

SETDA

Case Studies 2012

SETDA published a series of case studies from 28 states to showcase examples of how ARRA EETT grant funds have impacted teaching and learning. SETDA collected data for the case studies through a variety of mechanisms, including a detailed survey of the participating Local Education Agencies (LEAs), personal interviews with grant managers and teachers, and reviews of state and local program evaluations. The case studies highlight powerful examples of innovations resulting from the federal state/local partnerships created by the EETT program. They illustrate what can happen when “seed money” in the form of federal grants is leveraged by states, local school districts, and individual schools. Teachers and students across the country continue to benefit from these innovative programs as shown by higher formative and standardized test scores, increased technology literacy and technology integration, improved access to both digital curriculum resources and project-based learning initiatives, and increased student engagement. Access the case studies at <http://www.setda.org/web/guest/casestudies2012>.

Featured States:

Alabama
Alaska
Arizona
Arkansas
Connecticut
Delaware
Georgia
Iowa
Louisiana
Maine

Maryland
Michigan
Missouri
Nebraska
Nevada
New Hampshire
New Jersey
New York
North Carolina
Ohio

Pennsylvania
South Carolina
South Dakota
Tennessee
Texas
Virginia
West Virginia
Wisconsin



Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Alabama’s EETT Competitive Grants

The goal of the Alabama Department of Education’s ARRA EETT Competitive Grant program was to increase graduation rates. The grant program provided the equipment and professional development support to establish 21st century classrooms in grades 7 to 12. The focus was to model 21st century classroom instruction and to help increase student achievement statewide.

Alabama 21

Gadsden City Schools, Alabama

November 2009-September 2011

The purpose of the Alabama 21 project was to immerse the 9th Grade Academy students of Gadsden City High School into a technology-rich learning environment to stimulate interest, promote learning, and improve achievement. Alabama 21 reformed traditional classroom instruction and learning opportunities by integrating 21st century technology tools.

Demographics

Gadsden, Alabama is located in Etowah County, in the foothills of the Appalachian Mountains and 65 miles northeast of Birmingham. Gadsden has been affected by the recent economic downturn. In the last decade, a major industry, Gulf State Steel, went out of business. There is now one major employer in the area, the Goodyear Tire plant. With a decrease in job opportunities, the population has also declined significantly. Gadsden City Schools is home to eight elementary schools, three middle schools, and one high school. The 9th Grade Academy is housed in Gadsden City High School. High school enrollment is approximately 1,600 with a free and reduced lunch rate of 71%. The 2011-2012 AYP report for the school indicates a “Clear” status for all 17 indicators and a 92% graduation rate. The school features a growing advanced placement (AP) program, offering 10-credit AP courses and 9 pre-AP courses.

Project Description

Alabama 21 focused on providing technology tools and professional development to participating ninth grade teachers to increase access to technology, student achievement, and technology literacy. Ninth grade is a pivotal year. Historically, it had the highest retention rate and lowest attendance rate. Also, grades 9 and 10 had the highest dropout rates. The Alabama 21 project centered efforts and funds on the 9th Grade Academy to engage students, increase achievement, and improve the graduation rate. Before the Alabama 21 program was implemented, the 9th Grade Academy classrooms each had one or two desktop computers with hardwire

internet access. In an effort to support this grant program, local funds were used to provide wireless access for the Academy. Alabama 21 provided devices, at a three-to-one student-to-laptop ratio, response systems, document cameras, digital cameras, projection systems, and interactive whiteboards. Ten technology-rich classrooms were established in the core subject areas of English, social studies, and science. The laptops were housed in five 30-station laptop carts and shared among the 478 ninth grade students. Ten ninth grade teachers received professional development via Moodle in designing project-based learning activities and cross-curricular activities, developing Alabama Learning Exchange (ALEX) lessons, and incorporating online resources.

ARRA EETT Grant Details	
Grant Focus	High Access, Technology-Rich Learning Environment, Ongoing Professional Development
Beginning/End Date of Grant	November 1, 2009–September 30, 2011
Locale	Rural
Funding	\$250,000 Federal Funds \$25,000 Local Funds
Grade Level (s)	9-12
Number of Teachers Impacted	10
Number of Administrators Impacted	1
Number of Students Impacted	945 (over two years)

Project Implementation

During the 2009-2010 school year, the focus was on acquiring and installing equipment, orienting students, and providing initial professional development on the use of the hardware. In the spring of 2010, ninth grade students and their parents were provided an orientation of the program, and full implementation began in the fall of 2010.

Alabama 21 grant technology—it has brought life to my classroom for my students as well as myself.

- Alexis Wise, English Teacher,
Gadsden City High School

Professional development was ongoing for the 10 Academy teachers, occurring on a formal and informal basis. Teachers initially worked with vendor-provided instructors to learn to use the new classroom tools. The school technology team, positions funded through formula EETT grant funds, provided ongoing support through coaching. Academy teachers also had the opportunity to work with visiting technology professionals, such as Wesley Fryer and Chris Lehmann. Overall, teachers received approximately one day per month of in-person professional development sessions. Three of the Academy teachers attended the ISTE 2011 conference and returned to share best practices with their colleagues. These teachers played a key role in the district-wide in-service day, EduTech. During EduTech, all instructional staff from the district attended training sessions conducted by outside facilitators as well as by Academy teachers. In addition, the Academy teachers, and other school technology leaders, provided valuable peer-to-peer training incorporating many of the technology tools and strategies from this grant project. Many of the teachers also had lessons accepted to Alabama's state portal, ALEX, which requires a stringent approval process before lessons are made available to teachers statewide. The project culminated in a Tech Saturday event in the fall of 2011, during which Academy teachers had an opportunity to present their technology best practices.

Classroom Examples

- In a history classroom, before this grant, the class was taught using many handouts, textbooks, and teacher lectures. With the technology and professional development, the history class became more project-based. The teacher uses webquests as a way to introduce upcoming eras or themes. A webquest is a project where students are guided through research, working independently or collaboratively. Students organize their research into a final product that may be in the form of a letter, presentation, or game. Webquests help build background information and set a foundation for more focused classroom activities. For example, in studying World War II, students completed a webquest on the war. Students learned about the war through independent research and used that background information to tackle the next activity, interviewing a World War II veteran and producing a video. They were able to create more informed questions and present war information in their video. Students worked in small groups to plan their interview, record it using a Flip camera, and edit and produce the video using a laptop. DVDs were created of all the final products and issued to students, interviewees, and other teachers in the history department to share in their classes.
- Before the integration of technology, one high school English teacher taught parts of speech by verbally explaining rules, having students work in the textbook, and complete multiple worksheets. With the technology, the teacher presented information to her students with a PowerPoint presentation, and engaged the students with a mobile interactive whiteboard. Students took turns identifying

I believe one has to relate student learning to student experiences and by incorporating technology, students are more eager to learn due to the fact that they are using technology every day of their lives.
-Jeff Colegrove, History Teacher,
Gadsden City High School

which words in a sentence belonged to different parts of speech, then discussed and checked each other's work. They also used a student response system to practice identifying the parts of speech of shared words. The immediate feedback enabled students to learn from errors and take a more active role in mastering the concept.

Evaluating Effectiveness

State Benchmark indicators for student and staff technology skills and utilization increased, in almost all cases, beyond the goal levels of the project. Teachers were assessed using an online survey each spring, the IMPACT Teacher Survey.

Benchmark Data

- Benchmark 1.2: Percentage of students that make use of current and emerging technology in the learning process.
 - ✓ 2008—18 %
 - ✓ Target Goal—25%
 - ✓ Spring, 2011—33.8%
- Benchmark 1.6: Percentage of teachers that model the appropriate use of technology tools and resources.
 - ✓ 2008—42%
 - ✓ Target Goal—45%
 - ✓ Spring, 2011—59.6%
- Benchmark 1.8: Percentage of educators that use technology to communicate with stakeholders at the local, district, and state level.
 - ✓ 2008—53%
 - ✓ Target Goal—60%
 - ✓ Spring, 2011—67.18%
- Benchmark 2.1: Percentage of educators that foster and nurture an environment that supports innovative uses of technology.
 - ✓ 2008—36%
 - ✓ Target Goal—40%
 - ✓ Spring, 2011—52.3%
- Benchmark 2.2: Are technology resources provided to support the learning and technology needs of the school and community?
 - ✓ 2008—33%
 - ✓ Target Goal—37%
 - ✓ Spring, 2011—53.1%
- Benchmark 3.1: Teachers, administrators, and school staff are provided high quality, research-based, job-embedded, technology professional development that is aligned with local, state, and national standards and course of study content standards.
 - ✓ 2008—29%
 - ✓ Target Goal—33%
 - ✓ Spring, 2011—30.8%

Although the effect on the school graduation rate will not be realized for 2 more years, it is noteworthy that of the 31 students who dropped out of the high school during the 2010-2011 school year, only 3 (9.7%) were from the 9th Grade Academy. Historically, the majority of our high school dropouts leave school during their ninth and tenth grade years.

Moving Forward

The technology tools that were acquired for this project will serve the 9th Grade Academy for many years to come. Local funds provided through city government will be used to maintain equipment and provide periodic refresher training for teachers. Expanding the program to a full 1-to-1 initiative is a goal of the district. Funding is being sought and consideration being given to lower cost options, such as netbooks or tablets. The Academy teachers will continue to receive support from the school's technology team and the statewide program, Technology in Motion, funded by the state of Alabama. As well, the Academy teachers will continue to conduct their own peer training and mentoring within the district.

Resources

Gadsden City Schools

www.gcs.k12.al.us

Gadsden City High School

<http://gchs.gcs.k12.al.us>

Alabama's State Portal, ALEX

<http://alex.state.al.us/index.php>

Alabama Department of Education

<http://alsde.edu>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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Alaska's EETT Competitive Grants

Alaska's ARRA EETT competitive grants focused on helping students and teachers achieve proficiency in technological literacy and skill in integrating technology into the curriculum. Grants that were selected built models that could be replicated in other communities. Presentations were given at the Alaska Society for Technology in Education (ASTE) conference, Alaska's annual technology conference, to ensure sharing and modeling of the final products.

Wave VII: Turning Our School Inside Out Sitka School District, Alaska July 2010-June 2011

With district funds and other federal grant dollars providing wireless access and equipping schools with technological tools, such as interactive whiteboards, document cameras, and student response systems, the ARRA EETT grant, Wave VII: Turning Our School Inside Out, provided focused professional development for sixth grade teachers as a means to foster collaboration and communication, to integrate technology, and to change the educational experience for Sitka students.

Demographics

Sitka is located on Baranof Island in what is considered the panhandle of Alaska and can only be accessed by plane or boat. The population of Sitka is approximately 9,000 and is the fifth largest city in Alaska. The Sitka School District (SSD) consists of two elementary schools, one middle school, and two high schools, serving approximately 1,300 students. Approximately 50% of SSD students are Caucasian, 30% are Alaska Native, and the remaining students have a variety of ethnic heritages with Asian being the next largest student population subgroup.

Project Description

The Wave VII: Turning Our School Inside Out grant focused on providing professional development to five sixth grade teachers in Sitka's only middle school. Historically, sixth grade students were having difficulties transitioning to the middle school, and the intent of the grant was to change the traditional classroom experience through the integration of technological tools. Furthermore, by targeting sixth grade, the intent was to set the stage for a positive, technologically enhanced middle school experience. The hope was to have students feel connected to the academic content and their classmates, thus helping with

the transition to the rest of their school career. Seventh and eighth grade classrooms had been the focus of previous grants yet never received the intense professional development needed to maximize technology integration. By targeting sixth grade students and teachers, the intent was to "trickle up" the experience and expertise. Through formal, professional development meetings and informal discussions, teachers and administrators collaborated and shared internally across the district. The Wave VII teachers provided a vision of meaningful technology integration that allowed teachers, colleagues, and the community of Sitka to understand the critical need to empower students to be collaborators and contributors to their own learning.

ARRA EETT Grant Details	
Grant Focus	Project-Based Collaborative Learning and High-Access and Technology-Rich Learning Environment
Beginning/End Date of Grant	July 2010-June 2011
Locale	Rural
Funding	\$99,778
Grade Level(s)	Grade 6
Number of Teachers Impacted	5
Number of Administrators Impacted	2
Number of Students Impacted	88

Project Implementation

To best prepare for the influx of technology tools and the increased use of the online content, the school district used ARRA: State Fiscal Stabilization Funds to help build a wireless broadband network and to purchase an online content management system for the schools. A majority (62%) of the Wave VII grant money was spent on professional development. Remaining dollars went to technology purchases, including a laptop cart to be used exclusively by the sixth grade team.

Our confidence with the technology grew greatly due to the collegial community. I think this was the most powerful part of the project.
- Deborah Riva, Wave VII Teacher

TheWave VII grant provided professional development and technology tools for five Blatchley Middle School (BMS) sixth grade teachers. The Wave VII teachers represented each of the four core curriculum areas (Language Arts, Math, Science, and Social Studies) and the technology teacher. Teachers received a total of ten professional development days organized into three distinct focus areas: August Kick-Off (two days), Focus on Technology Integration (two days), and Learning About Engaged Learning (six days). During the August kick-off, teachers met with a consultant to set the stage for technology integration and targeted training was provided in the use of the interactive whiteboards and student response systems. Teachers were given time to create and share a technology-enhanced lesson they would use the first week of school. The remaining professional development days occurred throughout the school year, typically on Saturdays. Teachers were trained in technology integration and the use of specific technology tools, and were provided the opportunity to develop and share lesson plans. Throughout the school year, teachers used online tools to share resources and experiences and also met in person each Tuesday to collaborate and focus on student learning. The on-going professional development allowed teachers the opportunity to build their skills and learn from one another throughout the school year.

Classroom Examples

- In the Social Studies classroom, the teacher designed a geography game to review landforms. Each student received a different landform written on a piece of paper for “his or her eyes only.” Students were then randomly selected to come up to the front of the room and act out his/her assigned landform in a charade format via the video document camera tool. After 30 seconds of acting, students in the audience texted their response via the interactive response systems and results were posted on the screen. This activity became a template for other topics and other subject areas.
- In a cross-disciplinary lesson, integrating science, history, health, and technology, students were shown Alaska seaweed species and recipes. Next, students researched various seaweed recipes on their laptops, and created a digital seaweed card that included a picture, classification, explanation of how to harvest, and a recipe. Cards were printed and shared with friends and family.

I let students teach me technology techniques and praised their expertise! I saw student productivity double along with their excitement of the research.

- Patty Dick, Wave VII Teacher

Evaluating Effectiveness

The success of the Wave VII grant helped to define professional development for Sitka School District teachers in the area of integrating engaged technology-infused teaching and learning. The ongoing professional development established through regular face-to-face meetings and the use of online tools was often cited as the most important part of

program's success. The support the teachers received from their peers was critical in terms of understanding successes and failures and how to improve for the future.

The sixth grade teachers emerged as school and district leaders and served as models for innovative teaching. For example, at the Technology Infused Learning Conference, the Wave VII teachers taught sessions in a mini-conference environment for their secondary colleagues. They also presented at the Alaska Society for Technology in Education (ASTE) conference.

The grant evaluator surveyed the teachers at the end of the grant period, and as a result of the responses found three themes that emerged from the data.

Themes

1. The grant had a positive impact on how teachers teach.
2. The grant had a positive impact on how students learn and behave.
3. Collegiality was a key to success.

Moving Forward

A critical mass of stakeholders, students, parents, school board, teachers, and administrators embraced the journey toward relevant teaching and learning for today's students. Even in the face of declining revenue, the school board increased the technology budget for the 2011-2012 school year. This program will continue to expand; the teachers involved in the grant will mentor other teachers. The progress made in acquiring hardware and bandwidth will continue to open new opportunities for all teachers in the district.

Resources

Sitka School District's Grant Page
<http://sitkaschools.org/Page/288>

Alaska's Full Evaluation Report of the Wave VII Competitive Grant
<http://tinyurl.com/6sksrt2>

Alaska Department of Education and Early Development's Educational Technology Resources
<http://eed.state.ak.us/EdTech/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

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Arizona's EETT Competitive Grants

In Arizona, the ARRA EETT competitive grant provided funding to assist local districts in creating and expanding 21st century, technology-rich classrooms, and helped to ensure that every student is technologically literate by the end of eighth grade.

iAchieve Project

Creighton Elementary School District, Arizona March 2010-September 2011

Creighton's iAchieve project addressed specific academic needs by introducing an environment of high-access, 1-to-1 mobile devices to support instruction. The funding provided iPod Touches and iPod Learning Labs in 18 third grade classrooms across the district and two Spanish immersion classrooms in one school. Funding also provided training for teachers to manage and integrate the tools and online content into the curriculum.

Demographics

Creighton Elementary is a K-8 school district based in Phoenix, Arizona. The district has 10 schools with approximately 750 staff members providing instructional and support services to 6,848 students. The student population is 85% Hispanic, 6% Caucasian, 5% African American, 3% Native American, and 1% Asian. In addition, 94% have low socio-economic status, and 31% of the students are English Language Learners. The majority speak Spanish at home and have little to no experience reading or speaking English before entering school.

Project Description

The iAchieve project was designed to create 21st century learning opportunities and to use technology to close the performance gap in third grade reading. Third grade students were identified as being at high risk to fail state achievement expectations. At the time of implementation, six of the seven project schools were in Title I School

Improvement, and the district had not achieved Adequate Yearly Progress (AYP) with three consecutive years of reading for the third grade in the English Language Learner (ELL) subgroup. At

one additional school, the project also supported English reading instruction and second language learning (Spanish) for native English speakers through math and science instruction in kindergarten. Grant funds were used toward the purchase of 700 iPod Touches and professional development training. Creighton Elementary School District has a strong tradition of supporting educational technology tools. Each Creighton teacher already had access to a laptop, classroom projector, and document camera. Adopting the use of handheld devices was a good match for third grade students. The devices were easily handled and managed by the students and many software applications were not only engaging to this grade level but also available at no cost.

ARRA EETT Grant Details	
Grant Focus	High Access, Technology-Rich Learning Environments
Beginning/End Date of Grant	March 24, 2010- September 30, 2011
Locale	Urban
Funding	\$400,000 Federal Funds \$105,033 Local Funds
Grade Level (s)	Grades Kindergarten and 3
Number of Teachers Impacted	27
Number of Administrators Impacted	10
Number of Students Impacted	700

Project Implementation

In June of 2010, participating teachers attended a week-long training session to set up their learning labs with the iPods and to practice using educational apps. The training also included Intel Teach's professional development components and instruction on project-based lesson planning. During the school year, teachers had access to two full-time Technology Peer Coaches formally trained in adult

The iPods are a great way to increase student engagement. One of the most essential things in teaching students is to have them engaged, excited, and wanting to learn.

- Third Grade Teacher

mentoring and coaching concepts. The coaches visited classes on a weekly basis, providing professional development throughout the school year. The coaches provided real-time, hands-on support in the classroom and in lesson planning. A project website was developed to share project successes and challenges, including staff blogs.

Students began using the iPods at the beginning of the 2010-2011 school year. Initial emphasis was on improving student reading fluency through iPod recordings. Students recorded themselves reading stories, passages, and high-frequency words. They worked independently or with a partner; one student would read the passage while the other listened, timed the reading, and recorded errors. Recordings became a digital running record for students, with rubrics being used to evaluate and set goals for the next recording. The iPods were also used to create flashcards and digital stories. A variety of educational apps and internet resources accessed via the iPod also supported the curriculum. In addition, two kindergarten classes at Squaw Peak Traditional Academy piloted a Spanish immersion program that allowed fluent English speakers to learn Spanish. The iPods were used to aid in their learning of Spanish while also supporting their developing literacy skills in English.

During this grant implementation, teachers utilized common planning, which was already in place, to make sound decisions on application use and integration. For example, teachers found that “drill and kill” apps did not have the impact or usefulness to students as apps where students created and shared products, such as “StoryKit” and “Sonic Pics.”

In the summer of 2011, three-day training was provided for returning and new teachers and presented teachers with an opportunity to share resources, lessons, and ideas.

Classroom Examples

- During a reading instruction, third graders learned about the organizational features of expository texts, such as a table of contents. Usually students explored books and completed worksheets to learn the concept. Using the StoryKit app on the iPod Touch, students created their own expository books that included these features. They drew pictures, wrote text, and included a table of contents, index, and glossary for their books. This app allowed students to record themselves reading their books and to share their products with classmates.
- In another example, while learning about persuasive text, third graders, in small groups, created a new brand of cereal and wrote commercials persuading others to buy it. Next, students presented the cereal commercials to their classmates. Students in other participating classrooms watched the

I like my iPod because it is like playing games all the time, even when you say we are learning!
– Eric, Third Grade Student

commercials via Skype, and parents were also able to observe and participate in the presentations because of the online access.

Evaluating Effectiveness

iAchieve third graders improved in reading proficiency and technological literacy, based on the spring 2011 assessments. On common formative assessments, where iPods were integrated into initial instruction of the performance objective, results in iPod project classrooms were significantly better than those in non-iPod classrooms.

School Data

- iAchieve third graders improved by 8% from 2010 to 2011 on the Arizona Instruction to Measure Standards (AIMS) reading assessment, while students in non-iPod classrooms improved by just 0.5%.
- iAchieve third graders achieved a 7% pre-post growth in student technological literacy.

In addition, concepts considered rote to teach and learn, like the organizational features of a book, came alive when students created their own digital books. The books included a table of contents and index, along with recorded audio explaining the purpose of the book features. When focused in this manner, students showed much greater content understanding and retention of knowledge, as observed by teachers.

Moving Forward

Moving forward, the Creighton Elementary School District will maintain one Technology Peer Coach. This coach, along with the district Technology Trainer, will continue to support iPod classrooms and will also help implement a small pilot of 60 iPads at two additional schools that were not part of the original project. The district used capital funds to purchase the iPads, demonstrating the importance the Creighton School District places on providing effective technology tools. In addition, administrators and teachers will continue to be cognizant of how software applications are selected and implemented into curriculum, considering age, content, and instructional appropriateness.

Resources

iAchieve Project
<http://tinyurl.com/74fztu5>

iAchieve Classroom Videos

- Students Training Students: <http://vimeo.com/2910318>
- SonicPics Tutorial Video: http://youtube.com/watch?feature=player_embedded&v=2ks_PbBz0A
- iAchieve Parent Video: <http://vimeo.com/28074929>
- High Frequency Sight Word Videos: http://creightonschools.org/?page_id=2599

Creighton Elementary School District

<http://creightonschools.org/>

Arizona Department of Education

<http://azed.gov/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

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Arkansas's EETT Competitive Grants

In Arkansas, the focus of ARRA EETT funding was to create 21st century learning environments, develop higher level thinking skills and increase student engagement. Through the use of digital content, teachers developed interactive lessons, and students were exposed to a variety of technology rich learning activities, including interactive resources and model simulations.

ExploreLearning: Math and Science Gizmos Statewide Initiative July 2009-September 2011

Northwest Arkansas Education Cooperative managed the statewide grant, which provided professional development and online math and science simulations for Arkansas's sixth, seventh, and eighth grade teachers and students. Professional development included workshops, one-on-one training, and coaching. The cooperative contracted with ExploreLearning to provide a library of online simulations for the math and science curriculum.

Demographics

Approximately 480,000 students are enrolled in Arkansas's 1,145 public schools. Of those schools, 67.6% are Title I schools and 59.6% of students are eligible for free or reduced lunch. Arkansas is divided into 16 educational cooperative units to help serve the districts. The cooperatives support the school districts by providing professional development and technical support.

Project Description

At the time of the grant, 46% of Arkansas students entering college had to take remedial math courses. In science, 59% of students taking the state End of Course (EOC) biology exam were not proficient. This data suggested a lack of understanding of key math and science concepts. This project's intent was to assist teachers in creating 21st century learning environments by providing access to digital content in math and science. In addition, the program assisted teachers in using technology as a tool for translating abstract ideas into concrete representations, resulting in deeper understanding for students.

ARRA EETT Grant Details	
Grant Focus	Digital Content and High-Quality Assessments
Beginning/End Date of Grant	July 2009-September 2011
Locale	Statewide
Funding	\$500,000
Grade Level (s)	6-8
Number of Teachers Impacted	3,226
Number of Administrators Impacted	600
Number of Students Impacted	113,746

Grant funds were used to purchase a one-year subscription to ExploreLearning's Gizmos, the world's largest and most advanced library of online math and science simulations. All of Arkansas' sixth, seventh, and eighth grade math and science teachers and their students were given access to the content so they could explore, experiment with, and visualize math and science topics. The simulations were accompanied by customizable inquiry-based lessons, which included real-time assessment, reporting, and instructional background for teachers. Gizmos could be presented to students using a projector and/or interactive whiteboard as well as on individual laptops or desktop computers. Most importantly, funding was also used for professional development, including the position of a project manager. The project manager provided train-the-trainer sessions, workshops and coaching across the state. With training and access to the content, teachers better utilized existing technologies, such as interactive whiteboards and laptop computers. The grant funds did not include the purchase of any devices and therefore implementation varied based on the available technologies.

Project Implementation

In the fall of 2010, all Arkansas districts received the Commissioner of Education's memo announcing the new program. Awareness sessions regarding the project and its benefits to middle grade students and teachers were held in the 16 regional service cooperatives. Two-day initial train-the-trainer sessions were given in various regions of the state so "Gizmo trainers" could begin training teachers in their respective areas on the setup and use of the digital content. Teachers, curriculum specialists, and media specialists

volunteered to be Gizmo trainers. Over 120 training sessions were subsequently held throughout the state, led by the Gizmos project manager. ExploreLearning also provided an online training course. The initial course included demonstration, guided instruction, and hands-on practice with the tools. Approximately 1,627 teachers received formal training though it was not a requirement for access to the content. Teachers simply needed to request login information to access the program, which was available online. Teachers then registered their students who were provided full access to the content for both classroom and home use. Parents were also provided access through their child's student login. To assist teachers in using the simulations to content and learning standards, the ExploreLearning website provided the correlations to the Arkansas Frameworks for math and science, and the Gizmos project manager created a spreadsheet of correlations to the most frequently tested Student Learning Expectations (SLEs) in sixth, seventh, and eighth grade math, and EOC algebra.

