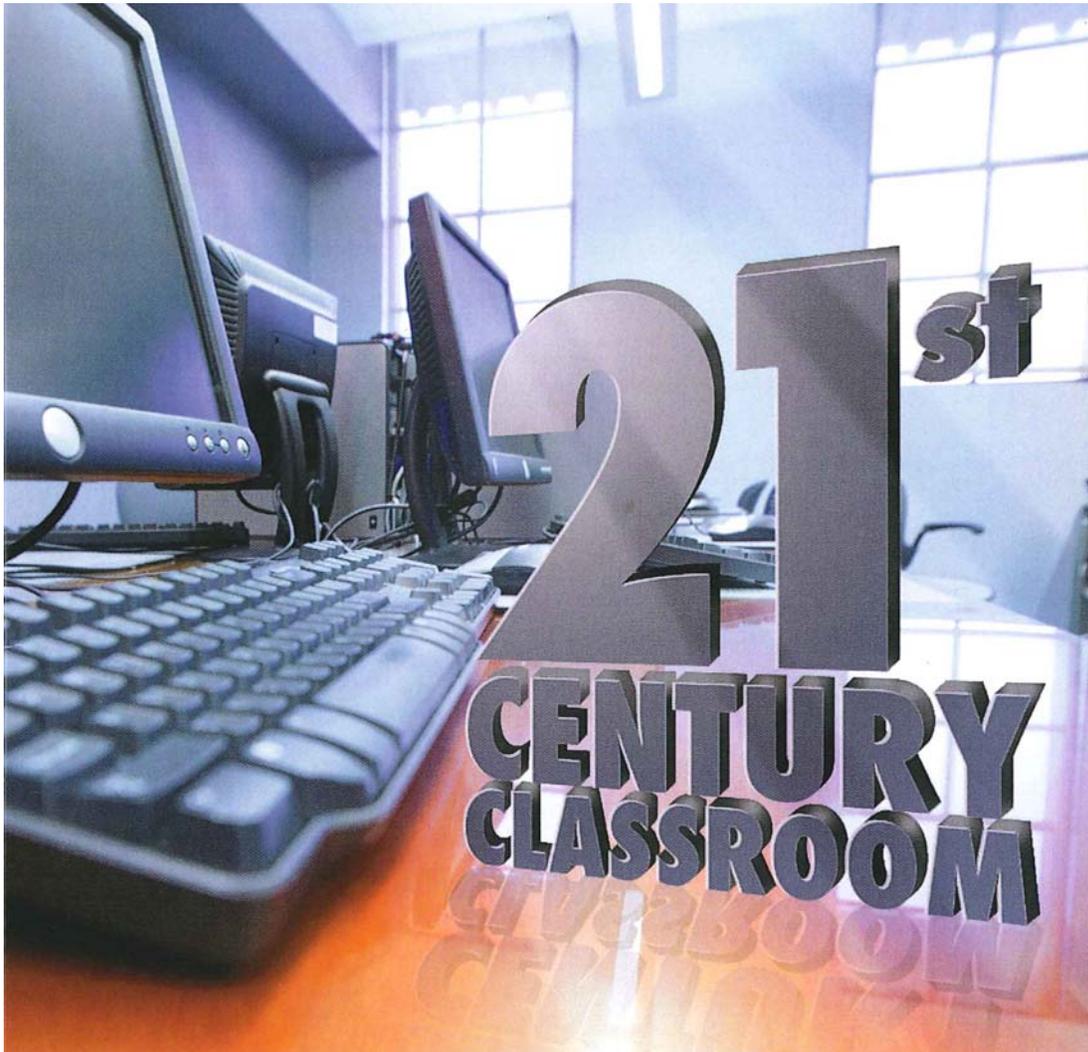


Report of the Arkansas Task Force on Knowledge-Based Technology Curriculum



**A Report Addressing ACT 2266 of 2005
– Completed August 2008 –**

**Report of the Arkansas Task Force on Knowledge-Based
Technology Curriculum**

**Addressing the Need to Integrate Technology into the
Public School Curriculum Described in ACT 2266 of 2005**

**Developed by the Arkansas Technology Task Force
– A Subcommittee of the Arkansas STEM Coalition –
August 2008**

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Part I

Executive Summary

I. Executive Summary

In the 2005 session, the Arkansas Legislature passed Act 2266 (Arkansas Code Section 6-16-319) to help address the challenges for education, economic development, and community development brought on by the emerging global economy of the 21st century. As a step towards meeting these challenges, Act 2266 authorized the Arkansas Science & Technology Authority (ASTA, or the Authority) to develop a knowledge-based technology curriculum, with lesson plans and related materials, for use in Arkansas Public Schools, grades seven through twelve.

