Annual Report for Period: 05/2010 - 04/2011 **Submitted on:** 1/31/11

Principal Investigator: Ostos, Ray **Award ID:** 0802487

Organization: Maricopa County CC District

Submitted By: Ostos, Ray - Principal Investigator

Title: Achieving Technological Literacy in Arizona for Students and Teachers

Project Participants

Senior Personnel

Name: Ostos, Ray
Worked for more than 160 Hours: Yes
Contribution to Project: Serves as the Project Principal Investigator (PI).

Manages the Industry Partner Panel, oversees all project financial and programmatic decisions, and provides overall leadership to the project.

Name: Shaffer, Jeannette
Worked for more than 160 Hours: Yes
Contribution to Project: Serves as Project Co-PI and Project Coordinator.

Coordinates all activities, events and functions of the ATLAST project. Networks with secondary school educators, designs and implements technology training sessions, provides follow-up support to teachers, and interfaces with school administrators and technology business representatives. Assists in creating and evaluating reports for the project.

Name: Corcoran, Gerry
Worked for more than 160 Hours: Yes
Contribution to Project: Serves as Project Co-PI.

Provides opportunities to promote the ATLAST project at Future Educators of Arizona (FEA) state events for teachers and students. Provides Career and Technical Education (CTE) Director and FEA Advisor directories with contact information of teachers. Integrates ATLAST into FEA functions and activities.

Name: Poole, Karen
Worked for more than 160 Hours: No
Contribution to Project: Serves as Project Co-PI.

Has connected the PI with industry partners, provided the Program Coordinator with resources and industry experts from the High Tech Workforce Initiative ATE Project.

Name: Rodberg, Stu
Worked for more than 160 Hours: Yes
Contribution to Project: Serves as the Technologist for the project.

Created marketing materials and application identification cards for training events. Also supported several activities at training events and created the multimedia presentation for the ATE Conference.

Post-doc

Graduate Student

Undergraduate Student

Technician, Programmer

Other Participant

Name: Dooling, Kelly
Worked for more than 160 Hours: Yes
Contribution to Project: Serves as the Assistant Researcher.

Assists the project researcher and evaluator with data collection through survey development and administration, and qualitative observations at ATLAST events and participating schools.

Name: Rodrigo, Rochelle
Worked for more than 160 Hours: No
Contribution to Project: Serves as a technology instructor for project workshops.

Assists the Project Coordinator in planning, developing, and facilitating training curriculum. Provides follow up support to teachers.

Name: Cooper, Alisa
Worked for more than 160 Hours: No
Contribution to Project: Serves as a technology instructor for project workshops.

Assists the Project Coordinator in planning, developing, and facilitating training curriculum. Provides follow up support to teachers.

Name: Hahn, Stephanie
Worked for more than 160 Hours: No
Contribution to Project: Serves as a CTE consultant.

Assists the Project Coordinator in connecting with Education Professions teachers through CTE events. Assists in scheduling training sessions.

Name: Mattoon, Joe
Worked for more than 160 Hours: No
Contribution to Project: Serves as Research Leader for the project.

Makes periodic site visits, analyses data, and produces project research reports.

Research Experience for Undergraduates

Organizational Partners

Arizona Department of Education
The grant focuses on the teachers and students who participate in the Arizona Department of Education's Education Professions Program, a high school Career and Technical Education (CTE) program for students who have an interest in pursuing a career in the field of education. CTE personnel have been essential in facilitating participation by teachers and students to ensure a smooth integration of the technological literacy training with the Education Professions curriculum. They have also assisted in scheduling training dates and locations for participants.

Maricopa Advanced Technology Education Center
The Maricopa Advanced Technology Education Center (MATEC), a department within the Maricopa County Community College District Office's Academic and Student Affairs Division, has provided the project with important expertise in the areas of technology curriculum, insight into skills needed for industry jobs, identify high tech industries in Arizona, and serving on the project's Technology Industry panel. MATEC's experience and resources with the NSF ATE program has proved very valuable to this project by contributing to instructional materials and training development.

Maricopa Center for Workforce Development
The Maricopa Center for Workforce Development, a department within the Maricopa County Community College District Office's Academic and Student Affairs Division, has provided the Project Coordinator with many technology resources and contacts. They have been crucial in facilitating contact with industry representatives for industry panel discussions, industry tours, and creating career guidance sheets for participants.

School District Partners
The following school districts have partnered with the ATLAST project by allowing their Education Profession teachers and students to participate in grant training and activities, and the Project Coordinator to collaborate with their teachers within school settings.

Blue Ridge Unified School District
Buckeye Union High School District
Chandler Unified School District
Coolidge Unified School District
Douglas Unified School District
Dysart Unified School District
Florence Unified School District
Fountain Hills Unified School District
Gilbert Public Schools
Glendale Union High School District
Mesa Public Schools
Mingus Union High School District
Peoria Unified School District

Phoenix Union High School District
Santa Cruz Valley Unified High School District
School District of Superior
Sunnyside Unified School District
Tempe Union High School District
Tolleson Union High School District
Tucson Unified School District

Other Collaborators or Contacts

ATLAST Technology Industry Advisory Panel members discuss project progress and help project staff to gain further insight into local technology industry companies, innovations, and contacts. Other collaborators have contributed to the success of the project by providing facilities, resources, personnel, and additional learning opportunities at their facilities. By including additional collaborators the project has been able to expand the dissemination of information to include other educators and the general public.

- Arizona Science Center
  Located in downtown Phoenix, the Arizona Science Center features more than 300 hands-on exhibits, a state-of-the-art planetarium, a five-story giant-screen theater, live demonstrations, traveling exhibitions, and exciting science programs for people of all ages. The Arizona Science Center mission is to inspire, educate and entertain people of all ages about science.

