How Can SEAs Use Digital Technologies in Support of Education Reform?

A White Paper

2009-2011 Statewide Evaluation of the Illinois EETT Program

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On behalf of

EVALSOLUTIONS INC.

For

Illinois State Board of Education

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Foreword

There is growing concern over the divide between American students' academic achievements and the necessary skills needed to prepare them for a globally-demanding workforce.

Education reform efforts have been largely focused on making changes within the structures of the current systems, requesting more data from the didactic, time-based, place-based system of learning. Meanwhile, new reform efforts, driven by the capabilities of emerging technologies and platforms, provide enormous opportunity for dramatically improving student outcomes.

With the demands of global competitiveness, the data shows that even the most gifted groups of students in the United States are falling short compared to top-performing foreign nations. Thus, the drumbeat for education reform continues, and it becomes a more dire need than ever that our nation works to provide true equity, access and excellence for educating every student to world-class standards. Education reform is of utmost importance for the future of the U.S.

With new advanced learning technologies, there are solutions on the horizon that could produce dramatically different results for students – but making the shift involves major systems thinking and change management. States must support the innovative transition by adopting policy and practices that allow for moving from a time-based system toward competency-based education, building new student-centered environments to take advantage of 21st century learning – beyond textbooks, any time, everywhere, with extended learning opportunities. These efforts will not be top-down from the federal government, as federal funding resources have shifted away from integrating technology.

The transformational efforts will be from the ground up, as states and districts work to implement world-class, internationally-benchmarked knowledge and skills, using digital tools and resources to personalize education, with competency-based approaches to ensure that success is the only option for each and every student. Maintaining these new models of learning using technology requires a systems approach – and states are uniquely suited to step into a powerful role in highlighting the new systems.

As federal funding transitions, this report explores the key role that states play in leading education reform through efforts focused on the Common Core and shared learning approaches to collaborate, build upon and transform education from the ground up.

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Summary

As U. S. Department of Education funding shifts away from dedicated educational technology funding, State Education Agencies should consider the role that effective integration of technology can play in meeting their cross-program goals for education reform.

Effective integration of digital technologies has the potential to improve K-12 educational outcomes. It can play an important role in education reform initiatives intended to prepare students for college and careers, strengthen STEM education, improve teacher effectiveness, and turn around failing schools.

In this White Paper, examples are presented of ways that SEAs and other entities are meeting these 21st century K-12 education goals through technology-enhanced projects.

These projects serve as tangible models of highly effective technology integration and the essential planning, technology infrastructure, educator training, and leadership components needed for success.

The changing landscape of educational innovation and related funding creates opportunities for states to take the lead—by exploring the best ways to use digital technologies in education reform, and by collaborating to develop the next generation of assessments, content, and data systems that will transform education while bringing cost savings for districts.

As central players in education reform, SEAs can play a key role in using digital technologies to transform education at the national, state and local levels.

Introduction

This week, we found out that the brutal truth that we're being out-educated. On the 2009 Program for International Student Assessment, the United States scored as average in reading and science – and below average in math.

(Arne Duncan, Secretary of Education, December 8, 2010)[1]

The U. S. Department of Education (ED) has invested in several programs to help bridge the gap in students' performance, most recently through American Recovery and Reinvestment Act (ARRA) funding for the Enhancing Education Through Technology (Ed Tech) program, Race to the Top, and related programs. These funds were intended to target students' learning through technology literacy and innovation. As the Department explains in its guidance for the Ed Tech program:

> *The primary goal of the Ed Tech program is to improve student academic achievement through the use of technology in schools. It is also designed to ensure that every student is technologically literate by the end of eighth grade and to encourage the effective integration of technology with teacher training and curriculum development to establish successful research-based instructional methods.*
>
> (US Department of Education)[2]

From 2002 through 2010, EETT program funds and an ARRA supplemental appropriation provided $3.73 billion in Ed Tech-specific funding to the states. Because of infrastructure investments over the last two decades, today's schools are digitally connected, an important step toward one of EETT's key program objectives—ensuring equitable technology access in high-poverty, high-need schools.

By 2005, 100% of U. S. public schools reported having Internet access, compared to 35% in 1994. In 2005, the ratio of students to Internet-connected computers was just over 4 to 1 in high-poverty schools, and 3 to 1 in low-poverty schools. This rapid rise in connectivity can be attributed in part to EETT, and in part to E-Rate (www.usac.org), a program established by the FCC in 1996 to subsidize telecommunications services and development of Internet infrastructure in schools and libraries based upon economic need. In 2010, E-Rate provided $2.3 billion in support to applicants.