Presentations were made at multiple state conferences during the year to continue promoting the integration of Gizmos in the math and science classrooms. An electronic newsletter produced by the project manager, the *Arkansas Gizmo Gazette*, was sent out across the state to highlight upcoming training sessions, communicate support available, and spotlight Arkansas teachers and districts that were using Gizmos to enhance learning.

Classroom Examples

- In seventh grade, students learn about plant growth. Before using Gizmos, students would have learned about plants through the textbook, teacher lectures, and growing plants in the classroom. Using the *Growing Plants* Gizmo, students simulated the growth of plants and manipulated four variables: seed type, soil additives, amount of water, and amount of light. Students used the Gizmo to grow the biggest plant while investigating the effects of each variable. At the beginning of the lesson, students completed Prior Knowledge Questions and discussed as a class key terms, such as compost, fertilizer, mass, seed, soil, and variable. Students then worked in small groups to complete the *Growing Plants* Gizmo. As students worked, the teacher and students discussed the effects of the variables, controlling an experiment, and the results. Students then grew their own plants with better knowledge of how to control the variables.
- In Algebra I, students used the *Distance-Time Graphs* Gizmo to learn what the slope and y-intercept represent, and how distance and time are displayed on a graph. The *Distance-Time Graphs* Gizmo shows a runner on a track along with a graph that represents the runner's position over time. By changing the graph, students

I have used Gizmos as a full lesson on a specific standard, like spring and neap tides. It was wonderful to see the students have an “ah-hah” moment when the moon and sun lined up during full and new moon. The students were able to manipulate the time and the moon phases to watch the tides change from spring to neap. They had a full understanding of the gravity of the sun and moon and their effect on the tides.

– Kelly Allison, Science Teacher

manipulated the runner. The students were better able to visualize a graph's representations, time versus distance. Students explored how the graph displayed the speed of a runner and interpreted a graph when two runners were displayed. Finally, they solved problems using the graph. In the past, students may have just worked on graph paper, plotting points without the benefit of a corresponding model to provide context to the graphical representation.

Evaluating Effectiveness

With the support provided, teachers increasingly integrated the digital content and simulations over the course of the project. Teachers noted the ease of using the tools and particularly the ability to differentiate the content with students. For example, some students needed to run a simulation multiple times for better understanding while other students were able to move on to the next simulation. Students could also access the content at home to reinforce concepts. Many teachers noted that Gizmos provided content and concepts that were often difficult to put in words, and the models and simulations led to great moments of understanding for students. Over the course of the project, 3,226 teachers requested logins for 113,746 students. While it is too early to make the correlation between student achievement and the use of these digital tools, teachers reported increased student understanding and engagement.

The simulations allowed the students to actually be a part of the experiment or activity as they manipulated variables and control data input. This makes it much, much easier for students to make the leap from simply memorizing definitions to actually understanding science and mathematics as part of their daily lives.

–Dr. Curtis Varnell, Science Specialist

Moving Forward

The Gizmos subscription provided by this program expired in January of 2011; however, state funds were used to extend the subscription through the end of the school year. Many districts found local funds to renew the subscription for the 2011-2012 school year. Regardless of current access to the Gizmos, teachers gained experience with the power of digital content and are now able to integrate a variety of digital content resources into their daily lessons.

Resources

Explore Learning in Arkansas

<http://explorellearning.blogs.com/Arkansas/>

Arkansas Department of Education

<http://arkansased.org/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology program* (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Connecticut's EETT Competitive Grants

Connecticut's competitive grant program provided funding to school districts for improving student achievement through the creation and implementation of 21st century, technology-rich learning environments. Professional development opportunities provided training for teachers to transform instruction that included technological tools, and provided students with opportunities to collaborate and connect with relevant content through project-based learning.

Green-Green Wintergreen Wintergreen Interdistrict Magnet School, Connecticut March 2010-August 2011

The purpose of this grant was to engage students in 21st century technology-rich learning focused on the study of the environment. Teachers integrated environmental studies in all areas of the curriculum while transforming the school into a technologically and ecologically fluent community.

Demographics

Wintergreen Interdistrict Magnet School is located in Hamden, Connecticut and managed by Area Cooperative Educational Services. The school provides a liberal arts education, which is supported by technology including a 1-to-1 laptop program. Wintergreen has an extended school year, in session from mid-August to late June. The school population is approximately 640 students from the 5 towns that are eligible to apply to Wintergreen. The five towns bring together a diverse student body, which includes children from the inner city of New Haven, to suburban areas of Hamden and Woodbridge. Students are selected by lottery to attend Wintergreen.

Project Description

The purpose of the Green-Green Wintergreen project was to integrate interactive tools, while engaging students in the practice of environmental awareness. Wintergreen Interdistrict Magnet School established a 1-to-1 laptop program in 2006. With technology integration underway, administrators and teachers sought to build a stronger school community and increase 21st century skills. By exploring the environment and what it means to be “green,” teachers introduced students to a more in-depth study of environmental science. Students learned about scientific theory and the changes to making a positive, sustainable change in the

environment. Through these studies, the grant focus was to improve science and technology skills. All teachers and students were included in the efforts of this program. Teachers participated in professional development opportunities that provided resources and instruction on connecting the curriculum to real-life science and using technology to help solve everyday problems. The grant funding also provided interactive whiteboards, science probes, birdhouses, video cameras to film the birds and plants, and one hydroponic garden per classroom. In addition, the school purchased Moodle to provide a content management system and a communication tool for teachers and students.

ARRA EETT Grant Details	
Grant Focus	High-Access, Technology-Rich Learning Environment and Ongoing Professional Development
Beginning/End Date of Grant	March 1, 2010-August 31, 2011
Locale	Urban
Funding	\$140,000 Federal Funds \$14,000 Local Funds
Grade Level (s)	K-8
Number of Teachers Impacted	37
Number of Administrators Impacted	3
Number of Students Impacted	640

Project Implementation

Green-Green Wintergreen started with a team of teachers who volunteered to develop and guide the curriculum activities for renewable and sustainable energy while incorporating the school theme of being “green.” During the school year, all teachers were required to design one research project with a green theme, using the Big 6, a research approach to teaching

information and technology skills. All teachers were trained on using the newly installed interactive whiteboards and the video cameras. In addition, professional development

This grant empowered our students and teachers to think globally and to act locally. Never before has science been such a hands-on, interactive subject at our school.

-Wintergreen Teacher

highlighted the use of Moodle in the classroom, technology skills for students, as well as training on content such as how to conduct a scientific study. Teams of teachers met to discuss project ideas with the help of Dr. Lara Smetana of Southern Connecticut State University. Dr. Smetana provided support for teachers for project-based science lessons, which included monthly visits to the school and ongoing, online support for teachers. As a faculty, teachers met weekly to discuss strategies for integrating the technology into project-based science lessons. During these meetings, experts in the field were invited to help teachers craft their projects, including faculty from Yale University and members of the Connecticut Forestry department. Teachers also participated in e-learning workshops using Moodle to help develop student-centered lessons. In January of 2011, a full day of professional development was provided for teachers, spanning the topics of hydroponic gardening, energy sources, community involvement, interactive whiteboard training, and Moodle integration.

The ongoing training and support helped teachers to provide project-based lessons for students with authentic, relevant learning experiences. Teachers and students maintained indoor hydroponic gardens in each classroom and harvested greens and herbs to sell through the school store and at parent meetings. The gardens became a source of pride and accomplishment for the staff and students. All classes in grades 2 to 8 used the Big 6 model for research and explored various topics, such as composting, recycling, and energy sources best suited for the region and globe. Through the various projects, with technology seamlessly integrated, teachers and students increased their understanding of habitats, alternative and renewable energy, wind turbines, solar power, and hydro power. In addition, teachers and students increased their technology skills.

Classroom Examples

- In second grade, students learned about the life cycles of flowering plants including seed germination, growth, flowering, pollination, and seed dispersal. During the Big 6 research project, students used texts and online resources to study seeds and their growth. Students posted blog entries on Moodle describing their particular flower and were able to read and respond to each other's entries. The culminating project was the creation of a multimedia project that combined images and student narration and explained the life cycle of their plant. Students uploaded their projects to Moodle for all students and parents to view. Prior to this grant, teachers typically assigned books and students took notes on a plant's life cycle via their laptops, however, the culminating project was typically a self-drawn picture of the plant.
- An after-school program was developed for students called "Bird Brains." Twenty-five students were accepted to be a part of this group. The purpose of the program was to connect and enrich the curriculum in science, and to understand animal behavior, specifically of birds. Students erected numerous

I feel like a real scientist. I love to see what the birds are doing and know that they are living right here in our own school yard. It's so exciting to see them every day.

-Wintergreen Student

birdhouses throughout the school property. Teachers installed video cameras to capture footage of the birds (bird cams). Students blogged about their bird observations. The Bird Brains program also connected with the first grade science class as they studied living things, animal behaviors, and the fulfillment of basic needs. The Bird Brain students made videos from their bird cam explorations for first grade as well as posting the videos on Moodle for the larger school audience. All students were able to see firsthand what birds needed to build and produce for their nests. Before this grant, students studied animal behavior through the use of pictures and textbook material. The content was not connected to the region, and students could not observe birds in real time. The bird cams allowed students to watch the animals that surrounded their school each day. The Bird Brain students often gave up their recess time to check the birdhouses.

Evaluating Effectiveness

Teachers and students found the integration of science and technology to be motivating. The integration of the online content managements system enabled full interaction for students and teachers and also provided access to parents. One of the major impacts of this grant was in the area of teacher productivity.

School Data

- 100% of teachers created at least one content-rich online lesson.
- 100% of teachers, who received an interactive whiteboard, used them on a daily basis.
- Approximately 80% of teachers made gains in the use of 21st century technologies as measured by Edviation, an online assessment tool.

Moving Forward

The goals, objectives, and tools for this grant are in place and can be easily sustained in the coming years. The interactive whiteboards, cameras, and probes will continue to engage students in all areas of learning. The school community acquired seeds to maintain the hydroponic gardens through the sale of herbs grown in the classroom gardens. Additionally, the assessment tool, which was acquired with grant funds, will continue to be used to measure 21st century skills. The use of Moodle also grows as teachers continue to share lessons and students to post their work, even parent-teacher conferences were scheduled using a Moodle wiki.

Resources

Area Cooperative Educational Services

<http://aces.org/>

Big 6: Information and Technology Skills for Student Achievement

<http://big6.com/>

Connecticut State Board of Education

<http://www.sde.ct.gov/sde/site/default.asp>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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Delaware's EETT Competitive Grants

In Delaware, EETT funds helped to support the state goals in three areas: 1) continued support of the eMINTS (enhancing Missouri's Instructional Networked Teaching Strategies) model to improve instructional strategies and student academic achievement including technology literacy; 2) innovative use of technology to enhance teaching and learning; and 3) upgraded or enhanced existing technology infrastructure to improve instructional strategies and student achievement.

Delaware 21st Century Wireless Consortium Red Clay Consolidated School District, Delaware April 2010-September 2011

The Delaware 21st Century Wireless Consortium used ARRA EETT funds to create a state of the art wireless infrastructure in nine districts across the state with the goal to increase the integration of technology seamlessly. Districts also used funds to create professional development opportunities specific to the needs of the individual districts. Red Clay Consolidated School District managed the project and led the collaborative process.

Demographics

Delaware is home to approximately 103,000 students in 19 districts and was among the first states to develop a statewide online assessment program. Started during the 2010-2011 school year, the new online assessment program is administered multiple times during the school year to provide teachers and parents immediate feedback on student performance. Students follow a testing schedule by grade level and subject area starting in the spring of second grade.

Project Description

The Delaware 21st Century Wireless Consortium grew from a statewide organization called Technology Managers and Coordinators Council (TechMacc). A member from each district is represented on this council, which meets monthly to discuss technical support issues across the state. Members recognized that ubiquitous wireless access was needed to ensure success of the statewide assessment initiative. The Delaware Department of Education provided laptops to assist with test administration of the online assessment program, but not all schools had the wireless infrastructure to use these laptops. The consortium realized that

Delaware would benefit from a consistent approach to wireless infrastructure, and the grant was a catalyst for ensuring wireless capability. Working in a consortium provided an economic advantage in the ability to buy equipment and service in bulk. As well, in standardizing installation and utilization, districts could better support each other. The consortium concentrated on high-need schools to address the digital divide. They also recognized that each individual district had unique professional development needs and therefore created separate professional development plans but linked the plans by sharing resources via the consortium's website and sharing sessions. As part of the program, 83 schools participated (42 Title I schools) with 1,633 teachers participating in professional development. An additional 1,984 teachers were indirectly impacted, benefitting from the wireless infrastructure. Each district in the consortium took advantage of the availability of wireless internet access to meet the needs of teachers and students in their own schools. The professional development opportunities included trainings on multiple technology tools including interactive whiteboards, podcast creation, software, integration of free online internet tools (i.e. Google Apps), and classroom web page development. Despite the variety of activities, all consortium members had the same goal to increase the level of technology integration. Due to the collaborative nature of the consortium, members shared professional development plans, replicated successful strategies, and shared lesson plans and rubrics.

ARRA EETT Grant Details	
Grant Focus	Digital and/or Open Content and High-Access, Technology-Rich Learning Environment
Beginning/End Date of Grant	April 2010-September 2011
Locale	Rural
Funding	\$1,448,284 EETT ARRA Funds \$300,000 Local Funds
Grade Level (s)	K-12
Number of Teachers Impacted (Directly and Indirectly)	3,617
Number of Administrators Impacted	34
Number of Students Impacted (Directly and Indirectly)	51,923

Project Implementation

Beginning in the summer of 2010, the wireless infrastructures was installed in participating schools; bandwidth provided by the installed access points was 54MB for the local LAN. Technical staff in the districts received training on how to manage and support the new infrastructure. In addition to the technical professional development, individual districts designed individual professional development programs, which were implemented in the 2010-2011 school year and continued through September 2011. These plans varied as the access to technology tools and software varied from district to district. For example, in the Red Clay Consolidated School District, classroom teachers were trained to create and maintain useful and informative classroom websites that supported instruction and helped foster communication between teachers, students, and parents. Edline, a content management system, provided teachers an opportunity to post calendars, grades, assignments, and resources as a way of extending the school day. In the Delmar School District, 16 middle and high school special needs teachers participated in podcasting training and professional development under a LoTi model, which was designed to increase student academic progress while fostering digital age professional learning communities. Teachers attended a workshop on podcasting and using iPods in the classroom and developed lessons plans integrating podcasting into the content areas.

Using the wireless infrastructure in combination with an interactive whiteboard, allows students and teachers to display a map, simulation, or other interactive website. Students can design experiments and use simulations to test hypotheses in a center, small group or as a whole class. Companion work can be done individually or in pairs on laptops or mobile devices. Students and teachers are able to take advantage of a multitude of higher level thinking resources.

- Judith Conway, Instructional Technology Coach

Classroom Examples

- Seventh grade students study watersheds in both the science and social studies class. They learn about the water cycle and use topographic maps. Using the technology provided by this grant, students created podcasts about storm water drainage ponds and the Chesapeake Bay. This project offered students an opportunity to practice their informational reading and writing skills while reinforcing important science concepts. Wireless broadband access allowed them to use the internet to research the Chesapeake Bay watershed and factors affecting its water quality. The teacher led a discussion about storm water ponds. The class then took a walk to a pond on school grounds, noting its location, layout, and surrounding land use. Students answered the research questions of how the school's storm water drainage pond affects water quality in the Chesapeake Bay and recorded their responses. Students then shared their recordings with the teacher and the class.

Evaluating Effectiveness

The data and demographic information below strongly supports the purpose of this grant to provide assistance to schools that serve students from poverty and those with special needs.

Program Data

- Of the 83 schools affected by this grant:
 - ✓ 50% of the schools that received PD and/or wireless equipment were Title I schools
 - ✓ 78% of the schools where a wireless network was installed were Title I schools
- Of the 83 schools involved, the grant affected:
 - ✓ 75% of the instructional staff
 - ✓ 79% of the students
 - ✓ 81% of the low-income students
 - ✓ 78% of the special education students

Each individual district also assessed the impact of the professional development program. For example, in the Red Clay Consolidated School District, teachers strongly believed a classroom website would foster communication (4.28 average out of 5 on teacher survey), and teachers strongly believed classroom websites support instruction (4.13 average out of 5 on teacher survey). The average increase in page views on school websites (where classroom websites are linked) was 270% over the course of the project. In Smyrna School District, 43% of teachers' LoTI scores increased, and a surge in creativity and enthusiasm was noted in the way participants used the instructional technology strategies as explored in their professional development.

The biggest challenge in administering this grant was communicating among a geographically dispersed consortium. A consortium website, conference calls, and email communication helped to distribute information and successfully organize efforts.

Moving Forward

The success of the wireless infrastructure spurred a number of districts to find funding to expand the project. In Red Clay, for example, the district allocated an additional \$300,000 to continue the rollout of wireless infrastructure. In addition, Red Clay found such overwhelming interest in the district's webpage tool, the training will be continued for teachers who were not able to take part in the first training through a train-the-trainer model. In addition, the tool has been utilized for the district's new distance learning labs to serve as an electronic space for sharing, distributing, and collecting work. Other districts also adopted the train-the-trainer model to establish experts in each school on using the interactive whiteboards.

Resources

Red Clay Consolidated School District

www.redclay.k12.de.us

Delaware 21st Century Wireless Consortium

<http://www.redclay.k12.de.us/jc/index.html>

Delaware Department of Education

<http://www.doe.k12.de.us/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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Georgia's EETT Competitive Grants

Georgia's ARRA EETT competitive grants sought to create model eTextbook environments to be leveraged across all school districts in Georgia. The focus was on teacher professional development in the use of digital content to differentiate instruction, improve student engagement, and increase student technology literacy by providing students with the opportunity to use digital tools and resources. Programs also concentrated on parent engagement by providing training sessions that demonstrated the purpose of eTextbooks at home and school.

E-Textbook Program Thomasville City Schools, Georgia June 2010-June 2013

The goal of Thomasville High School and the e-Textbooks program was to move from traditional textbooks to digital content to help increase student achievement by engaging students and differentiating instruction. This grant also addressed the problems of low levels of student technology literacy and lack of adequate technology resources.

Demographics

While located in a rural area of southwest Georgia, Thomasville City Schools is one of the last city school systems in Georgia. The school system has a charter from the city but functions as other systems in Georgia with an elected school board and appointed superintendent. There is one high school in Thomasville with 475 students, and the Scholars Academy educates students in grades 6 to 12, of which 319 were impacted by this grant. Fifty-five percent of students qualify for free lunch and 8% qualify for reduced lunch. The graduation rate for Thomasville High School has fluctuated in recent years; graduation rate was 60.7% in 2007-2008, 74.9% in 2008-2009, and 72.7% in 2009-2010.

Project Description

Thomasville High School students performed at a basic level of technology literacy and lacked access to technology tools. While there were 39 desktop computers and 43 laptops prior to the grant, these were scattered among classrooms with a majority of the classrooms only having one or two computers to share amongst the students and teacher. Eight of the classrooms had interactive whiteboards. On the 21st Century Skills Assessment Pretest, the average score at Thomasville High School was 275 basic proficiency, in a scaled score range of 155-450. With this

ARRA EETT Grant Details	
Grant Focus	High-Access, Technology-Rich Learning Environment and Digital and/or Open Content
Beginning/End Date of Grant	June 10, 2010-June 30, 2013
Locale	Rural
Funding	\$1,335,184
Grade Level (s)	8-12
Number of Teachers Impacted	90
Number of Administrators Impacted	5
Number of Students Impacted	800

grant, a 1-to-1 program was implemented for all 9th to 12th grade students in Thomasville High School and the Scholars Academy, as well as 8th grade students participating in the Scholars Academy program. Teachers were also supplied with a netbook. In the high school, 593 notebooks were integrated, along with 56 projectors, 44 whiteboards, and 149 individual student response devices. Subscriptions to Discovery Education, Scholastic, and Gizmos provided access to interactive digital content in all content areas and e-textbooks for most core subjects. Wireless infrastructure in the Thomasville High School and Scholars Academy, located across the street from the high school, was improved with grant funds by providing all new access points as well as a management system. In addition, a partnership was established with the City of Thomasville to set up free wireless access points throughout the city in the business corridor and at the Boys and Girls Club since the city was not able to provide free or reduced cost internet access for students at their homes. Professional development was key to the success of the program. The on-site technology coordinator and media specialist provided professional development throughout the school year. After-school sessions and just-in-time training provided opportunities for teachers to explore tools and devices for integration. More intensive training was offered during the summers.

Project Implementation

During the summer of 2010, interactive whiteboards, mounted projectors, document cameras, and sound systems were installed in all classrooms. The netbooks were prepared with the necessary software for teachers and students. In August 2010, netbooks were distributed to teachers first, and were then issued to all 9th to 12th grade students and 8th grade Scholars Academy students. Students and parents participated in an orientation, which included information on care and maintenance of the notebook, cyber security, and acceptable use policies. Fourteen orientation sessions were offered and a video was produced for parents who were not able to participate in a session or transferred into the school later in the school year.

Students are engaged and eager to participate in classroom activities when using technology. Students appear to retain information better when it is presented in different ways, such as on the interactive whiteboard, on their notebooks, or on the internet.

- Thomasville High School Teacher

During the school year, teachers participated in after-school training sessions and just-in-time training. On staff, the media specialist, technology coordinator, and technician provided ongoing support to teachers and students. During the first year of implementation, teachers worked together and with the technology support team to learn how to integrate the technology and e-Textbooks. At the end of the school year, a three-day intensive content and unit planning workshop was held. Representatives from Discovery Education, Scholastic, and the Georgia Educational Technology Center helped teachers work with the digital content and plan units. In the 2011-2012 school year, two additional part-time specialists, formerly of the Georgia Educational Technology Center, joined the staff to assist and support teachers through coaching, modeling lessons, and co-teaching.

Classroom Examples

- The digital content has had a huge impact on mathematics classes. Prior to the grant, students worked out of the textbook. Gizmos and interactive simulations offer opportunities for students to digitally simulate and alter data and functions. The *Quadratics in Factored Form* Gizmo shows vertical and horizontal shifts as well as shrinks and stretches based on how the numbers are changed in an instant. Students change the data to see the effects graphically, and make predictions and test their projections. To see the changes via technology is dramatically faster than graphing several quadratics on paper and viewing the results.
- In the US history classes, the notebooks were used for a variety of tasks. For example, in reviewing the Reconstruction era and preparing for the test, each student was assigned a topic and completed a slide presentation. Slides were uploaded and combined via Google Docs. Students were able to use the combined presentation to review for the test. Digital content available on the iCivics website (<http://icivics.org/>) created by the United States Supreme Court, was also used

throughout the course which helped to enhance the lessons and provide real world examples.

Evaluating Effectiveness

Student technology literacy as well as teacher technology proficiency is being measured by Thomasville City Schools through Learning.com's 21st Century Skills Assessment and WayFind Teacher Assessment. Student achievement is measured through the Georgia End-of-Course Tests and Georgia High School Graduation Tests. No gains have been realized yet in the second current year of implementation. Through informal discussions with teachers, it has been reported that students are more engaged in class. In walking through classrooms, engagement is apparent as students interact with the content available via classroom whiteboards, use netbooks for collaborative group work, and access digital resources.

Moving Forward

The citizens of Thomas County passed an Educational Special Purpose Local Option Sales Tax (ESPLOST) in November 2011 to take effect in January 2013. The ESPLOST will provide funds to aid in keeping the infrastructure and technology equipment, including netbook upgrades and replacements as needed. Also, the school system will continue to fund instructional technology and infrastructure support by system employees through state and local funds.

Resources

Thomasville City Schools
<http://tcitys.org>

Georgia Department of Education
<http://doe.k12.ga.us/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

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Iowa's EETT Competitive Grants

Iowa's ARRA EETT competitive grant focused on online learning for both teachers and students with the goal to positively affect student achievement in Iowa. The project included the purchase of online content for all Iowa students, creation of a repository for online content and professional development for teachers to help them create lessons, units and online courses.

Iowa Ed Tech ARRA Des Moines Public Schools, Iowa June 2010-September 2011

In Iowa, rural students did not have access to the same depth of curriculum as urban students, and urban students needed support for credit recovery. This grant focused on acquiring and developing online courses and content, as well as training teachers to develop and facilitate courses so that all Iowa students would have access to online content through a common, statewide content management system. Therefore, it was also the goal of the grant to increase student achievement, increase access to technology, and better prepare students for the 21st century. Two projects were funded by ARRA EETT funds, including the Des Moines Public Schools (DMPS) initiative, which focused on increasing access for secondary students to online coursework and content.

Demographics

Located in the center of Iowa, DMPS is the largest district with 30,000 kindergarten through 12th grade students. On average, 58.5% of DMPS high school students are eligible for free or reduced lunch, 45.9% are minority, 7.2% are English Language Learners, and 20.6% receive special education services.