- West MEC
  West-MEC is a public high school district dedicated to providing innovative Career and Technical Education programs that prepare students to enter the workforce and pursue continuing education. West MEC provides educators the opportunity to update their knowledge and skills and receive on-the-job training in CTE program-related industries.

- Salt River Project (SRP)
  One of Arizona's largest utility companies, SRP provides electricity to nearly 934,000 retail customers in the Phoenix area. It operates or participates in 11 major power plants and numerous other generating stations, including thermal, nuclear, natural gas and hydroelectric sources. Community outreach efforts include educational resources for teachers and students.

- Arizona Technology Council
  The Arizona Technology Council is a non-profit trade association founded to connect, represent, and support the state's expanding technology industry. To promote economic growth and professional development in Arizona's technology sector, the Council provides members networking opportunities, business support, and access to educational forums.

- Arizona Career and Technology Education (CTE)
  CTE programs provide students the opportunity to explore and experience careers in high school and apply their academic and technical skills in relevant real-world settings. The Arizona Department of Education's Education Professions Program provides members with key contacts, facilitates project participation by teachers and students, and assists in scheduling training dates and locations for participants.

- Queen Creek School District CTE Program
  The Queen Creek School District CTE Program provides a local perspective on technology needs of school districts.

- Maricopa Center for Learning and Instruction (MCLI)
  MCLI is committed to student success, effective teaching and learning pedagogy, technology innovation, and the scholarship of teaching and learning by working collaboratively with faculty, administrators, and district-wide groups.

- Center for Workforce Development
  The Center for Workforce Development is committed to fulfilling the job training needs of the many and diverse employer communities throughout Maricopa County. The Center serves as a hub that connects workforce development programs and resources available through the Maricopa Community Colleges and Skill Centers to employer communities in the Greater Phoenix area.

Activities and Findings – Year 3

Research and Education Activities: (See PDF version submitted by PI at the end of the report)

Project Overview

ATLAST is a project for increasing technological literacy in secondary education. The performing unit is the National Center for Teacher Education (NCTE) of the Maricopa County Community College District in Arizona. This project provides teachers and future teachers with the knowledge and skills needed to prepare students for an increasingly technology-driven society. The grant focuses on the teachers and students who participate in the Arizona Department of Education's Education Professions program, a high school Career and Technical Education (CTE) program for students who have an interest in pursuing a career in the field of education.

ATLAST focuses on knowledge of technology industry in the community and ability to use instructional technology to raise the level of student technological literacy - using technology to teach technology. A key factor in helping teachers build their technological confidence is to teach relevant skills for the classroom. Taking what they learn from ATLAST training sessions, teachers design and develop their own classroom activities using Web-based tools and collaborative learning. In addition, students now have the opportunity to learn new technology with their teachers at joint training sessions. These joint sessions promote knowledge sharing, mentoring, and peer support, both within the training group and at school sites where participants implement what they have learned.

Grant Goals

Goal 1: Provide Arizona participants with knowledge and understanding of regional high-tech industry, impact on Arizona residents, and future career opportunities for students.
Goal 2: Enable participants to understand the purpose of technological literacy and its impact on student success.
Goal 3: Enable participants to leverage Web 2.0 capabilities and instructional technology tools to attract students to technology subject matter and improve their technological literacy.
Goal 4: Integrate research within the ATLAST project that addresses key issues and questions about technological literacy in education.

Major Accomplishments in Year 3

- The Project Coordinator worked closely with teachers and students from seven Arizona school districts by providing face-to-face and online training opportunities; visiting schools as requested to assist with the implementation of technology in classrooms; monitoring and assisting with individual technology activities developed by participating teachers; and making herself available online for assistance, questions and chat.
- The ATLAST Coordinator assisted with the finalization and review of the new state Education Professions technology standards, and co-presented and distributed them at the ACTE Conference at Tucson in July.
- In June 2010, a three-day ATLAST summer institute (Workshops 8, 9 and 10) was offered for participating teachers and students. (all workshop agendas posted at https://sites.google.com/a/atlastproject.com/www/online-atlast-workshops)
    - Ten teachers and eight students from six school districts participated in this training opportunity.
    - Day 1 (Workshop 8) introduced participants to digital storytelling, the technology to create digital stories, and how digital storytelling can be used to meet standards in the Education Professions curriculum.
    - Day 2 (Workshop 9) introduced participants to technology in the news industry with an industry tour, discussion with the Director of Human Resources, and observing the live broadcast of the afternoon newscast. Teachers and students then continued creating a digital story and learned how to embed audio and images. They also created a social business card and began a professional learning network by social networking with other ATLAST participants.
    - Day 3 (Workshop 10) provided participants the opportunity to produce a finished product for digital storytelling and reflect on the experience of creating a digital story. Focus group discussions focused on what personal technology is being used by students and how that technology can be tapped for learning. At the end, participants showcased their successes by presenting their digital stories.
- ATLAST Workshop 11 was offered as a full-day professional development event on a Saturday in October 2010. (all workshop agendas posted at https://sites.google.com/a/atlastproject.com/www/online-atlast-workshops) Five teachers and six students from four school districts attended this workshop, which introduced teachers and students to mobile smartboards and smartpens, and how these tools can be used for screencasting in order to create additional curriculum materials for students.
- ATLAST Workshop 12 was offered as a full-day professional development event on a Saturday in November 2010. (all workshop agendas posted at https://sites.google.com/a/atlastproject.com/www/online-atlast-workshops) Seven teachers and twelve students from five school districts attended this workshop, which was offered in response to participant request for those interested in preparing for the spring 2011 Arizona FEA technology competitions. Education Professions teachers and students focused on blog and video editing techniques and started their competition submissions.
- ATLAST Workshop 13 was offered as a full-day professional development event on a Saturday in January 2011. (all workshop agendas posted at https://sites.google.com/a/atlastproject.com/www/online-atlast-workshops) Eight teachers and six students from seven school districts attended this workshop, which introduced teachers and students to Quick Response (QR) codes, Geocache (a high-tech treasure hunting game played

throughout the world by adventure seekers), and augmented learning where teachers and students worked in teams and used various mobile technologies to solve a mystery.