The Authority, in cooperation with the Arkansas Science Technology Engineering and Mathematics (STEM) Coalition, established a task force of volunteers to assist in the process and to develop further legislative recommendations in this area. This is a report on that endeavor which began October 4, 2005. The Technology Task Force volunteers were diverse, coming from state agencies, school districts, businesses and foundations. A Steering Committee led the activities and a larger open membership participated at general meetings, conferences, and organized events.

The Task Force and the Authority examined the act and endeavored to clarify the practical meaning of “knowledge-based technology curriculum.” It was soon established that the term “21st Century Skills” was more often used than knowledge-based skills and had detailed definitions promoted by a national organization, the Partnership for 21st Century Skills. This term has been adopted as a state standard by seven states. By this definition, 21st Century Skills involve higher-level thinking, communication, and collaboration, in addition to the ability to use technology in education and the economy. Further information on 21st Century Skills and the Partnership for 21st Century Skills is included in the report.

The Task Force determined that interweaving 21st Century Skills into existing Arkansas Curriculum Frameworks would be more beneficial than creating a new, standalone course or courses. We selected the SMART Portal as a means of demonstrating this concept. The SMART Portal is the Task Force’s “proof of concept” project for integrating 21st Century Skills into Smart Core, Arkansas’ public school college preparatory curriculum. The SMART Portal hosts continually updated lesson plans and materials that meet three criteria for content:

- (1) They address objectives in the Arkansas frameworks for core educational content.
- (2) They have a technology component that will help prepare Arkansas students for a technology-rich world.
- (3) They include practice of 21st Century Skills that prepare students for the emerging challenges of a global economy.

Since Act 2266 had no accompanying appropriation, the Authority provided some funds for this effort and leveraged existing grants to develop the SMART Portal. Because these grants focused on science and math resources, the initial lesson plans and materials cover these subjects. The intent is to add other subjects over time.

The Task Force took on the duty of raising private funds to cover other expenses, such as school district costs, in order to involve teachers in the activities. With the help of the Arkansas Community Foundation, the IMPAC Technology in Education Endowment, an AT&T grant, and other state and private sources, the Task Force raised the required funds. The Arkansas Department of Education (ADE)

contributed funds for professional development for teachers contributing to or utilizing the SMART Portal.

The Task Force held over two dozen meetings to gather information, arrive at consensus, and guide action. These included:

- An industry panel, which focused on helping the Task Force understand the skills needed in 21st century enterprises.
- A symposium held in April 2006 called "Thinking Outside the Box." With nationally known guest speakers, this event provided a larger perspective and information beyond the Task Force membership.

In addition, to gain broader insight into the present and future of 21st Century Skills, technology, and education, Task Force members attended or made presentations at state and national events including:

- Annual National Educational Computing Conference (NECC) meeting, sponsored by the International Society for Technology in Education (ISTE) and held in July 2006 in San Diego, CA.
- Apple Education R & D facility visit.
- Annual National School Board Association (NSBA) T+L educational technology meeting held in Dallas, TX, in November 2006.
- National Symposium for Scientists and Engineers on K-16 Education, Santa Fe, NM.
- Consortium for School Networking, Visionary Leadership: Scaffolding 21st Century Learning with Technology, March 9-12, 2008, Washington D.C.
- Arkansas TICAL (Technology Information Center for Administrative Leadership) conferences
- Hot Springs Technology Institute (HSTI) conference, held in Hot Springs.
- "It's All Connected - Linking Your Local Economy to Global Opportunities" conference sponsored by University of Arkansas Cooperative Extension Service, Little Rock, May 2008.
- Multiple site visits to schools with significant investment in educational technology, including NSBA organized visits in Texas, South Carolina, and Washington.

The visits to varied best practice sites made clear that part of successfully introducing the vision and practice of 21st Century Skills into the classroom involves exposing teachers and administrators to best practices both nationally and in Arkansas. This realization led to recommendations to encourage participation in NSBA site visits and to establish a spectrum of best practice alternatives within Arkansas.