Project Description

The grant targeted secondary students to address achievement gaps and to provide equity to resources. The program sought to reach a large, high-need student population with limited access to technology. At the core of the program was a rigorous professional development program for teachers, including a course sequence built around best practices in online teaching known as OLLIE (Online Learning for Iowa Educators). In addition to OLLIE courses, Iowa teachers have been using Communities of Practice and Innovation with content-specific focus groups to

sustain the work and apply it into content areas. In this program, teachers met to analyze, evaluate, develop, and implement online courses in four content areas (mathematics, science, social studies, and English/language arts) from across Iowa with 93 districts out of 359 represented. In a statewide effort, Iowa provided hundreds of hours of professional development for teachers on how to use online tools, develop online content, and integrate media into existing content areas. Des Moines teachers benefitted and expanded on these efforts in this grant program.

ARRA EETT Grant Details	
Grant Focus	Professional Development, Online Learning
Beginning/End Date of Grant	June 2010-September 2011
Locale	Urban
Funding	\$402,987
Grade Level (s)	9-12
Number of Teachers Impacted	100
Number of Administrators Impacted	6
Number of Students Impacted	1,000

Project Implementation

During the summer of 2010, Des Moines Public Schools purchased 300 netbooks for students and provided 100 teachers with 2 of the 5 OLLIE courses in professional development. Teachers returned to the classroom and immediately implemented the Moodle Learning Management System (LMS) with 1,000 students. Students had access to course materials, homework, assignments, and projects both in school and at home. Learning to use online resources like Moodle in the classroom was transformational for teachers.

Using Moodle and the various links to many tools, a teacher can focus on the needs of students as learners and be very creative with their assessments of learning.

-DMPS Teacher

Classroom Example

- Des Moines teachers use a blended learning model to implement the use of Moodle in their classroom. One assignment at a time is delivered online along with inquiry and discussion activities for students. Teachers discovered that using online tools provides support for differentiated instruction in the classroom.

Evaluating Effectiveness

Enrollment in the Iowa Learning Online Virtual School is 700 students. In addition, 5,000 students in Des Moines and 9,000 students statewide were learning in a blended learning environment. As well, the grant program laid a foundation for the training and tools teachers needed to effectively use technology in the classroom. For the first time, all Iowa Area Education Agencies and Urban Education Network districts worked together to provide economy of scale solutions on a statewide basis for all teachers and all students in Iowa.

District Data

- In 2010-2011, 1,000 high school students enrolled in an online course in Des Moines.
- 80% of students completed an online course with a Grade-to-Date of 60% or higher.

Moving Forward

Despite the end of the funding in Des Moines Public Schools, 26 teachers volunteered to act as building leaders to continue coaching and mentoring teachers in how to use the online content and Moodle. At the beginning of the 2011-2012 school year, 7,000 teachers and students were using Moodle in Des Moines.

While the grant funded the initial startup of this long-term project, the work completed during the grant cycle was critical to the long-term viability of education in Iowa. With declining rural enrollment and increasing urban enrollment, online learning provides equity of educational content for students and allows teachers to have classes composed of students from multiple districts, which can minimize the impact of changing demographics. Online learning also offers educational opportunities to students who would, in other educational models, have restrictions on course offerings. With the establishment of this program, all students can have access to courses offered through this project which will, in turn, allow those students to access courses required by institutions of higher learning.

Resources

Des Moines Public Schools

<http://www.dmschools.org/>

Iowa Department of Education

<http://educateiowa.gov/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

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The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Louisiana's EETT Competitive Grants

In Louisiana, ARRA EETT grants were awarded to address school-wide improvement efforts through the effective, expanded use of instructional technology tools. Grant programs developed instructional technology models that addressed the goals and instructional strategies of the technology plan and local school improvement efforts to assist teachers with effective technology integration, improve technology proficiency and increase student performance.

EETT HIGHTech Grant Rapides Parish School District, Louisiana July 2010-June 2011

The HIGHTech grant project created a 1-to-1, digital curriculum learning environment at Northwood High School. Teachers received professional development through the support of a full-time technology facilitator and through a partnership with nearby Bolton High School's Digital Academy.

Demographics

Rapides Parish School District is located in rural, central Louisiana in the town of Alexandria. Northwood School is a K-12 school of 800 students; Northwood High School is a part of this school community serving 225 students in grades 9-12. Seventy-seven percent of Northwood students qualify for free or reduced lunch, and the school qualifies for Title I. The Louisiana School Accountability System provides a School Performance Score (SPS) consisting of test and graduation results, student attendance rate, and dropout rate. Northwood High School, at the beginning of the grant period, scored 77.1. By 2014, the state's goal for each school is an SPS of 120.

Project Description

Rapides Parish, a low socio-economic rural school district, had limited access to technology tools, digital content, advanced placement courses, and high-speed broadband prior to this grant. In Northwood High School, there were computer labs for business vocational courses only and a few interactive whiteboards. Students also struggled with developing the 21st century skills of collaboration, critical thinking, and communication. This grant provided a total redesign of the instructional environment by integrating a 1-to-1 program and a variety of online resources including advanced

placement opportunities, distance learning classes, and subscription-based services. Students were provided with 24/7 access to netbooks. School and community wireless hot spots were established so that students could access internet resources during, before, and after school, and outside of school property at community centers and on the nearby Indian reservation. In addition to student tools, classrooms were equipped with interactive whiteboards and digital curricula resources including a schoolwide content management system. The technology coordinator provided comprehensive professional development for teachers with in-person training and ongoing classroom support. Teachers learned how to use the new devices and how to implement collaborative, project-based lessons into the core curriculum. Northwood teachers also partnered with teachers from Bolton High School, the district's all-digital high school.

ARRA EETT Grant Details	
Grant Focus	High-Access, Technology-Rich Learning Environment and Technology Coaches/Mentors
Beginning/End Date of Grant	July 1, 2009-September 30, 2011
Locale	Rural
Funding	\$414,600
Grade Level (s)	9-12
Number of Teachers Impacted	19
Number of Administrators Impacted	3
Number of Students Impacted	225

Project Implementation

The first step in implementing this program was to establish a technology-rich infrastructure including a campus-wide wireless network, laptops for teachers, and netbooks for all 9th, 10th, 11th, and 12th grade students. Additionally, digital curricula resources such as Gizmos, Geometer's Sketchpad, ABC-CLIO, Nettekker, and Blackboard were provided to help create a technology-rich instructional environment.

Before we had the computers, I knew very little about technology. Now I think I am more prepared for my future.

- 12th grade student

At the start of the 2010-2011 school year, parents and students were oriented to the 1-to-1 program and signed user contracts. Students received training at the beginning of the year in laptop maintenance and basic word processing, spreadsheet, and presentation applications. Teachers received professional development in basic computer applications and project-based learning principles. Before the beginning of the school year, teachers attended workshops, which then continued throughout the year. Teachers also received training on each of the digital content and online management resources. A full-time technology facilitator was added to the faculty, who coached, modeled, and provided support both during the school day and after school. In addition, during the summer of 2011, Northwood teachers attended a two-day curriculum planning event during which technology teacher leaders from Virginia, Florida, and Bolton High School assisted the Northwood teachers in working within their content areas and writing unit plans that integrated the technology.

The partnership with Bolton High School was critical to the success of the grant implementation. Northwood teachers worked with the more experienced Bolton High School teachers, who had three years of experience with their 1-to-1 program. Northwood teachers visited Bolton twice during the school year by curriculum departments to observe classes and work with teachers. Bolton teachers also provided workshops for Northwood teachers. In addition, students and teachers received technical support from Bolton High School. As laptops needed to be serviced, they were sent to the technical staff at Bolton and a loaner laptop was made available so students were not without a computer.

Classroom Examples

- In an Algebra I class, students became travel agents and completed online research to develop three different travel packages for a family of four. Each seven-day vacation package was researched and planned to a different location. Students used their laptops and the internet for researching information for their different destinations. Research included exploring available transportation, entertainment, food, and lodging options, and average temperatures of each destination. Students graphed temperature data based on data collected from various weather-related websites. Students produced a one-page report of all costs associated with each vacation package. In addition, they presented their work via a brochure, slide show, or movie. Final products were presented at Technology Night, an open house for teachers, parents, students, and community leaders, focusing on student-created technology projects that showcased their technology skills.
- In American history class, students studied Christopher Columbus. In the past, students read and discussed general information about Christopher Columbus and his explorations. With the grant, students took their exploration of Columbus much further. Working in small groups, they researched Columbus's expeditions and outcomes. Each group created an electronic flipchart in which they explained and supported their opinions on whether Columbus's voyages should have been supported by Spain. After presenting their flipcharts to their classmates, each group scripted and filmed a video letter to the king and queen of Spain in which they either thanked them for paying for Columbus' expedition or told them why it was not a good decision on their part. The groups shared their videos with the rest of the student body at a "Video Breakfast." A

section of the school's cafeteria was set up with tall countertops, electrical outlets, and a large flat-screen television. Once a week during breakfast, the students were able to share their projects using their laptops and the television. All the students in the cafeteria were able to see video presentations.

Evaluating Effectiveness

At the beginning and end of the project, teacher and administrator technology proficiency was assessed using the Louisiana Department of Education Southwest Educational Development Laboratory survey, based on ISTE Educational Technology Standards and its performance indicators. Based on survey results, technology skills and student attitudes toward learning with technology improved.

School Data

- Teacher Proficiency: For the standard measuring of technology-rich learning environments, teacher proficiency increased from 64% to 85% based on pre- and post-grant assessments.
- On-Target for Graduation: Previous junior classes measured approximately 58% on track for graduation; for the last two years the junior classes have improved to 75.6 and 74.5% on track for graduation.

Anecdotally, the changes to the curriculum and access to technology and the internet excited the students and provided new opportunities as they considered their futures. Teachers saw an increase in interest in pursuing higher education and/or technical careers.

Moving Forward

Near the beginning of this project, a local property tax millage to provide technology for the school district was implemented. This tax provides long-term sustainability for this project and has provided technology tools and training for the lower grades during this grant period. Ongoing, the local funds will support the maintenance and replacement of the high school's netbooks. Northwood will continue to receive support from district technology facilitators; however, the school-based technology facilitator was only provided during the grant cycle. The program allowed many teachers to become campus leaders and those leaders continue to support and educate the school community.

Resources

Northwood High School
<http://rpsb.us/northwood/>

Rapides Parish School District
<http://rpsb.us/>

Louisiana Department of Public Instruction

<http://doe.louisiana.gov/>

<http://louisianaschools.net>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology program* (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Maine's EETT Competitive Grants

Maine's ARRA EETT competitive grant focused on the integration of Open Educational Resources (OER) into the daily curriculum. The grant provided professional development to increase awareness of OER, research, and evaluation of the resources. In addition, Maine built an online community to provide an avenue for sharing and evaluating OER beyond the end of the grant cycle.

Open Educational Resources in Mathematics Professional Development Project Maine Regional School Districts #54 and #11, Statewide Grant April 2010–September 2011

The primary goal of the Open Educational Resources in Mathematics Professional Development Project was to build the capacity of mathematics teachers and technology integration specialists to effectively utilize open educational resources for selected mathematics topics to improve mathematics achievement and technological literacy for students in grades 7 to 12. Development teams of teachers and education partners designed resources and activities to connect content topics and curriculum needs to assessment practices and instructional strategies.

Demographics

The grant recipients included two partner districts: Regional School Unit (RSU) #54, which includes schools from Canaan, Cornville, Mercer, Norridgewock, Skowhegan, and Smithfield and RSU #11 with schools from Gardiner, Pittston, Randolph, and West Gardiner. Both districts are regional school units drawing from nearby rural communities. Three of the partner schools are Title I schools.

Project Description

The Maine Learning Technology Initiative (MLTI) currently provides professional development to Maine teachers and 21st century tools to middle and high school students to support the state curriculum and standards. As of January 2010, 226 middle schools and 66 high schools were participating in the 1-to-1 MLTI program. With tools and strong professional development initiatives in place, Maine sought to utilize and extend resources and assessment data to better meet the needs of students, particularly in the area of mathematics. This project took advantage of the potential of

OER, combined with training and appropriate technological hardware, to support classroom technology integration with the goal to improve mathematics achievement and technological literacy for grades 7 to 12 students.

State and district assessment data showed students struggling in foundational algebraic concepts. Therefore, Maine RSU #54 and RSU #11, in partnership with Education Development Center, Inc. (EDC), collaborated to develop, pilot, and implement a comprehensive package of professional development resources for teachers to help impact mathematics instruction and student achievement. The professional development focused on use of research-based instructional methods for mathematics indicators in the Maine Learning Results (MLR): Parameters for Essential Instruction (PEI) aligned with identified needs in the partner districts and the state. The targeted indicators were critical foundational skills for algebra in grades 7 to 12, including rational number concepts. Professional development was designed to use OER and technology tools to support the connections between and among Assessment practices, Curriculum, and Instruction (ACI). In addition, the project utilized the technological pedagogical content knowledge (TPACK) framework for project planning and professional development activities with educators. Teachers were trained to use formative assessment data to determine specific areas of student difficulty and how to explicitly target those areas of weakness through the online resources.

ARRA EETT Grant Details	
Grant Focus	Ongoing Professional Development, Digital, and/or Open Content
Beginning/End Date of Grant	April 1, 2010-September 30, 2011
Locale	Rural
Funding	\$183,868
Grade Level (s)	7-12
Number of Teachers Impacted	97
Number of Administrators Impacted	5
Number of Students Impacted	1,684

Project Implementation

The project was designed as a multi-tiered professional development initiative with three cohorts involved; the development team of teachers from the partner districts, the partner teachers from the partner districts, and the statewide online group. The professional development activities provided instruction, guidance, and support for all participants. The three groups were engaged in using OER and other technologies to connect Assessment practices, Curriculum topics and Instruction (ACI) through the learning cycle.

The first cohort, the development team, which included 14 teachers from 2 partnering districts, received face-to-face professional development in the spring and summer of 2010 along with online professional development that included both synchronous and asynchronous components from the fall of 2010 through the spring 2011. This team, along with the EDC staff, created a series of lesson sets, which were organized by targeted mathematics topics, such as the distributive property. The lesson sets, now available on the project website (<http://maine.edc.org/file.php/1/oermath.html>), included lesson materials, diagnostic assessment tools, information on analyzing data, classroom implementation and instructional resources, and a post-assessment tool. Designed for teachers and students, a typical lesson set included screencasts—digital recordings of the computer screen—as a demonstration of student thinking or as a guide to implementation of the resources. As well, the instructional resources included applets designed specifically for the lessons and many other appropriate OER resources. Fifteen topic sessions were made available on the project website (see http://maine.edc.org/file.php/1/oer/math_PDResources.html).

The second cohort, the participating partner teachers, received face-to-face professional development in the fall of 2010 and participated in online professional development that included both synchronous and asynchronous components from the fall of 2010 through the spring of 2011. Training began with review of background lesson materials in order to determine the learning targets followed by training in the administration of pre-assessments to determine students' knowledge and areas of weakness. The participating teachers then analyzed their students' data and selected instructional activities and areas of focus using the online applets and student explorations. After each lesson, teachers re-assessed to determine what students learned and the focus of the next instructional activities. Over the course of the year, participating teachers and project staff customized and shared resources, created new resources, and established a community of practice both online and in smaller school-based groups.

The third cohort, the statewide online group, participated in online professional development opportunities described above that included both synchronous and asynchronous components from the fall on 2010 to spring 2011. Teachers, not a part of the initial development, gathered to define OER, explore resources, and use OER to improve the learning process. Webinars were conducted to guide participants in utilizing the lesson sets. Upon implementing the lessons, teachers were encouraged to participate in an online discussion on the project website, including a reflection about any changes pre- to post-assessment and possible next steps in instruction. Through participation in this project, teachers gained a better understanding of OER and how to implement OER in the

classroom. Teachers also had the opportunity to create and share OER through online discussions on the project website.

A total of 58 schools supported teachers in this program and in the spring of 2011, face-to-face professional development was offered to additional middle and high school teachers during the statewide dissemination efforts.

Classroom Examples

- Before the grant, even with laptops available, many teachers taught integer operations in the seventh grade using paper and pencil activities, and some used hands-on manipulatives. As part of this program, upon starting the study of integers, students completed a formative assessment task and entered the data through the use of handheld clickers. The students and teacher then examined and discussed the results. During this process, the students and teacher identified some critical questions to explore. The teacher selected teams of students to participate in an activity in which they "walked the number line" to investigate integer operations. Students then launched an interactive applet titled "Walking the Number Line" on their laptops. This applet models the addition and subtraction of integers by walking a character along a number line (<http://maine.edc.org/file.php/1/tools/IntegerWalkNumLine2.html>).
- Students in eighth grade mathematics engaged in a lesson about equivalent expressions using a distributive property interactive applet. They began by predicting whether expressions are equivalent or not on an online formative assessment probe. Students and teacher discussed the whole class predictions then paired to explore the distributive property with an interactive applet. The students discussed and compared their findings with their original predictions. Students recorded their interactions with the applet and their discussions in a screencast to share with peers and their teacher (for an example of a screencast see: http://maine.edc.org/file.php/1/oer/math_StScreencast_EquivExprDistribProp3.html).

I am more comfortable allowing students to work at their own pace and to be more independent in their learning. I like that different students can do the same activity, beginning with different skill levels, but still advance their understanding of a topic through the applet and the assessments.

–Grade 8 Math Teacher

Evaluating Effectiveness

The formal evaluation of the project included teacher and student data. Evaluation results suggest educators in the survey sample self-reported upward shifts in areas such as: knowledge of areas of student difficulty; frequency of implementing formative assessments; frequency of use of OER; frequency of use of technology to support a cycle of inquiry; and competency with targeted technology integration strategies and tools.

A descriptive analysis of project student formative assessment results shows that student achievement did increase overall in the Maine Learning Results (MLR): PEI indicators targeted by the project. Averaging the percent correct scores across the targeted domains shows that increases varied for matched pre-/post classes from 6% to 17%, and for matched pre-/delayed post classes from 0.2% to 20%. The greatest gains for both the pre-/post matched classes and the pre-/delayed post matched classes were in the domains of Symbols and Expressions (17% and 20%, respectively) and Functions and Relations (16% and 12%, respectively).

Assessment Data

- The average percent correct scores across the targeted domains shows increases from pre-to post-assessments up to 17%.
- The greatest gains were in the domains of Symbols and Expressions (20%) and Functions and Relations (16%).

Moving Forward

The lessons and OER resources will be disseminated more broadly to ensure teachers statewide can implement the resources in their classrooms. The website developed for this project offers lessons and applets for global use.

Resources

OER in Mathematics Professional Development Project

<http://maine.edc.org/file.php/1/oermath.html>

Maine Learning Technology Initiative

<http://maine.gov/mlti/index.shtml>

Maine Department of Education

<http://maine.gov/education/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Maryland's EETT Competitive Grants

The ARRA EETT competitive grant funds provided an opportunity for Maryland to implement 21st century classrooms using innovative strategies that enhanced instruction, facilitated teaching and learning, and improved student achievement. ARRA funds helped to stabilize LEAs and eligible local entities to provide new and emerging technologies, and to offer additional training and support for teachers to help increase academic achievement and acquire the skills needed to compete in a global economy.

The College and Career Readiness Support Project Howard County Public Schools, Maryland July 2009-September 2011

The College and Career Readiness Support Project provided high-quality professional development and resources to help teachers individualize instruction through the use of emerging technologies in their classrooms and by understanding and applying the principles of Universal Design for Learning. Howard County partnered with nine Maryland districts to develop and offer an array of blended learning opportunities and up-to-date technology tools for teachers. The partnering districts included Baltimore City, Calvert, Caroline, Carroll, Cecil, Dorchester, Prince George's, Somerset, and Worcester.

Demographics

Howard County Maryland is located in the central part of the state, positioned conveniently between Baltimore and Washington, D.C. Howard County is one of the fastest growing regions in the state, increasing its population by 34% in the past 10 years. The public school system manages 71 schools with approximately 49,000 students, 17.6% of whom qualify for free or reduced meals.

Since Maryland's districts include economically challenged communities as well as wealthier ones, the State required applicants in the former category to include one or more high-need districts in their consortia. Prince George's County Public Schools, in which 53 percent of the 125,000 students are eligible for free and reduced meals, was one of Howard County's 9 partner districts in the consortium described in this case study.

Project Description

The College and Career Readiness Support Project (CCR Project) aimed to support secondary teachers in high-need content areas as identified by the statewide high school assessment program, particularly in the subject areas of algebra, biology, English, and government. The goal of the project was to create and deliver effective professional development courses focusing on open content and support for integrating technology, particularly Universal Design for Learning (UDL) principles. Using a blended model of traditional and technology-infused instruction and

ARRA EETT Grant Details	
Grant Focus	Online and Blended Learning and Digital and Open Content
Beginning/End Date of Grant	July 1, 2009-September 30, 2011
Locale	Suburban
Funding	\$1,258,663
Grade Level (s)	6-12
Number of Teachers Impacted	319
Number of Administrators Impacted	120
Number of Students Impacted	10,200

resources, teachers were inspired to explore and integrate new online tools and techniques in their classrooms. Additional aspects to this project included the development of a teacher resource app and a research project on 21st century learning. The teacher resource app was developed to run on the technology tool many teachers already own; their mobile phone. Also, software, with accompanying training, was purchased for use by partner districts' online content developers.

Project Implementation

At the onset of the project, efforts focused on the development of professional development courses for integrating technology and using the framework of UDL principles in algebra, biology, English 10, and government content areas respectively. These courses included open materials from, but not limited to, the National Repository of Online Courses (NROC), UDL Center for Applied Special Technology (CAST) content, and Creative Commons (CC) material.

Course Development: In the fall of 2010, training in UDL and a pilot of the preliminary course material were conducted in 3 face-to-face sessions with 29 administrators and 26 teachers from partner districts. Participants were dual-enrolled in a Teaching Online three-credit course offered by the Maryland State Department of Education (MSDE) and were paid with a stipend to participate in the course material pilot.

One of the things that I valued the most from the UDL course was learning about the three brain networks. This helped me to find ways to offer students more choices to accomplish the same goal.

- Laura Herbers, Science Teacher

In early spring, the participants viewed the course content via the course sites, conducted usability testing, and provided valuable feedback for the final development of courses. Later in the spring, the Biology Online Professional Development course and Government Online Professional Development course were offered to teachers from partner districts. These online professional development offerings included an online orientation session, two face-to-face modules, and three online modules, each incorporating UDL. The 36 participating teachers interacted online through discussion boards and wikis. These three-credit, hybrid professional development courses supported the use of technology in teaching and learning with an emphasis on the use of the online Maryland High School Assessment (HSA) mastery courses.

During the winter and spring of 2011, 228 teachers and administrators participated in the online professional development course pilots and regional UDL professional development offerings. As a result of the success of the UDL professional development course, MSDE asked the College and Career Readiness Support Project to develop another three-credit course: UDL and Next Generation Learning (<http://udl.mdonlinegrants.org>).

Mobile Apps: The development of another project, a mobile app, UDLlinks, emerged from teacher feedback during the professional development. Participants in the blended and face-to-face professional development indicated that they were in need of specific content resources that were readily accessible, searchable, and correlated to UDL principles. The app currently features a compilation of over 1300 resources and is a free download in the App Store and the Android MarketPlace. The app is currently used by the Center for Applied Special Technologies (CAST) in their UDL professional development offerings around the country.

Instructional Resources: Additional projects took place in 2010-2011, including the development of two sets of instructional resources for teachers and students aligned with the Common Core Standards in algebra and English 12. The Algebra Instructional Resources included 20 lessons and 10 tasks for students, and the English Instructional Resources covered argument, explanatory, and narrative writing in 16 lessons.

To model low- to high-tech access to technology, an interactive wheel was developed as an online resource (<http://udlwheel.mdonlinegrants.org/>). This resource's display of UDL principles and guidelines helps educators design flexible lessons and curricula that reduce

barriers to learning and provide innovative and supportive learning to meet the demands of all learners. It also helps educators evaluate existing curricula goals, materials, methods, and assessments.

21st Century Learners Research Study: The final project developed was a collaborative research study with IDEO, a design, thinking, and engineering company, Howard County Public Schools, and the largest district partner, Prince George’s County Public Schools. In the spring of 2011, the two districts and research partner conducted a collaborative investigation to discover the characteristics of the 21st century learner with the purpose to guide policy and instruction. The study included a one-week workshop and interviews in the field centered around two focus questions: what does it mean to be a 21st century learner today and how might technology enable 21st century learning? The study and synthesis workshops conducted with teachers, administrators, central office leadership, and partner representatives resulted in seven design principles and seven insights. The seven guiding principles identified were intended to help inform how teachers and administrators should design for today’s learning environment.

Web 2.0 Integration: Throughout all aspects of the project, numerous Web 2.0 tools were integrated into the professional development courses, including a blog for the UDL training, twitter postings (@nextgenlearners) and a website for quick dissemination of content, including video and web conferencing for course orientations. Teachers were required to explore and implement at least one Web 2.0 collaborative tool in their classroom as part of their training.