- The ATLAST Tech Fair by Teachers for Teachers and Project Celebration is scheduled for March 2011 at the Arizona Science Center. (agenda posted at https://sites.google.com/a/atlastproject.com/tech-fair-for-teachers-by-teachers/) Participating teachers and students have been invited to showcase what they have learned through the ATLAST project at this event, which will include a poster session, workshops and an interactive, topic-based discussion session. Local teachers will be invited to attend, and the poster session will be open to the public. Participant recognition and a luncheon will conclude the day.
- A Summer Mini Conference is scheduled for June 2011. Participating Education Professions teachers and Maricopa Community College faculty will run sessions at a two to three day mini conference for CTE teacher and student teams (one teacher and one student). The mini conference will be held at West MEC facilities in Glendale, AZ and the theme will be Technology Toolkit for CTE Teachers. The purpose of this session is to use our ATLAST "Champion" teachers to start disseminating to a wider audience what they have learned in ATLAST and how they have implemented the skills and technology into their classroom.
- The ATLAST Coordinator presented at various events and conferences in 2010.
  - Five workshops were presented at the Arizona Career and Technical Education (ACTE) Conference in Tucson in July 2010.
    - A half-day, hands-on session titled *New Curriculum for Education Professions Program* was co-presented with four ATLAST participating teachers for Education Professions teachers. This session covered new curriculum focusing on brain-based learning, diversity, lesson planning and classroom management. (offered twice) Approximately 26 conferees from across Arizona attended these sessions.
    - A one and a half hour session titled *Web 2.0 and the Design Process* was offered for CTE teachers with a focus on using Web 2.0 applications to enhance the engineering design process for solving problems, a process used in S.T.E.M. courses and everyday tasks. International Technology Education Association (ITEA) standards were addressed. Approximately 18 conferees from across Arizona attended this session.
    - A one and a half hour session titled *Building a Personal Learning Network (PLN) - 21st Century Learning for Educators* was offered for Education Professions teachers. Participants learned about building a personal learning network using Web 2.0 applications and how to leverage the tools for lifelong learning. Education professions standards were addressed. (offered twice) Nineteen conferees from across Arizona attended these sessions.
  - A poster session about the ATLAST project and Maricopa Community College teacher education programs was presented at the APS Back to School Resource Fair with an attendance of two thousand educators at the Arizona Science Center in Phoenix in September 2010.
  - An *Inquiry-based Learning + Technology = Differentiation* breakout session was presented at the Rim Country Differentiated and Gifted Strategies Symposium at Rim Country Middle School in Payson in October 2010. Three event participants attended.
  - The ATLAST PI, Project Coordinator and a participating teacher participated in the National Science Foundation's (NSF) ATE Principal Investigators Conference in Washington D.C. in October 2010. The group facilitated a roundtable discussion about the ATLAST project, manned an ATLAST booth, and participated in the American Association Community Colleges (AACC) and NSF Blue Ribbon Task Force for teacher education.

    - Two breakout sessions were presented at the Arizona FEA Fall Regional Leadership Conference at Arizona State University, Tempe campus in October 2010, and again at the Arizona FEA Fall Regional Leadership Conference at the University of Arizona in Tucson in November 2010.
        - In *Amp It Up Part I: Create an Amazing Multimedia Presentation* students were introduced to a variety of technology devices and free applications that they can use to amp up their blogs and eportfolios for the state FEA competitions. Twenty and five conferees attended, respectively.
        - In *Amp It Up Part II: Create an Amazing Multimedia Presentation* students were introduced to a variety of technology devices and free applications that they can use to amp up their program of work multimedia presentations and instructional technology lessons for the state FEA competitions. Twenty one and seven conferees attended, respectively.
- An ATLAST participating teacher and her students presented a breakout session at the spring 2010 FEA state conference. The session was an introduction to the ATLAST project and a demonstration of the technology the students have learned through project activities.
- The ATLAST website at www.maricopa.edu/ATLASTproject continues to serve as the central point for resources and information about the project to the public. Information on this site includes a description of the project and training design; grant goals; a project calendar; benefits for participants; partnering businesses and school districts, contact information; team members; and links to technology standards, grant reports, a project slideshow and the project facebook page.
- The ATLAST Google Apps website was created in order to provide participants and coordinators a place to communicate. The Project Coordinator populates the site with key information not only for participants, but also for potential participants. In addition, participants populate the site with eportfolios, blogs, and online projects. Features of the site include:
    - A description of the ATLAST project, goals, training design, project partners and senior personnel
    - Upcoming activities announcements and registration options
    - Information from previous activities, which is available to participants who attended or did not attend the activity (i.e., workshop)
    - An activities calendar
    - A live chat option to talk to the Project Coordinator in real time
    - A project podcast, in which the goals and activities of the project are discussed
    - An alternative energy project, with voicethreads created by participants
    - An ATLAST blog created by former participating students, and links to other technology education blogs
    - An Everything ATLAST page, with links to technology sites, education sites and online publications
    - Conference presentations made by the Project Coordinator
    - Virtual fieldtrips and voicethreads created by project participants (teachers and students)
    - Participant eportfolios
    - Industry partner information
    - A link to information about the Arizona FEA state technology competition and other technology-based opportunities

Students and Teachers Impacted by ATLAST

Through individual support at school sites and group training sessions 16 Education Professions teachers and 22 Education Professions students participated in hands-on technology skills workshops this year. Seven Education Professions teachers and 196 students participated in a school based site visit during

which participants were provided support by the Project Coordinator or a faculty consultant. Sixty-three CTE teachers participated in a conference workshop. An additional, untold number of teachers and students have been trained, formally or informally, by participating Education Professions teachers on how to utilize technology in the classroom.