Some Task Force meetings focused on construction of the SMART Portal, including meetings with the Authority and the developer, Information Network of Arkansas (INA). Authority staff administered the grants funding the initial portal work and supervised the construction effort that led to the operational web site.

The SMART Portal, which will be made available fall 2008, currently provides access to lesson plans organized by course and by the specified elements of Arkansas Curriculum Frameworks. Additional information in the database covers how the lesson plans integrate technology and practice of 21st Century Skills. Material illustrating the SMART Portal in operation is included as an attachment to the full report.

To develop the initial lesson plan content, teacher workshops were held -- one at UALR and a second at UAF -- to initially develop approximately 80 lesson plans for the SMART Portal. Other workshops

followed, including a multi-day workshop in Little Rock for 100 teachers held in May 2008. This workshop is a model for future efforts involving expert instructors and requiring all participants to submit newly created lessons to the SMART Portal. The result will not only be lesson plans for all teachers to share, but 100 teachers better prepared to use technology and 21st Century Skills in their classrooms.

Professional development is an ongoing part of the effort, including development of on-line training units for classroom teachers on the use of the SMART Portal. The Authority has held coordination meetings with ADE and the Arkansas Educational Television Network (AETN) to guide the way towards the eventual integration of the SMART Portal into other ADE and AETN online portals.

Including technology content in the lesson plans raised the issue of what technologies would be available in the classrooms. The Task Force explored the previously published standards and inventories for guidance and found three problems that may interfere with progress in education in Arkansas. State facilities standards for technology infrastructure and technical support exist, although there appears to be no process to ensure that they are followed. Local districts may build new facilities that do not meet the standards, leaving a potentially large future financial obligation. There is also no process for revising standards over time to address technology change. There has also been a lapse, perhaps now rectified through the 2008 Education in Arkansas Technology Assessment (eDATA) project, in collecting and analyzing data to track technology resources available in the schools. The net result is that wonderful 21st century lesson plans may be usable in some, but not all, schools.

Inclusion of a broad group of people in the Task Force also led to the observation that expensive facilities with common requirements are required for K-12, university, and workforce education. Given financial constraints, there was interest in good stewardship and use of a Community Learning Center concept, using shared local technology resources and facilities for multiple uses and linking to distance learning centers. This cooperation was seen as a way to bring higher quality 21st century education at all levels to more locations across Arkansas.

In addition to the SMART Portal development issues and exploration of the Partnership for 21st Century Skills, the Task Force held a writing retreat. The focus of this retreat was to articulate recommendations that will advance the integration of technology and 21st Century Skills in Arkansas classrooms. The group narrowed its focus to the four recommendations that follow in the next section of this report. Briefly, the recommendations are:

- A. Accelerate SMART Portal development.
- B. Participate in the Partnership for 21st Century Skills and encourage best practices.
- C. Manage technology infrastructure and support standards in schools.
- D. Explore shared use of facilities and technology resources concepts.

The Task Force would not have been possible without the volunteers that comprised it. Each one brought knowledge, experience, and wisdom to the task and collectively we emerged with a much broader and deeper picture of what Arkansas education could be in the 21st century. The benefits of having a diverse group of interested citizens look at the needs and trends in Arkansas education in the 21st century seem clear. Other task forces have done valuable work in the past but there is often a loss of forward motion after the reporting is complete. To avoid such loss, the task force added a 5th recommendation:

E. Authorize Continued Citizen Involvement.

This continued involvement could be in the form of an advisory committee to the Authority. The current Technology Task Force was actually both, advising the Authority and serving as the STEM Coalition's Technology Committee.

The Task Force wants to acknowledge the state agencies and foundations that provided funding and institutional support. The Executive Summary concludes with a more detailed version of the recommendations. Following the Executive Summary are sections with additional material relevant to each recommendation.

Legislative Recommendations of the Technology Task Force

A. Accelerate SMART Portal development in partnership with AETN, ADE, and the Authority.

- Expand the development of resources for the SMART Portal.
- Integrate STEM curriculum across all curricula.
- Provide professional development resources for teachers delivered via the SMART Portal.
- Provide professional development models and resources that unite STEM curriculum standards and 21st Century Skills.
- Provide sufficient funding to accomplish the activities needed.