Classroom Examples

- In an English lesson on narrative writing, students learned to write realistic, effective dialogue with correct punctuation. Students first created a comic strip using dialogue between two characters using an online cartoon generator. Once students finished their comic strip organizers, they shared their work with peers and requested feedback. Students made edits based on the peer critique. Next, as a class, students listened to an audio recording of a dialogue excerpt from *The Story of an Hour* by Katie Chopin. Students discussed the mood created by the dialogue and the characters' feelings and reactions as revealed by dialogue. Additional lessons and activities in this narrative writing unit included punctuating dialogue, and plot and character development through dialogue. In the culminating activity, students used their initial comic strip to write a narrative, which had to include dialogue to advance the action of the story and reveal traits of the characters. Students first completed a digital Story Map. Next, students worked in pairs and shared story maps, by switching computers, to gain feedback and critique. Students revised their story maps, wrote their narratives, and submitted final products to their teacher electronically.
- In a science class, utilizing the UDL principles of engagement, exploration, explanation, extension, and evaluation, students learned the mechanism of evolutionary change and were able to explain how new traits may result from new combinations of existing genes. Students first explored the concept of evolution by

watching videos online. As a class, students compared their hand-spread measurements and discussed the variables that exist (gender, age, number of students in sample) to identify if the average hand measurement of the class was a good representation for the school. Next, students used the website, <http://www.bighugelabs.com> to create a mosaic of pictures that showed variations in organisms. Upon completing this activity, students responded to the teacher's blog posting on the relationship between evolution and variation. To extend the learning, they completed a peppered moth lab, a simulation of moths to identify the variation and conditions affecting the survival of moths. To assess learning, students were given a choice of three activities: to complete a podcast, concept map, or lab design. Students showed improvement in collaborative activities and had extended opportunities for independent learning and self-expression.

Evaluating Effectiveness

In an end-of-the-course evaluation, teachers enrolled in the initial UDL workshops were asked how they planned to apply what they had learned into their classrooms, while other educators were asked how they planned to apply what they had learned to their current positions. Nearly all of the teachers attending the workshops indicated that they planned to develop or implement a lesson that incorporated UDL the following school semester. They planned to incorporate UDL into their lessons by providing more student choice, utilizing the websites provided on the UDL checklist, creating engaging lessons, and integrating Web 2.0 tools. Other educators said they would use what they learned from the workshop in their current roles by providing additional professional development to teachers and administrators, collaborating with staff in lesson planning, improving and revising curriculum, and aligning UDL principles with the Common Core Standards. Having completed the workshop, participants felt most strongly that they could support teachers in developing lessons using the UDL framework and in creating engaging lessons for students.

Participant Data

- All teachers participating in the UDL professional development strongly agreed or agreed that UDL principles will help in developing more engaging lessons.
- Ninety percent of teachers felt prepared to develop lessons using the UDL framework.

Moving Forward

In moving forward, Howard County Public Schools continues to use the UDL course with its Media Specialists and Technology Teachers as part of their professional development offerings. Howard County Public Schools is also working on a systemic plan to incorporate UDL into next generation curriculum design. In the spring of 2012, the online professional

development courses will be offered to all districts in Maryland for teachers to receive continuing professional development credits.

Resources

The College and Career Readiness Support Project

<http://ccr.mdonlinegrants.org>

Biology Online Professional Development Course

<http://biology-pd.mdonlinegrants.org/>

Government Online Professional Development Course

<http://government-pd.mdonlinegrants.org/>

Algebra Instructional Resources

<http://algebra.mdonlinegrants.org>

English Instructional Resources

<http://english12.mdonlinegrants.org>

Maryland State Department of Education

[http:// marylandpublicschools.org/msde](http://marylandpublicschools.org/msde)

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education through Technology program* (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level to create effective, viable, and robust reform in education and improving the way teachers teach and students learn.

Michigan’s EETT Competitive Grants

In Michigan, the goal of the ARRA grant program was to provide educators with an opportunity to differentiate and individualize instruction to improve student achievement utilizing state and local student data. Projects included providing professional development on how to use data to inform instruction and how to individualize instruction to better meet the needs of students.

Sparking Broadband Use in the Eastern Upper Peninsula of Michigan Eastern Upper Peninsula Intermediate School District (EUPISD) September 2010-August 2013

The purpose of the Sparking Broadband Use in the Eastern Upper Peninsula of Michigan project was to increase the use of broadband in rural communities. The program leveraged ARRA EETT funds, Broadband Technology Opportunities Program (BTOP)ⁱ funds, and local funds. The goal was to address the expanding digital divide between rural and urban residents by providing opportunities to students and their parents to access educational resources both in school and at home or in community centers. Teachers participated in ongoing professional development in Web 2.0 tools, online course content development, and data assessment.

Demographics

In Michigan, Intermediate School Districts serve public school districts, charter schools, and private schools. The Eastern Upper Peninsula Intermediate School District (EUPISD) is an extremely rural area in Northern Michigan, covering over 4,000 square miles. In some areas, the one-room schoolhouse concept still applies as grades K-12 are housed on one campus. In this region, there are 7,400 students in 50 buildings across 17 school districts. There is a high concentration of Native American students across in the region with a range of 10% to 99% by district and an average of 30% in the EUPISD.

Project Description

Prior to this grant, teachers and some students had some access to technology, and teachers were provided with technology integration training, content management tools, and software, but lack of access both on campus and at home led to minimal use. This new project focused on increasing broadband access and 1-to-1 student access to maximize technology integration including, but not limited to the use of online content and data systems. Essential to this grant program was the widespread training opportunities for students, teachers, parents, and the community at large. The program leveraged grant funds from multiple funding streams including ARRA EETT, BTOP, and local funds.

The EUPISD project

implemented a 1-to-1 netbook program in grades 7 to 12. EUPISD worked with local broadband providers to offer discounted home broadband connection costs using a \$100 per family voucher system. The voucher was a one time offering to offset any initial connection fees or monthly fees for first year. Professional development was provided using workshops including 50 full or half day sessions on a variety of educational and Web 2.0 tools topics in the summer of 2011 and throughout the school year. In addition, training extended into the community promoting broadband adoption and the use of technology to support learning, finances, business opportunities, health care, and community outreach. Additional support was provided from one instructional technologist and three computer system technicians from the district.

ARRA EETT Grant Details	
Grant Focus	Technology Infrastructure and High-Access, Technology- Rich Learning Environment
Beginning/End Date of Grant	September 1, 2010-August 31, 2013
Locale	Rural
Funding	\$3,165,207 Federal BTOP Funds \$273,000 ARRA EETT Funds \$1,275,000 Local Funds
Grade Level (s)	7-12
Number of Teachers Impacted	420
Number of Administrators Impacted	56
Number of Students Impacted	4,200 directly (with netbooks); 7,400 by extension via teachers trained in enhanced technology use and broadband support to families and communities

Project Implementation

Beginning in the fall of 2010, the netbooks were distributed to students in grades 7 to 12. All students received a half-day session training on basic device use, how to access files remotely using cloud computing, and how to address technology issues and repairs. Parent meetings were held simultaneously where acceptable use policies were reviewed, the voucher system for broadband connection was explained, and the entire project was

described. Local district staff, teachers, administrators, and technologists received support via workshops on Web 2.0 tools, Moodle (the district's adopted online management system), Compass Learning (a modular-based learning product), and progress monitoring using the existing regional data system. Face-to-face sessions and webinars provided the initial instruction, and the instructional technologist visited districts and/or schools for follow-up support. After the trainings on basic use and software, participants discussed opportunities and methods of integrating technology into lessons. The data systems training helped teachers to use the netbooks to conduct more frequent, online assessments that helped to guide instruction and aid in differentiation. Conducting pre- and post-assessments focused on the standards became easier. Data was used to help target whole class, small group, and individual instruction. Other regional professional development offerings supported the broadband effort including training that was part of the Mid-continent Region for Education and Learning (McREL)'s "Using Technology in the Classroom that Works." This three-day training, occurred throughout the academic year and linked integration of technology with research-based instructional strategies at the classroom level.

The grant has allowed students to unlock their potential in and out of the classroom. Students find it easier to complete work such as note taking, presentations, and papers. Students are growing with the exposure to the technology, being able to understand and execute technical functions that may have seem foreign less than a year ago, but are essential in a post graduate world.

- Jason Byma, K-12 Music Teacher, St. Ignace Area Schools

The online management system and courses that were accessible to the rural students provided meaningful alternative learning experiences and assisted in credit recovery. Likewise, students were able to take courses offered at other schools using Moodle. Other online opportunities and content were utilized, including courses from Michigan Virtual High School, Florida Virtual High School, and WAV, a British online, project-based program.

The student netbooks and availability of broadband access at home provided new opportunities for the entire family. Each semester, community programs were offered at the schools, which typically served as community centers. Topics were selected to serve this remote area, providing access to information that typically community members would have to travel considerable distances to obtain. Topics included online banking, online business set-up, and instruction on online courses enrollment for adults. Students also provided support to their parents and other community members. Through the program "Teaching Through Generations," students helped adults with tasks such as setting up email accounts and uploading photos. Additional community sessions will educate community members on the availability of online health care services, including the option to teleconference with doctors.

Classroom Examples

- In EUPISD, only five schools have Spanish teachers. This program has allowed schools to share teachers more efficiently across the region. For example, a Spanish teacher at a very small high school can offer classes at two other nearby schools without having to drive approximately 30 miles to the other schools. DeTour High School's Spanish teacher used Moodle to deliver her online course to all of her students in the three schools. The course included the audio files and opportunities for students to practice their Spanish speaking and written skills. Ms. Livingston traveled to the nearby schools at least once a semester but utilized the existing IATV (interactive television) rooms to provide instruction. Spanish students would meet in the IATV room to take the class and "meet" with Ms. Livingston. Typically, the classes formally met face-to-face once a week and "as needed" for individual student support or conferencing.
- Les Cheneaux High School social studies teacher used what she learned from the training she attended at McREL to apply research-based instructional strategies in her classroom. The teacher worked to improve her students' note taking and research skills. Students read information both online and in print. Using their netbooks, they wrote five summarizing sentences and found five visual representations or images to represent each sentence. This technique was utilized often for a variety of research topics and not only engaged students but solidified the research process. The teacher also integrated smartphones as a means of collecting information to bring into class. Students would take pictures using their smartphones and email the images to themselves and classmates. This grant program implementation provided many opportunities including the ability for students to post their assignments online. The teacher integrated online discussions into her assignments.

Evaluating Effectiveness

District Data

- Enrollment in Moodle courses increased from 0 initial users to over 1,000 by Fall 2011.
- The number of student users in Compass Learning tripled to over 2,000.
- Improvement in summative test scores in grades 3 to 8 students who scored proficient or advanced in reading:
 - ✓ 2008-2009, 82% students
 - ✓ 2010-2011, 85% students
- Improvement in summative test scores in grades 3 to 8 students who scored proficient or advanced in mathematics:
 - ✓ 2008-2009, 85% students
 - ✓ 2009-2010, 85% students
 - ✓ 2010-2011, 88% students

The state-level, summative test scores for both reading and math have improved overall and the gap in scores between the largest ethnic groups, Native American and white, has been essentially eliminated. In addition to the increase of use of data in decision making, teachers increased the integration of online content in their instruction.

Moving Forward

All EUPISD districts are working on a shared sustainability model that includes replacement of devices every three years as well as increased classroom level technologies, including the addition and upgrade of interactive white boards. Districts have provided matching funds of \$50 per year per device for maintenance and upgrades.

Some local districts have been fortunate to pass technology millages, which have helped expand 1-to-1 laptops to sixth grade and enhance classroom level technologies such as interactive whiteboards, digital cameras, and interactive response devices.

The district-level technology, general education, and special education staff will continue to support technology enhanced teaching and learning beyond the term of the grant.

Resources

Eastern Upper Peninsula Intermediate School District
www.eup.k12.mi.us

Michigan Department of Education
<http://www.michigan.gov/mde>

Broadband Technology Opportunities Program (BTOP)
<http://www2.ntia.doc.gov/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

ⁱ American Recovery and Reinvestment Act provided the Department of Commerce's National Telecommunications and Information Administration (NTIA) and the U.S. Department of Agriculture's Rural Utilities Service (RUS) with \$7.2 billion to expand access to broadband services in the United States. Of those funds, the Act provided \$4.7 billion to NTIA to support the deployment of broadband infrastructure, enhance and expand public computer centers, encourage sustainable adoption of broadband service, and develop and maintain a nationwide public map of broadband service capability and availability.

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Missouri's EETT Competitive Grants

Missouri's ARRA EETT competitive grants provided professional development for teachers to meet the demands for 21st century learning. Missouri's professional development follows a research-based approach to organizing instruction as a means of helping teachers integrate technology into the classroom by promoting inquiry-based and project-based learning.

The Assess for Success Project Arcadia Valley R-11 School District, Missouri June 2009-July 2010

At Arcadia Valley R-II High School, in Arcadia Valley R-II School District, each student has access to a computer. With technology in place, the Assess for Success Project focused on using assessment data to provide appropriate, technology-rich activities in the core content areas. Teachers received instructor-led professional development, to educate teachers on using and developing assessment tools to better serve students.

Demographics

Arcadia Valley R-II School District is located in rural Ironton, Missouri, 75 miles southwest of St. Louis. Ironton does not have any industry to speak of, and the primary employer is the school system. At Arcadia Valley R-II High School, 47% of students receive free or reduced lunch. The graduation rate is 96.9%. The post-secondary entrance rate based on Missouri's definition is 59.8%. Within the high school, there is a 1-to-1 ratio of computers to students. The technology was purchased with the Comprehensive School Reform grant, previous EETT funding, and Title VIB funds. The school was also the recipient of a Missouri's Instructional Networked Teaching Strategies program (eMINTS) grant prior to the implementation of the Assess for Success project.

Project Description

The Assess for Success Project provided technology tools and professional development to all Arcadia Valley R-II High School staff with the goal to raise student achievement by planning instruction and remediation resources based on formative and summative assessment data. For this project, Arcadia Valley district pooled federal funds including Title 1 (formula), EETT (educational technology), and Title VI (small school) with district funds. Through analysis of assessment data, teachers recommended CAI (computer-aided instruction) for remediation, enrichment, and project-based learning

activities for course content mastery. Students also completed grade-level technology projects based on the National Educational Technology Student (NETS) standards. In addition to professional development, grant funds were used to purchase interactive whiteboards, teacher laptops, classroom sets of student response systems, and computers to provide an additional lab for students.

ARRA EETT Grant Details	
Grant Focus	Technology-Rich Learning Environment and Assessment
Beginning/End Date of Grant	June 1, 2009-July 30, 2010
Locale	Rural
Funding	\$200,000
Grade Level (s)	9-12
Number of Teachers Impacted	29
Number of Administrators Impacted	2
Number of Students Impacted	359

Project Implementation

Teachers aimed to provide technology-rich learning environments and received training in various areas, including sessions on the use of interactive whiteboards, student response unit setup, data acquisition, and data analysis.

Teachers also participated in a six-week online learning course, entitled Classroom Assessment Enhanced by Technology. In this course, teachers defined and identified strategies to better understand and utilize the relationship between classroom assessment and increased student achievement. The professional development helped teachers make better use of the technology in their classroom to enhance the presentation of the content during their lessons. Teachers also learned to use technology to develop various types of formative assessments. The formative assessment process allowed teachers to determine weaknesses in student perception and learning, and adjust their instruction accordingly. The student response systems successfully allowed teachers to incorporate the formative assessment process almost seamlessly in their

Technology is key to helping teachers modify instruction effectively.

- Arcadia Valley High School
Teacher

classrooms. When applicable, summative assessments were also created and scored through the automated scoring devices. The early use of technology in formative and summative assessments allowed Arcadia Valley R-II High School to be at an advantage in moving to the newly adopted Common Core State Standards. The teachers have a sound foundation in assessment and are adjusting instruction to meet student as well as meet curricular needs.

In 2009, the language arts department took the lead in individualizing instruction by designing a technology-based class project requirement for all students. They also developed their own assessments to individualize instruction for students based on the assessment data.

Classroom Example

- In an 11th grade English class, students completed a "History vs. Hollywood" research project. Students selected a movie based on a real event and researched the historical and literary aspects of the film via online resources. They prepared a slideshow presentation for the class to compare the accuracies and inaccuracies of the movie versus reality. The students then discussed the content of the slideshows in small groups.

Evaluating Effectiveness

This project's goal was to have 80% of Arcadia Valley R-II high school students master 80% of the district's identified student learning objectives for each course as measured through technology-based summative assessments at the end of each quarter/semester during the 2009-2010 school year.

School Data

- Students mastered the unit objectives for each course as measured by technology-based summative assessments at an average of 83%.
- Students scoring 80 percent or better on the language arts culminating project as scored using department-created rubrics:
 - ✓ 74% of 10th graders
 - ✓ 68% of 11th graders
 - ✓ 92% of 12th graders

Arcadia Valley R-II High School has a relatively young, new staff that was eager to embrace technology tools as part of everyday instruction. Administrators provided the necessary professional development time so that teachers could learn how to utilize those tools, such as student response systems to assess students, and remediate and individualize instruction as necessary. Teachers also learned how to use the technology tools to increase student engagement on a daily basis.

Moving Forward

Arcadia Valley High School has the technology tools and necessary professional development initiatives in place to continue to provide students with a high access, technology rich learning environment. Since 2010, the district continues to hone both formative and summative assessments to guide needed changes in instruction.

In 2011, the high school teachers continued to refine their teaching and evaluation skills to augment student success.

Resources

Arcadia Valley R-II School District

<http://avr2.org/>

Missouri Department of Elementary and Secondary Education

<http://dese.mo.gov>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Nebraska's EETT Competitive Grants

Nebraska's ARRA EETT grant goals included: to improve student academic achievement through the use of technology in elementary and secondary schools; to assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability; and to encourage the effective integration of technology.

Reading in Hand Program

Educational Service Unit 6, Nebraska

March 2010-September 2011

Reading in Hand sought to utilize proven, researched-based reading instruction, intervention, and assessment tools (i.e., Lexia, Accelerated Reader, DIBELS, and MAPS) on mobile computing devices (iPod Touches) to improve reading achievement and literacy skills for K-6 students in four rural Nebraska schools.

Demographics

In 1965, the Nebraska Legislature created educational service units (ESU) to provide supplemental support to district schools. ESUs offer services in the areas of administration, media, professional development, special education, and technology. ESU 6 is located in the southeast corner of the state, around Milford. The four rural schools participating in this program included Dorchester, Milford, York, and McCool Junction Elementary Schools.

Project Description

Reading in Hand program's goal was to improve literacy skills for students in grades K-6 among four rural Nebraska schools with a concentration of high-poverty students.

Specifically, the project's primary goal was to move from 30-50% of students who were reading below grade level or benchmark (varied according to grade level), to achieving 100% of K-6 students reading at or above grade by the completion of the 2010-2011 academic year. This project also intended to show sustained reading growth among higher achieving K-6 students, as baseline data indicated that the majority of high-achieving students were actually declining in reading

achievement under current practice. Data was collected from ESU 6 schools to document content areas where students were not reading at an acceptable level. Scores showed that the elementary students in the four targeted schools needed intervention to improve their reading skills. The two grade levels at each school with the lowest reading achievement scores from the previous school year were chosen to be a part of the program. Due to school sizes, this ranged from one to four classrooms at each grade level. Each teacher, including special education teachers, involved in the project worked with the ESU 6 literacy coach and technology integration specialist to receive training through large group, professional development, 1-to-1 coaching and webinars, live chat or instant messaging sessions, and other online learning environments. Each selected school received a cart of student iPod Touches to be shared between the two teachers per school. A laptop was made available on top of the cart to assist with the syncing of iPod Touches. Each member of the leadership team received a laptop, and each teacher received an iPod Touch. The wireless network infrastructure was improved to support the use of the wireless capabilities of the tools.

ARRA EETT Grant Details	
Grant Focus	High-Access, Technology-Rich Learning Environment and Technology Infrastructure
Beginning/End Date of Grant	March 1, 2010-September 30, 2011
Locale	Rural
Funding	\$300,057 ARRA EETT \$40,000 FY10 EETT
Grade Level (s)	K-6
Number of Teachers Impacted	35
Number of Administrators Impacted	4
Number of Students Impacted	450

Project Implementation

The project leadership team, consisting of representatives from each school, the literacy coach, and technology specialist, played an instrumental role in the implementation of the project. They met continuously throughout the project and planned the majority of the

professional development. In June of 2010, participating teachers met all day for an introduction of the tools and an overview of apps. Each teacher received an iPod Touch to use over the summer with the intent to increase his or her comfort level. They were shown how to download free apps and podcasts, including resources from Nebraska Department of Education's iTunes U. Teachers and administrators gathered again in August for two days to receive training on literacy and reading fluency. Since research shows a strong correlation between fluency and comprehension, this training covered discussions on connecting fluency and comprehension in classroom activities. Also, during this training, the coaches outlined the logistics of the fluency/comprehension assessments to evaluate the students' reading levels.

During the 2010-2011 school year, participating teachers met three times individually with the project leadership team. In September, the literacy coach visited each classroom and modeled lessons for teachers. The lesson focused on using rubrics to teach students about reading fluency. Students learned how to record themselves on the iPod Touches in order to self-assess their fluency skills. Teachers debriefed with the coach after the modeled lesson to discuss and assist with lesson planning. The technology specialist was also on site during these days to help with integrating the technology into the lessons, to provide support and answer questions, and to offer any other technical assistance as needed. In October, the literacy coach observed teachers and met each teacher to design a personal teacher action plan. The action plan reflected reading and technology use, goals, and actions that the project leadership team needed to support the teachers. In January of 2011, coaching sessions were determined on an individual basis and included additional modeled lessons, co-taught lessons, observations, and/or planning sessions.

Teachers created portfolios of student fluency samples for each student during the fall. Teachers worked to complete analytic scoring of the samples in December, then continued the teaching, recording, and collecting process throughout the spring. Teachers came back together in late spring to do a second analytic scoring of the audio files, which showed universal gains in fluency. Teachers used the data to validate that grant activities were making a positive impact on student achievement. The data also helped indicate which students needed additional supports to reach benchmark fluency rates.

In addition to using the iPod Touches for literacy recordings, teachers downloaded appropriate apps for student use, such as Puppet Pals where students can choose puppets, animate, and record stories to create a puppet show. Teachers shared and evaluated apps using the Reading in Hand project website.

Classroom Examples

- In second grade, students completed a variety of fluency lessons utilizing the iPod Touches as recording devices to record, play back, and evaluate readings. To teach appropriate intonation while reading, students learned the importance of using punctuation as a guide. First, students, as a whole group, recited the alphabet or numbers as a conversation. For example, ABC? DE. FGH! I? JKL. MN? OPQ! RST! UV? WX. YZ! 123. 4! 567? 89. 10! Next, students recited a sentence using different end

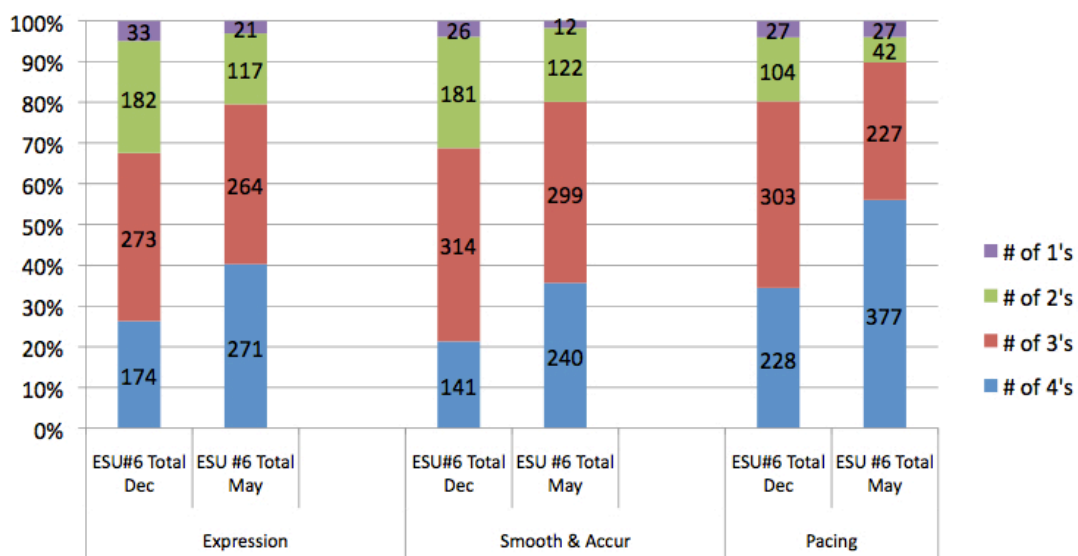
punctuation marks. For example, Cows moo. Cows moo? Cows moo! To practice placing the stress on different words in the same sentence, the teacher modeled reading the following sentences: *I* am sad. I *am* sad. I am *sad*. Students then worked in pairs and practiced reading the sentences. Next, students recorded their readings, listened to the recordings, and evaluated themselves, using a provided rubric, with a partner or a teacher. Students worked to improve their reading based on self and peer evaluations. Prior to the grant, students had never recorded themselves or evaluated their own reading.

- To help students chunk text as they read, a participating teacher focused on grammar skills. Students learned to differentiate between a subject and a predicate as a means to help them chunk text based on these two main parts of a sentence. During one lesson, students were provided a paper copy of a short passage with the subject underlined once and the predicate underlined twice. In pairs, students underlined the provided texts. After practice and discussion, students worked with a new short passage. The teacher modeled how to use these phrase chunks to read fluently. After students practiced reading the passage, they recorded themselves on the iPod Touches and evaluated their own reading fluency. They were taught to evaluate their fluency and analyze the data to know their strengths and weaknesses as part of this grant program.

Evaluating Effectiveness

In December of 2010, participating teachers worked together to evaluate two audio files per student (total of 330 students). Students' recordings were evaluated for three reading traits; expression, smoothness/accuracy, and pacing using a detailed four-point scale rubric.

Comparing ESU #6—330 Students (December) to ESU #6—335 Students (May)



Reading Evaluation Data

- In December, 17% of students scored at level 1 or 2, 46% scored at level 3, and 37% scored at level 4.
- In May, 10% of students scored at level 1 or 2, 34% scored at level 3, and 56% scored at level 4 demonstrating significant gains.