- Winners at the technology related contests (multi-media, blog and instructional technology lesson) at the Arizona FEA state competition in spring 2010 included at least five ATLAST participating students. Ten participating high schools also got recognized for their dedication and hard work, and one very involved high school received the FEA Chapter of the Year, FEA Teacher of the Year and FEA Student of the Year Runner Up awards.
- Ten teachers and eight students participated in the three-day ATLAST Summer Institute (Workshops 8-10) in June 2010.
- 63 teachers participated in one of the three ATLAST training sessions offered at the Arizona Career and Technical Education Conference in Tucson, AZ in July 2010 (see workshop details above).
- Five teachers and 6 students participated in ATLAST Workshop 11 in October 2010.
- Seven teachers and 12 students participated in ATLAST Workshop 12 in November 2010.
- Seven teachers and 196 students received individual, on-site training at their schools by the Project Coordinator and/or a faculty partner on digital storytelling, smart pens, Bloom's taxonomy, mobile smart boards, and social networking/online communities and collaboration.
- The 15 teachers who have attended at least one ATLAST workshop this year have utilized the technology skills they have learned with approximately 375 Education Profession students in the fall and spring 2010 semesters. [1]

In April 2010, a second ATLAST Project Post-Workshop Survey was administered online for participating teachers and students.

Specific observations of the utilization of technology for classroom purposes include:

- Five teachers incorporated digital storytelling into their Education Professions II classroom as a follow up activity after attending the ATLAST Summer Institute (Workshops 8-10). https://docs.google.com/View?id=dfzmp45s_264cnrnhnfh
- Two teachers introduced their students to smartboards as a follow up activity after attending the ATLAST Workshop 11 in October 2010. https://docs.google.com/View?id=dfzmp45s_258d955p8gp
- Twelve students are utilizing technology learned through ATLAST project Workshop 12 (and others) to prepare for the Arizona FEA state competitions in April 2011.
- Several participating teachers are utilizing the education edition of Google Apps with students. Students maintain eportfolios, create documents, submit assignments, and write reflections with this application.
- The Research Assistant conducted site visits at three participating high schools in spring 2010 to observe and record the implementation of technology activities in the classrooms of participating teachers. Her conclusions are as follows:
    - "After visiting the classrooms of these three participating teachers, I must say I am impressed by their attempts to incorporate technology into their classrooms. They are open and willing to learn at workshops, communicate with the Project Coordinator as needed to receive guidance, and have made honest efforts to teach the technology they have learned to their students in an applicable way. My impressions are that:

[1] This total is based upon Arizona Department of Education statistics showing that the average number of individual students per semester per Education Professions teacher is 12.5.

- the teachers had used technology in class before (e.g., computers with internet access for research or Microsoft Word for writing observations), but not to the extent that they now do so.
- the teachers are now more comfortable using technology and exploring new applications and programs for professional and personal use.
- the teachers are aware that there may be glitches when they use technology for educational purposes and are able to overcome them, as well as being able to help students to overcome them.
- The teachers are not afraid to say, "I don't know how to do that," and ask students for help or tell students that they will ask someone else for help.
- the teachers are eager to incorporate more technology-based activities into their curriculum, but are restricted by school and/or district policies that block technology in classrooms."

Description of Changes and Processes - no changes

Findings:

Goal 1: Provide Arizona participants with knowledge and understanding of regional high-tech industry, impact on Arizona residents, and future career opportunities for students.

Objectives: ATLAST training will provide teachers and future teachers the ability to:

1.1: Identify key technologies associated with rapid-growth industry in Arizona.

The ATLAST Technology Advisory Panel has proven invaluable in helping to address this objective. Industry representatives identified by members of this panel served as contacts for a Fox News station tour during the Summer Institute in June 2010. One member also developed supplemental television industry career guides.

The Fox News studio tour included a meeting with the Human Resources Director and viewing a live news cast. The HR Director focused on how technology has and is changing the television industry, and what they look for when hiring new employees.

Participant response to the Fox News station tour was positive, and demonstrates the effectiveness of this method of delivery.

- "The technology required to run a station should not have been a surprise, but I was stilled wowed by the scope of the implementation of technology and saddened by the human cost. [The HR Director] did a fantastic job in summarizing the news industry and the applications of technology in that industry. She was incredibly knowledgeable and very personable."
- "The fox news tour was very educational. [The HR Director] did a great job of describing the inner workings of television. We learned that even in television the recession hit hard and that many positions are being eliminated due to advanced technology. Their jobs will never exist again."
- "The visit to FOX News Studio was very interesting. I thought [The HR Director]'s presentation was great, very informative. It was beneficial for us (students and teachers) to hear the ever changing challenges of the job market. The different job opportunities within the "news business" are

extensive however not necessarily stable. . . As a result of the visit, I will incorporate more technology into my curriculum."

- "The trip to Fox Studio was so exciting. I really enjoyed seeing how the news works and hearing about how much technology is used at the station. The HR director was quite knowledgeable. She shared how the TV station works and gave an eye-opening view of how much technology is needed. I think that students today really need to understand that the technology is constantly changing and they need to be flexible and ready for change."
- "I learned that the news industry is using technology to automate most jobs and therefore many people are being let go. It appears that no matter how good you are at your job, it could become nonexistent. The lesson learned about this is that I need to teach my students that they need to become great at learning and continue to update their skills."