Rationale: *The Technology Task Force advocates and endorses the continued development of the SMART Portal database of lesson plans and materials for teachers. This database is linked to the Arkansas Curriculum Frameworks and enhanced through the development of skills in the use of technology and the acquisition of knowledge-based skills required for the 21st Century. This will require funds in the budgets of the cooperating departments to supplement costs covered during the past year by grants and public donations secured by the Task Force.*

B. Participate in the Partnership for 21st Century Skills.

- Adopt state standards that incorporate 21st century tools and learning skills; articulate 21st Century Skills expectations for all grade levels.
- Embed digital literacy skills into current standards, curricula, and assessments for core subjects.
- Create state and local infrastructure (bandwidth, hardware, software, intelligent classroom devices) that supports a 21st century education by providing funding for equitable access to technology.
- Provide professional development paths for administrators and teachers that are strategically aligned to support the goal of offering effective 21st Century Skills in all Arkansas Curriculum Frameworks.
- Engage educators, employers, community members, parents, and policy makers in an ongoing dialogue that provides recommendations and advice about 21st century education.
- Encourage site visits to NSBA selected schools and develop opportunities closer to home for visits to schools and districts that practice 21st Century Skills in the classroom.
- Develop a video introduction to 21st Century Skills in the classroom as a basic introduction to concepts and practices.

Rationale: *The Technology Task Force endorses efforts by ADE to move Arkansas into full participation in the Partnership for 21st Century Skills, joining other states, including Iowa, Maine,*

Massachusetts, North Carolina, South Dakota, West Virginia, and Wisconsin. The Partnership for 21st Century Skills is an established coalition that supports well-defined educational strategies for full participation in the 21st century global economy. The Task Force believes the direction of the Partnership is consistent with the goals expressed in Arkansas Act 2266 of 2005.

C. Manage Technology Infrastructure and Support Standards for Arkansas Schools.

- Establish responsibility for ensuring that the standards for technology infrastructure and new facility technologies are followed. Such standards were included in the draft *Arkansas School Facility Manual*. Other standards are implied in the Arkansas Curriculum Frameworks, calling for equipment for classroom and laboratory use specific to the standards. This category of equipment was categorized in the report to the legislature known as the *Unattached Equipment Manual* and must be implemented and funded.
- Provide Standards to ensure:
 1. Network bandwidth and bandwidth management techniques necessary for schools to engage meaningfully in 21st century learning techniques.
 2. Equipment, such as interactive whiteboards, video projectors, and audio speakers, necessary for schools to provide 21st century learning environments.
 3. Technical support and instructional technology integration training to equip learners (students, parents, teachers and administrators) with the skills necessary to function in 21st century learning environments.
 4. Classroom and laboratory equipment and materials adequate to meet the requirements of the Smart Core curriculum and the teaching of current technology and 21st Century Skills across all curricula.
- Provide for periodic updates to these standards and ensure that future funding of infrastructure and new construction is contingent on meeting these standards.
- Strengthen data collection and analysis that tracks the technology resources available in Arkansas schools in terms of quantity and quality in order to assist in the assessment of technology infrastructure and compliance with standards by making permanent the data collection and analysis system developed as part of the 2008 eDATA (Education in Arkansas Technology Assessment) project.

Rationale: *Appropriate technologies are imperative to support enriched learning environments in which students can practice 21st Century Skills as they find and utilize current information and resources and apply their academic skills in solving real-world problems. Without an adequate technology infrastructure to support 21st Century Skills, students will enter the workforce and/or higher education without needed skills and experience. If there are no uniform standards, there will be potential inequality between schools and/or districts. Providing technology infrastructure in new buildings is less expensive than adding technology at a later date. Once the technology infrastructure is in place, it must be supported and maintained over time.*

D. Explore Shared Use of Facilities and Technology Resources.

- Encourage all levels of education, including K-12, university, and workforce, to collaborate on ways to share facilities and technology resources to better meet the needs of the state.
- Collaborate with Connect Arkansas and other partners to provide technology access and support in all areas of the state.
- Encourage each school district to work with the eCommunity projects of Connect Arkansas as it identifies community needs for school improvement and economic development.

Rationale: *In the 21st century, every community needs access to all levels of education in order to provide opportunities for individual improvement and economic advancement while supporting requirements of local industry and business. While distance learning and other tools have a place, hands on access to technology in classrooms, laboratories, and communities is also imperative.*

E. Authorize Continued Citizen Involvement.

- Establish a permanent advisory committee to the Arkansas Science & Technology Authority to review the activities above, to provide oversight, and to evaluate strategic direction and progress.
- Membership of this advisory committee shall include representatives of all stakeholders: state agencies, classroom educators and administrators, business community, and STEM professionals.

