



eSATS

eLearning System for Arizona Teachers and Students

ROADMAP

For

ARIZONA K-12 TRANSFORMATION

With

**eLEARNING BASED
SYSTEMS DESIGN**

June 25, 2006

Background

System designs are a powerful means for determining what to do and in what order. Most people get a comfortable feeling then they hear their car or dress was created by a great designer. But few have experience in bringing designs to fruition.

Fortunately we are still living in the automotive age. Everyone is familiar with roadmaps. Most of us are pretty good at using them to get around in a strange city. Our eSATS team came to the realization that our system design for eLearning transformation of Arizona K-12 education while absolutely critical, is not sufficient on its own. Thousands of Arizonans are going to be engaged in the next ten years doing their part to implement the transformation. A road map is needed to garner their hearts and minds and to engage them in implementing the system design.

We could have gone to our friendly cartographer or Google/Yahoo/Mapquest Maps for help. But, it was time to use the civic entrepreneur's lever – "borrow" a roadmap framework and embed the eSATS system design into it.

In 2002 the biotech folks and the Flinn Foundation invested a few hundred thousand dollars with the Battelle Memorial Institute to craft "Arizona's Bioscience Roadmap." It is a great document. We believe if it is good enough for the biotech folks it ought to be good enough for eLearning and K-12 education. Let's take a look at their sections and sequence:

Vision is 10 years: K12 eLearning is not a one time expenditure or effort but must be a major commitment with adequate resources to ensure success over the long haul.

Mapping a plan: We were mapping a human factors system design – a significantly large step beyond a plan.

Why: Arizona students deserve it, and our economy and our global competitiveness depend on it.

Return in investment – Many dollars return per dollar invested. Our children are our future. This time, let's act like we mean it!

Journey has begun – Much of the technical, pedagogical and human infrastructure is in place, accessible or is being developed. 2006 SB1512 for eLearning Centered Schools is prime example.

To Maintain Momentum Arizona Must: Exercise leadership at the highest parenting, educational, executive and legislative levels.

Getting There Will Take: Ten year commitment and resources to expand intellectual infrastructure by building out continuous teacher professional development, digital curricula, data warehouse, broadband infrastructure and a computer on every desk, in every classroom, in every school in Arizona.

Investments Now = Growth Later: The potential return is astounding. Arizona K-12 going from wherever we are now into the top five states in national academic testing with funding requirements of only 2% of total legacy K-12 cost.

Arizona's Place in the eLearning Map – AZ's Bioscience project provides a model of how community, stewardship and political support can move the State into eLearning leadership position.

Paving the Way – initially eSATS system design focuses on the intellectual infrastructure and piloting eLearning Centered Schools.

Achieving the Goal – in year three the massive innovation wave begins to be deployed to all schools, grade levels and subjects.

Looks like this roadmap framework is the way to go! Thanks biotech, we owe you one.

Vision Arizona 2016

Arizona K-12 education is flourishing within an eLearning centric school system designed and implemented with a focus on teacher-student interaction. After passage of the first eSATS legislation in 2006, student academic performance began to soar and high school dropout rates began to plummet. All the while the student population was growing from 1 million to 1.3 million by 2016. Arizona's unique focus on digital curricula and teacher professional development assured successful adoption of eLearning. Arizona now leads the United States in efficiency, effectiveness, accessibility, equity and accountability with an eLearning computer for every student. eLearning has generated large cost savings in construction avoidance, teacher effectiveness, and delivering thirteen K-12 academic years of learning, typically, in eleven to twelve calendar years. The savings have returned per pupil K-12 funding to historical legacy education levels while affording a net twenty percent increase in teacher salaries. The benefits of each graduate's occupational success and Arizona's economic development far exceed the ten year eLearning investment of two percent of legacy education cost.