1.2: Understand the implications and impact of Arizona high-tech industry on regional economy, natural environment, and population.

See information in Objective 1.1.

The Fox News studio focused on rapid growth technology industry in Arizona, with an emphasis on regional economy (i.e., workforce needs). The HR Director emphasized again and again the impact of technology on the reduction of jobs in the television industry and how that affects those planning to enter that industry, as well as the need for employees or potential employees to be not only tech literate but also able to adapt to rapid change and learn new technology.

1.3: Identify and explain the basic concepts of research, manufacturing, applications, and markets of key technologies that drive regional industry.

The Fox News studio tour included in-depth information about how the industry collects and uses data from the public's viewing habits to determine selection of shows and their air times, regulation of advertising rates, and the importance of having the most viewers every fifteen-minute increment.

1.4: Outline the different academic and career pathways for students who wish to become science teachers, technologists, scientists, or engineers.

Through participation in this year's ATLAST workshops and industry site visits, participants were exposed to regional high tech industry and related key technologies. These activities presented options for future professionals, and a feel for what type of education would be necessary in order to participate in related careers. Participants also received a Careers in Television guide provided by the Center for Workforce Development which included career pathways and job outlook for Arizona. (See Appendices)

Goal 2: Enable participants to understand the purpose of technological literacy and its impact on student success.

Objectives: ATLAST training will provide all participants with:

2.1: Understanding of links between technology and the natural, social, and designed world.

Through participation in this year's ATLAST workshops and industry site visits, participants were exposed to technology and its relationship to the natural, social and designed world. At each event, participants

learned about technology devices and applications that are making it easier to communicate and collaborate. Discussions did not only emphasis educational uses but how they change the way in which humans interact with each other, gather and understand information, and make learning more Global in nature.

2.2: Knowledge of how technology affects the lives and wellbeing of all people.

Through participation in this year's ATLAST workshops and site visits, participants gained knowledge of how technology affects the lives and wellbeing of people. First and foremost, the ATLAST project workshop facilitators emphasized at every event how each presented technology is used by the public, both for professional and private use; the benefits and drawbacks of technology use by the public and students; and the benefits and challenges of introducing technologically-based activities into the classroom. Secondly, participants learned about Web 2.0 applications and technology as a whole with an emphasis on not only their uses in education but how they are changing the way in which humans interact with each other and gather and understand information.

2.3: Knowledge of research on technological literacy and its implications for teaching.

Student and teacher focus groups were conducted at Workshop 10 in which the discussion focused on technology use by students, how common tools (e.g., cell phones, laptops, iPods/MP3 players) could be incorporated into classroom lessons, and associated challenges. Project participants are realizing, through workshops and other field experiences, that the use of technology in education is not only an effective way to engage students, but imperative if they are to prepare students for today's world and workforce.

Training event participants were provided with a copy of The New Media Consortium's Horizon Report 2010 K-12 Edition. The *Horizon Report* series is the most visible outcome of the New Media Consortium's Horizon Project, an ongoing research effort established in 2002 that identifies and describes emerging technologies likely to have a large impact on teaching, learning, research, or creative expression within education around the globe. This volume, the *2010 Horizon Report: K-12 Edition*, examines emerging technologies for their potential impact on and use in teaching, learning, and creative expression within the environment of pre-college education. The hope is that the report is useful to educators worldwide, and the international composition of the Advisory Board reflects the care with which a global perspective was assembled. Each edition of the *Horizon Report* introduces six emerging technologies or practices that are likely to enter mainstream use in the educational community within three adoption horizons over the next one to five years. Each report also presents critical trends and challenges that will affect teaching and learning over the same time frame.

The project coordinator acknowledges that the technological literacy of teachers and students involved in this project has been low. Beyond the interest of using low-tech tools to entertain and engage students in the classroom for learning, teachers are not very interested in increasing their overall technological literacy. As a result, the desire or drive to be technological literate is not being role modeled for students (future teachers). Many educators do not understand the difference between using educational technology for learning and the concept of technological literacy. This misunderstanding and lack of desire to know (on the teacher's side) continues to provide a big challenge of how to impress upon the importance of digital literacy on current and future teachers. Teachers realize the importance of technical skills after industry tours and panel discussions but making a connection with their own teaching practices to prepare students for a technical career is beyond their

scope. One belief is the task at hand is too overwhelming and teachers' exposure and technology knowledge of industry careers is very limited. The next step for teachers is unknown so teachers do not attempt to tackle the challenge. However, most teachers do make the attempt to implement low-tech devices and applications in their classroom so this is a step in the right direction.

2.4: Ability to apply technological literacy standards to science and non-technical disciplines.

At each workshop participants were provided a book, which supplemented the content of the training event. The books, published by ISTE, defined the technology, gave examples of applications and devices, provided how-to tutorials, addressed the educational value, provided lesson plans across the curriculum, and aligned activities with the NETS*S and NETS*T. Books have included: *Student-Powered Podcasting: Teaching for 21st-Century Literacy* by Christopher Shamburg, *Digital Storytelling: Guide for Educators* by Midge Frazel, and *GPS and Geocaching in Education* by Burt Lo.

Links to ISTE, ITEA and Arizona Department of Education technology standards are also listed as resources to the ATLAST Google Apps website.

During the session, Web 2.0 and the Design Process, offered at the Arizona Career and Technical Education Conference in Tuscon, Arizona, July 2010 a graphic arts teacher approached the ATLAST Project Coordinator about making the connection between the design process and the graphic design curriculum. The teacher was excited because he realized the value added to his curriculum by understanding the process and being able to communicate to school administrators the importance of his curriculum to science and technology.