Part II

Additional Information on Recommendations

- A. SMART Portal (Act 2266) Implementation
- B. 21st Century Skills and Best Practices
- C. Technology Infrastructure
- D. Shared Use of Facilities and Shared Technology Resources
- E. Task Force Membership/ Continued Citizen Involvement

II. Additional Information on Recommendations

A. SMART Portal (Act 2266) Implementation

Recommendation:

Accelerate SMART Portal development in partnership with AETN, ADE, and the Authority.

- Expand the development of resources for the SMART Portal.
- Integrate STEM curriculum across all curricula.
- Provide professional development resources for teachers delivered via the SMART and AETN Portals.
- Provide professional development models and resources that unite STEM curriculum standards and 21st Century Skills.
- Provide sufficient funding to accomplish the activities needed.

Rationale: *The Technology Task Force advocates and endorses the continued development of the SMART Portal database of lesson plans and materials for teachers. This database is linked to the Arkansas Curriculum Frameworks and enhanced through the development of skills in the use of technology and the acquisition of knowledge-based skills required for the 21st century. This will require funds in the budgets of the cooperating departments to supplement costs covered during the past year by grants and public donations secured by the Task Force.*

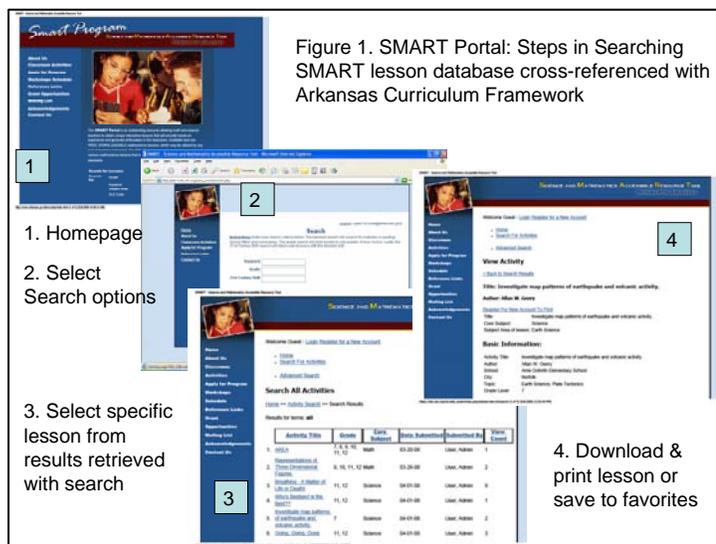
Additional Materials:

- Smart Portal Enhancement and Professional Development

SMART Portal Enhancement and Professional Development

Although the long-range goal is to impact the skill sets of Arkansas students and improve achievement, the short term goal of the Task Force is to produce a set of resource materials and on-line professional development tutorials that will assist Arkansas teachers with the requirement of integrating technology skills into the curriculum. The Task Force determined that this could be facilitated by augmenting a web-based science and mathematics resource portal (Science and Mathematics Accessible Resource Tool, *SMART Portal*) already under construction by the Arkansas Science & Technology Authority that is supported by a grant from the Winthrop Rockefeller Foundation.

The Task Force decided to provide a set of deliverables tied to this web portal for easy teacher access (Figure 1). This independently funded web portal is a database of “one-concept lesson plans” cross-referenced with the Arkansas course frameworks and representing best practices activities for science and mathematics. The previously proven quality of these lesson plans in Arkansas classrooms and the implicit value of the hands-on activities become even more significant given that teachers are faced with extensive curriculum and testing requirements that restrict time for all but extremely meaningful activities.



The Technology Task Force has produced **technology-rich integrations**, linked to these lessons, which are in essence “overlays” on these science and math lesson plans. These technology-rich deliverables and the infrastructure to facilitate delivery of these



materials are the beginning of a larger project that the Task Force envisions as a comprehensive resource tool to help teachers incorporate technology into their classroom curriculum. These technology-rich overlays are designed to be optional but highly enriching activities which add value to lesson materials *without* extending required classroom implementation time, a critical factor in the tightly-packed curriculum schedule. The optional quality of the overlays also provides flexibility since various tools, software, or other prerequisites may not be available in all classrooms.

Funds raised by the Task Force have been used to provide high quality professional development training and help develop curriculum materials that target integrating technology skills across the curriculum. Continued training is a critical issue that will require funds beyond those raised independently by the Task Force. Such training models, although more expensive than traditional workshops, build the library of technology-rich materials and resources while simultaneously expanding the skills of teachers who will be expected to facilitate 21st century classrooms.