Mapping Arizona's K-12 eLearning Systems Design

In 2004 the Greater Arizona eLearning Association decided to go beyond planning by creating a systems design. They created a task team to address the system transformation of Arizona's K-12 education to an eLearning model. This roadmap summarizes this system design and the advocacy results in the 2005 and 2006 legislative sessions. It also lays out strategies for cost effective implementation. The eSATS Design Report can be found at <http://azelearning.org>.

eLearning is the application of digital instructional programs and computer-internet systems to support learning. eLearning almost always forms a hybrid with the legacy education tools of books, lecture, recitation and seatwork. It integrates the best of both into a more effective, efficient and accessible form of massively individualized and small team learning. eLearning ranges over all ages and types of formal and informal learning. In fact, it is creating the first major transformation in education since the Prussians invented the "classroom" system 300 years ago. eLearning enterprises both deliver and support 21st century eLearning with products and services in the K-12, post secondary education, work force, military-simulation and individual (life-long learner) markets.

Why Arizona Should Invest in K-12 eLearning

1. Societal – information age demands for levels of academic performance and graduation rate has change radically from fifty years ago.
2. Legacy education reforms and restructuring have made little progress in the past twenty years, and without huge cost increases (25%) the future looks bleak.
3. eLearning is a scalable technology based solution that has a track record of increasing academic performance by an average of one letter grade level across all types and ages of students. (SOURCE: Many meta-studies including those from the Office of the Secretary of Defense)
4. eLearning students will graduate high school with a full set of 21st Century workforce and college preparatory skills, and they will be motivated and skilled for a life span of eLearning;
5. This massively individually skilled and motivated set of home-grown graduates will be a dream-fulfilled for every economic development professional working to position Arizona for global leadership;
6. Arizona K-12 eLearning has an unfair advantage with support of Arizona's \$3 billion cluster of eLearning enterprises. These businesses are global leaders in workforce, higher education, military-simulation, and individual (life-long learner) as well as K-12 markets.

Return on investment

As Arizona made a fresh investment of 2% of our ten year K-12 education costs into eLearning:

1. A transformation of Arizona from one of the poorer performing K-12 states into the top 5 and probably number 1;
2. eLearning will generate cost savings from construction avoidance, teacher effectiveness, reduced book expenditures and elimination of one to two years from the current 13 years to graduation. Also teachers will be paid 20% more and have an additional \$2,500 each year for professional development and mentoring; full digital curricula individualized for each student; and, as the technology evolves, computer systems refreshed every four years;
3. Every student will have a modern multimedia computer. 300,000 older computers will flow each year into Arizona homes that lack computers, quickly erasing the digital divide.
4. High school graduates will earn five times more in their first year on the job than the entire twelve year marginal cost of their eLearning experience;
5. Arizona will be globally recognized as the eLearning break out state to be replicated across the U.S. and around the world;
6. Arizona K-12 eLearning will provide the foundation for Arizona's eLearning dominance at all educational levels;
7. Federal research funding will flow into Arizona's eLearning research institutes and laboratories.
8. Higher value eLearning enterprise products and services will flow into global markets and companies, and quality jobs will flow into Arizona.

Journey has begun

For the past 25 years Arizona school districts have been using computer labs with some eLearning in the classroom. Wilson District adopted one-to-one computing systems in 1993 and Emerald High School in Vail District followed suit with laptops in 2005. In the late 1990's the School Facilities Board (SFB) wired all schools and classrooms and brought the level to one computer for every eight students. The SFB-Cox Education Network then offered email service and instructional access to all schools. Arizona Department of Education is creating a state wide student instructional and data system. The Government Information and Telecommunications Agency (GITA) is pursuing a broadband initiative to all rural and under served urban areas of Arizona with education as an anchor tenant.

A series of educational initiatives needs eLearning for full and effective implementation: Academic Standards, Math and Science, Charter Schools, Formative Assessments, Summative Assessments, AIMS Testing, English Language Learners, All Day Kindergarten, No Child Left Behind, Highly Qualified Teachers, Research Based Curricula, etc.

The eSATS human factors system design for transforming all of Arizona K-12 education is in place. System legislation was introduced in 2005. Senate Bill 1512 in the 2006 legislature secured \$3 million funding for a middle school math eLearning pilot program for 10,000 students and a ten year eLearning Task Force to guide implementation of eLearning for all students. Arizona Department of Education received \$2.5 million to accelerate development of the data warehouse with decision support system. Support is growing for this ten year initiative with major communities: education, business, government, philanthropy and eLearning enterprises. Their stewardship is being united and coordinated from within a P20 collaboration model.