Goal 3: Enable participants to leverage Web 2.0 and other open-source, free emerging technology tools to attract students to technology subject matter and improve their overall technological literacy.

Objectives: AT LAST training will provide all participants with:

3.1: Knowledge of how students use technology outside the classroom and how to channel these interests and motivation to the study of science and technology.

This objective has been addressed through a simulated pandemic outbreak activity using mobile devices (cell phones, iPads, iPods, flip video cameras, and GPS receivers) to read QR codes, find a location, bulk texting, collaborative blogging, and video interviews. The simulated activity divided participants into three groups which included medical professionals, emergency management, and reporters. Each group had a different role to play and different mobile technology to complete their tasks. Participants learned about pandemic outbreaks by obtaining scientific information about pandemics, interviewing victims (role-played by volunteers), and analyzing collected information and data. This activity exposed participants to technology commonly used by students and how the technology can be used for science related lessons.
In addition, visits to technology industry sites, such as Fox News studio, exposed participating teachers and students to the use of technology in local industries, and the skill set needed to pursue related careers. Participants discovered news reporters are using iPhones to capture video and video interviews when it is not possible to transport in bigger industry video recorders and equipment.

3.2: Awareness of a broad range of Internet information and social interaction resources and how they can be tapped for technological literacy education.

A broad range of Internet information and social interaction resources, and how they can be tapped for technological literacy education, has been presented at ATLAST workshops throughout project Year 3. At each workshop, online resources are presented and utilized by participants, with the express intent of teaching participants how to leverage them as classroom resources and teaching tools. Sites and applications such as You Tube, wikis, blogs, Google Apps (including Google docs, maps, eportfolios, gmail, calendar and more), voicethread, Animoto, Prezi, Ning and Grou.ps have been covered. One educator realized the power of Twitter to connect with other educators for curriculum and instructional ideas.

A one and a half hour session titled *Building a Personal Learning Network (PLN) - 21st Century Learning for Educators* was offered for Education Professions teachers at the Arizona Career and Technical Conference in July 2010. Participants learned about building a personal learning network using Web 2.0 applications and how to leverage the tools for lifelong learning. Education professions standards were addressed. (Session offered twice) Nineteen conferees from across Arizona attended these sessions.

3.3: Ability to use Web tools to develop real-world learning objects (RWLOs) and eportfolios.

Teachers developed real-world learning objects (RWLOs) based on the lesson plans and activities presented at training events. Lesson plans were written specifically to meet the curriculum of the Education Professions teachers so teachers only made minor modifications when implementing the lessons into their classrooms. Student participants developed real-world learning objects for their field experiences required in the Education Professions curriculum. Many of these students completed field experiences at elementary schools so the learning objects created were applied to real learning situations (the student actually taught elementary students).

3.4: Ability to maintain up-to-date knowledge on technology using Internet RSS news feeds.

A one and a half hour session titled *Building a Personal Learning Network (PLN) - 21st Century Learning for Educators* was offered for Education Professions teachers at the Arizona Career and Technical Conference in July 2010. Participants learned about building a personal learning network using Web 2.0 applications and how to leverage the tools for lifelong learning. Education professions standards were addressed. (Session offered twice) Nineteen conferees from across Arizona attended these sessions.

Participants are referred to RSS feeds as resources are addressed in training events and blogging activities.

Goal 4: Integrate research within the ATLAST project that addresses key issues and questions about technological literacy in education.

Objectives: The ATLAST research will:

4.1: Define a model of technological literacy training for teachers.

The ATLAST grant focuses on the teachers and students who participate in the Arizona Department of Education's Education Professions Program, a high school Career and Technical Education (CTE) program for students who have an interest in pursuing a career in the field of education. The long term program goal is to produce an effective Grow Your Own training program for Education Professions teachers.

The following program model is used by the ATLAST project.

- The ATLAST project is promoted through news releases, conference sessions, presentations to professionals, emails, new Education Professions teacher training events, and the two related websites.
- The Project Coordinator initiates contact with potential participants, often with the help of Arizona department of education/FEA representatives, Career and Technical Education directors, and current participants.
- Teachers and students indicating an interest in participating in project activities complete an online ATLAST Participation Consent and Survey.
- Data gathered from initial participation surveys, including baseline data about technological literacy, and participant requests guide activity curriculum development.
- ATLAST training focuses on knowledge of technology industry in the community and ability to use instructional technology to raise the level of student technological literacy—using technology to teach technology.
- Trainers assist participants in setting up a Google Apps account for eportfolios and project reflections.
- Online resources presented at workshops are, for the most part, free applications. There is a conscious effort to introduce participants to free resources in an effort to respect their financial well-being.
- Workshops are planned and facilitated by skilled educators, who include time for participants to practice newly learned technology skills and continue to utilize skills learned in previous sessions. This strategy is very effective in ensuring that participants have the opportunity to try out new technologies and get assistance as needed during the training sessions. Related comments from workshop evaluations include:
  - "Hands on work is always my favorite time at these workshops!"
  - "Today we got to use a smart pen. . . I could see myself using this in school with notes.
  - "I am so glad that I am able to be here. Learning the technology, with such great support, lessens my fears."
  - "I am so grateful for being able to learn this technology. I also am glad that we were given time to try the new programs during the workshop. It helped to use the technology and not just hear and see it."