Phase II of this project, using remaining funds in the Task Force account that are earmarked by stakeholders in the project, will allow development of an online tutorial which will provide specific skill/application hands-on training and guided integration of this skill/application into a traditional lesson. This will provide opportunities for Arkansas teachers from any remote location to receive high-quality professional development in technology integration. The guided tutorial will take teachers through a specific technology application assisting them through hands-on use of the skill/technique and completing the activity (assessment) by integrating this skill/technique into their lesson of choice. The Task Force has worked with ADE and

AETN to guarantee that the online resource can be cross-linked with AETN’s Internet Delivered Education for Arkansas Schools (IDEAS) Portal, allowing Arkansas teachers to log into the system using their passwords and ADE-issued teacher identification numbers. At the completion of the guided activity, the lesson with its newly-created technology-rich overlay is uploaded into the SMART Portal and cross-linked to the IDEAS Portal to allow the teacher to receive technology professional development credit. The newly-created lessons with overlays are reviewed as a quality control by master teachers and specialists, and following approval, may then be publicly viewed in the SMART Portal for sharing with others in the education community.

B. 21st Century Skills and Best Practices

Recommendation:

Participate in the Partnership for 21st Century Skills

- Adopt state standards that incorporate 21st century tools and learning skills; articulate 21st century skills expectations for all grade levels
- Embed digital literacy skills into current standards, curricula, and assessments for core subjects
- Create state and local infrastructure (bandwidth, hardware, software, intelligent classroom devices) that supports a 21st century education by providing funding for equitable access to technology
- Provide professional development paths for administrators and teachers that are strategically aligned to support the goal of offering effective 21st Century Skills in all Arkansas Curriculum Frameworks
- Engage educators, employers, community members, parents, and policy makers in an ongoing dialogue that provides recommendations and advice about 21st century education
- Encourage site visits to NSBA selected schools and develop opportunities closer to home for visits to schools and districts that practice 21st Century Skills in the classroom
- Develop a video introduction to 21st Century Skills in the classroom as a basic introduction to concepts and practices.

Rationale: *The Technology Task Force endorses efforts by ADE to move Arkansas into full participation in the Partnership for 21st Century Skills, joining other states, including Iowa, Maine, Massachusetts, North Carolina, South Dakota, West Virginia, and Wisconsin. The Partnership for 21st Century Skills is an established coalition that supports well-defined educational strategies as necessary for full participation in the 21st century global economy. The Task Force believes the direction of the Partnership is consistent with the goals expressed in Arkansas Act 2266 of 2005.*

Additional Materials:

- The Partnership for 21st Century Skills
- The Role of 21st Century Skills In Building a Knowledge-based Economy
- 21st Century Skills List
- Best Practices in Technology and Learning with Technology
- Technology Task Force - Criteria for Selecting Best Practices
- Reports from Site Visits

Partnership for 21st Century Skills

Early in the history of the Task Force, the group decided to look for similar efforts elsewhere. This search found the Partnership for 21st Century Skills, a broad national coalition formed to address the educational and economic challenges of this century. These challenges include:

- The nature of education is changing internationally.
- The nature of competition is changing internationally.
- The nature of workforce, jobs, and skill demands is changing internationally.

The Partnership has a very useful web site, www.21centuryskills.org, and has published reports and materials. Some of the basic materials are included in this report and its appendices. Others can be downloaded or ordered from their website. The Partnership's concerns are parallel to the thrust of Act 2266. They address competency in core academic subjects, coupled with literacy in information and communications technology and development of advanced learning and thinking skills. To these categories the Partnership adds 21st century content to global awareness: financial, economic, business and entrepreneurial literacy, civic literacy, and health and wellness awareness. They also provide a means of assessment for the success of programs based on their vision. Multiple states, including Iowa, Maine, Massachusetts, North Carolina, South Dakota, West Virginia, and Wisconsin, have adopted the methods and standards of the Partnership.

Partnership for the 21st Century materials have been presented at Task Force meetings and at the symposium, and Task Force members have met with the Partnership Executive Director and hope to invite representatives of the Partnership to Arkansas to talk to key individuals and organizations. At the same time, ADE has been exploring the Partnership. Jim Boardman of ADE spoke at the December 1, 2006 Task Force meeting on this topic.