To Maintain Momentum and the Vision of eLearning For All Students, Arizona must:

Increase the general public's knowledge and understanding of current and emerging K-12 eLearning and the power it has to dramatically improve academic performance for every student;

Assure that statewide K-12 eLearning is at the center of economic, governance and education policy;

Garner full support and leadership from organizations in education, governance, business and eLearning enterprises;

Convince Arizona's legislature and governor to commit to a ten year investment equivalent to 2% of ten year legacy K-12 costs;

Have year to year success in schools and at the legislature with committed lobbying support from all stakeholders;

Remain resolute in our commitment to lead with teacher education and professional development integrated with digital curricula;

Continue to demonstrate and display Arizona's global position as the center for research, development, implementation and support of eLearning.

Getting There Will Take:

A ten year long commitment with steadfast patience in the early years. The intellectual infrastructure must first be built along with pilot schools. It will be several years before there are enough eLearning Centered Schools with eLearning savvy teachers to begin the significant rise in Arizona statistics. With these innovation drivers, the academic performance curve will be a hockey stick.

Champions. Leadership and stewards are needed at all levels. From the Governor, Superintendent of Public Instruction and legislative leaders to school level educators, each must provide collaborative leadership across the state to implement the school by school transformation.

Strategic Focus. Short range focus of one time purchase of computers and wired schools is behind us. Strategic focus on implementing a long term, total system solution is the road to success.

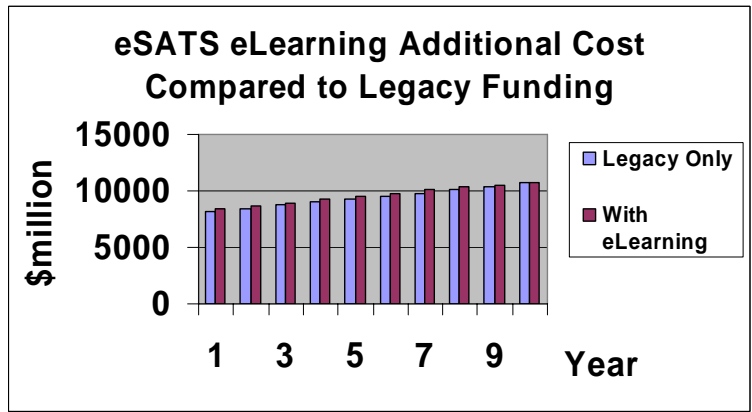
Strong public-private collaboration. Arizona has a strong history of working together with the great example of Arizona's Biosciences initiative. The Southern Arizona and Arizona Technology, Arizona Business Education, Business Education Roundtable, Innovation and Technology, and P20 Councils are now joined by the new eLearning Task Force. They are aggressively addressing 21st Century public-private policy issues. eLearning is on an ascendancy as the K-12 transformation is implemented.

Acceptance by educators. The eSATS system design places an awesome responsibility of transformation on our Arizona Department of Education (ADE), colleges of education, school districts, schools and classrooms. This transformation will be effective only with creative and enthusiastic commitment at all levels.