[1] http://www.ed.gov/news/speeches/education-and-language-gap-secretary-arne-duncans-remarks-foreign-language-summit

[2] Guidance on Enhancing Education through Technology (Ed Tech) Program Funds Made Available under the American Recovery and Reinvestment Act of 2009, http://www2.ed.gov/programs/edtech/guidance-arra.doc

Now that schools are digitally connected, a shift in infrastructure focus is underway, from connectivity to ensuring adequate bandwidth for student-centered technology integration in 21st century learning[3]. EETT helped with this move beyond connectivity funding, by helping schools pay for hardware, software and technology-related training for educators.

Gauging Return on Education Investments: PISA Scores and GDP

The general per student expenditures of U. S. public schools have risen over the last three decades. They increased 37 percent in the 1980s, less than 1 percent in the early 1990s, and 32 percent from the mid-1990s to 2007–08. Currently, per student expenditures are just over $10,000[4].

Despite rising education budgets, the U. S. continues to lag behind many developed and developing nations on international tests of reading, math and science skills. When 15-year-olds from Shanghai, China participating in Program for International Student Assessment (PISA) testing for the first time in 2009, they scored highest in the world in each content area. In contrast, the overall performance of U. S. high schoolers on PISA has been middle of the pack since 2000, with few gains in overall scores.

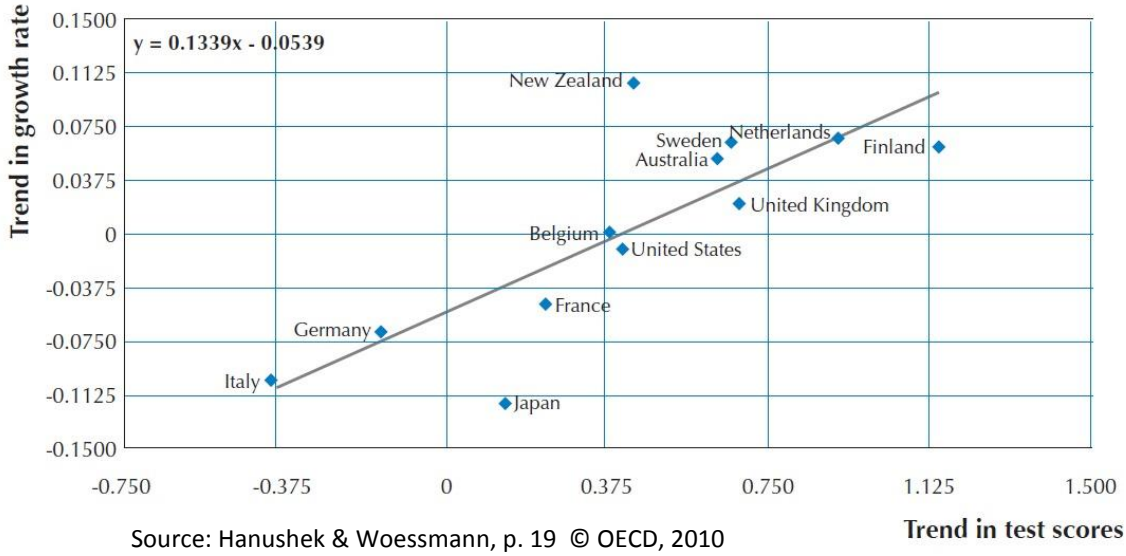
This relative lack of progress in Science Technology Engineering and Mathematics (STEM) and English Language Arts (ELA) high school learning outcomes has serious implications for America's competitiveness in the global marketplace. Research by Hanushak and Woessmann (2010) demonstrated not only a relationship between a nation's PISA scores and its Gross Domestic Product (see Figure 1), but a causal influence of scores on GDP in countries that began participating in PISA testing before 1972[5]. In other words, cognitive skills learned in school have a real impact on economic growth. Efforts to boost the cognitive skills of America's K-12 students must be continued, even during difficult economic times, to avoid a negative effect long-term on the economy.

This important connection has long been intuitively obvious to U. S. policymakers, who have grappled with formally defining and funding a

[3] Education Week, *Technology in Education* Special Issue (September 1, 2011)
[4] U.S. Department of Education, National Center for Education Statistics, http://nces.ed.gov/programs/digest/d10/ch_2.asp
[5] *Eric A. Hanushek and Ludger Woessmann, The High Cost of Low Educational Performance: The Long-Run Impact of Improving PISA Outcomes (Paris: Organization for Economic Cooperation and Development, 2010) p. 17*

comprehensive approach to public education policy since the 1963 passage of the Elementary and Secondary Education Act (ESEA) during the Johnson administration.

Figure 1. Scatter plot of trend in growth rate of GDP per capita against trend in test scores, 1975-2000



Source: Hanushek & Woessmann, p. 19 © OECD, 2010

The evolution of the ESEA reflects their attempts to address important educational concerns over time with each reauthorization. Hanna succinctly describes the legislative progression from its roots in desegregation to the development of standards in Goals 2000 and finally the current iteration which attempts to institutionalize accountability for all students[6]. With each reauthorization, policymakers balance their educational ideals with the complexity of implementing and enforcing national policies effectively in a state-led educational environment. While ESEA formally established the role of U. S. Department of Education for articulating nationwide, globally focused goals for education, state and local educators will always be at the heart of enacting the legislation and accomplishing the vision for all students.