The Role of 21st Century Skills In Building a Knowledge-based Economy

In the 21st century, it has become increasingly clear that the potential success of high school graduates cannot be measured with the traditional metrics used in American education, such as attendance, graduation, college matriculation, and academic test scores. Rigor in high school courses must encompass high degrees of mastery in core academic subjects, 21st Century Skills, and specialized content. Increasingly, graduates must be critical thinkers, problem solvers, and effective communicators using a variety of methods and the mind tools of technology.

The "Rising Above the Gathering Storm Conferences" attended by Task Force members at Washington, District of Columbia, Santa Fe, New Mexico, and Little Rock, Arkansas suggest that there is a growing sense of urgency and determination by leaders at all levels of government, business, and industry and across education to implement some fundamental reforms. These reforms should result in significantly better outcomes. Underlying this felt urgency and determination is the "Gathering Storm" that education and economic competition are changing internationally and hence, workplace jobs, skills, and the opportunity and demand for innovation is a wind that is blowing everywhere and in all directions.

The Accelerate Arkansas Report published in the fall of 2007 (www.acceleratearkansas.org) provides evidence that the per capita income of Arkansans lags behind the United States in part because we do not have a strong knowledge-based economy in the state and, among other things, calls for an increase

of the education level of Arkansans in science, technology, engineering and math. Furthermore, the report states that “Employers of today and tomorrow need a workforce that is flexible and adaptable, with the ability to learn new and complex technologies throughout an entire working lifetime. Central to such outcomes is a broad -based workforce that increasingly develops 21st Century Skills through 21st century learning.

The recent report “Building a Knowledge-based Economy in Arkansas: Strategic Recommendations by Accelerate Arkansas” lists five core strategies to build a knowledge-based economy in Arkansas. Strategy four is “Increase the education level of Arkansans in science, technology, engineering and math (STEM).”

The Accelerate Arkansas Committee, relative to K-12 education, cites the need for:

- (1) Creating accelerated learning programs
- (2) Improving STEM content in curriculum frameworks
- (3) Beginning adequate STEM education at the elementary school level

Central to these outcomes are knowledge-based curriculum enhancement, 21st Century Skills development, and the establishment of Best Practices Programs in schools as related to the integration of technology into curriculum and learning as well as student assessment.

Best Practices Programs essentially address the impact of technology on student achievement through the following research-based outcomes:

- (1) Mastering fundamental skills
- (2) Becoming proficient users of technology
- (3) Preparing students with 21st Century Skills
- (4) Motivating students to higher levels of achievement

Any vision of 21st Century Skills must include a judgment about six aspects of knowledge-based skills. The Task Force has reviewed several reports in this area of concern – some at the state level and some at the national level. Several Arkansas school districts have developed 21st Century Skills programs and the Arkansas Department of Education is addressing this matter as it relates to revisions of the state’s curriculum frameworks.

Six Aspects of Knowledge-based Skills

1. Core subjects for the school curriculum
2. Content relevant to 21st century living
3. Learning and thinking skills including:
 - Critical-thinking and problem solving skills
 - Communication skills
 - Creativity and innovative skills
 - Collaboration skills
 - Contextual learning skills
 - Information and media literacy skills

4. Information and communications technology literacy
 - Using technology to help students learn content and skills and how to think critically, solve problems, use information, communicate, and collaborate
5. Life skills including leadership, ethics, accountability, adaptability, being productive and responsible, social skills, aspects of being self directing and socially responsible
6. 21st century assessment relative to student acquisition and application of core subjects, relevant content, information and communications technology literacy, and life skills

21st Century Skills List

1. GLOBAL AWARENESS

Students need a deeper understanding of the thinking, motivations, and actions of people from different cultures and countries in order to successfully navigate and respond to communities and workplaces extending beyond their neighborhoods. Key elements of Global Awareness include a student's ability to:

- Use 21st Century Skills to understand and address global issues.
- Learn from and work collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts.
- Master non-English language skills as a tool for understanding other nations and cultures.

2. CIVIC LITERACY

Students need to understand, analyze, and participate in government and in community, both globally and locally, in order to shape the circumstances that impact their daily lives. Key elements of Civic Literacy include a student's ability to:

- Be an informed citizen to participate effectively in government.
- Exercise the rights and obligations of citizenship at local, state, national, and global levels.
- Understand the local and global implications of civic decisions.
- Apply 21st Century Skills to make intelligent choices as a citizen.