Moving Forward

Many components of the Reading in Hand program will be continued. The literacy coach will be funded using state funds, and additional iPod Touches were purchased by individual schools. Additional applications and functionality is being utilized with the iPods, including iMovie on the newer iPods, and literacy apps. The participating teachers have served as models and advocates for the reading program and cannot imagine their classrooms without these powerful tools.

Resources

Reading in Hand Project Website
<http://esu6rih.wikispaces.com>

Nebraska Department of Education
<http://www.education.ne.gov/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Nevada's EETT Competitive Grants

Nevada's EETT competitive grant addressed the statewide concern regarding student engagement and achievement. Efforts focused on recognizing and addressing the needs of 21st century students through the framework of the revised Nevada Educational Technology Standards, which align to the National Educational Technology Standards for Students (NETS-S). In order to meet the needs of students, teachers were trained in providing 21st century learning experiences for students. To best reach teachers across the state, professional development was provided online and archived for future professional development needs.

Pathway Project July 2009-July 2011

The main purpose of the Pathway Project was to improve middle school achievement by engaging students in 21st century learning experiences. This statewide program sought to provide accessible professional development despite the geography and disparity of Nevada's school districts.

Demographics

Nevada is a geographically diverse state. Clark County, which includes Las Vegas, is the largest school district, and over two-thirds of Nevada's population lives in the Las Vegas metropolitan area. As the seventh largest state in the United States, the remainder of the population living outside Las Vegas is spread across vast rural areas. The Clark County student population is approximately 314,000, while the total state student population is 437,000. There are 341 schools in Clark County and current expenditure per student is \$7,615, well below the national average of \$10,190.

Project Description

The Pathway Project, inspired by collaborative discussions with technology professionals from around the state, provided professional development and tools to create 21st century learning experiences for middle school students. The Pathway Project advisory committee chose to target middle school teachers and students to spark interest and curiosity in adolescent learners. The two-year professional development program focused on changing teacher behavior, using the Technological Pedagogical Content Knowledge (TPACK) model, and delivering effective online professional development. Teachers

received training and worked collaboratively to develop, implement, and revise standards-based projects for their students. A classroom package of technology equipment was provided to participating teachers to support this change, including iPod Touches and laptop carts. All training was conducted online, through a Moodle environment and by building electronic, professional learning communities. In addition, training and collaboration was provided for the site administrators who supported the participating teachers.

ARRA EETT Grant Details	
Grant Focus	Ongoing Professional Development and Project-Based Collaborative Learning
Beginning/End Date of Grant	July 1, 2009-July 31, 2011
Locale	Statewide
Funding	\$4,038,709 Federal Funds \$100,000 Local Funds
Grade Level (s)	6-8
Number of Teachers Impacted	128
Number of Administrators Impacted	30
Number of Students Impacted	18,000

Project Implementation

Beginning in July of 2009, teachers across the state applied for acceptance into the Pathway Project; teachers were selected in pairs so that they could provide support to each other as they progressed through the two-year program. Applicants were selected based on administration approval, level of technology support at their school, and geographic location to ensure that each district was represented proportionally. One hundred twenty-eight teachers were selected, representing 17

I haven't had to pull out the textbooks at all this year. It's not that I never use pencil and paper; obviously that still has a lot of value, but as much as I can, I try to get the technology used in whatever way possible. It's a never-ending source of information and reading and writing and critical thinking skills, and it's really all of that together. It's been a very pleasant experience having all this stuff in my classroom!

– Pathway Teacher

districts. The teachers received an iPod Touch cart and a laptop cart per pair of teachers. Teachers were also provided additional devices such as a laptop and projector if not already in place at the school. The professional development consisted of four modules, developed and facilitated by University of Nevada, Las Vegas professors and school district professional developers. Module 1 provided an introduction to the technology tools and a theoretical foundation of the TPACK model and national and state technology standards. In Module 2, teachers planned project-based activities, collaborating across the state. In Module 3, teachers implemented projects with students. Module 4 provided the opportunity for reflection and refinement. Throughout all of the modules, teachers completed assignments, attended webinars, participated in online discussions, and engaged in synchronous sessions.

Classroom Examples

- In seventh grade science, identifying and explaining seismic waves is part of the curriculum. In previous years, science teachers showed a video and asked students to read about seismographs. In the Pathway classroom, using a seismograph app on their iPods, students recorded different waves and manipulated the waves in real time. Next, students worked online to gather data and graph seismic activity in Nevada. Students were engaged in this hands-on discovery of waves and seismograph functions.
- In the unit on immigration in an American history class, students would typically read the textbook and watch a video about immigration through Ellis Island. In the Pathway class, pairs of students chose video segments from the PBS *Faces of America*. Students then responded to prompting questions posted on the teacher's blog. They had the opportunity to share and read the diversity of blog posts, resulting in the expression of empathy for the immigrants and realizing that every immigrating group faced different and yet similar struggles and dreams.

Evaluating Effectiveness

The two main objectives of this program were to change teacher behavior through online, collaborative professional development, and to identify and implement effective tools, strategies, and resources for professional development. To evaluate these goals, qualitative and quantitative data were collected through multiple survey instruments, interviews, classroom observations, and review of artifacts (blog reflections, work samples and online discussion threads). Surveys included the following tools: Attitudes Toward Technological Tools, Dispositions Toward Teaching with Technology, Technology Self-Efficacy (Confidence), and TPACK survey. Teachers were surveyed at the beginning of the professional development and the end of each of the four modules. Data confirmed that the first objective was met; the program positively affected teacher behavior. Participants noted increased confidence and higher attitudes with the tools and pedagogies. In examining a particular variable, participants' attitude toward interactive and delivery tools, there was little change in attitude with each module but a significant positive change by the conclusion of the project. Subsequently, ample anecdotal data, including that from classroom observations and teacher interviews, indicated increased student engagement.

Findings showed that students were indeed motivated by the various technology tools and applications employed. Strengths of the project included the access to the tools and resources, with the freedom to explore, and the collaboration and feedback from the project facilitators and participants. See “Resources” below for access to the *Clark County School District: ARRA-Pathways Project Final Report FY 2011*.

Moving Forward

Many Pathway teachers have already provided professional development within their own schools and districts, and some presented at the state conference. These teachers have become advocates and mentors for integrating technology. Small parts of each module have been archived with plans to adjust and combine in a Moodle environment so that teachers may participate in self-paced and unguided professional development for continuing education credit.

Resources

Nevada Pathway Project Website

<http://cpdmoodle.ccsd.net/pathway/>

Clark County School District: ARRA-Pathways Project Final Report FY 2011

<http://tinyurl.com/7fwy53d>

Nevada Department of Education

<http://doe.nv.gov/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

New Hampshire's EETT Competitive Grants

In New Hampshire, the 21st Century Classrooms Initiative provided grants to school districts and/or consortia of school districts for innovative integration of educational technology and information literacy to advance student learning. To transform traditional models of schooling into 21st century learning environments, students, teachers, and administrators were immersed in projects that focused on media-rich teaching and learning resources and strategies.

Transforming Classrooms Through Technology New Hampshire School Administrative Unit #53 December 2009-September 2011

The purpose of the Transforming Classrooms Through Technology grant was to increase student achievement in science with a hands-on, inquiry-based approach in K-12 while integrating technology. Through equipment purchases, professional development, in-depth curriculum alignment, and a commitment to higher order cognitive processes, this program revamped the science curriculum.

Demographics

School Administrative Unit (SAU) #53 is comprised of 10 schools in the school districts of Allenstown, Chichester, Deerfield, Epsom and Pembroke, New Hampshire. The SAU provides PK-12 educational experiences for approximately 3,500 students. SAU #53 schools are in the suburbs of Concord, the state capital.

Project Description

The Transforming Science Classrooms Through Technology project focused on science education in nine schools, with mandatory participation from all five high school science teachers and voluntary participation by the elementary and middle school science teachers. Recent revisions to the New Hampshire Science Frameworks, provided the opportunity to infuse technology and encourage new professional development. The equipment purchased included two lab stations per school and five lab stations for the high school. The lab stations included a laptop, an interactive whiteboard, video

cameras, science probes (including electronic, motion, temperature, biology, and chemistry probes), a document camera, digital microscopes, a weather station, high speed digital cameras, and the appropriate software. Participating teachers engaged in professional development and developed lessons using the Understanding by Design (UBD) model, which included incorporating the new equipment. The professional development also established a learning community for the science teachers. As part of the process, teachers analyzed the effectiveness of technology-enriched lessons by comparing them to traditionally delivered lessons using experimental and control groups.

ARRA EETT Grant Details	
Grant Focus	Content Standards and High-Quality Assessments and High-Access, Technology-Rich Learning Environments
Beginning/End Date of Grant	December 10, 2009-September 30, 2011
Locale	Town/Rural
Funding	\$534,066
Grade Level (s)	K-12
Number of Teachers Impacted	27
Number of Administrators Impacted	10
Number of Students Impacted	482

Project Implementation

During the spring and summer of 2010, materials and equipment were ordered and set up in the participating classrooms. In preparation, teachers conducted technology literacy pretests to establish a baseline. Project leaders attended statewide meetings, and monthly meetings were held for all SAU #53 participating teachers and administrators to discuss project goals and activities, equipment use (i.e., interactive whiteboards, probes, and weather equipment), and experiment and evaluation strategies.

A full-time integration specialist was employed as part of this project. She guided the classroom teachers to integrate the technology tools into the curriculum based on the New Hampshire Science Frameworks and ISTE standards. This specialist also assessed individual professional development needs and aligned the professional development with

district technology plans and the science grade-span standards. She visited each participating classroom on an almost weekly basis to help with integration and collaboration. She organized the template used for sharing lessons in the learning community's online site, which was hosted by Sakai, New Hampshire's content management system. She also organized monthly meetings and disseminated information locally, across the project, and statewide.

Teachers were well versed in developing lessons using UBD principles through previous professional development. Each participating teacher was responsible for developing a minimum of two lessons using a UBD template to share via the learning community's site. In addition, a wiki was part of this site, and teachers communicated with each other via the wiki throughout the school year. A listserv provided another opportunity to communicate information to and between the participants. Many of the participants also attended regional and national conferences.

Classroom Examples

- In two first grade classes, students studied plant growth. Two separate classrooms were established, a control and treatment (with technology-enhanced instruction) classroom. In the control class, students studied plant growth as they have in the past, planting a seed in soil, documenting the plant's growth, and labeling diagrams. In the technology-rich classroom, students planted seeds and observed growth but also used probes and technology tools to vary sunlight and water to manipulate and observe their effect on simulated plants. Students viewed video clips to show plant growth from a seed to a full plant in fast time. They also used interactive sites on the computers to alter plant growth via simulations. Pre- and post-test scores on a plant growth assessment were collected for both the control and treatment classes and showed higher scores for the treatment group (87% versus 82%). Teacher observations indicated that students were significantly more engaged when using technology. The simulation for the plant growth was especially beneficial and fun for the students.
- In a sixth grade science unit on sound, the objective was to have students explain that sound vibrations move at different speeds and frequencies and have different wavelengths. Two classes, a control and treatment (with technology-enhanced instruction) completed activities to study sound. A different teacher taught each class. Both teachers developed the lessons and tried to make the experience, with the exception of the technology, similar for the students. Students determined what a wave looked like if a sound was loud or soft and what it looked like if a sound has a high pitch or a low pitch. In the technology-rich classroom, students used an MP3 player, tuning forks, and additional instruments to create different sounds and used probes to record the wavelengths. Students uploaded the sound files to a computer

The integration of technology in the first grade classroom has been positive. The students are significantly more engaged. They regard the lessons as fun and can't wait to have their turn with the tools.
-Barbara Nelson, First Grade Teacher

and used Audacity software to view and edit the sound waves. In the control classroom, students worked with tuning forks and probes but did not have the MP3 players using textbooks and diagrams as reference. At the end of this activity, all students took a quiz. Students matched diagrams of six different waves with its type: loud and high-pitched, loud and low-pitched, soft and high-pitched, soft and low-pitched, loud and medium-pitched, or soft and medium-pitched. The average score of the treatment group was 5.29 out of a possible 6. The average of the control group was 3.88 out of 6 points. In addition, 70% of the students in the treatment group answered all the questions correctly on the quiz while only 47% of the students in the control group answered all the questions correctly.

Evaluating Effectiveness

All districts receiving ARRA Ed Tech grant funds were required to complete evaluation instruments/surveys created by Hezel Associates and instruments created by NHDOE, including a Walkthrough Observation Tool, Educator Survey, Student Survey, NH School Technology and Readiness (STaR) Chart, NH District Technology Survey, and NH School Technology Surveys. See "Resources" below for access to the full evaluation report.

The program had multiple benefits for both students and teachers. Students benefited from an engaging and interactive 21st century learning environment. Informal observations and data collection by the science/technology integration specialist and administrators concluded that the integration of technology helped to increase student comprehension and engagement. Teachers believe that their productivity and efficiency increased, as they were able to utilize the new technology in their daily plans and share plans with other teachers.

Moving Forward

As other classroom teachers saw the technology used by their colleagues and the gains in comprehension and engagement with students, there was a demand in other classes for increased technology. At Epsom Central High School, all other classrooms were equipped with interactive whiteboards. At Hill School, additional student labs were installed, and local funds were used to rehire the project's integration specialist on a part-time basis. The online management system, Sakai, continues to support professional learning, and teachers continue to meet to share ideas.

Resources

New Hampshire School Administrative Unit #53

<http://www.sau53.org>

State-wide Evaluation of the New Hampshire ESEA Title II, Part D Grant Program Final Report, October 2011

<http://tinyurl.com/8yz3l5k>

New Hampshire Department of Education
<http://www.education.nh.gov/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology program* (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

New Jersey's EETT ARRA Competitive Grant Program

New Jersey's Talent21 (Teaching and Learning with Essential New Technologies in the 21st Century) program awarded ten districts grant funds, targeting sixth and seventh grade students. Students were provided a 1-to-1 mobile device, the use of Web 2.0 tools, and online collaborative learning opportunities. Intensive professional development for teachers and administrators provided participants with the ability to change the delivery of instruction through the acquisition of skills to effectively integrate technology and 21st century skills and themes across content areas using the Universal Design for Learning (UDL) framework. Teachers and administrators also developed a sustainability plan extending beyond the grant period.

Talent21 Grant, Lawrence Township Public Schools, New Jersey June 2010-September 2011

Lawrence Township was one of ten New Jersey districts that received a Talent21 grant. In Lawrence Township, each sixth grade student received a netbook for use in school and at home. Teachers and administrators engaged in summer and after-school professional development sessions, in-class coaching, and one-on-one consultation with professional consultants in the fields of educational technology. The focus of the training was on integrating technology into all curriculum areas, implementing student-centered instruction through the UDL framework, communicating more effectively within the school and community, using collaborative tools, and managing change.

Demographics

Lawrence Township Public Schools is a suburban school district located in Lawrenceville, New Jersey, geographically between Princeton and Trenton. It is a diverse community with over 40 languages spoken by students. The school system is made up of four elementary schools (K-3), one intermediate school (4-6), one middle school (7-8), and one high school (9-12).

Project Description

The Talent21 Project provided technology-enriched classrooms and professional development for schools. Grant funds included the establishment of a reliable and robust wireless network and a 1-to-1 wireless mobile computing environment. The grant required recipients to establish a formative assessment system and process to collect, manage, and analyze student data in order to allow for individualized instructional strategies. Lawrence Township's Talent21 grant focused on the use of technology to support and enhance instruction in the core content areas. Intense professional development for teachers and administrators targeted effective integration of technology and 21st century skills.

ARRA EETT Grant Details	
Grant Focus	Technology Coaches and High-Access Technology and Technology-Rich Learning Environment
Beginning/End Date of Grant	June 2010-September 15, 2011
Locale	Suburban
Funding	\$1,400,000
Grade Level (s)	Grades 6 and 7
Number of Teachers Impacted	62
Number of Administrators Impacted	9
Number of Students Impacted	598

Project Implementation

To accommodate the new tools, the one intermediate and middle school in Lawrence Township first increased its bandwidth to accommodate the maximum number of netbook users. Approximately 288 sixth grade students were issued a netbook during the summer of 2010 and 310 sixth grade students during the summer of 2011. The summers of 2010 and 2011 were filled with intensive professional development for staff, students, and parents. Teachers were instructed on using Web 2.0 tools, including Diigo, Google docs, Google Earth, Brainpop resources, Quizlet, Jing, and Wikispaces. November Learning consultants trained teachers on using the collaborative Google tools, including docs, calendars, forms, sites, and groups. The consultants demonstrated how to manage student work electronically and to communicate with students and parents through Google sites, Wikispaces, and Teacherspages. During this time, teachers developed collaborative sites by class and by content area as a way to better organize and communicate information. Teachers also transformed lessons to a digital format to allow students to access information from home. At the same time, administrators participated in professional development to learn new ways to communicate with parents, community members, and

There isn't a place in the school that isn't a learning space.
- Lawrence Township Assistant Superintendent

students through social networks, such as Twitter, blogs, and Facebook. Content supervisors investigated using new Web 2.0 tools to infuse additional technology resources into the curriculum. Supervisors also utilized new tools to disseminate information to staff. Parents participated in a series of workshops that introduced them to the Web 2.0 tools their children would be using, and they were provided helpful tips for internet safety and in managing “netbook time” at home.

Professional development continued during the school year through in-class coaching. Participating teachers received one day of content training with time to develop new lessons integrating technology. During the next week, a coach visited the classroom to assist the teacher in implementing the lesson. Teachers and students together became experts in learning, and developers of content, helping each other with the technology and the applications.

With the mobility of the netbooks, all corners of the school building were utilized for learning spaces. Engaged learning occurred in the classrooms and even hallways as students worked in small groups. Student activities incorporated collaborative learning, podcasts, and videos. Integrating technology tools and online content allowed students to understand global connections, differing points of view, and diverse cultural values.

Classroom Examples

- Language Arts students took a new approach to studying current events. Instead of clipping newspaper articles and bringing them into class, students used TweenTribune.com, a site featuring relevant news stories specifically for tweens and teens. After exploring and identifying proper web etiquette, students, as a class, set guidelines for using the TweenTribune website and leaving comments on the site. Students were tasked with reading articles, submitting comments to the teacher for review, and then posting comments. This process engaged the student and teacher in the writing and reviewing process. By posting comments on the site, students were able to share their writing not only with their classmates but with all TweenTribune visitors. Students were highly motivated to read current articles and craft thoughtful responses to elicit discussion.
- Mathematics students engaged in an ongoing stock market project throughout the school year. Early in the school year, students watched an online video and participated in discussions, which provided an overview of the stock market. Students tracked stocks using Yahoo! Finance and conducted independent, online research of various companies. From September through April, students selected stocks, tracked them, and graphed progress via desktop tools. When prices rose or fell dramatically, the teacher led a discussion on how major events (such as the Japanese tsunami) affected the stock market. As the culminating project, students worked in pairs and chose two competing companies, such as Adidas vs. Nike or Sprint vs. AT&T, and researched each company. Students chose one of the companies as a recommended investment and presented all findings to their classmates using presentation tools. Presentations were also posted online.

Evaluating Effectiveness

The key to this successful program was ongoing professional development. Teachers received support from administrators, coaches, and students. The teachers who received the coaching as part of this program will become the coaches to other teachers in the future. Other accomplishments included the establishment of a virtual professional learning community, teacher websites, and web-based lessons and tutorials for students and parents to access from home.

Students and teachers in the Talent21 program increased their technology proficiency. Based on the post-test results of a student engagement survey developed by the National Center for Student Engagement, the students in the Talent21 group outscored their peers, from a control group who did not experience the program, by 13 percentile points.

School Data

- Student technology proficiency increased from 75% to 87% in one school year as measured by the NJTAP-IN rubric from the New Jersey Department of Education.
- Based on results from the pre-test and post-test LOTI Digital Age Survey, the participating teachers increased their technology literacy by approximately 11% in one year.

Moving Forward

Building on the success of this program, the program expanded for the 2011-2012 school year. Eighth grade students received a netbook provided through local funds. Students moving from sixth to seventh grade were redistributed netbooks, and the new sixth graders were issued new netbooks as part of the Talent21 program. All middle school students will work 1-to-1 with the technology for the first time in the district's history. In addition, Talent 21 grantees, including Lawrence Township, now serve as best practice models for schools across the state in establishing and implementing 21st century learning environments.

Resources

Lawrence Township Public Schools

<http://ltps.org/>

New Jersey Department of Education

<http://nj.gov/education/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

New York’s EETT Competitive Grants

The New York State Education Department (NYSED) identified four priorities areas for ARRA EETT funds: 1) To develop technology-rich, student-centered, active learning environments; 2) Provide an online formative assessment data management system compatible with current data system; 3) Deliver online instruction connected with the development of NYSED’s Virtual School Initiative; and 4) Support English language learners (ELLs) and students with disabilities through the use of technology tools.

EETT Model Classrooms

Rochester City School District, New York

September 2010-September 2011

The purpose of this grant was to scale-up Rochester’s Model Classrooms program by providing the equipment and professional development required to establish additional technology-rich, student centered, model classrooms. Through professional development and the addition of technology to classrooms, teachers learned to integrate technology into a student-centered model of instruction.

Demographics

The city of Rochester is located in upstate New York. It is considered one of New York’s Big 5 districts, along with Syracuse, New York City, Buffalo, and Yonkers. The school system supports approximately 32,000 PK-12 students and 10,000 adults. Students speak 35 different languages, from 28 different countries. In Rochester, 88% of the student population is eligible for free/reduced lunch, while 22% of the city schools are at 90% poverty or higher.

Project Description

In Rochester City Schools, a district survey revealed that most teachers were not prepared to effectively teach using technology tools. All teachers had a computer each, and schools had at least a computer lab. In addition, some schools had mobile labs, projectors, and interactive whiteboards but this was not widespread. In response, the district targeted fourth through eighth grade teachers to help ensure student technology proficiency by the time students entered ninth grade. Using a combination of federal and local funds, this large endeavor aimed to couple appropriate access to

ARRA EETT Grant Details	
Grant Focus	Ongoing Professional Development and High-Access, Technology-Rich Learning Environments
Beginning/End Date of Grant	September 2010-September 2011
Locale	Urban
Total Funding	\$ 1,857,403
Grade Level (s)	4-8
Number of Teachers Impacted	120
Number of Administrators Impacted	150
Number of Students Impacted	3,600

technology tools with intense, professional development that would build teachers' skills, support instruction, and change classroom practices. This initiative initially began in 2006 with local funds on a small scale, and then expanded annually with the help of local, EETT formula, and competitive funds. By 2008, the program expanded to reach each school in the district. The ARRA EETT funds awarded for the 2010-2011 school year enabled the Model Classroom program to expand to 120 additional classrooms. The program provided multi-modality professional development opportunities for teachers and building level staff, which included face-to-face training and coaching by a technology integration specialist. Overall, since the Model Classrooms inception, 396 teachers from 159 classrooms have been trained, and the district continually provides training so that staff members are prepared as additional technology tools are distributed. Overall, 5,683 unique participants have participated in at least one Model Classroom training sessions since 2006. The total funds for this grant since 2006 include \$3,000,000 in local funds, \$953,216 in EETT Formula Funds, \$2.4 million in EETT competitive funds, and \$1,857,403 in ARRA EETT Funds.

Project Implementation

Model classroom teachers were selected in pairs based on their instructional expertise and their interest in technology integration. Each participating teacher's classroom was outfitted with an interactive whiteboard, projector, document camera, a teacher laptop, and a pod of six desktop computers. In addition, each participating school was supplied with a mobile lab of netbooks, class set of interactive response systems, and digital cameras for

the model classrooms to share. The teachers attended five to seven days of training spread out over the course of the year. The face-to-face instruction covered training of the technology equipment provided in the classroom, software applications, and the overall integration of technology into classroom practices, including Technological Pedagogical Content Knowledge (TPACK) framework with focus on content and pedagogy. Following each training session, teachers benefited from direct support through classroom coaching. For example, if teachers received training on using the interactive whiteboard, the coach would work with the teacher to effectively integrate the interactive whiteboard into the content instruction as well as develop student-centered classroom activities.

Classroom Examples

- In fifth grade language arts, students wrote poetry about the holidays including how different countries celebrate Christmas and other holidays. Using their netbooks, students researched other countries and their celebrations including using Google Earth to locate and track the distances to multiple countries. Students presented their research using a slide show presentation and shared a poem about their country. Classmates evaluated other students' presentations using a rubric. Prior to the grant, limited technology tools minimized research and presentation options.
- In the fifth and sixth grade, students studied geology and plate tectonics. Before the grant, students used maps provided by the teacher and textbook readings to explore plates and earthquakes. With greater access to technology, students participated in a unit created by The Center for Innovation in Engineering and Science Education during which students took on the role of United States Geological Survey (USGS) scientists to explore locations of recent earthquakes and determine areas that are most prone to earthquakes. Students used maps on the USGS website to research earthquake activity. They explored a projected tectonic plate map and worked in small teams to explore the connections and correlations between the earthquake map and tectonic map.

The engagement I have seen in my fifth and sixth graders is inspiring. They are invested in their learning and take pride in the work they turn in to me. I haven't seen that pride in the paper/pencil assignments for some years now.