The Hewlett Foundation believes the reason American students have middling PISA scores is that state high-stakes tests and classroom assessments typically do not test for deeper learning, and therefore schools do not teach for it. In contrast, PISA tests require application of knowledge that demonstrates deeper learning. The skills involved include an ability to know and understand core academic content, think critically and solve problems, communicate effectively, work collaboratively, and continue learning throughout life. To help address this concern, Hewlett awarded a $1 million grant to the Organisation for Economic Co-operation and Development (OECD) to develop PISA-aligned local assessments for pilot testing in U. S. schools. In addition, Hewlett provided limited funding to support assessment consortia of states funded by Race to the Top in 2010 (See *Ensuring College Career and Success*, p. 10.

[6] Julia Hanna, ed., *The Elementary and Secondary Education Act 40 Years Later* (August 2005), Harvard University Graduate School of Education, http://www.gse.harvard.edu

The Future of Educational Innovation

> *We should implement a new approach to [R&D] in education that focuses on scaling innovative best practices in the use of technology in teaching and learning, transferring existing and emerging technology innovations into education.*
>
> (National Education Technology Plan, 2010)

The future direction of educational innovation is reflected in the vision put forth in the draft 2012 ESEA reauthorization. In this legislation, the largest U. S. Department of Education (ED) funding source for educational technology in schools, the Enhancing Education through Technology (EETT) has been eliminated. If the new ESEA is re-authorized as requested, there will no longer be an ED program dedicated solely to large-scale funding of technology in schools. However educational technology is the first potential program priority cited for elective inclusion in some of the Department's new and continuing programs.

> *We may apply specific priorities across programs, as appropriate, including priorities for: (1) programs, projects, or strategies that leverage digital information or communications technology to accomplish the stated goals of the grant*.
>
> (A Blueprint for Reform[7], p. 41)

In addition, a series of federal and state initiatives have been undertaken to address a range of goals related to improving K-12 educational outcomes in the United States. This White Paper focuses on the role that educational technology can play in attaining four of the key goals most commonly incorporated into large federal grant programs:

- Achieving College and Career Success for All Via Standards, Assessments and Programs
- Strengthening Science, Technology, Engineering, and Mathematics (STEM) Education
- Supporting Educator and Principal Effectiveness
- Turning Around Persistently Low-Performing Schools and Expanding School Choice

These priority goals correspond to the innovations sought under the new ESEA reauthorization, as implemented via major grant programs which have been renewed for FY2012, such as Race to the Top, Investing in Education, Charter Schools Grants to SEAs, Math and Science Partnerships, and the Teacher Incentive Fund.

[7] http://www2.ed.gov/policy/elsec/leg/blueprint

These programs support a combined $1.4 billion in 2011-2012 federal grants to SEAS and other entities[8]. An additional $500 million was awarded in December 2011 to fund Race to the Top—Early Learning Challenge grants in nine states, while seven other states—Arizona, Colorado, Illinois, Kentucky, Louisiana, New Jersey, and Pennsylvania—received an additional $200 million in Race to the Top funding to support K-12 education reform[9].

An enduring issue that arose during EETT, ensuring funding equity for small and rural schools, continues to garner attention in the recent funding initiatives. One independent analysis showed that in one state, large school districts (defined by the state as having 3300 or more students) were significantly more likely than small districts to have their EETT proposals funded in 2003[10]. The Department has responded to this perennial equity concern by instituting categories under Race to the Top, i3 and other major programs that are dedicated to addressing the needs of rural schools.

Attaining Key Goals with Digital Technologies

Technology is at the core of virtually every aspect of our daily lives and work, and we must leverage it …. Technology based learning and assessment systems will be pivotal in improving student learning and generating data that can be used to continuously improve the education system at all levels.

(National Education Technology Plan, 2010)

The external evaluation of the EETT statewide program in Illinois[11] documented some of the common challenges that rural, suburban and urban U. S. schools face in moving beyond basic technology integration. The state EETT program laid out a coherent model leading to technology-enabled learning, including the development and assessment of student digital products to reflect deep learning. Most grantee districts made earnest efforts to implement the model in practice. Widespread technology integration was observed, and competent instruction with technology was often seen. But highly effective technology integration focused on deeper learning and student artifacts that demonstrate such learning was only seen occasionally within the short (1- to 2-year) district grant timeframes.

[8] www.gpo.gov/fdsys/pkg/BILLS-112hr2055enr/pdf/BILLS-112hr2055enr.pdf
[9] http://www.ed.gov/news/press-releases/department-education-awards-200-million-seven-states-advance-k-12-reform
[10] Mary P. Morris and Mark J. Fenster, *Characteristics of Winning Title II-D Edtech Grant Proposals*, Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, Apr 8, 2006)
[11] E. Oyer, T. Clark, & T. Jaresowich, *Title*, (Carmel, IN: EvalSolutions Inc., 2012).

