Chapter 8
Sustainable Resourcing

Leadership

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Professional Development

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Student Success

Sustainable Resourcing

Information Communications Technology

Education leaders and policymakers worldwide are looking for ways to improve the quality of schools while slowing the growth of expenditures. The positive financial impact of properly implemented educational technology can contribute substantially to the solution. In fact, Project RED found significant evidence that properly implemented educational technology can be revenue-positive at all levels—national, state, and local. These savings can be continually reinvested back into the program to enhance its success, such as increasing bandwidth, purchasing digital content, and enhancing professional development.

Financial Impact of 1:1 eLearning

Transformation requires much more than a one-time infusion of technology. To have your transformation initiatives be sustainable and deliver long-term value, you'll need a solid understanding of the costs you'll incur for technology, including professional learning, curriculum resources, program evaluation, and other aspects of transformation. You may also find potential sources of savings from using digital solutions that improve educational productivity. Then, you'll need a comprehensive, long-range financial plan.

Project RED found that the closer the implementation is to 1:1 the more that technology contributes to cost reductions and productivity improvements. The financial impact findings include direct cost reductions at all levels as well as indirect revenue enhancements that are realizable at the state or national level. One example of state or national level cost savings would be a shift from paper-based to electronic high-stakes tests.

The table shows examples of other potential cost saving areas and an estimate of how much the item can save per student per year, based on U.S. dollars ($).

Many of the cost savings listed in the table cannot be achieved until students are 1:1. Until there is a digital conversion to 1:1, for example, printing and textbooks costs cannot be reduced. Individualizing instruction and using targeted interventions cannot happen without each student having ongoing access to a device.

Smart technology choices can help you set a path for long-term sustainability, including ongoing upgrades to student devices, infrastructure, educational software, tools, and professional learning.

CATEGORY	PER STUDENT
Student data mapping	$11
Online professional learning	$12
Teacher attendance increase	$13
Power savings	$16
Digital core curriculum savings	$17
Disciplinary action reduction	$20
Post-secondary remedial education	$30
Digital supplemental materials vs. print	$31
Copy machine cost calculations	$40
Online assessment savings	$44
AP/dual course enrollment	$58
Paperwork reduction	$60
End-of-course failure	$107
Total Per Student excluding Dropout Savings	**$448**

To begin estimating your costs and potential cost savings when implementing 1:1, view the Project RED Cost Savings Calculator. Although the calculator uses U.S. metrics and is calculated in dollars, you should still be able to get a sense of your potential savings by inputting your current per-student expenditures and number of students.

You can improve long-term cost effectiveness and sustainability by using digital curriculum, online testing and assessment, and classroom and learning management systems. Solutions such as these can improve resource and time management, enable better options for personalized learning, and help enhance student outcomes.

Terengganu, Malaysia

Terengganu is a Malaysian state with more than 1 million citizens. The government recognized the importance of a knowledge-based economy to its long-term economic success, and in 2009 Projek Buku Elektronik was launched to increase digital access and literacy among students and their families. Specific goals included reducing the digital divide between urban and rural and between high- and low-income households.

As part of a national initiative, teachers from each school participated in the Intel® Teach professional development program to learn how to integrate technology effectively in their teaching and develop 21st century skills in their students.

Students in grades 4, 5, and 6 received Intel classmate PCs and were allowed to take them home for family use, giving low-income families equal access to technology. The computers are loaded with digital textbooks, test preparation software, Intel® Education resources, and other content including the Koran, other religious resources, and a dictionary. Classrooms were outfitted with electronic whiteboards, Internet connectivity, Wi-Fi access points, a teacher workstation, and sufficient electrical outlets for children to charge their computers in class.

The Terengganu government also collaborated with Intel and a state-owned manufacturer to open a factory for assembling PCs and developing software. The factory will be able to supply 10,000 Intel classmate PCs a month and has provided hundreds of local high-tech jobs and training.

As a result of this program, a record 15.4 percent of students received grades of all As. Projek Buku Elektronik has successfully increased digital literacy among young students and bridged the digital divide by bringing technology into the homes of low-income and rural students. And as a boost to the local economy, the initiative also created 500 ICT jobs and 360 public-sector jobs.

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15.4% of students received all As

Social inclusion broadens

500 ICT, 360 public-sector jobs added

Best Practices for Initial Investment and Long-Term Sustainability

Although large-scale 1:1 implementations can be revenue-neutral over the long term, it usually takes a significant initial investment. The initial investment is substantially increased if a country needs to build out a national wired and wireless infrastructure. Just as water supply, roads, and other traditional infrastructure are important to the growth of a nation's economy, so too is the build-out of the national technology infrastructure. The World Bank Group's ICT strategy for 2012-2015 emphasizes the transformative potential of ICT while focusing on innovation and infrastructure.

Project RED also found that for best results, investments need to be made in not only technology and infrastructure, but in a complete digital transformation of the schools. Students, teachers, and administrators need to use technology in appropriate ways on a daily basis in core academic classes (Key Finding #7), in targeted interventions (Key Implementation Factor #1), and in various ways to achieve efficiencies in the management of the school (Finding 2).