-Rochester City Teacher

Evaluating Effectiveness

Based on teacher surveys, 75% of participating classroom teachers surveyed stated that they now routinely use technology in the delivery of their daily content instruction. Technology is increasingly utilized for the planning of teacher lessons, the delivery of the classroom instructional program, and the adaptation of materials for individual student use. Furthermore, participating teachers believe that technology serves as a motivating factor for both teachers and their students, which fosters students' active participation in learning activities and drives increased students' achievement. By the end of the second year, teachers celebrated the many ways that technology helped to provide a more effective

instructional program and reported that they have become more cognizant about how to engage students in instructional content and process through the use of technology. As well, survey results show that teacher training has a positive impact on teacher use of technology in the classroom and that, in turn, has a positive impact on student academic achievement. The number of teachers who view technology as a teaching tool to enhance and enrich students' learning experiences has grown, and the number of teachers who have struggled with technology continues to decline.

Using technology engages students and offers them an opportunity to discover the world at their fingertips. The interactive whiteboard software allows me to prepare engaging, eye-catching lessons using media resources that address standards in all academic areas. I would find teaching very difficult if I had to go back to using a textbook, marker board only model.

-Rochester City Teacher

Overall results in the second year of the grant implementation show that instruction from technology-trained teachers in a model classroom setting had a positive impact on the achievement scores of students on the 2011 New York State Assessments. The No Child Left Behind (NCLB) subgroups of female, disadvantaged, black, and Hispanic students noted the highest gains. Results indicated that the most positive impact was made in eighth grade English language arts where nearly all measured subgroups demonstrated scaled scores that were significantly greater than their regular classroom peers. Overall, results suggest that instruction from technology-trained teachers in a Model Classroom setting has a positive impact on the achievement scores of students on the 2011 New York State Assessments.

District Data

- In year one, 52% of classroom teachers surveyed now state that they routinely use technology in the delivery of their daily instructional program.
- In year two, 75% of classroom teachers surveyed now state that they routinely use technology in the delivery of their daily instructional program.
- English and language arts had the largest positive academic impact with 44% of the measured students benefiting from technology-integrated instruction based on 2011 New York State Assessments.
- The average positive academic impact for all subgroups; female, disadvantaged, black and Hispanic was above 33%.

Access full evaluation report at <http://tinyurl.com/8xf5lxr>.

Moving Forward

For the 2011-2012 school year, \$525,000 of FY10 EETT funds and \$570,000 in local funds have been dedicated to support and expand the program. Based on the implementation, buildings are now also using local funds to scale out the program within individual schools. During the 2011-2012 school year, all certified district staff received training and were issued laptops. In addition, using the same professional development model, including a coach, teachers are continually trained to integrate technology. This professional development model has proven most effective and will be used to teach and implement other district initiatives strategies. Technology will continue to be refreshed, and alternative devices will be researched for implementation in the classrooms.

Resources

Rochester City School District Instructional Technology Website

<http://rcsdk12.org/197310107101030933/site/default.asp>

New York State Education Department

<http://nysed.gov/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

North Carolina's EETT Competitive Grants

IMPACT (initially titled: Information Power: Building Partnerships for Learning) provides the overall vision of the role of media and technology for North Carolina Department of Public Instruction by recognizing that an effective school library media and technology program is essential to support teaching and learning. The IMPACT Leadership for the 21st Century Learner continuation grants provided funding to schools that were awarded IMPACT III and IMPACT IV funds through traditional Title II Part D, competitive grants. Funds awarded enabled IMPACT Model Schools to implement additional technology enhancement programs, including a 1-to-1 program for high schools and provision of digital teaching tools for middle and elementary schools. Furthermore, the IMPACT model acknowledges that an effective school media and technology program supports teaching and learning and encourages collaborative planning.

IMPACT: Leadership for the 21st Century Learner

Asheville City Schools, North Carolina

September 2009-December 2012

This grant was designed to increase student learning through the full implementation of North Carolina Department of Public Instruction's IMPACT model guidelines. Asheville City Schools' (ACS) teachers, media coordinators, instructional technology facilitators, and other education leaders collaboratively developed curriculum to infuse learning with media and technology resources. These curricula engaged students in the core curriculum while developing 21st century skills.

Demographics

Asheville is located in the western part of North Carolina in the Blue Ridge Mountains. ACS has two high schools, Asheville High School and the School of Inquiry & Life Sciences at Asheville (SILSA), one middle school, and five elementary magnet schools. Elementary students in the district may attend the elementary school of their choice; a magnet program allows students to attend the school whose “theme” best matches their interests. Themes include Arts and Humanities, Science, Mathematics and Technologies, Global Scholars, Experiential Learning, and Human Diversity and Ecology.

Project Description

ACS took the first steps toward implementing the IMPACT model during the 2007-2008 school year as part of the "Digitally Literate Asheville" (DLA) initiative that the district is currently striving to fully implement. The ultimate goal of the DLA initiative is to transform student learning by providing every teacher and student with a laptop and a stable infrastructure to support 21st century teaching and learning. At the same time the DLA initiative was being developed, ACS was identified as a North Carolina Department of Public Instruction IMPACT Model District and received

ARRA EETT Grant Details	
Grant Focus	Project-Based Collaborative Learning and Professional Learning Communities
Beginning/End Date of Grant	September 2009-December 2012
Locale	Rural
Funding	\$2,148,605 Competitive Grant \$32,170 Formula Grant
Grade Level (s)	K-12
Number of Teachers Impacted	335
Number of Administrators Impacted	25
Number of Students Impacted	4,017

EETT funds to provide professional development and devices to teachers. Building on the initial IMPACT grants, the ARRA EETT IMPACT Leadership for the 21st Century Learner continuation grant provided all eight ACS schools with professional development, support for collaborative planning, and equipment. Over 25% of grant funds were used to provide professional development, which emphasized the use of Web 2.0 tools such as wikis, blogs, and Moodle to support a social constructivist approach to learning. Teachers, media coordinators, instructional technology facilitators, and other educators collaborated to develop rigorous, engaging, and standards-aligned collaborative student learning opportunities emphasizing 21st

century skills. The equipment provided included teacher laptops, network infrastructure to support wireless computing, over 900 student laptops for anytime and anywhere learning, digital projectors, 113 interactive whiteboards, 33 student response systems class sets, and other digital tools.

Project Implementation

Implementation started with professional development for teachers, moved to network readiness, and only then moved to provide students access to learning technologies. To guide the project, each school's Media and Technology Advisory Committee developed an implementation plan. The plans included a needs assessment, equipment acquisition plan, professional development plan, and schedules for collaborative planning.

The hardware implementation initially went into building the network infrastructure and increasing switch capacity and wireless access. The next step of hardware implementation supplied teachers with laptops and the interactive presentation technologies. The final step introduced the student learning technologies, which included laptops, interactive whiteboards, software, scientific monitors, and multimedia tools for students and teachers. Deployment of these technologies required careful planning for implementation. The 9th grade classes were provided 1-to-1 access, and 10th to 12th grade classes were provided laptop carts.

Professional development varied by school and was tailored to the needs of the teachers and school program. School teams developed their professional development plans based on teacher surveys, observed needs, and recommendations of the state instructional technology specialists. Each school had a school media coordinator and instructional technology facilitator funded by the district. Additional professional development in the form of summer institutes, afternoon workshops, grade level and department professional learning communities, guest speakers, and conference attendance, including ISTE and the North Carolina Technology in Education Society conference, was also provided.

Through technology, student engagement increased as well as the ability to access and interact with rigorous material.

- Asheville City Schools Teacher,
Grade 5

As importantly, teachers received direct support in planning and implementing new methods of instruction during collaborative planning. In the elementary and middle schools, teams of teachers were provided collaborative planning sessions four times during the school year to design units and work with the school media coordinator and instructional technology facilitator to integrate technology and information skills. In the high schools, teachers met as a department twice during the school year. High school teachers received training on particular devices or Web 2.0 tools in the

morning and then worked as a department in the afternoon to explore instructional uses. The most successful collaborative planning teams grew into professional learning communities in which teaching professionals helped one another analyze formative and summative student achievement data in order to identify the best ways to meet the needs of their students.

Leadership was crucial in helping the teachers see the necessity to change practice and make use of new tools and techniques. School leadership was particularly effective in the instances where administrators modeled new tools and allowed staff to see that mistakes were part of the learning process.

Classroom Examples

- In a cross-curricular project in second grade, students and teachers participated in Heifer International’s Chores for Change program. Teachers integrated social studies, research skills, reading comprehension, science, math, and persuasive writing. First, students participated in a read aloud activity with the book *Beatrice’s Goat*. In this story inspired by Heifer International, Beatrice, a schoolgirl in a poor African village, receives the gift of a goat and is able to sell the milk to help her family of six. Using the interactive whiteboard, students learned mathematical concepts of doubling and division and interacted with a lesson on geometric growth as described in the book. Students researched the various animals available to donate through the program and raised funds to donate the animal. Math lessons revolved around counting and dividing the funds received. The seamless access to internet resources, the opportunities for small group research with laptops, and the interactive lessons via the whiteboard made an otherwise daunting project manageable for the teachers to engage and motivate students.
- In a high school social studies class, students participated in a “Meeting of the Minds” project on Civil War tensions. Equipped with laptops, half of students conducted research and prepared to take on the voice of an individual from the Civil War era during a live class debate. The rest of the class was assigned to develop their background knowledge of the historical era in order to analyze the debate. The analysis took place in live online chat during the debate. This provided an opportunity for students to record reactions and facts as the debate was taking place without interrupting the flow. Debate students were engaged, knowing their peers were chatting about the points they were making, and the “chat” students were engaged as they had the

Our grade level has used the quarterly collaborative planning sessions to create rich, multidisciplinary projects, ranging from student-researched and acted public service announcements about germs and health to service learning projects about world hunger.

- Asheville City Schools Teacher,
Grade 2

opportunity to build knowledge through the chat. A text archive of the chat provided additional learning opportunities. Prior to the grant, students debated the Civil War, but the engagement was minimal except for the few students who played major roles in the debate.

Evaluating Effectiveness

In partnership with the Friday Institute at North Carolina State University, ACS administered the following surveys to staff and students: School Technology Needs Assessment (STNA), Technology Skills Checklist (TSC), and National Educational Technology Standards survey of Performance Standards for In-service Teachers (NETS-T Survey). Based on survey results, technology skills and student attitudes toward learning with technology improved.

District Data

- STNA: 70.5% of teachers either agree or strongly agree that technology has made their students better learners and self-starters.
- STNA: 74.3% of teachers either agree or strongly agree that student engagement is significantly increased as a result of technology.
- STNA: Over the course of the grant, the percentage of teachers that agree that “technology professional development is relevant” increased by 30% in one school and by 27% in another.
- NETS-T: 68.4% of teachers report they now regularly teach students how to “assess the quality of information they gather via the web and/or other technologies.”
- Student passing rate of the end of grade level math and reading scores increased by 6% and 7.5% respectively. The percentage of students exceeding expectations also increased.

Moving Forward

The two high schools have leveraged this grant to acquire additional funding from the Appalachian Regional Commission and the Mebane Foundation to support the Digitally Literate Asheville initiative’s goal of 1-to-1 computing. The IMPACT grants laid the groundwork that has ACS poised to reap the benefits of a digital transformation in teaching and learning and has served as “proof of concept”, demonstrating that the schools would fulfill the promise of 1-to-1. In February 2012, student-to-laptop ratio will increase to 1-to-1 in 10th through 12th grade. Although it may prove difficult to equip the schools at the same level without the IMPACT grant funds, the collaborative practices, professional learning communities, and social constructivist approaches to learning brought about by the IMPACT grants will sustain high levels of student achievement.

Resources

Asheville City Schools

<http://ashevillecityschools.net>

North Carolina IMPACT Website

[http://it.ncwiseowl.org/resources/i m p a c t/](http://it.ncwiseowl.org/resources/i_m_p_a_c_t/)

Friday Institute Evaluation of the IMPACT Model

<http://tinyurl.com/6v4xbvp>

North Carolina Public Schools

<http://ncpublicschools.org/>

SETDA ARRA Information and Resources

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Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Ohio's EETT ARRA Competitive Grants

Ohio's 21st Century Learning Environments Technology program awarded 96 schools grants, targeting students in grades 6 to 12. Ohio's program focused on professional development and student learning. Through intensive, collaborative and job-embedded professional development and the use of research-based methods, teachers and administrators experienced new models and strategies for teaching and learning. As part of the required summer professional development, each school's grant team, made up of the building administrator, four teachers, and a half time coach, developed a needs-based action plan which helped inform technology purchases.

21st Century Learning: Transforming Teaching and Learning, LHS 2.0 Program Lakewood High School, Lakewood City Schools May 2010-June 2011

Lakewood High School was one of 96 Ohio schools that received a 21st Century Learning Environments Technology grant. They utilized a technology-enhanced, newly renovated school building to build an academic program embracing technology, project-based learning, and the team approach.

Demographics

Lakewood City School District is located in a western suburb of Cleveland, Ohio. The district contains a highly diverse student population with over 30 languages spoken. Approximately, 50% of students qualify for free or reduced lunch. There is one high school with 2000 students in Lakewood. Due to the aging community, the school has noted a declining population over the last five years.

Project Description

In 2008, Lakewood High School completed a partial renovation, and all new classrooms were equipped with projectors, interactive whiteboards, and wireless internet access. At the same time, a set of ninth grade teachers began teaching in a team; the team consisted of an English, history, mathematics, and science teacher who shared the same group of students. Inspired by the increased access to technology and collaborative nature of team teaching, teachers began to reassess their teaching practices. As well, the district focused on enabling and supporting teacher-based teams and project-based

ARRA EETT Grant Details	
Grant Focus	High-Access, Technology-Rich Learning Environment, Online and Blended Learning, and Professional Development
Beginning/End Date of Grant	May 18, 2010-June 9, 2011
Locale	Urban
Funding	\$225,000
Grade Level (s)	9-10
Number of Teachers Impacted	10
Number of Administrators Impacted	1
Number of Students Impacted	200

learning. With technology in place and team teaching beginning to take hold, Lakewood High School received the ARRA grant. At the onset of the grant, 2 teams of core subject area teachers and an intervention specialist, one in the 9th grade and one in the 10th grade, began working with approximately 100 students per group. Each student was provided with a netbook for school and home use. The participating teachers were each provided an iPad, and each team shared two classroom sets of iPod Touches. The team approach allowed for flexible time and flexible grouping within the schedule and cross-curricular teaching opportunities. Anytime, anywhere access to the netbooks provided the opportunity for teachers to leverage their Moodle sites to create collaborative workgroups for students to access content both in and out of the classroom, blurring the lines of a typical school schedule. Professional development through workshops and the efforts of a technology coach supported the integration of technology tools and project-based learning through the school year. In addition, team planning and collaboration enabled teachers to employ and share best practices.

Project Implementation

Beginning in the summer of 2010, the team participated in the state-sponsored Transforming Education course focusing on the digital learner, 21st century skills, Technology, Pedagogy and Content Knowledge (TPACK), project-based learning, and Web 2.0 tools. In the fall, teachers completed small projects and met during regularly scheduled planning times to discuss curriculum and the integration of technology tools. Students received their netbooks during the second semester. Teachers continued to increase their

collaboration and move toward a more project-based curriculum, and by the fourth quarter the entire curriculum was project-based.

An instructional, technology coach was assigned half time to the program. She provided support in the classroom, feedback on lessons, and overall support. The coach also helped support the teachers with curricular and technical issues so they could focus on teaching and learning. Teachers participated in a book study of Doug Lemov's *Teach Like a Champion*, which generated discussions around best teaching practices. Teachers also were provided three separate days during the school year to spend writing unit plans, using tools, and discussing what was working and what was not. Teachers formed natural school-based communities, sharing their ideas, knowledge, and research.

Classroom Examples

- Tenth grade students researched and identified an environmental problem within their community. Students used community resources and the Internet to research issues such as litter in the parks and the appropriate use of bike lanes. Using persuasive writing and principles of design, students presented the selected environmental problem and posed solutions. They created final presentations, which took on a variety of formats including blogs (sample blogs are accessible below under "Resources"). Students also worked with local newspaper reporters to get their feedback on coverage and presentation of community issues. The culminating activity was a presentation of their findings to city officials.
- Tenth grade students worked together on an AIDS Day project. Under the guidance of the biology teacher, students studied the science of viruses and the AIDS virus. In English and history, students examined stereotypes and stigma in American literature and studied the politics of the 1980's during the onset of the AIDS epidemic. The culminating activity was a day spent sharing with local AIDS activists. The students simulated an AIDS test and discussed the results with real AIDS counselors. Students blogged their reactions and research during the entire project, and they created video diaries about their reactions to the day. Students also created 30-second public awareness commercials on AIDS.

Through this grant, our team has really come to think of ourselves as learners again. With so many new possibilities open to us thanks to all of the new tools, we have really had to go back and think very hard about what it means to be a student, what it means to be a teacher, and what it might look like if we became better students of our teaching.

- Sean Wheeler, Lakewood High School
Teacher

Evaluating Effectiveness

The LHS 2.0 Program's overall goal was to raise student achievement by creating a more accessible, flexible, and student-responsive learning environment that employs innovative 21st century skills and tools to enable students to create authentic and relevant products

for authentic audiences. According to their local evaluator, the LHS 2.0 project successfully met all grant objectives and was shown to significantly affect student learning. Positive outcomes for students included an increased level of attainment of knowledge and skills as measured by the Ohio Graduation Test and an increased sense of personal engagement and pride in students' learning.

The LHS 2.0 Program affected a subset of Lakewood High School students. Tenth grade results of the 2011 Spring Ohio Graduation Tests show higher scores in all five subject areas for the participating students compared to like peers. There was a significant increase in test scores for students with disabilities.

School Data

- All students comparison scores:
 - ✓ Writing LHS 2.0 96% pass rate; Non-LHS 2.0 92% pass rate
 - ✓ Reading LHS 2.0 95% pass rate; Non-LHS 2.0 90% pass rate
 - ✓ Math LHS 2.0 88% pass rate; Non-LHS 2.0 83% pass rate
 - ✓ Social Studies LHS 2.0 88% pass rate; 84% Non-LHS pass rate
 - ✓ Science LHS 2.0 84% pass rate; Non-LHS 2.0 79% pass rate
- Special education students comparison scores:
 - ✓ Writing LHS 2.0 77% pass rate; Non-LHS 2.0 55% pass rate
 - ✓ Reading LHS 2.0 77% pass rate; Non-LHS 2.0 58% pass rate
 - ✓ Math LHS 2.0 58% pass rate; Non-LHS 2.0 38% pass rate
 - ✓ Social Studies LHS 2.0 54% pass rate; 40% Non-LHS pass rate
 - ✓ Science LHS 2.0 42% pass rate; Non-LHS 2.0 33% pass rate

The transition to project-based learning, specifically the work on a local community-based Earth Day project and a partnership with the Cleveland HIV/AIDS Taskforce during an HIV/AIDS unit, broadened students' understanding of collaboration, communication, and creativity as essential 21st century skills and vital components of any relevant classroom aimed at preparing students for the world outside the walls of a classroom.

The role and nature of professional development underwent a significant change in relation to the grant team and has great potential as a model for professional development to a much wider degree within the district as a whole. The teachers truly embraced the notion of developing a Personal Learning Network (PLN). Some of the best thinking and writing about the teaching profession is occurring on a wide-array of blogs and twitter feeds, and the grant team is in a state of continual learning thanks to its use of Google Reader and Twitter hash-tag searches.

Moving Forward

Based on the success of this program, Lakewood City Schools is moving forward with a 1-to-1 model. Teams of teachers across the district were able to apply for class sets of netbooks. Using funds from the textbook budget, 500 netbooks were purchased and distributed for in-class use only. The school is researching the possibility of supplying all incoming ninth graders with netbooks in the 2012-2013 school year. Training in project-based learning has continued with 15 Lakewood High School teachers attending training by the Buck Institute for Education, specializing in project-based learning. New teams of teachers, along with the original participants, meet on a regular basis to support one another with the integration of 21st Century skills and technology, and new team members are mentored by the original LHS 2.0 project team teachers.

Resources

Lakewood City Schools

<http://lakewoodcityschools.org/>

Lakewood High School Student Blogs

<http://kevinmarekblog.blogspot.com/2011/05/gum-litter-problem.html>

<http://nattaliep.blogspot.com/2011/05/blog-post.html>

<http://imagine-yesterday.blogspot.com/>

Ohio Department of Education

<http://www.education.ohio.gov>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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Pennsylvania's EETT Competitive Grants

Pennsylvania's ARRA EETT competitive grants focused on classroom technology tools and teacher training to help provide academic settings structured to develop 21st century skills, such as collaboration, problem solving, creativity, and innovation. Teachers participated in extensive training to develop rigorous, relevant, student-centered, technology-rich lessons.

Upper Darby School District Middle School EETT Project June 2010-September 2011

In the Upper Darby School District of Pennsylvania, the EETT competitive grant focused on increasing teacher proficiency in technology, and effectively integrating technology in the middle school classroom through professional development and mentoring by an Instructional Technology Coach.

Demographics

Located just west of Philadelphia, Upper Darby School District is one of the most densely populated and urbanized townships in Pennsylvania. Over the past 23 years, the district has grown from 7,523 to 12,041 students, making it the 11th largest school system in the state out of over 500 Pennsylvania school districts. At the same time that enrollment has increased, the educational and socioeconomic needs of Upper Darby students have grown in complexity and severity. Almost 50% of district students meet the low-income standard set by the Free and Reduced Lunch Program, and 6 of the 14 schools receive Title I schoolwide services. Students also represent an increasingly diverse population: 43% African American, 39% Caucasian (non-Hispanic), 13% Asian/Pacific Islander, 4% Hispanic, and 1% other. Across the district, students speak 66 languages with the top 5 being Spanish, Bengali, Vietnamese, Punjabi, and Chinese. Upper Darby School District made Annual Yearly Progress (AYP), without qualification, in 2009 and 2010, after six years in District Improvement or Corrective Action status.

Project Description

Upper Darby School district targeted the EETT grant for its two large middle schools to advance its strategic plan that would increase teacher usage and the integration of technology. The district had previous success in using an EETT grant to provide elementary teachers with laptops, and a Classrooms for the Future (CFF) state-funded grant provided laptops to selected high school teachers.

In the two Upper Darby middle schools, the goal was to increase teacher computer literacy in general and their ability to integrate technology into the teaching-learning process in particular. Specifically, the grant supported three major program components: 1) a laptop for each of the 215 middle school teachers; 2) professional development delivered by a full-time Instructional Technology Coach shared by both schools; and 3) four student laptop carts (2 per school with 30 computers each) to be used in the eighth grade Social Studies program. While this grant equipped all teachers with laptops, the district had invested in a new Social Studies program that included extensive technology resources, and the goal of increased technology integration was particularly extended to the seven Social Studies teachers for student laptop use in the eighth grade. As part of the initiative, the district invested its own funds in a wireless network for both schools.

In 2010-2011, with the implementation of the grant and additional district-funded technology purchases, the number of computers for instructional use increased from 619 to 881 computers with all of the oldest computers eliminated. Eighth grade Social Studies students were the only students who had direct access to the additional 120 laptop computers (60 per school).

ARRA EETT Grant Details	
Grant Focus	Technology Coaches and High-Access, Technology-Rich Learning Environment
Beginning/End Date of Grant	June 2010-September 2011
Locale	Urban
Funding	\$522,000
Grade Level(s)	Middle School (6-8)
Number of Teachers Impacted	215
Number of Administrators Impacted	7
Number of Students Impacted	2,707 students impacted due to teacher use of technology, with 832 eighth grade students impacted by direct access to classroom laptops

Project Implementation

In June of 2010, the district conducted initial teacher training, which included an overview of the laptop functionality and instruction of specific applications. After the initial training and then throughout the summer of 2010, middle school teachers participated in one-day training sessions of 6.5 hours in groups of 20 led by the Instructional Technology Coach. This training focused on integrating technology into lesson planning and delivery, including how to conduct content-rich, visual lessons. During the 2010-11 school year, the Instructional Technology Coach worked intensively with subject area department supervisors and teachers to provide technology integration training specific to curriculum areas. The professional development included 1-to-1 sessions, small groups, modeling, and larger workshops. Teachers learned how to create solutions to technological issues, develop instructional materials, and utilize the technology tools for instruction. While all middle school teachers benefitted from the training and work with the Instructional Technology Coach, the Social Studies classrooms had access to the additional laptop carts to increase student hands-on time with the technology. In addition to the technology training, the 7 Social Studies teachers each received 120 hours of coaching from the Instructional Technology Coach. An additional 60 teachers received 5 hours of coaching by the Instructional Coach.

Every time I mentioned to my class that we were using computers there was more excitement in the classroom. Computers allowed us to visit places we would normally only read about, from Yorktown to the Hermitage to Ellis Island.

- Upper Darby
Middle School Teacher

Classroom Examples

- Eighth grade students used online digital content to research the history of the Alexander Hamilton vs. Thomas Jefferson debate and developed group position statements, which students then presented via a wiki. The class also participated in a video conferencing session with a university debate team. To demonstrate mastery, the students created video podcasts (or vodcasts) of their debates modeled on the historic debate of Hamilton and Jefferson. The teacher posted lessons and student products online as resources for other teachers and students. Prior to the grant program implementation, the teacher typically assigned textbook reading, and the students created a poster.
- Technology coaches from across the state meet regularly for their own professional development and growth. This enables the coaches to connect teachers and students from different regions of the state to collaborate on projects. For example, the eighth grade students from Upper Darby connected with a third grade class in Punxsutawney, Pennsylvania, a small, rural town. Both groups of students were studying the Oregon Trail, so they made podcasts and shared them with each other. Through their collaboration, they learned and taught each other about the Oregon Trail. As well, students shared information about their hometowns and schools.