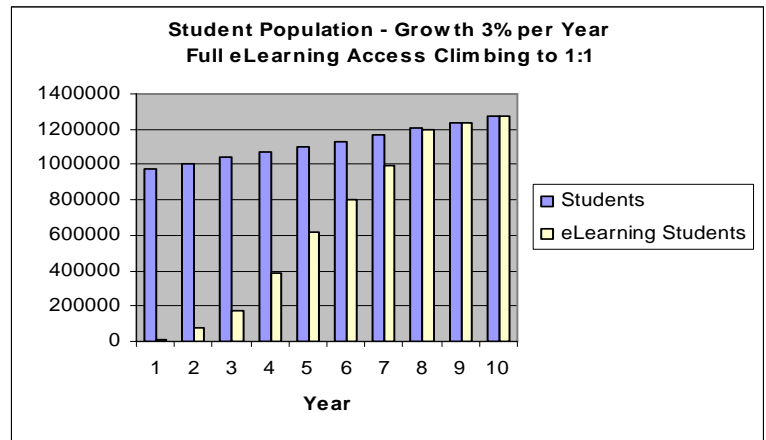
Active state level support. Systems must be in place for success. These include an extended and integrated ADE-School District data driven decision support and instructional delivery system. Colleges of education must transform to produce eLearning savvy teacher graduates. The Arizona university system will be home to the Digital Curriculum Institute (DCI) to assess the quality of, and provide access to the best available digital curricula. The DCI will use a portal and instructional technologist extension service to the classroom. Arizona universities and ADE will create a Teacher Education and Professional Development Institute. It will provide access to the most effective learning sources to transform the practice of 50,000 going on 70,000 educators to a set of certification standards. The auditor general will be tasked to create the rules for funding individual students based on subject mastery of an academic year. The Communication Infrastructure Advisory Committee is expected to be successful with their statewide Broadband Initiative.

Invest in Transformation => eLearning Academic Gains Become Self Sustaining

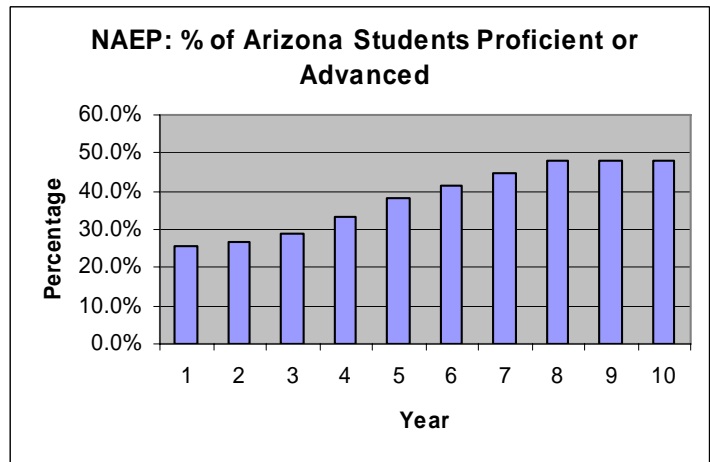
Hard to see the 2% increase in cost that drops to cost neutral in ten years.



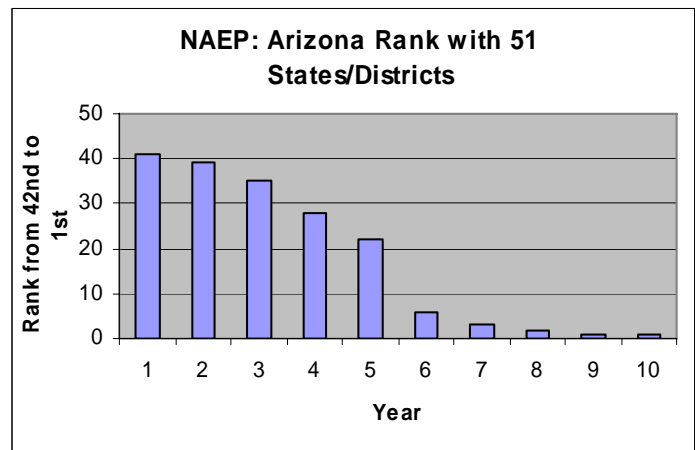
As Arizona student population soars the number of eLearning supported students soars even faster.



Based on the best data, eLearning will double the number of Arizona students in Proficient or Advance Classifications within the NAEP national exam for 4th and 8th math and reading.



From our current 41st NAEP ranking Arizona will be in the first quartile by the Arizona Centennial year and beat out Massachusetts for number 1 within 10 years.



Note: Lower on the chart is better

Arizona's Place in the K-12 eLearning Map

Encouraging:

Wilson Elementary District, the most disadvantaged in Maricopa county, adopted one-to-one elearning 12 years ago. They have steadily progressed from dead last to academic leadership among the 13 feeder districts to Phoenix Union High School district. Empire High School and several charter schools have adopted one-to-one eLearning with growing success.