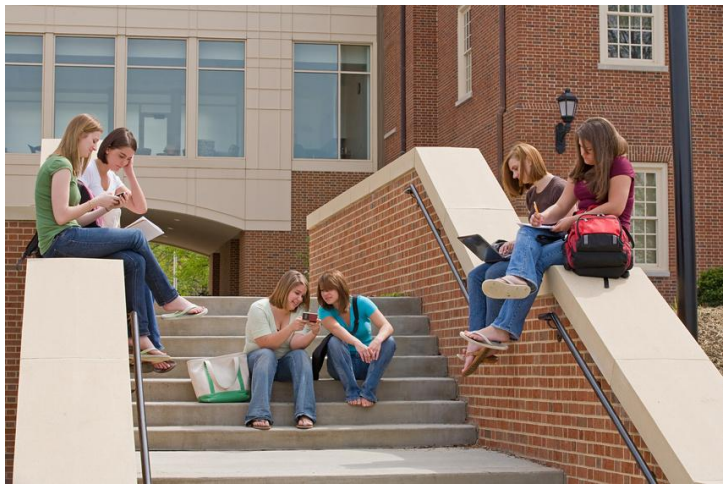
Identifying Benchmarks for Educational Success

The federal EETT summative evaluation report by SRI International showed that two key benchmarks, teacher technology use and classroom-level student technology access, grew in EETT districts[12]. By FY 2007, 81% of teachers in EETT funded districts reported receiving technology professional development in the past year, while 63% reported students had high-speed Internet access in their classrooms, with no significant difference between high and low poverty schools.

However, states were often unable to document their progress toward meeting other federal EETT goals. By FY 2007, only 27 states had created standards for teacher technology competency, only 24 states had measures for technology integration, and only 6 had completed statewide assessments of 8th grade student technology proficiency[13]. Additional states provided this documentation later on, but after five years, many states could not effectively monitor results.

Can digital technologies help educators and schools succeed in attaining key K-12 education reform goals? One recent study, *Project Red: The Technology Factor—Nine Keys to Student Achievement and Cost-Effectiveness*[14], provides promising evidence that districts that undertake intensive technology integration efforts can attain educational success.

Data from a purposive sample of 997 schools were used to create predictive models that identified the key drivers of educational success. Predictive modeling analyses were limited to four education success measures in high schools: disciplinary action reduction, graduation rate improvement, high-stakes test improvement, and dropout rate reduction. Implementation factors most strongly linked with success appear on the next page.



This evidence from Project Red and examples from major projects funded by state and federal programs suggest that over time, well-planned technology-enhanced initiatives can help educators and education agencies meet key federal, state and local goals.

[12] M. Bakia, B. Means, L. Gallagher, E. Chen, and K. Jones, *Evaluation of the Enhancing Education Through Technology Program: Final Report*, U.S. Department of Education (Menlo Park, CA: SRI International, 2009).
[13] http://www2.ed.gov/rschstat/eval/tech/netts/finalreport.pdf
[14] http://www.projectred.org/uploads/PREP11/ProjectREDPreview.pdf

Project Red: Key Implementation Factors

Project Red researchers found nine implementation factors for technology integration were most strongly linked with educational success. They rank ordered them by predictive strength as follows:

1) Intervention classes
2) Change management leadership by principal
3) Online collaboration
4) Core subjects
5) Online formative assessments
6) Student-computer ratio
7) Virtual field trips
8) Search engines
9) Principal training

In other words, schools with these factors were more effective academically than those without them. Integration of technology into (1) intervention classes for students with special needs during every class period was found to be most predictive, followed by (2) principal support, such as the provision of learning and collaboration time for teachers. Daily use of technology by students for (3) online collaboration was an important factor. Effective schools also (4) integrated technology into core subjects and (5) conducted online formative assessments at least weekly. While not a top factor, (6) lower student to computer ratios did have an effect. Student participation in(7) virtual field trips at least monthly and (8) use of online search engines at least daily were also important factors. Finally, (9) principal training to effectively support technology integration was a factor in educational success.

Achieving College and Career Success for All Via Standards, Assessments and Programs

To have any real impact, a system that seeks to improve student cognitive skills must model effective instructional practices aligned with accountability and progress monitoring systems that test for deeper learning. For example, programs funded under ED's College and Career Success initiative incorporate a prominent focus on the development of standards and assessments to reach these goals. Digital technologies can play a key role in these efforts.

The Hewlett Foundation provided limited funding to support the PARCC and SBAC assessment consortia of states funded by ED's Race to the Top competition in 2010. These state-led consortia propose to increase the number of students graduating from high school and prepared for college and career by developing innovative assessment systems for state testing in ELA and Math aligned to the Common Core State Standards[15].