Evaluating Effectiveness

This initiative has had multiple benefits for teachers and students. Students benefitted from an engaging 21st century learning environment. Informal observations and data collection by the Instructional Technology Coach and administrators concluded that the integration of technology helped to increase comprehension and student engagement. In addition, teachers believe that their productivity and efficiency increased, as they were able to utilize the laptop computers for administrative tasks, such as attendance and grading. Teachers also reported more timely and effective communication with parents and students. In the past five years, the district has moved from over five students per computer to a little over two students per computer, in part thanks to this program.

School Data

- Based on pre- and post-tests, the middle school teachers' technology proficiency increased 47% to 60% in one school year on the SimpleAssessment Teacher Edition tool from SimpleK12.
- Student technology proficiency increased from 4% to 17% in one school year on the SimpleAssessment Plus tool from SimpleK12

A primary condition leading to the success of this program implementation was the time and ability for teachers to work closely with one another, and the Instructional Technology Coach with support from the administration. This project also leveraged the technology tools and broadband access available prior to program implementation. Additional information is available on *Pennsylvania's CFF/EETT Evaluation Project* website accessible below in the "Resources" section.

Moving Forward

The district plans to maintain the equipment purchased for up to five years and will look to their district's technology budget to coordinate replacements. Technology integration continues to be encouraged; however, the Instructional Technology Coach position has not been funded because of district cutbacks.

Resources

Upper Darby School District

<http://upperdarbysd.org>

Pennsylvania Department of Education

<http://www.education.state.pa.us>

Pennsylvania CFF/EETT Evaluation Project

<http://eett.psu.edu>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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South Carolina's EETT Competitive Grants

South Carolina's EETT ARRA competitive grant program focused on increasing achievement and technology literacy and providing new applications of technology to enable teachers to improve student performance. Professional development provided teachers and administrators with the ability to integrate technology and align instruction with state academic content through high-quality professional development programs.

iLearn 21

Lexington School District Two, South Carolina August 2010-June 2012

The iLearn 21 program addressed the need to increase teacher and student technology proficiency levels and to integrate technology into the core content areas of math, science, social studies, and language arts in eight targeted schools. By providing a comprehensive professional development program and ongoing school-based support, teachers gained knowledge and experience in planning dynamic, technology-rich lessons.

Demographics

Lexington School District Two is a diverse school district serving almost 9,000 students in 17 schools. The district is located in West Columbia and is in close proximity to the capitol thus maintains a small town feel. Seven out of the nine elementary schools qualify for Title I funding, and one of the three middle schools is also a Title I school.

Project Description

The grant provided funds to purchase 1-to-1 handheld devices, iPod Touches, for all eighth grade students in three middle schools. The iPod Touches were assigned to individual students for use throughout the school day; however, they were not provided 24/7 access to the devices. Eighth grade teachers also received a laptop. Class sets of iPod Touches were also provided to ninth grade mathematics classes and participating teachers in three elementary schools. Over 1,000 iPod Touches were integrated daily into instruction to target 21st century skills while addressing core content. Over the 2 years of the program, 75 participating teachers received professional development to help ensure seamless technology integration. Teachers received face-to-face training from contracted trainers and the district technology coach. As well, a school-based coach was assigned to each participating school to provide ongoing support throughout the school year. Each teacher received a minimum of 20 hours of coaching and support during the school year.

ARRA EETT Grant Details	
Grant Focus	Technology Coaches and High-Access, Technology-Rich Learning Environments
Beginning/End Date of Grant	August 1, 2010-June 1, 2012
Locale	Suburban
Funding	\$240,000
Grade Level (s)	K-9
Number of Teachers Impacted	75
Number of Administrators Impacted	12
Number of Students Impacted	1,350

Project Implementation

In the winter of 2010 and 2011, all eighth grade teachers received one full day of professional development on their new laptops. Training included basic functions and applications of the laptop. The eighth grade teachers and additional participating teachers also attended a one-day training session with the handheld devices. Teachers were grouped by content area and were trained not only on how to use the device but also how to identify and integrate appropriate apps for their content area and grade levels. Lessons were demonstrated, and teachers finished the day by designing a lesson to be used in their classroom. Ongoing professional development was conducted

In the two and a half years that we've used the iPod Touch technology as a primary classroom tool we have transformed not only the way teachers think about teaching but the way students think about learning.

- Mr. Kinnett, Lexington Two
Teacher

quarterly by the district technology coach, which included instruction of Web 2.0 tools and other classroom applications, including Google Docs, Glogs, Word Clouds, StoryKit, Edmodo, and Moodle. Teachers used Google Docs and Google Mail with students. This provided students 24/7 access to their work and opened a new line of communication for students and teachers. Students also used Google Docs to collaborate on projects and post documents to share with their teacher. The students emailed these assignments from their handheld devices. In one middle school, students used their iPod Touches to access Google Docs, and in the other schools, students used computers in a lab setting.

Teachers also received support from a school-based technology instructional specialist, typically the school's media specialist, who served the role of coach. These school-based coaches met with participating teachers weekly to provide support and professional development. Together they examined best practices, apps, and lesson planning. The school-based technology coaches also received coaching and professional development on a monthly basis using the Microsoft Coaching model. Coaches and teachers used Google Docs to collaborate, and participating teachers were required to share at least one lesson per quarter. Final lessons were posted on the statewide media share of Discovery Education United Streaming.

Classroom Examples

- In an eighth grade science class, students worked in groups to create survival videos after crash landing on a planet in our solar system. Using the internet, students researched the conditions of the different planets in the solar system. After the research, students wrote scripts about life on the selected planet and planned their video production. The performances were recorded on a green screen using their iPod Touches. Students used iMovie to edit the videos, including adding backgrounds of the planet. The completed videos were posted on Discovery Education United Streaming media share and linked to the teachers' web page. Prior to the grant, students completed worksheets about the planets' composition.
- Second grade students at the Early Childhood Center used iPod Touches to improve reading fluency. During a typical week, students used the iPods on Monday to record their book of the week. When the students finished recording, the teacher used the recording to conference with the student and identify areas of improvement and strength in fluency. Together, the teacher and student set goals for the week's reading. Throughout the week, the students then practiced the reading using the iTalk app on the iPod and rated their performance. At the end of the week, the teacher conferenced with the student again to review the reading and goals. The technology offered an accessible tool for the student to use and practice reading, and it contributed to a richer dialogue between the student and teacher.

Evaluating Effectiveness

South Carolina uses the ePortfolio technology proficiency system to track technology literacy results. Due to this program, the district saw an increase in technology proficiency in students and teachers. In addition, the district also saw improvement in state

standardized test score in situations where technology integration has taken place.

District Data

- Student technology literacy scores improved 15% from the pre- to post-test in the 2010-2011 school year.
- In one 7th and 8th grade math class, 27 students moved from below-average to proficient.
- Discipline referrals at one of the participating middle schools decreased by 40%.

Moving Forward

Due to the success of this program, Lexington School District Two wishes to continue this rollout of a 1-to-1 for every student in the district. Other grant sources are being sought, and in some schools, Title I funds have been used to expand the program. Lexington School District Two was named an Apple Distinguished Program recipient for the 2010-2011 and 2011-2012 school years and is determined to continue this level of work.

Resources

Lexington Two School District
www.lex2.org

South Carolina Department of Education
www.ed.sc.gov

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

Background

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South Dakota's EETT Competitive Grants

South Dakota's ARRA EETT competitive grant awards encouraged the effective integration of technology through high quality professional development models. Focus was placed on 21st century skills instruction and improved student academic achievement. The four main goals of the project were to increase student achievement through the use of technology; build capacity for 21st century skills in staff and students; increase the level of technology integration among staff and students; and advance development of system wide integration programs

Master Teacher Academy East Dakota Educational Cooperative, South Dakota February 2010-July 2011

The Master Teacher Academy educated lead teachers and administrators to implement and share 21st century skills. Teachers and administrators engaged in focused training both face-to-face and online, and they received support in the classroom.

Demographics

South Dakota is divided into 7 educational service agencies serving approximately 120,000 students in 703 schools. The Education Service Agencies in South Dakota began as a way to better deliver services to schools. East Dakota Educational Cooperative services the school districts of Brandon, Lennox, and West Central in eastern South Dakota and is part of the Educational Service Agency, Region 2 (ESA2). This grant was developed in Region 2 but teachers statewide were invited to participate in the professional development program.

Project Description

In South Dakota, teachers and all high school students had access to laptops and the infrastructure for wireless access. However, the teachers were untrained in fully utilizing the devices and web-based tools, and hesitant to explore the educational uses for the emerging technologies.

Therefore, an increased need existed to provide professional development opportunities to improve teaching and the effective integration of technology in the K-12 classroom. Centralized professional development opportunities were not readily accessible due to geography, travel constraints, and program availability within the vast state.

Teachers needed more opportunities to collaborate, and school districts needed to create learners equipped with skills necessary to excel in a 21st century world. The purpose of this project was to educate lead teachers and administrators to recognize and implement 21st century skills through classroom lessons. Master Teacher Academy originated in 2008 through a combination of state and federal funding. From 2008-2010, 30 teachers participated in a variety of professional development opportunities and created a bank of lesson plans focusing on 21st century skills. At the onset of the ARRA EETT funding in June 2010, a second cohort of 60 teachers was recruited. The program was refined using feedback from the original cohort and included face-to-face meetings, coaching, and small group work. A third cohort was established in April 2011 and provided a condensed professional development program concluding in June of 2011.

ARRA EETT Grant Details	
Grant Focus	Professional Learning Communities and Project-Based Collaborative Learning
Beginning/End Date of Grant	February 1, 2010-July 30, 2011
Locale	Rural
Funding	\$460,878
Grade Level (s)	K-12
Number of Teachers Impacted	134
Number of Administrators Impacted	20
Number of Students Impacted	1,810

Project Implementation

In the spring of 2010, Education Service Agency, Region 2 accepted applications for the initial teacher training. Sixty teachers from across the state were chosen for the initial five-day training in June 2010. Gathering at the University of Sioux Falls, teachers met former members of the Master Teacher Academy, who shared their experiences. They also received

The Master Teacher Academy helped me grow as a teacher, mentor, and technology user. I have more confidence to do things I would have never tried.
-Master Teacher Academy Participant

demonstrations in different technologies, including Moodle and Wikispaces. Instructional sessions included topics such as global awareness and project-based learning. Teachers also participated in a model, project-based lesson and role-played as students to experience this style of learning first hand. During the 2010-2011 school year, teacher participants engaged in 15 hours of online training sessions in groups of 8 led by the Instructional Coach. This training focused on higher order thinking skills, assessment, and integrating technology into lessons. Two coaches worked with this cohort and visited each classroom at least twice to provide support. Teachers worked throughout the year to deepen their understanding of 21st century skills and effectively use appropriate technologies. Teachers also coached and offered training in their schools to share expertise and mentor colleagues.

In the spring of 2011, an additional 70 teachers were selected to attend a Project-Based Learning Academy, taught by the Buck Institute for Education (BIE). The teachers wrote lessons, implemented them, and gathered in June to share their successes and challenges.

Classroom Examples

- In one fifth grade class, in typical practice, students began the year by recycling paper in the classroom. The classroom teacher designed a project-based lesson inspiring students to research, investigate, and take action on expanding their recycling efforts. With the teacher's guidance, students researched online the cost of recycling materials and collection containers and began to recycle products in the lunchroom and at school events. The students interviewed recycling experts and created a video of their trip to the landfill about the importance of preserving the environment by recycling. Videos were shared with students and the PTA in their school. Their project culminated with an organized process of recycling paper throughout the school. The video and PTA presentation was the final event as the school year concluded.
- Among other expectations, fifth grade math students solve one- and two-step problems using addition, subtraction, multiplication, and division of whole numbers, use appropriate units with which to measure length, weight, and capacity, and solve problems involving perimeter, area, capacity, and volume. A typical assignment involved math work from the textbook. With the support of the Master Teacher Academy, a project-based lesson involving the redesign of the playground offered real world, inspirational use of math concepts. Students studied and measured their current playground, then brainstormed ideas for a new playground. On paper, they drew their concept to scale. Using the internet, students researched the cost of making playground equipment and materials. The students also interviewed community members to determine cost and ensure they met all municipal and Americans with Disabilities laws. The students created written and oral presentations for members of the school board. Some students used Microsoft PowerPoint; others used video for their presentations. They also used Microsoft Excel to build their budgets. The school board agreed to fund some of the requests if they prioritized needs and presented recommendations to the board. Technology was used seamlessly throughout this project as students gathered information and

resources to design a playground and make their presentation. The teacher was there to guide the process but the students were leaders in their learning. In this class, students gave up their recess time to complete the project.

Evaluating Effectiveness

This initiative resulted in multiple benefits for both teachers and students. Students benefitted from an engaging 21st century learning environment. Data collection concluded that the integration of technology helped to increase higher order thinking skills and student engagement. Based upon online collaborative community responses, comments, and classroom visits, Master Teacher Academy participants indicated an increased awareness of higher order thinking skills (critical thinking, reflection, authentic learning) from 7% at the beginning of the project to 92% at the end of the project. In addition, based upon online collaborative community responses, comments, and classroom visits, Master Teacher Academy participants indicated an increased awareness in incorporating 21st century skills (collaboration, communication, creativity) in teaching in a current context from 9% at the beginning of the project to 100% at the end of the project. Based upon a pre- and post-survey developed by the South Dakota State Department of Education, 40 of the 54 teachers surveyed increased their understanding of the 21st century skills and tools, 13 participants' understanding remained the same, and one teacher reported that his/her understanding of 21st century skills and tools declined.

Project-based learning provides students with a “sense of accomplishment” rather than let’s just get the assignment finished. Students really dig into their thinking process and become more metacognitively aware.

- Master Teacher Academy Participant

Of the schools participating in the year-long Master Teacher Academy, cohort 2, 10 schools were identified for school improvement in 2010. Three of these schools made Adequate Yearly Progress (AYP) and are no longer identified for improvement, a decrease of 12%. As a result of this program, 136 teachers became teacher leaders within their schools in regard to 21st century teaching and project-based learning.

Program Data

- Master Teacher Academy participants indicated an increased awareness of higher order thinking skills (critical thinking, reflection, authentic learning) from 7% at the beginning of the project to 92% at the end of the project.
- Master Teacher Academy participants indicated an increased awareness in incorporating 21st century skills (collaboration, communication, creativity) in teaching in a current context from 9% at the beginning of the project to 100% at the end of the project.

Additional data is available in the full *EETT Project Narrative* accessible below in the “Resources” section.

Moving Forward

The administrators made the commitment to ensure that teachers have the local support to continue to improve the curriculum through project-based learning and professional development opportunities. The teachers in each of the districts expressed the desire to change their teaching styles after seeing the engagement of students.

The success of the Master Teacher Academy is attributed to the collaborative and supportive learning environment. The design of the program provided support for participants throughout the year. Teachers were continually encouraged in their efforts, including sharing and learning from each other.

Resources

South Dakota Master Teacher Academy
<http://sdmasterteachers.wikispaces.com/>

EETT Project Narrative: Outline. South Dakota Stimulating Innovation - ARRA. Program Funds Made Available Under American Recovery and Reinvestment Act of 2009
<http://tinyurl.com/7d3tzmg>

East Dakota Educational Cooperative
<http://edec.org/>

South Dakota Department of Education
<http://doe.sd.gov/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

Background

The *American Recovery and Reinvestment Act of 2009* (ARRA) included a \$650 million allocation in ESEA Title II, Part D, commonly referred to as the *Enhancing Education Through Technology* program (EETT). This case study was prepared by the State Educational Technology Directors Association (SETDA) – the principal association representing the technology leadership of state and territorial departments of education – to provide an example of ARRA funds working at the district and classroom level that creates effective, viable, and robust reform in education, and improves the way teachers teach and students learn.

Tennessee’s EETT Competitive Grants

Tennessee’s focused their grant on expanding opportunities for students to enroll and succeed in online courses through the Effective Engaging E-learning Environment for Tennessee (e4TN’s) online learning program. Individual districts were encouraged to personalize the program and use the program as they see best to meet their students’ needs.

E4000TN Statewide Stimulus Strategy e-Learning Program (e4TN) Tipton County, Tennessee January 2010-July 2011

The purpose of the e4000TN Statewide Stimulus Strategy e-Learning Program (e4000TN) was to expand the online learning opportunities across the state of Tennessee by providing funding and access to e4TN courses and establishing a regional consortium modeling the existing e4TN program. E4000TN provided funding and e4TN course “seats” to 60 Tennessee LEAs so that more districts would have exposure to the e4TN online content. Additionally, by establishing a regional model, the goal of the grant was to promote the sharing of teachers and courses across district lines. Through participation in the grant, students gained access to rigorous online content, as well as to certified, highly qualified teachers, and were offered opportunities to take online courses to achieve credits that may not otherwise have been available.

Demographics

Tipton County was the hub of the regional area served by this program as well as the fiscal agent. Tipton County, located in West Tennessee, is home to the 13th largest school system in Tennessee. The school system serves 11,947 students and is the largest employer in the county. In this area, there is decreased teacher availability for specific courses in the more rural regions, particularly in subjects such as foreign languages and physics.

Project Description

While online courses were available in Tennessee through the e4TN program, the enrollment and acceptability of online learning in Tipton County and western Tennessee was primarily low. Initially, 96 participating teachers received professional development and training to facilitate courses, which increased the number of online teachers and the variety of online courses the region was able to offer. The e4TN catalog included approximately 30 courses (primarily high school level) such as English, Computer Literacy, Wellness, Algebra, Geometry, Biology, Physics, French, Spanish, Latin,

History, Global Studies, Economics, Government, Personal Finance, Career Management, and Art Appreciation. Subject-matter experts (SMEs) and Tennessee certified teachers in the particular subject area developed the courses. As new courses were developed, they were subject to a rigorous beta test period. Once the 18-month test period was complete, courses became part of the regular e4TN catalog. Credit recovery and vendor courses were also made available through the program.

The program not only strived to provide access to courses that were previously not available, such as Art Appreciation and Latin, but also provided access to updated devices, a reliable network and the opportunity to increase technology skills using the online courses. Sixty districts, including Tipton County Schools, were each awarded \$20,000 to use for equipment or teachers in order to facilitate online learning, and 52% of ARRA competitive funds were used to purchase equipment. Twenty-nine districts used ARRA formula funds to purchase networking hardware resources and services. For example, in Sumner County Schools, a traffic analysis of the existing T1 lines showed that many of their schools maxed out their available broadband throughout the day. Teachers had trouble connecting to resources in the classrooms. Using these funds, Sumner County installed fiber connections in all of their schools and increased their bandwidth to 100 mbps in their high schools.

Regional, districtwide, and schoolwide professional development on topics including web tools and project-based learning not only addressed the use of technology for online learning but helped enhance overall technology integration into the classroom. The professional development also helped to grow local and regional technology experts.

ARRA EETT Grant Details	
Grant Focus	Online and Blended Learning and Digital and/or Open Content
Beginning/End Date of Grant	January 2, 2010–July 31, 2011
Locale	Rural
Funding	\$475,000
Grade Level (s)	6-12
Number of Teachers Impacted	96
Number of Administrators Impacted	86
Number of Students Impacted	2687

Project Implementation

The regional model allowed for training and professional development to be directed through three regional offices, one of which was located in Tipton County. The initial step in implementing the program was to increase participation of teachers and students. Recruited teachers received one-day training and participated in monthly meetings. The initial training included instruction in using the learning management system, expectations of an online instructor, and use of the technology tools. The Instructional Support Representative trained teachers and provided support throughout the year via email and phone as needed. Through the regional office, the Regional Services Representative worked with school districts to enroll, train, and support students across the region to participate in the courses. With the new program, there were 2,687 enrollments from the spring 2010 through summer 2011, up from the average of 500 enrollments each year from 2006-2009.

It is so important for others to understand that the traditional school setting does not benefit all students, especially since small schools are no longer the norm.
- Parent of e4TN student

The e4TN courses met student needs in multiple ways. The program provided necessary remediation for students including course recovery. This allowed some students to graduate with their class when they were lacking courses due to transfer from another state or district. In Shelby County, more than 150 students enrolled in the e4TN courses as part of the summer school program, in many cases eliminating the transportation barrier, which otherwise prevented these students from taking summer school courses.

Additionally, students who were otherwise unable to enroll in upper level courses because of scheduling issues or lack of qualified teachers were able to complete courses by enrolling in e4TN. In addition, e4TN served gifted students in the middle school by allowing them to take high school courses online without needing traveling to the high school each day.

Many of the e4TN courses offered access to innovative interactivity to give students virtual options that simulated a lab setting. Organ Trail, for example, was developed to be an in-depth simulator for e4TN's biology course. Students performed virtual dissections on specimens. The virtual environment was developed with the idea to teach organ recognition, show how organs relate to each other, identify general purposes of organs, and show how organs function in the complete biological system. Students were guided through the lessons by instructor dialogue describing what the student sees and the proper steps for dissection and identification. Virtual forceps and scalpels cut and removed organs, simulating the way an actual dissection would be done in a real laboratory. This type of learning allowed students the freedom to explore each specimen, zooming in and out on individual parts and interacting with specimens to compare and identify organ parts.

Classroom Examples

- In Milan County, eighth graders took Algebra I online. The course was facilitated by an experienced Algebra I teacher from Tipton County Schools. The Milan teacher was certified Algebra I teacher but had not taught Algebra in several years. By working along with the students and collaborating with the online teacher, the Milan teacher was better prepared to support the students and prepared to teach Algebra I during the next school year.
- Using the online foreign language courses through e4TN, the Tipton County Alternative Learning Center was able to provide Spanish and French to students to stay on target for graduation. The school does not have a foreign language teacher on staff. Using e4TN courses in a learning lab, students were able to complete courses in French or Spanish to complete the foreign language requirement for graduation. This provided an economical and equitable solution for the district.

E4TN has helped me continually challenge myself. I have been able to graduate early because of it, and I will always be grateful for the opportunities it has opened for me.
- Jordan, Dickson County Student

Evaluating Effectiveness

The external evaluation of the e4TN, as part of the EETT program, is still in progress and will be submitted to the US Department of Education in December 2012. The evaluation of e4TN is being compiled by TNCRED-Vanderbilt.

Moving Forward

As a regional office for the program, Tipton County relied on the state to provide the curriculum, learning management, and student management programs. The state of Tennessee owns the curriculum and has offered it to any school district in the state. The learning management and student management systems support is no longer available due to lack of funds. Tipton County will assess the cost of running a program for Tipton and others in West Tennessee.

New state legislation allows LEAs to open their own virtual schools in Tennessee. Some of these LEAs are collaborating with each other to offer online solutions, not only to students in their own district but to students in other districts.

Resources

Tipton County Schools

<http://www.tipton-county.com>

Tennessee Department of Education

<http://tn.gov/education/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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Texas’s EETT Competitive Grants

The Texas Education Agency distributed ARRA EETT funds through the Target Tech in Texas (T3) Collaborative Grant-American Recovery and Reinvestment Act of 2009. “Target Tech” is the highest level of technology integration progress according to the Texas Campus and Teacher School Technology and Readiness (STaR) Chart. The purpose of the T3 grant was to encourage the use of educational technology tools to improve teaching and learning.

Think Forward, Project-Based Learning Institute Manor Independent School District, Texas October 2009-October 2011

Think Forward, Project-Based Learning (PBL) Institute is a dynamic professional development program designed to train educators in technology use, best practices in PBL, leadership, and 21st century skill applications. The professional development offered to K-8 teachers in the Manor Independent School District (MISD) and to high school teachers in Harlingen Consolidated Independent School District (HCISD) teachers included face-to-face training and follow-up, job-embedded coaching.

Demographics

MISD is located just outside the city limits of Austin, Texas. The City of Manor was established in the mid to late 1800s. By the early 1900s, it was a hub for the central Texas cotton and railroad industries. Today, Manor plays a key role in the Texas technology industry and is home to corporate offices of Applied Materials and Samsung. The City of Manor is growing rapidly. As a result, MISD is experiencing a phenomenal growth in student enrollment with 80% growth from 2004 to 2008. The enrollment for 2011-2012 is currently at 7,600 students in twelve schools with 82% qualifying for the free or reduced lunch program.

Project Description

In 2007, MISD received a four-year Texas STEM grant to integrate technology and PBL at the Manor New Technology High (MNTH). The enormous success of the program resulted in above-average standardized test scores, high attendance rates, and a 100% completion rate in 2010, compared to Manor's traditional high school's 82.4% completion rate. However, while MNTH was excelling, other campuses in MISD were continuing to struggle with 2 of its 11 other campuses receiving the state's lowest rating. With the use of T3/ARRA funds, MISD sought to expand the use of project-based learning through the establishment of the Think Forward: PBL Institute. Teachers applied to participate

in the program and upon completion of the four-day institute received a technology package for classroom use. The first MISD cohort included two teachers from each elementary and middle school campus. Subsequent cohorts trained additional teachers from these campuses, as well as counselors, campus principals, central office curriculum staff, and all department heads. Each classroom package included a teacher laptop, four classroom laptops, and five iPod Touches. Additionally, classrooms not already equipped with interactive whiteboards or projectors were provided a projector and whiteboard. The four-day Think Forward: PBL Institute provided instruction in basic technology use, PBL, and technology integration from MNTH teacher mentors. After the Institute, attendees received ongoing, job-embedded support from their designated mentor. The selected MNTH teacher mentors were identified as effective in the implementation of PBL based on a track record of student success. Prior to the initial Institute, the mentors were provided professional development related to effective adult learning techniques, including successful mentoring practices. While 29 teachers were trained as part of this grant, additional teachers attended the Institute using local funds. By the end of the grant period, all fourth and fifth grade teachers, special education inclusion teachers, middle school math teachers, district curriculum staff, school administrators, and central office administrators received the training. The focus of the administrator strand training was to eliminate any barriers toward successful PBL implementation. The curriculum staff received training to ensure that curriculum, assessments, and professional development sessions provided by

ARRA EETT Grant Details	
Grant Focus	Deeper Learning/Project-based Collaborative Learning and High-Access, Technology-Rich Learning Environment
Beginning/End Date of Grant	October 1, 2009-October 30, 2011
Locale	Rural
Funding	\$964,299 Federal Funds \$700,000 Local Funds
Grade Level (s)	K-12
Number of Teachers Impacted	44
Number of Administrators Impacted	12
Number of Students Impacted	1075

the districts supported PBL. MISD also partnered with HCISD to provide training for teachers and to establish an inter-regional partnership. Fifteen Harlingen teachers attended the original institute. Approximately one month later, MNTM mentors visited the HCISD teachers for two days to offer classroom support. Mentors also offered support throughout the school year via email and video conferencing. Approximately 200 educators have participated in the Institute.