For more information on Project RED's financial findings, reference The Positive Financial Impact of Technology-Transformed Schools or Chapter 9 of the full Project RED report.

Turning Research Into Practice Recommendations: Sustainable Resourcing

Sustainable Resourcing Recommendations for Centralized Education Systems

- Develop a long-term strategy for the creation and support of a state or national network that provides universal access to the Internet.
- Secure long-term funding sources.
- Mandated efficiency usage of the technology to enable funding reallocation.
- Incentivize local leaders to find cost savings and efficiencies through the use of technology.

- Provide equitable funding to schools to support their technology efforts.

Sustainable Resourcing Recommendations for both Centralized and Decentralized Systems

- Estimate costs and savings.
- Identify strategic allies and funding sources.
- Construct a plan to obtain and renew needed resources.
- Choose technologies to optimize effectiveness and costs over the long term.
- Generate savings through digital curriculum, online testing and assessment, and integrated data management systems (Learning Management System, Student Information System, etc.).
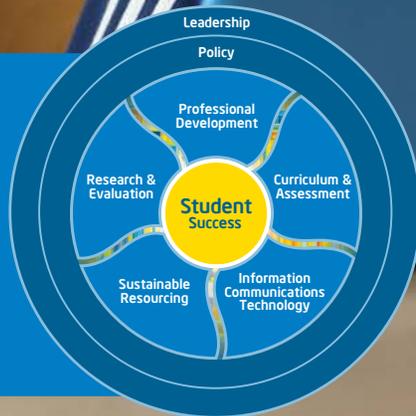
To download this global toolkit, resources, and learn more about Intel's support of the Project RED work, please visit intel.com/projectred

Conclusion
Student Success and Economic Development

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Student Success and Economic Development is at the Core of Education Transformation

Our futures rely on students' development and contributions locally, nationally, and globally. Students who participate in 21st century education systems, as fostered in this toolkit, learn how to innovate, create, become entrepreneurs, and thus stimulate economies. The latter is crucial for global competitiveness and to positively impact a national workforce.

The power of a guaranteed curriculum, effective implementation of ICT, and educators' continued professional growth fuel the foundation for students' abilities to achieve and excel.

Student success is at the heart of Intel's model for Education Transformation. We find that deep transformation often results from a broad vision of success. Research indicates that technology-enabled education transformation can benefit students, teachers, families, societies, and economies. (See the Intel Education white paper, The Positive Impact of eLearning—2012 Update, for a review of studies).

Transformation starts with your vision of success. Success takes many forms beyond higher standardized test scores including:

- Higher rates of attendance
- Lower matriculation
- Higher graduation rates
- Increased enrollment of girls
- Higher levels of student engagement
- Decreases in behavior problems
- Development of entrepreneurial skills to stimulate local economies

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CASE STUDY

Baccio da Montelupo Comprehensive School: School of the Future

The Baccio da Montelupo Comprehensive School near Florence, Italy, aimed to completely update its education system and progress through mobile computing for students and teachers. The school achieved a much more engaging and collaborative learning environment for the class, stimulated active learning in students, and is preparing students for the future with 21st century skills.

Italian school **transforms** through **mobile computing**

Increases collaboration and 21st century skill development

Gives **students greater control** of learning experience

Teachers at Baccio are delighted with the advancements the mobile devices have facilitated. Enabling digital learning not only made tracking and sending homework simpler and quicker, but is a more fun and practical way of learning. It has the additional benefits of encouraging collaboration between groups and providing a data backup for safety and security.

The aim of the head teacher and her team is to gradually give students greater control of their learning experience.

"The Baccio da Montelupo Comprehensive School is working toward a flatter structure for teaching and learning, which involves family, teachers, and children on a more equal footing, thanks to this technology," said Gloria Bernardi, head teacher, Baccio da Monteluop Comprehensive School. "It helps the students to develop important skills for the modern world, such as communication, collaboration, creativity, problem solving, critical thinking, and digital literacy."

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Universal access to technology and the Internet is a major conduit for advancing economic growth and development. There is an international movement toward personalized and individualized learning through 1:1 programs. This leads to student-driven learning, which increases engagement, independence, and achievement—even beyond bricks-and-mortar classrooms. Students who learn in a properly implemented 1:1 program achieve at greater rates, are highly engaged, matriculate at higher rates, and are more prepared to compete in the global marketplace.

Moving toward 1:1 is not easy work. It may take partnerships between the central government, private industry, and schools. It will require that the nation build out a robust technology infrastructure and make substantial investments in education. It may require government to be direct with low-performing schools. It may require rigid government systems to be flexible and innovative when dealing with better-performing schools. It requires the development of transformative leadership at all levels.

An effort of this magnitude may take years. You will be faced with many challenges along the way. It will take tremendous time, effort, and resources, but Project RED and Intel believe it is absolutely necessary for social and economic development of every nation. We hope this global toolkit and recommendations based on Project RED's research help you get started or continue transforming your educational system.

With the right leadership, policy, professional development, curriculum and assessment, research and evaluation, ICT, and sustainable resourcing, we can change the world, one student at a time.

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

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