[15] www.corestandards.org

These foundational standards, adopted by 45 states, define the basic knowledge and skills students should acquire in English Language Arts and Math during their K-12 education to be prepared upon college graduation for college and career.

Like PISA, the PARCC and SBAC assessments are focused on deeper learning, including learning enabled by digital technologies. They are expected to be operational in 2014-15. These focused assessments will test students' ability to read complex text, complete research projects, complete classroom speaking and listening assignments, and work with digital media[16]. **Table 1** shows how digital media are integrated within both assessments.

Table 1. PARCC and SBAC Assessments

PARCC Partnership for Assessment of Readiness for College And Careers	**SBAC** S MARTER Balanced Assessment
ELA & Math Grades 3-11	ELA & Math Grades 3-8 + high school
Computer-based; project-like testing includes working with digital media	Computer-adaptive.
Four summative assessments throughout the year (3 through-course, 1 EOY)	Last quarter performance tasks + EOY assessment; optional interim assessments
Digital library of formative assessments, released items, model curriculum, PD materials, scoring training	
Field testing 2012 – 2014 Operational 2014-15	Field testing 2013 Operational 2014-15

Source: B. Higbee, *The Partnership for Assessment of Readiness for College and Careers (PARCC) and SMARTER Balanced Assessment Consortium: Discussion Points*. March 2011, p. 10. http://tiny.cc/2erid

The SMARTER Balanced Assessment Consortium plans to use computer-based adaptive testing for interim as well as end-of-year summative performance tasks and tests. Both the PARCC and SBAC consortia plan to develop digital libraries of formative assessments, released items, model curricula, and staff development and scorer training materials.

They are jointly pursuing development of a cloud-based longitudinal system for which the State Educational Technology Directors Association (SETDA) noted:

[16] www.isbe.net/common_core/pdf/nclb_pres_beltchenko_ilscc_parcc.pdf

The shift to computer-based and online assessment is only one part of a larger and longer-term shift in K-12 education toward digital instructional materials, online learning, data systems, formative assessment, online professional development and school communications. ... States should consider re-directing and combining funds in new ways to meet technology needs[17] .

In some Illinois EETT case study schools, administrators shared concerns with evaluators that after adding significant network connectivity, hardware and software through their grant, it will be challenging to budget long-term for technology maintenance and replacement as well as for continuing educator training and support[18]. Part of the solution may be rethinking local budgets while having statewide or national access to low-cost cloud-based testing, software and other resources. Illinois is among the states moving forward with piloting of cloud-based Data and Learning Management Systems (DLMS), through collaborative grants to school consortia[19].

A few examples follow of technology-enhanced funded projects related to College and Career Readiness.

In its *National Educational Technology Trends: 2011* report , SETDA provides an excellent overview of projects funded by EETT and other state and federal sources that have impacted key K-12 education reform goals[20].

For example, Georgia is using technology to help teachers establish the school readiness of Kindergarteners.

Georgia: State and Federal Funding

Georgia Kindergarten Inventory of Developing Skills

The Georgia Kindergarten Inventory of Developing Skills (GKIDS) is a year-long, performance-based assessment [21]The goal of the assessment program is to provide teachers with information about the level of instructional support needed by individual students entering kindergarten and first grade. GKIDS will allow teachers to assess student performance during instruction, record student performance in an on-line database, and generate reports for instructional planning, progress reports, report cards, SST, and/or parent conferences. The primary purpose of GKIDS is to provide ongoing diagnostic information about kindergarten students' developing skills. The GKIDS website[22] allows teachers to enter and manage data throughout the school year. www.doe.k12.ga.us.

(Various Sources)

[17] http://assess4ed.net/document/new-setda-report-technology-requirements-large-scale-computer-based-and-online-assessment-c

[18] Oyer, Clark, and Jaresowich, 2012

[19] http://www.isbe.net/curriculum/elearning/pdf/arra_eett_dlms_rfp_11.pdf

[20] http://www.setda.org/c/document_library/get_file?folderId=6&name=DLFE-1302.pdf

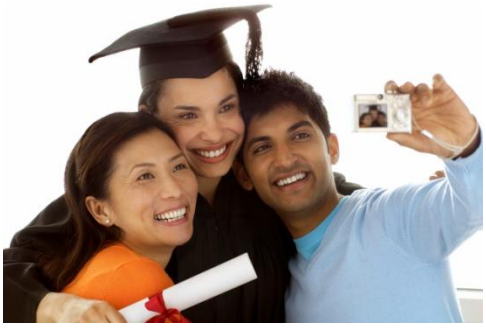
[21] http://www.doe.k12.ga.us/ci_testing.aspx?PageReq=CI_TESTING_GKIDS

[22] https://gkids.tsars.uga.edu/start

Alabama is using technology-enhanced instruction to boost high school graduation rates, while Michigan is using a seat time waiver program to support online programs that target dropout rates.