Project Implementation

Participants received an initial four-day intensive training during which they each developed a project for their classrooms and shared with the group. The training began with a review of basic technology use and an introduction to PBL.

Participants also observed classes at the successful MNTM and identified key elements of PBL in practice. On the second day, participants explored how to create a PBL project, including managing collaborative student work and using rubrics to determine student progress toward state standards. On the third day, participants learned how to scaffold student activities with continued work on the project in development. On the final day of the institute, mentor teachers conducted workshops providing guidance tailored to the individual needs of the participants based on their content areas and grade levels. Also, participants shared their individual projects and received feedback on the next steps of implementation. Upon returning to the classroom, teachers implemented their project with continued support from their mentors. Mentors and participants continued to interact throughout the school year through site visits, online learning communities, lesson plan development, and phone and email support. Teachers posted projects on a project wiki as a way to share and reflect. This content is now available for all MISD and HCISD teachers for future implementation.

The Institute provided new opportunities and methods to engage my students. Students perform better when their work is more meaningful to them.

-Fourth Grade Teacher

Classroom Examples

- In a fourth grade Social Studies class, students worked in small groups to explore how the media covers news stories, and they created their own newscast. Using media coverage of the Gulf of Mexico oil spill, the teacher and students discussed and viewed news videos. Using teacher-provided rubrics, students evaluated news stories for content, location, expert credibility, and reporting techniques. Next, in small groups, students worked to create their own newscast of the Gulf oil spill. They researched facts, wrote a script, created props, and practiced their newscast. Throughout the group work, students used a wiki to share and collaborate information. This allowed the teacher to check in on their progress. Student groups filmed their newscast, and all newscasts were shared with the class and posted online. Throughout the project, the teacher also used the interactive whiteboard to share videos, rubrics, and final products. The project closed with teams evaluating

their process and product and celebrating with a "wrap" party. Some of the products were posted on the MISD website and on individual teacher websites.

- In fourth grade math and reading, students received a special request from the third grade team. The fourth graders were asked to create a book to help third graders learn multiplication. The book was to contain a cover, title page, table of contents, numbers, words, and drawings to represent the multiplication tables, properties of multiplication, and tips for learning the multiplication tables. To begin, fourth grade



students explored websites about book making and ideas for creating engaging publications. Students also read various picture books and examined the pictures, amount of text on a page, and other elements of picture book design. After making decisions on the type of book to create, students storyboarded their ideas and focused on how to present the math content via an online tool. Finally, students created their books using online resources and

desktop publishing tools. The books were finalized and shared with third graders.

Evaluating Effectiveness

The external evaluator, Educational Research Institute (ERI), assessed and measured performance measures through periodic surveys and observations of students, parents, and teachers. While some expectations were not fulfilled, the effort of increasing technology integration and providing teacher professional development was achieved. The percentage of students whose use of technology literacy increased because of the grant was 100%. The number of campuses that improved their STaR Chart level, target goal of eight, was achieved. See "Resources" below for access to full evaluation report.

Moving Forward

The Think Forward, PBL Institute continues to thrive. The program is currently being sustained with local funds. By 2012, the majority of MISD teachers will have participated. Using Texas Title I Priority Schools funds, high school teachers in the two other high schools of MISD will receive training at the Institute in 2012.

Resources

Manor Independent School District

<http://manorisd.net/>

Harlingen CISD and Manor ISD (T-3) Final Program Evaluation

<http://tinyurl.com/7bj8e89>

Texas Education Agency

<http://www.tea.state.tx.us/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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Virginia's EETT Competitive Grants

The primary purpose for Virginia's EETT ARRA competitive grant competition was to implement programs to encourage the use of educational technology to improve teaching and learning. Divisions and schools used the funds to develop 21st century classrooms as envisioned by the Educational Technology Plan for Virginia: 2010-15, which encourages the effective use of technology to prepare Virginia students to learn and work in the 21st century.

iLearn Project

Pulaski County Public Schools, Virginia

January 2010-September 2012

The iLearn project addressed an increasing need to use emerging technologies to improve fundamental knowledge in core target areas and to increase problem solving skills. In Pulaski County, K-12 teachers integrated iPod Touches and laptops to create engaging and effective learning environments. The Radford University Games, Animation, Modeling, and Simulation (GAMEs) Lab worked in conjunction with Pulaski County Schools and other partners to create apps that aligned with Virginia's Standards of Learning.

Demographics

Pulaski County is located in Southwestern Virginia in the heart of the New River Valley. The population of Pulaski County is 35,000 people. There are five elementary schools, two middle schools, and one high school. Pulaski County benefits from close proximity to Virginia Tech, Radford University, New River Community College, and the cities of Wytheville and Roanoke. Of the participating schools, between 37% and 63% of the students receive free or reduced lunch.

Project Description

The iLearn project, a collaboration among Pulaski County Public Schools, Radford City Public Schools, New River Community College, Apple Inc., and Radford University, included three components: 1) the development and integration of mobile games and simulations; 2) development and integration of iPod Touch applications into the core content curriculum; and 3) professional development for participating teachers. This project employed strategies, which not only reflected the learning styles and personal interests of students but also expanded the current understanding of classroom practices and created 21st century learning environments.

ARRA EETT Grant Details	
Grant Focus	Technology Infrastructure and Professional Learning Communities
Beginning/End Date of Grant	January 1, 2010-September 30, 2012
Locale	Rural
Funding	\$435,000
Grade Level (s)	K-12
Number of Teachers Impacted	17
Number of Administrators Impacted	21
Number of Students Impacted	700

In Pulaski County Schools, the focus on specific content areas was determined by an analysis of state assessment scores for the specific grade level. Two elementary schools, two middle schools, and one high school participated in the project.

Project Implementation

At the onset of this project, two classroom teachers were selected per school. Each school received a cart with 2 sets of 20 iPods each and a cart with 30 laptops. Each teacher also received a laptop and an iPod Touch. Professional development was key to this program's success.

First, the teachers and district trainers engaged in professional development training to learn the functionality of each tool. Next, the training focused more on integrating the iPods and laptops into the curriculum and the overall instructional process. A trainer visited the county four times and provided training in the basic use of devices, iWorks, integration of apps, and curriculum support. The participating teachers also had ongoing support from the county's technology specialists to assist in troubleshooting problems, updating and syncing iPod Touches, and creating class activities and lessons. Through the life of the grant, teachers had an online learning community created through Ning, which provided a social networking platform allowing members to

iPod Touches have given us the ability to differentiate instruction. Time on-task has increased greatly.
- iLearn Teacher

share their experiences and ideas, receive feedback, and decide upon and communicate needed modifications to the project in a secure environment integrating wikis, blogs, and chat rooms.

In addition, apps were developed by the GAMeS lab and shared with teachers. A representative from the GAMeS lab visited the school and worked with teachers to determine their needs for original apps targeting specific content areas. The apps were aligned with Virginia's Standards of Learning (SOL). Integration of these apps was explored with the trainer. Over the course of the project, 20 SOL-aligned apps were developed and have been downloaded over 120,000 times by consumers in seven different countries.

Classroom Examples

- The fifth grade science curriculum includes the study of cells. Students learn the basic structures of a cell and the functions of the structures. In teaching this unit, one of the fifth grade iLearn teachers used an app on the iPod Touch that allowed each student to see a 3D view of the parts of a cell. By tapping each part, the function of each part of the cell was explained. After working through the different parts, the students created their own models of a cell on paper and checked their drawing with the cell app. Before using the technology, students gleaned information on cells from a teacher's presentation, textbook, and/or video.
- To help increase student engagement, seventh grade math students worked independently and collaboratively in stations to review proportions, functions, and integers. At the proportion station, students used an app to help them create their own word problems dealing with proportions. This not only gave them practice applying the concept but also allowed students to share their problems with each other. At the function station, student used a different app to review the concept, and used another app to create their own functions that they shared with each other. At the last station, the students used an app to practice adding, subtracting, multiplying, and dividing integers. Prior to this project, students practiced these math concepts by using pencil and paper. Based on teacher observation, use of the technology tools helped to increase student focus and interest in math. Teachers hope this will translate into increased student achievement.

Evaluating Effectiveness

Teachers responded positively to the classroom use of iPod Touches and laptops. The tools provided opportunities to differentiate the content and delivery to better meet the needs of students. Many apps have different levels that can be assigned to students based on ability. Anecdotally, as reported by teachers, students were more engaged when their lessons included opportunities to use the iPod Touches and laptops.

Moving Forward

Participating teachers were empowered to assume leadership positions by offering to informally support their colleagues through peer-to-peer trainings thereby sustaining the grant's proposed goals beyond the life of the grant. As well, the focus on professional growth increased the level of educational technology integration expertise throughout the region.

Resources

iLearn Website

<http://gameslab.radford.edu/ilearn/>

Pulaski County Public Schools

<http://pcva.us>

Virginia Department of Education

<http://doe.virginia.gov/>

SETDA ARRA Information and Resources

<http://setda.org/web/guest/ARRAresources>

Background

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West Virginia's EETT Competitive Grants

Based on research and the recommendations of the West Virginia State Technology Plan, this grant program's focus was to have a Technology Integration Specialist (TIS) provide and/or coordinate appropriate professional development activities for all teachers and administrators in West Virginia's Technology Model schools.

Sissonville High School Kanawha County Schools, West Virginia January 2010-August 2011

The purpose of the program at Sissonville High School was to improve academic achievement through technology integration, particularly math and reading proficiency, and to decrease dropout rates. The grant provided the support of a Technology Integration Specialist (TIS) to help teachers improve their technology skills, make curricular changes, and more effectively utilize existing technology devices and software.

Demographics

Sissonville High School is a public high school located in rural Sissonville, West Virginia, outside of Charleston. Sissonville is part of Kanawha County Schools (KCS), the largest school system in West Virginia. The district serves over 28,000 students in 44 elementary schools, 14 middle schools, 8 high schools and 2 career and technical education centers.

Project Description

Prior to the grant, Sissonville High School had adequate technology in place, including three school-wide labs and projectors with interactive whiteboards in many classrooms. As well, many state-funded software programs were available for teacher and student use including content sites such as TechSTEPS, ThinkFinity, and the online management system Edline. The mathematics department was scheduled to receive a mobile lab to support the Carnegie math curriculum funded by the county. However, even with the technology available, devices and programs were not fully

ARRA EETT Grant Details	
Grant Focus	High-Access, Technology-Rich Learning Environment, and Online/Blended Learning
Beginning/End Date of Grant	January 30, 2010-August 15, 2011
Locale	Rural
Funding	\$187,625 Federal Funds \$25,000 Local Funds
Grade Level (s)	9-12
Number of Teachers Impacted	60
Number of Administrators Impacted	3
Number of Students Impacted	630

utilized, and often the labs were in disrepair with numerous computers unavailable. The faculty at Sissonville High School was eager, but they did not know where to begin to integrate technology. Hence, Sissonville High School was a good match to the state goals for this grant program and received a full-time TIS to provide on-going, embedded professional development for all staff members at Sissonville High School. With the local funds, each teacher also received a laptop and additional software, including Discovery Streaming Basic, GradeQuick, and Skills Tutor.

Project Implementation

In the spring of 2010, teachers were issued laptops, and they received training provided by the district for some of the software programs. The TIS began the summer of 2010. He attended professional development provided by the West Virginia Department of Education during the summer of 2010. He also met with the staff prior to starting work at the school to assess their needs and to develop an initial professional development plan along with the teachers and administrators. Teachers attended subject-specific sessions during the summer of 2010, which allowed them to share ideas and learn how to better support one another. The TIS provided professional development workshops for teachers and administrators on various software applications and interactive whiteboard use. Teachers also received training in smaller groups or one-on-one in such areas as the use of Google documents for collaboration, content-specific software, and the content management systems. The majority of curricular support provided by the TIS occurred in one-on-one or small group sessions, utilizing teachers' planning time. For example, the TIS

worked with a teacher during his planning time to prepare a lesson. With a block schedule, the typical school day was three periods. The TIS would model the lesson during the first block. During the second block, the TIS and teacher would team teach. And, during the third block of the day, the teacher would teach the lesson with support from the TIS. The TIS also managed many technical issues, such as ensuring that all computer labs were fully functional and maintaining bandwidth support in the school. The TIS also built a cadre of teachers, an informal professional learning community, to support the staff. Some of the staff participated in a Thinkfinity community set up for the school to share their ideas and thoughts.

The TIS was instrumental in encouraging and assisting the use of state-mandated programs, such as TechSteps, a technology literacy curriculum and assessment tool. Teachers are required to use and assess TechSteps in grades K to 8 but optional for grades 9 to 12. By the end of the school year, 80% of teachers were using TechSteps' activities and tools compared to no teachers using the tool in the beginning of the year, its second year of implementation in the state. The TIS also worked with teachers using Edline, a content management system for posting classroom resources, setting up class webpages, and using as a parent communication tool. Teachers also used a shared Edline calendar to schedule computer lab time.

Classroom Examples

- In the 9th and 10th grade reading class, students worked to use vocabulary-building tools and increase self-esteem and participation. The students built an online dictionary by using PowerPoint to create their own Visual-Verbal Word Association charts, converted the files into jpeg format, and uploaded them to the class website. The students were able to see how others interpreted words and their meanings. The teacher found increased collaboration and interest among the students in completing this activity versus more traditional drilling and practice of vocabulary words.
- In an 11th grade English class, students studied types of rhetoric and writing persuasively. Students were provided online articles to read critically and annotate the rhetorical devices, exploring how devices were applied in the article. Then the students were given an editorial to which they annotated and responded using logos, ethos, and pathos. These responses were posted on the class website for comment and discussion amongst the class. Traditionally, the teacher simply explained logos, ethos, and pathos and how it was expressed in the works of William Shakespeare. Students preferred the online method of sharing their responses.

During the year, as teachers moved further into technology integration, I saw their teaching styles change to be more interactive and inquiry based; and with that came increased performance levels and more positive attitudes from their students.

- Kevin Goff,
Sissonville High School TIS

Evaluating Effectiveness

In examining the WESTEST, West Virginia's end-of-year proficiency tests, progress was made in each of the core subject areas, including math and English as indicated in the program's goal.

School Data

- English proficiency scores for the 2009-2010 school year to the 2010-2011 school year showed 11.14% improvement.
- Math proficiency scores from the 2009-2010 school year to the 2010-2011 school year showed 7.51% improvement.
- Science proficiency scores from the 2009-2010 school year to the 2010-2011 school year showed 11.12% improvement.
- Social Studies proficiency scores from the 2009-2010 school year to the 2010-2011 school year showed 8.92% improvement.

Moving Forward

Sissonville High School continues to move forward in their integration of technology in classroom instruction. While the TIS position was only funded for a year, a core group of tech-savvy teachers identified during the year of the grant continue to provide technical support and ideas for integration to improve academic achievement. In addition, teachers continue to meet during planning time to discuss ideas to improve classroom instruction and academic achievement.

Resources

Kanawha County Schools
<http://kcs.kana.k12.wv.us>

West Virginia Department of Education
<http://wvde.state.wv.us/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>

Background

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Wisconsin's EETT Competitive Grants

Wisconsin sought to increase student use of technology as a learning tool to improve student academic achievement within a learning environment where Wisconsin's Model Academic Standards for Information & Technology Literacy are embedded within the content curriculum. In addition, programs increased teachers' understanding of technology as a means to support student academic achievement.

Together—21st Century Learning Environment (ToTLE) Program School District of Janesville, Wisconsin July 2009-September 2011

The School District of Janesville's project, Together—21st Century Learning Environment (ToTLE), engaged teams of educators and their students to build teaching and learning strategies, assessment instruments to help personalize student learning, and technology-rich, 21st century classrooms. Teachers worked in teams to design, implement, and assess problem-based learning units.

Demographics

Janesville is a city of over 60,000 citizens located in southern Wisconsin, about 40 miles south of the state capital, Madison. Janesville was once a strong manufacturing community until General Motors shut down its plant in December 2008. Unfortunately, the unemployment rate of 10.2% in June 2011 is steadily growing. The School District of Janesville has approximately 10,400 prekindergarten through 12th grade students served by 21 schools. Washington Elementary School has approximately 500 students and 2 computer labs. They added 75 netbooks in mobile carts as a result of the grants.

Project Description

Janesville used multiple funding streams for this initiative to provide teacher training, online communities of practice, hardware and software, and upgrades to their internet access. Technology tools purchased included netbooks, interactive whiteboards, response systems, and video equipment. Teachers participated in ongoing professional development, which was comprised of workshops, common planning sessions, coaching, and online courses. Teams of teachers participated in the professional development even when not all teachers were able to receive all of the technology tools. Administrators encouraged this team approach so that all staff was cognizant of the power of integrating technology and in preparation for the additional technology tools to be added in future years.

The district initiated their ARRA 2009 Competitive Grant project in Washington Elementary School, which has a high percentage of free and reduced lunch students, and a need for improvement. Test

scores on Pearson's Developmental Reading Assessment (DRA) indicated the third grade students had high-level reading skills but the fourth grade students were scoring at significantly lower levels. The Wisconsin Knowledge and Concepts Exam and the Northwest Evaluation Association Measures of Academic Progress proficiency levels corroborated the findings from the DRA test scores. In addition, the students at Washington Elementary only had access to 2 computers labs with 28 computers in each lab. The initial ARRA grant provided with 2 carts of 15 netbooks each for the 4 grade 3 and 4 grade 4

ARRA EETT Grant Details	
Grant Focus	Problem-Based Collaborative Learning and Communities of Practice
Beginning/End Date of Grant	July 2009–September 2011
Locale	Rural
Funding	\$50,000 (Competitive ARRA EETT 1) \$80,000 (Competitive Grant ARRA EETT 2) \$27,000 (ARRA EETT Formula Grant) \$14,501 (Partial funds FY09 EETT Formula Grant) \$762,303 (Microsoft Program Vouchers) \$150,000 (Wisconsin Technology Initiative, TOSA Foundation) \$1,083,804 Total
Grade Level (s)	3-12
Number of Teachers Impacted	192
Number of Administrators Impacted	14
Number of Students Impacted	3,532

classrooms to share. Subsequent grants provided 4 additional carts for a total of 75 netbooks for use in classrooms. During the same year, the district provided wireless access for the school. Seventy-four percent of the initial ARRA grant funds were used for professional development, and the remaining funds were used for the hardware and infrastructure upgrades along with other funds. Teachers engaged in professional development through summer training, graduate coursework, and peer coaching to learn to collaborate on and create 21st century classrooms with technology tools. Washington Elementary became a model school for all other Janesville schools. In fact, teams from neighboring districts, Wisconsin's Department of Public Instruction, and even the Ukraine have visited this model site to observe.

A second ARRA award was granted in December 2009, which led to the continuation of the professional development program at Washington Elementary School plus two middle schools and five additional elementary schools. Some ARRA funds were used for the purchase of additional netbooks, video production equipment, and interactive whiteboards with projectors, but the majority of funds were used for professional development. In addition, other federal funds and private foundation funds were used to provide additional netbooks, iPads, interactive whiteboards with projectors, and student response systems. A third EETT grant was also awarded during the same time period to expand the entire program, once again on a larger scale that included two entire elementary buildings, additional grades at three elementary schools, one middle school, the two high schools, and one charter school.

Project Implementation

In the summer of 2009, a group of 12 teachers comprised of 3rd and 4th grade classroom teachers, school leaders in special education and English Language Learner (ELL), the library media specialist, the learning support teacher, and one administrator from Washington Elementary participated in a summer institute, which included instruction in collaboration strategies, Universal Design for Learning (UDL), problem-based learning, 21st learning standards, Web 2.0 tools, and digital resources. The technology was distributed to the classrooms in the fall and throughout the 2009-2010 school year. Professional development continued with monthly sessions. The meetings helped to establish a professional learning community that followed the Critical Friends Protocol, a professional learning community model designed by the Annenberg Institute for School Reform. Throughout the school year, teachers, library media specialists, and innovative learning specialists planned, implemented, and shared model lessons, student work samples, and assessments via a wiki.

The technology tools provided access to social networking sites such as Edmodo where students now converse and problem solve collaboratively. These are conversations that our students didn't have when they completed paper and pencil tasks. The online collaboration leads to higher level thinking and students make connections to their daily lives.

-Shelley Block, Innovative Learning Specialist, Adams and Washington Elementary Schools

During the summer of 2010, 104 classroom teachers, including grade level/content teachers, gifted and talented challenge teachers, special education teachers, ELL teachers, and library media specialists, formed professional learning teams to complete a 30-hour symposium. Teams developed problem-based learning activities and lessons aligned with the Common Core Standards for English/language arts and mathematics that followed the UDL model and targeted Partnership for 21st Century Skills (P21). Also, a total of seven cohorts of teachers took a two-credit graduate class through Viterbo University. The class offered instruction in UDL principles of design and assisted teachers in developing problem-based collaborative unit plans.

Ongoing systemic professional development continued throughout the school year from September 2010 until June 2011. By June 2011, a total of 206 additional social studies, science, mathematics, world language, language arts, art, and health educators from other elementary and secondary schools participated in at least 30 hours of professional development.

The sharing of model lessons including videos of classroom best practices continued via a Google site. A monthly online school newsletter included participant interviews highlighting professional activities. Articles and videos were featured on the district superintendent's "What's Right in Janesville Education" monthly blog. Face-to-face and online presentations at regional and state conferences provided the opportunity to model best practices and share performance assessments.

Throughout both school years, team members learned to be "Critical Friends" and mutual peer coaches. Critical Friends reviewed one another's lesson designs, studied student work samples, and helped to revise lessons. Teachers learned to support each other as they grew to become the class guide and facilitator for their own students by challenging them, posing higher level information questions, and creating problem-based learning opportunities within a technology-rich learning community. Together these teams also built common formative assessments for each lesson, which guided future lesson design and delivery working toward higher levels of thinking and content proficiency. Each team developed a minimum of three digital-age common assessments based on targeted P21 skills: collaboration, information inquiry, critical thinking, problem solving, communication, and technology literacy.

Classroom Examples

- In fourth grade science, students studied the food chain. Working within their collaborative teacher teams, teachers created a new unit employing UDL principles with the guiding question of what would happen to food chains and webs if a disaster occurred. Students researched and participated in online discussions about organism food chains, and the flow of energy and interdependence of organisms within a food chain. Next, students worked with their teachers and the media specialist to research food chains online from one of three biomes and created a

slideshow on how a natural disaster might affect their food chain. Students used the Big 6 research model to plan and conduct their research, and they used a storyboard to plan and complete their final product. Assessment tools included a checklist, formal rubric, and student reflection journal entry. Students also paired to evaluate one another as part of the process for preparation of presenting the finished projects at the spring technology fair.

- In studying civil rights, eighth grade social studies students addressed the essential question of why and how people have struggled for social justice. The class explored questions about social justice in teams and then students chose a civil rights leader to research via online and traditional research tools. Students then completed a Glogster (an online poster) sharing details about their leader. They presented their Glogster to the class and published it online. As a culminating activity in the Technology Education class, students created a graphic design representing civil rights and printed it out to be ironed on a T-shirt.

Evaluating Effectiveness

Baseline data for Washington Elementary School, the school impacted by the first ARRA award, showed 3rd and 4th graders scoring well below the minimal score of 80.5 in reading and 68.5 in math on Pearson's Developmental Reading Assessment (DRA) for meeting Adequate Yearly Progress. One year later, students showed marked improvement.

Washington Elementary School Data

- 2009-2010 third graders:
 - ✓ 96% significantly increased their reading comprehension to minimal or above as measured by the DRA.
 - ✓ 98% reached their growth target on the *Measures of Academic Progress* (MAP) assessment.
- 2009-2010 fourth graders:
 - ✓ 100% increased their reading comprehension to proficient as measured by the DRA test.
- 2010-2011 eighth graders:
 - ✓ Students scoring proficient or advanced on the baseline Next Generation Assessment for Student Information and Technology Literacy increased by 9.96%.

Moving Forward

Funding from a private foundation continues to support Janesville's 21st Century Learning Environment program. Future plans include a focus on continual improvement of the coursework offered to educators to reflect changing technologies. Also, building on their experiences, Janesville is adopting Moodle as a content learning management system for the district in 2012. Local funds and federal EETT funds will support continued staff

development including online courses for teachers and transforming the ToTLE symposium into a hybrid-learning environment.

Currently, library media specialists and innovative learning specialists continue to coach and team teach lessons as a way of mentoring and offering additional support to teachers through the process.

Contact Information

School District of Janesville
<http://janesville.k12.wi.us/>

Wisconsin Department of Public Instruction
<http://dpi.wi.gov/>

SETDA ARRA Information and Resources
<http://setda.org/web/guest/ARRAresources>