- Teachers attending workshops are encouraged to bring students with them. Teams of teachers and students working together has been the most powerful component for teachers when implementing and revisiting the technology after the training.
-
- The Project Coordinator and faculty trainers make themselves available to participants for follow up activities and/or onsite support. Participating teachers have requested support in the form of setting up Google Apps accounts for classes, assisting with the implementation of technology lessons, presentations to district personnel, and communication by email, phone, and chat lines.
- Ongoing data collection through event evaluations and observations by researchers and training facilitators helps to identify what activities are effective and what may need to change.

Modifications that have been made this year focused on reducing the amount of content in training sessions in order to allow participants more time to practice their new skills,.

- Suggestions by participants on future training topics are considered, and have been implemented this year (e.g., participants requested a separate workshop to assist Education Professions students in getting started on their technology competition submissions for the spring 2011 FEA state conference.)

4.2: Explore methods to improve technological literacy via collaborative learning.

Several teachers have realized the value of applications like Skype, Ning, Facebook, and Twitter for connecting with other professional communities and educators interested in educational technology. An example is one teacher learned about a new application which was microblogged on Twitter and she implemented a lesson using that application the next day in class. Teachers have also used applications like Ning to connect their students with students from another country for a collaborative project. While the project content did not focus on technological literacy students were exposed to using technology to communicate and collaboratively work on a project. As a result, students indirectly became more technologically literate.

An online professional development program is in the process of being developed to guide interested professionals though the use of technology for educational purposes. The Instructional Technology Adventure Park, interactive PDF format, will take participants through modules on an introduction to the logistics of technology use in education, digital tools and teaching, research literacy, collaborative learning, project based learning, and reflective learning.

4.3: Identify factors that increase and sustain interest in technology.

Key factors that increase and sustain interest in technology, according to our research, are

- Training is based on their needs. Teachers are surveyed each year to identify their instructional needs. Training events are then designed around these instructional needs.
- Project Coordinator being a part of the teachers' professional community by serving on advisory councils, committees, assisting and presenting at conferences hosted by teachers but unrelated to ATLAST project, attending personal performances of teachers, and attending performances of students of the community.
- Training events presented technology in small increments and only what they needed in order to implement the technology in a project with students.
- Technology presented at training events could also be applied across subject areas. Students receiving training often used the technology in other classes which exposed other students and teachers to the technology.
- Lesson plans and training events were designed so teachers had hands-on practice with the activity they would implement with students. Therefore, little effort was required on the teacher's side to replicate the activity in the classroom.
- Schools dominating Arizona FEA competitions was also a factor in sustaining interest in technology. When two – three schools win the majority of the competitions other teachers want to know how they are doing it. Teachers take pride in their students knowing the technology to submit outstanding competition entries.
- Constant exposure. Teachers and students have multiple opportunities throughout the school year to attend ATLAST training events. The Project Coordinator has made great efforts to offer training

events where teachers and students would already be present like Fall FEA Conference, district professional development, school events, classroom visits, and Arizona State FEA Conference.
- Technology activities at training events focused on teaching learning standards for Education Professions. Content was specific to the curriculum being taught by teachers.
- Technology presented at training events could be implemented in the classroom immediately but could also be implemented into teachers' personal lives. There was a personal interest in using the technology which builds confidence when implementing the technology with students.
- Teachers and students walked away with a book published by ISTE which reinforced and supplemented the technology and curriculum ideas presented at the training event.
- Being accessible to teachers and students. The personal assistance and ongoing support offered by the Project Coordinator and other workshop facilitators. Participants are comfortable asking questions and seeking assistance as a result of the Project Coordinators efforts to build relationships with them. Ongoing support is offered in the form of setting up Google Apps accounts for classes, assisting with the implementation of technology lessons, presentations to district personnel, and phone, email, and chat line communications. This personal touch, in addition to the training content, also keeps participating teachers coming back for more.
- Training opportunities are scheduled at times indicated as the most convenient by participants. Based upon participant preference, the summer institute was held in early June and workshops are held on Saturdays.
- Offering stipends to participating teachers seems to be a motivating factor. Teachers are offered stipends for attending workshops, and then again if they implement follow up technology activities in their classrooms. Involving students with a follow-up activity and the reflection exercise seem to encourage teachers to repeat technology implementation even after the initial activity for the extra stipend.

4.4: Disseminate findings that benefit the improvement of technological literacy nationwide.

The ATLAST Project has presented at numerous local, statewide, and national conferences and events, including those mentioned in the 'Major Accomplishments in Year 3' section of this report. At such events, presenters disseminate information about the project, including what has worked and what has had to be revisited according to feedback and response.

Project information, materials and resources developed and/or referenced by the project are posted on the Google Apps website and available to anyone interested.

In addition, an online professional development program is in the process of being developed to guide interested professionals through the use of technology for educational purposes. The Instructional Technology Adventure Park, in interactive PDF format, will take participants through modules on an introduction to the logistics of technology use in education, Digital Tools and Teaching, Research Literacy, Collaborative Learning, Project-Based Learning, and Reflective Learning.

Training and Development:

A three-day summer institute (constituting workshops 8 through 10), three full-day workshops (11 through 13)) and a Tech Fair were/will be offered from May 2010 to April 2011. A detailed agenda for each workshop is located at www.atlastproject.com.