Alabama: State-Funded Statewide Program
The Alabama Connecting Classrooms, Educators, and Students Statewide (ACCESS)
The ACCESS distance learning program has served students in grades 6 through 12 statewide by delivering instruction via the web and interactive videoconferencing, thus helping students stay in school and graduate. State funds provided each state high school with a distance learning lab with tablets, videoconferencing equipment, interactive whiteboard, and other technologies in support of the program. ACCESS offers 101 unique courses, including 11 AP courses, all taught by teachers specifically trained for the program. Over 560 teachers were trained and are currently teaching for ACCESS. In 2009, ACCESS provided 26,197 student enrollments in courses needed to meet graduation requirements and 6,059 additional enrollments in non-credit remediation modules for the state high school graduation exam. In 2007, the average freshman graduation rate was 67 percent, up from 62 percent in 2002. Ongoing evaluation indicates continued positive success rates. http://accessdl.state.al.us **(SETDA, 2011)**

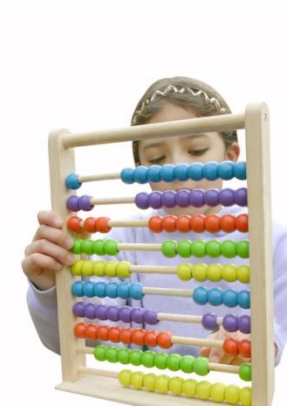
Michigan: EETT Statewide Program; State Funding
Dropout Challenge Program/Seat Time Waiver Program
EETT funding, including ARRA EETT funding, supports Michigan's dropout prevention programs. Michigan's superintendent created the "Dropout Challenge Program." Over 1,300 schools signed up for Graduation Town, a professional learning community for building-level administrators for sharing data and best practices. Michigan has a Seat Time Waiver program[23] which provides flexibility for up to 100 percent online enrollment. The Seat Time Waiver program requires one-to-one and broadband connectivity to the home. Through this program, students may accelerate learning or learn at an individualized pace. An on-site mentor who is a certified Michigan teacher must act as Teacher of Record. www.michigan.gov/mde **(SETDA, 2011, and other sources)**



[23] http://www.michigan.gov/documents/mde/5-O-B_SeatTimeWaivers_329678_7.pdf

Strengthening Science, Technology, Engineering, and Mathematics (STEM) Education

STEM education has become a major priority at the local, state and federal levels. Of the top 30 fastest growing jobs as projected by the Bureau of Labor Statistics from 2008 to 2018, 25 are STEM-related[24].



In 2009, the Obama Administration launched the 'Educate to Innovate' campaign for excellence in STEM Education[25]. Through the America COMPETES Reauthorization Act of 2010, a committee was established under the National Science and Technology Council to coordinate federal activities in support of STEM education[26]. Representatives from 11 federal agencies met in March 2011 to lay a 5-year strategic groundwork, including agreement to develop a detailed inventory of existing STEM programs[27]. The National Governors Association is coordinating collaborative STEM efforts among states, and supporting the efforts of governors to advance state-level STEM policy agendas[28]. Local districts are carrying out a wide variety of STEM-related initiatives.

SETDA highlights several EETT-funded projects related to strengthening STEM education. For example:

Connecticut: EETT Competitive Program
Connecticut Career Choices Bio21
The New Haven Public Schools, in collaboration with The Center for 21st Century Skills @ EDUCATION CONNECTION, implemented the Connecticut Career Choices "Bio21" biology course at Wilbur Cross High School as a means of providing students with cutting-edge technology and 21st century skills, as well as assisting teachers in the use of technology to achieve more effective instruction in science. Bio21 is a lab-intensive science course that covers the most exciting fundamentals of life science and biotechnology. Students gained techniques and knowledge that helped prepare them for careers in medicine, microbiology, molecular biology, forensics, and public health. The project trained teachers to use 21st century learning management systems. In addition, the project positively impacted school administrators by increasing their familiarity with classroom observations of blended learning pedagogy and online standardized assessments. http://ctcconline.org **(SETDA, 2011)**

[24] http://www.bls.gov/emp/ep_table_103.htm
[25] http://www.whitehouse.gov/the-press-office/president-obama-launches-educate-innovate-campaign-excellence-science-technology-en
[26] http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR05116:@@@D&summ2=m&
[27] http://www.whitehouse.gov/blog/2011/03/04/new-science-technology-engineering-and-math-education-committee-launched
[28] http://www.nga.org/cms/stem

