is a fundamental break with current practices that sparks an irreversible new system. It requires new knowledge and skills for successful implementation.

It does not mean doing traditional things in a new way, or new things within a traditional system; it is the inception of a whole new educational system. This takes time and focus, through a planning and implementation process.

FIGURE 4



Transformation Guidelines

The Project RED Design offers specific, research-based steps to bring transformational change to education. The image shown of Project RED's Transformation Model [Figure 5] identifies key stakeholders that must be included in the change and communication processes of transformation. Project RED's transformation model and Intel's holistic model for transformation, both show students at the center of this process.

As with Intel's Model of Education Transformation, student learning is at the center of the need for change. Children must be given the opportunity to learn through self-directed, inquiry-based methods. Transformational change occurs ONLY when all spokes of this wheel are in motion in support of this common vision. Each spoke is a structure that must be strong and complete for the wheel to move forward. Commitment to the common vision and collaboration among these spokes is essential to move the vision forward.

FIGURE 5