Outreach Activities:

- Information about the ATLAST project and its activities are posted on the National Center for Teacher Education website (http://www.maricopa.edu/academic/teachered/ATLASTproject/) and the ATLAST Google Apps site (http://www.atlastproject.com/). In particular, the Google Apps site includes detailed project information that is available to the public.
- The ATLAST Project Coordinator works closely with Arizona Department of Education, CTE Directors and FEA coordinators to get word to Education Professions teachers about the ATLAST project and its activities, and helps to coordinate technology standards development and event activities.
- The ATLAST Coordinator presented at various events and conferences in 2010.
    - Exhibited information about the ATLAST project and Maricopa Community College teacher education programs at the APS Back to School Resource Fair at the Arizona Science Center in Phoenix in September 2010.
    - An *Inquiry-based Learning + Technology = Differentiation* breakout session was presented at the Rim Country Differentiated and Gifted Strategies Sympostium at Rim Country Middle School In Payson in October 2010. Three event participants attended.
    - Two breakout sessions were presented at the Arizona FEA Fall Regional Leadership Conference at Arizona State University, Tempe campus in October 2010, and again at the Arizona FEA Fall Regional Leadership Conference at the University of Arizona in Tucson in November 2010.
        - In *Amp It Up Part I: Create an Amazing Multimedia Presentation* students were introduced to a variety of technology devices and free applications that they can use to amp up their blogs and eportfolios for the state FEA competitions. Twenty and five conferees attended, respectively.
        - In *Amp It Up Part II: Create an Amazing Multimedia Presentation* students were introduced to a variety of technology devices and free applications that they can use to amp up their program of work multimedia presentations and instructional technology lessons for the state FEA competitions. Twenty one and seven conferees attended, respectively.
    - Five workshops were presented at the Arizona Career and Technical Education (ACTE) Conference in Tucson in July 2010.
        - A half-day, hands-on session titled *New Curriculum for Education Professions Program* was co-presented with four ATLAST participating teachers for Education Professions teachers. This session covered new curriculum focusing on brain-based learning, diversity, lesson planning and classroom management. (offered twice) Approximately 26 conferees from across Arizona attended these sessions.
        - A one and a half hour session titled *Web 2.0 and the Design Process* was offered for CTE teachers with a focus on using Web 2.0 applications to enhance the design process for solving problems, , a process used in S.T.E.M. courses and everyday tasks. International Technology Education Association (ITEA) standards were addressed. Approximately 18 conferees from across Arizona attended this session.
        - A one and a half hour session titled *Building a Personal Learning Network (PLN) - 21st Century Learning for Educators* was offered for Education Professions teachers. Participants learned about building a personal learning network using Web 2.0 applications and how to leverage the tools for lifelong learning. Education professions standards were addressed. (offered twice) Nineteen conferees from across Arizona attended these sessions.
    - The ATLAST PI, Project Coordinator and a participating teacher participated in the National Science Foundation's ATE Principal Investigators Conference in Washington D.C. in October 2010. The group facilitated a roundtable discussion about the ATLAST project, manned an

ATLAST booth, and participated in the American Association Community Colleges (AACC) and National Science Foundation (NSF) Blue Ribbon Task Force for teacher education. The ATLAST External Evaluator was also at this event.

- The ATLAST project hosts Arizona FEA student officers meetings at its office at the Maricopa Community Colleges district office/NCTE.

Journal Publications

Books or Other One-time Publications

Web/Internet Site

URL(s):

www.maricopa.edu/ATLASTproject

http://www.atlastproject.com/

Description:

The ATLAST website at www.maricopa.edu/ATLASTproject continues to serve as the central point for resources and information about the project to the public. Information on this site includes a description of the project and training design; grant goals; a project calendar; benefits for participants; partnering businesses and school districts, contact information; team members; and links to technology standards, grant reports, a project slideshow and facebook.

The ATLAST Google Apps website at www.atlastproject.com was created in order to provide participants and coordinators a place to communicate. The Project Coordinator populates the site with key information not only for participants, but also for potential participants. In addition, participants populate the site with eportfolios, blogs, and online projects. Features of the site include:

- A description of the ATLAST project, goals, training design, project partners, and senior personnel
- Upcoming activities announcements and registration options
- Information from previous activities, which is available to participants who attended or did not attend the activity (i.e., workshop)
- An activities calendar
- A live chat option to talk to the Project Coordinator in real time
- A project podcast, in which the goals and activities of the project is discussed
- An alternative energy project, with voicethreads created by participants
- An ATLAST blog, and links to other technology education blogs
- An Everything ATLAST page, with links to technology sites, education sites and online publications
- Conference presentations made by Project Coordinator
- Virtual fieldtrips and voicethreads created by project participants (teachers and students)
- Participant eportfolios
- Industry partner information
- A link to information about the Arizona FEA state technology competition and other technology-based opportunities

Other Specific Products

Contributions

Contributions within Discipline:

In previous grant years, the ATLAST Coordinator

- Contributed to the development of Education Professions standards at the state level,
- Contributed to Education Professions assessment of standards, and
- Wrote the curriculum overview of Educational Technology for Arizona's Education Professions program, which did not previously contain education technology content.

This year, the ATLAST Coordinator assisted with the finalization and review of the new state Education Professions technology standards, and co-presented and distributed them at the ACTE Conference at Tucson in July.

ATLAST training activities are promoted by the Arizona Department of Education's Education Professions program as a highly recommended technology training opportunity for professional growth.

Contributions to Other Disciplines:

Contributions to Human Resource Development:

Contributions to Resources for Research and Education:

Research and evaluation reports, and project information and activities are posted on the ATLAST Google Apps website at www.atlastproject.com for sharing purposes.

Contributions Beyond Science and Engineering:

Special Requirements

Special reporting requirements: None

Change in Objectives or Scope: None

Animal, Human Subjects, Biohazards: None

Categories for which nothing is reported:

Any Journal
Any Book
Any Product
Contributions: To Any Other Disciplines
Contributions: To Any Human Resource Development
Contributions: To Any Beyond Science and Engineering

Attached

Reports:

- Evaluation Progress Report January 2011
- Research Report January 2011

Participant Evaluations

- Workshop 8
- Workshop 9
- Workshop 10
- Workshop 11
- Workshop 12
- Careers in Television