Illinois: EETT Competitive Program

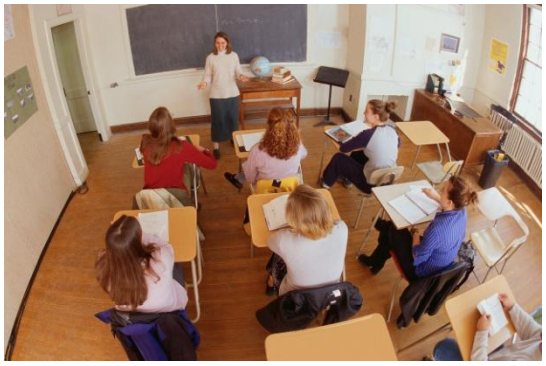
Pontiac Township High School Algebra Program

Because it had not made Adequate Yearly Progress (AYP) in Mathematics for 3 years, this school developed an EETT proposal that detailed fundamental changes to how Algebra instruction was delivered. The new plan gave teachers the ability to move from direct instruction to a one-to-one program which engaged students to become more involved with their own learning through differential guidance from the teacher. This one-to-one program enabled all Algebra students to increase mathematics achievement, improve communications skills and improve technology literacy. This initiative also allowed all Algebra students to experience fundamentally different learning approaches. Students used various media and through a variety of formats encountered various technologies throughout instructional integration. http://www.pontiac.k12.il.us **(SETDA, 2011)**

Supporting Educator and Principal Effectiveness

The external evaluation of the Illinois EETT Statewide Program revealed that EETT-funded school districts find it very challenging to provide the in-depth training needed by teachers and administrators to support full technology integration into curriculum and assessment. Research on training in-service teachers for effective technology use indicates the following professional development elements:

- embed technology integration into overall reform efforts
- integrate technology standards with school-level professional development
- provide teachers with professional development on analyzing and selecting digital resources aligned with content standards
- provide opportunities for teachers to develop their computer skills
- provide opportunities for modeling, practice, and reinforcement of technology use with curricula[29]



Even when all components are present in staff development, the extent to which teachers adopt and implement these practices varies considerably. Adoption is improved by leaders who promote opportunities for collaboration as well as model technology use and leverage resources to provide ubiquitous access. Professional development is most likely to result in highly effective technology integration into teaching and learning when it is sustained and intensive.

[29] J. Cradler, M. Freeman, R. Cradler, and M. McNabb, Research Implications for Preparing Teachers to Use Technology, *Learning & Leading with Technology*, 30, no. (2002).

Tennessee's TN-TIFprogram incorporates many of these elements. SEAs and school district grant the Teacher Incentive Program (funded at $300 million for FY 2012), are making active use of digital technologies in dissemination and training. These grants focus primarily on teacher effectiveness, but also include teacher training and content resources in assessment- and related topics.

Tennessee: Teacher Incentive Program, Race to the Top and other funding sources

TN-TIF Performance-Based Compensation System

Through their five-year Teacher Incentive Fund grant, Tennessee Department of Education and participating school districts are implementing TN-TIF performance-based compensation systems in 109 high-need schools[30]. Online professional development and digital learning plays a central role in implementation. A series of six online strategic compensation courses developed during the TN-TIF planning year to personnel in participating schools. Support Webinars and video conferences are also being used to disseminate information to teachers. Online professional development, learning resources and promising practices are delivered via an Electronic Learning Center. The initiative builds on a 20-State Longitudinal Data System and the Tennessee Value Added Assessment (TVAAS), built by Tennessee Department of Education and its partners[31] [32], www.tn.gov/education **(various sources)**

Missouri's eMINTs provides sustained training.

Missouri: i3 Program grant and other funding sources

Enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS)

Districts in Missouri as well as in Alabama, Arkansas, Delaware, Illinois, Maine, Minnesota, Nevada, New Jersey, Oklahoma, Texas, and Utah have been using the eMINTS project based collaborative learning program, which blends high levels of technology for students and teachers with up to 250 hours of professional development for teachers.

Instructional strategies focus on inquiry-based teaching, higher order thinking skills and cooperative learning. Students in eMINTS classrooms consistently outperform students in schools with similar demographics who are not enrolled in these classrooms.

An article published in the fall 2010 edition of the *Journal of Research on Technology in Education* showed evidence of positive long-term effects on student achievement for teachers who had completed eMINTS PD programs.

The eMINTS National Center was awarded one of 49 Investing in Innovation (i3) grants by the ED to conduct further research and to study the impact of eMINTS on seventh and eighth grade students and teachers in rural Missouri schools. www.emints.org **(SETDA, 2011**)

[30] http://cecr.ed.gov/profiles/pdfs/cohort3/CECR_GP_Tennessee_DOE.pdf
[31] http://www2.ed.gov/programs/teacherincentive/awards.html#57
[32] http://news.tn.gov/node/8213

Turning Around Persistently Low-Performing Schools and Expanding School Choice

In 2009, U. S. Secretary of Education Arne Duncan urged charter school providers to work with LEAs and states to turn around low-performing schools. ED's Charter Schools Program, funded at $255 million for FY 2012, provides seven grant programs, the largest of which makes grants to SEAs which in turn create state grant competitions. *In The Rise of K-12 Blended Learning*[33], a number of charter schools are profiled that offer blended learning programs for academic recovery and school turnaround. One program developed by EdisonLearning shows how charter school operators have begun to respond to Duncan's call.