All schools are wired (a National first), and there are many eLearning experts throughout the state.

Arizona has one of the largest clusters of eLearning enterprises, including the Corporate Headquarters of Pearson Digital Learning the largest K-12 digital curricula company in the world.

Challenges:

The Cox Education Network sunset in June 2005, due to lack of state level funding.

Arizona has a history of frugal spending on K-12 education, and eSATS eLearning design requires new investment.

eLearning is a new, transformational concept in an industry that is not designed for rapid change nor rewarded for risk taking.

No state has yet initiated total eLearning transformation of K-12 education, Arizona would be the pathfinder.

Making a Mark on the K-12 eLearning Map

On June 21st, 2006 of SB1512 eLearning Centered School bill, with a three year \$3 million appropriation for eLearning middle school math pilot for 10,000 students and a ten year high level eLearning task force appointed by the governor and legislative leadership, was passed and signed. This bill opens the door for passage of the legislation needed for full implementation of eSATS' eLearning system design

Arizona's eLearning transformation must seize not only local interest but become nationally acclaimed. National leadership can reduce the barriers to federal government, corporate, and foundation support.

Susan Patrick, the immediate former Director of the U.S. Department of Education's Office of Educational Technology, reviewed the eSATS System Design in her quest for an eLearning breakout state. She stated that if implemented, "Arizona could be the model state for the nation."

The Digital Curriculum Institute and Teacher Education and Professional Development Institute will secure worldwide clients to enhance their ability to serve to Arizona children.

The eSATS system design facilitates significant field testing by K-12 eLearning researchers in Arizona schools. Arizona will be an early adopter of emerging eLearning products and services. Arizona will become the center of the vortex for K-12 eLearning research with significant benefit for jobs and economic development in addition to our existing universities, enterprises and students.

By starting as a state mired in the fourth quartile of academic performance our stunning rise (like Wilson District) in ten years to lead the first quartile will make Arizona a super star. We will not only have solved the K-12 academic dilemma but will assure a 21st Century work force that leads global competitiveness for our public-private employer community and our workers

Time Line for Success

Since this is a roadmap, let's use road analogies.

Paving the Road, Building Bridges

Ten years is a short time for total transformation of any industry, especially K-12 education. Creating intellectual infrastructure and transforming schools will be on parallel paths. eSATS system design is high level with many detailed aspects to be developed at the school level. The rapidly changing technologies and classroom methods are expected to produce 2016 schools that are quite different than the 2007 pilots. Here is the high level schedule:

- 2005 – SB1181 -- Introduced eSATS fully funded system design concept (\$0);
- 2006 – SB1512 -- Established eSATS launch with Task Force (high level governance), middle school math pilot program and data-decision support system boost at ADE (total appropriation, \$5.5 million);
- 2007 – Launch eSATS intellectual infrastructure: Digital Curriculum Institute, Teacher eLearning Professional Development and Education Institute, broadband Initiative to all rural districts, laptop-projector-smart board-essential suite of software to all teachers, instructional system with formative assessment and Auditor General rule making. Fund 10 pilot eLearning Centered Schools. (\$80 to \$120 Million)
- 2008 - 2009 – Transform 100 eLearning centered schools and bring statewide infrastructure (both physical and intellectual) to full operation (\$150 to \$250 million a year).

Building Our Communities Along the Road

- 2010 – 2011 Accelerate transformation to 500 schools as cost savings start kicking in. (\$300 - \$400 million a year)
- 2012 – Celebrate Arizona Centennial with Arizona breaking into the top quartile of academically performing states with 1000 schools participating.
- 2013 to 2015 – Continuously improve the eSATS System Design as Arizona based research delivers better eLearning solutions. Bring the number of schools in the system to 2000.
- 2016 – Celebrate the final Arizona school choosing the 2016 eSATS model and Arizona moving into U.S. academic leadership. (Average \$150 million a year as cost savings takeover.)

Stewards:

We must be committed stewards in our own way, bringing our talents and resources to bear if eSATS is to succeed.

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