Ohio: State Funding
EdisonLearning Dropout-Solutions Centers
In the fall of 2010, EdisonLearning opened eight dropout-solutions centers in Ohio—four in Columbus and four in Cleveland. It worked with the Ohio State Department of Education, local school districts, and communities to set up the centers, each of which has a dedicated classroom for small group or individual direct instruction and tutoring, and a technology lab for delivering online courses. Solution centers offer a flexible schedule that provides students the option to attend one of several sessions during the day. EdisonLearning is also beginning to incorporate online learning into the more than 40 brick-and-mortar schools that it manages, offering its menu of eCourses, eAcademy solutions, and eSchoolware tools through online labs. While results are not yet available, a rural Pennsylvania district that replaced its existing credit-recovery program with EdisonLearning's online learning lab saw a 12.5% increase in credits earned and realized a savings of nearly $5,000. **(Innosight Institute, 2011**)

Next Generation Learning Challenges[34] is a P-20 initiative funded by the Gates and Hewlett Foundations and led by EDUCAUSE. Dedicated to technology-enhanced solutions that can improved college and career success, NGLC has awarded more than $17.5 million to date in successive funding waves. Its Wave III RFP for secondary schools (grades 6-12) focuses on whole school reform, one of ED's priorities for school turnaround. Through this competition, NGLC seeks to identify and scale up fundamentally redesigned whole school models that blend the best aspects of bricks-and-mortar and online learning.

[33] http://www.projectred.org/uploads/The-Rise-of-K-12-Blended-Learning.pdf
[34] http://nextgenlearning.org

Florida was one of two states to receive one of ED's Charter School SEA grants in FY2011. Virtual charter schools in Florida are now eligible to compete for funding through its Charter School competitive grant program. While studies have shown some virtual charter schools to be low-performing, Florida provides an example of how charter schools can use digital tools effectively for full-time online learning.

Florida: State Funding

Florida Virtual School Full-Time Program

The 2002 Florida School Code recognized Florida Virtual School (FLVS), a middle and high school online learning provider, as a public education entity and a School Choice option. law, Florida districts must offer virtual instruction programs, and some have elected to create full-time virtual charter schools under a new state law passed in 2011 that permits the operation of virtual charter schools to provide full-time online instruction to eligible students. A virtual charter school must contract with an approved provider of virtual instruction services, such as FLVS. Through a new initiative, Florida Virtual School Full-Time, a partnership of FLVS and Connections Learning, students have the option to enroll in FLVS Full-Time courses through their own district's virtual or blended charter school, or through FLVS Full-Time directly. FLVS Full- FLVS Full-Time cites its results as a pilot program and as a district provider, noting that: We have been rated an "A" school by the Florida Department of Education for the fourth year in a row (2006–10), and an "A" on the first year of school accountability for Virtual Instruction Program (VIP) providers (2010)[35].

(Connections Learning/FLVS)

[35] www.connectionsacademy.com/florida-school/proven-results.aspx

A Call to Action

Building leadership capacity [in state education agencies] involves altering organizational structures and traditional ways of doing business so that state education agency leaders are able to learn from and with districts and schools engaged in improvement efforts[36].

(The Education Alliance, p. 8)

As dedicated educational technology funding for schools diminishes at the federal level, state education agency (SEA) personnel need to be aware of ways in which the integration of educational technology can help them meet strategic goals that run across their formula and competitive grant programs and other funded initiatives. This White Paper has explored the rapidly changing landscape of K-12 educational reform initiatives in the U. S and their relationship to technology integration. While the defunding of the federal Ed Tech program presents challenges for SEAs and LEAs, it also creates opportunities for states to take the lead in exploring the best ways to incorporate digital technologies into education reform efforts overall.

State-led consortia developed the standards for what students need to know for college and career success. They are now developing low-cost, high-quality online assessments, content, and resources that have the potential to transform education while bringing significant cost savings to digitally connected districts. These resources may help districts realize the potential for redirecting and combining school funds in new ways to meet school needs through technology. States are also leading the development of online longitudinal data systems that can be used to gather the evidence that both state and local education agencies need to demonstrate the educational success of their programs.

By incorporating digital technologies into innovative educational strategies that foster deeper student learning and improved academic outcomes, we can help restore America's leadership in education and guarantee a brighter economic future for our nation. State education agencies can play a key leadership role in these efforts to transform education.

[36] C. Unger, B. Lange, E. Cutler, S. Lee, J. Whitney, E. Arruda, and M. Silva, *How Can State Education Agencies Support District Improvement: A Conversation Amongst Educational Leaders, Researchers, and Policy Actors* (Providence, RI: The Education Alliance at Brown University, 2008).

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