3. FINANCIAL, ECONOMIC, AND BUSINESS LITERACY

There is a growing demand on people to understand business processes, entrepreneurial spirit, and the economic forces that drive today's economy. Key elements of Financial, Economic, and Business Literacy include a student's ability to:

- Make appropriate personal economic choices.
- Understand the role of the economy and the role of business in the economy.
- Apply appropriate 21st Century Skills to function as a productive contributor within an organizational setting.
- Integrate oneself within and adapt continually to our nation's evolving economic and business environment.

4. LEARNING SKILLS: INFORMATION AND COMMUNICATION SKILLS

Students need to think critically, analyze information, comprehend new ideas, communicate, collaborate, solve problems, and make sound decisions. Some critical elements of these thinking and learning skills are:

- *Creativity and intellectual curiosity.* Developing, implementing, and communicating new ideas to others while staying open and responsive to new and diverse perspectives.
- *Information and media literacy skills.* Analyzing, accessing, managing, integrating, evaluating and creating information in a variety of forms and media. Understanding the role of media in society.
- *Communication skills.* Understanding, managing and creating effective oral, written, and multimedia communication in a variety of forms and contexts.
- *Self-direction.* Monitoring one's own understanding and learning needs, locating appropriate resources, and transferring learning from one domain to another.

5. LEARNING SKILLS: THINKING AND PROBLEM-SOLVING/DECISION MAKING SKILLS

Students need to think critically, analyze information, comprehend new ideas, communicate, collaborate, solve problems, and make sound decisions. Some critical elements of these thinking and learning skills are:

- *Critical thinking and systems thinking.* Exercising sound reasoning in understanding and making complex choices. Understanding the interconnections among systems.
- *Problem identification, formulation, and solution.* Ability to frame, analyze, and solve problems.

6. LEARNING SKILLS: INTERPERSONAL AND SELF-DIRECTIONAL SKILLS

Students need to think critically, analyze information, comprehend new ideas, communicate, collaborate, solve problems, and make sound decisions. Some critical elements of these thinking and learning skills are:

- *Interpersonal and collaborative skills.* Demonstrating teamwork and leadership, adapting to varied roles and responsibilities, working productively with others, exercising empathy, and respecting diverse perspectives.
- *Self-direction.* Monitoring one's own understanding and learning needs, locating appropriate resources, and transferring learning from one domain to another.
- *Creativity and intellectual curiosity.* Developing, implementing and communicating new ideas to others. Staying open and responsive to new and diverse perspectives.
- *Social responsibility.* Acting responsibly with the interests of the larger community in mind. Demonstrating ethical behavior in personal, workplace and community contexts.
- *Accountability and adaptability.* Exercising personal responsibility and flexibility in personal, workplace, and community contexts. Setting and meeting high standards and goals for one's self and others. Tolerating ambiguity.
- *Managing time and projects for productivity.* Prioritizing, planning, and managing for results. Effective use of real-world tools and ability to produce relevant, high quality products and services. Managing multiple priorities and maintaining focus and good personal attitudes.

7. INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) LITERACY

Technology has become an essential tool for the realization of learning and thinking skills in today's knowledge economy. Key elements of ICT Literacy include use of ICT in service of:

- *Information and media literacy skills.* Analyzing, accessing, managing, integrating, evaluating and creating information in a variety of forms and media. Understanding the role of media in society.

- *Communication skills.* Understanding, managing, and creating effective oral, written, and multimedia communication in a variety of forms and contexts.
- *Interpersonal and self-direction skills.* Becoming more productive in accomplishing tasks and developing interest in improving own skills.

Definitions

Digital-Age Literacy includes the following:

- **Basic Literacy:** Language proficiency (in English) and numeracy at levels necessary to function on the job and in society to achieve one’s goals and to develop one’s knowledge and potential in the Digital Age.
- **Scientific Literacy:** Knowledge and understanding of the scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity.
- **Economic Literacy:** The ability to identify economic problems, alternatives, costs, and benefits; analyze the incentives at work in economic situations; examine the consequences of changes in economic conditions and public policies; collect and organize economic evidence; and weigh costs against benefits.
- **Technological Literacy:** Knowledge about what technology is, how it works, what purposes it can serve, and how it can be used efficiently and effectively to achieve specific goals.
- **Visual Literacy:** The ability to interpret, use, appreciate, and create images and video using both conventional and 21st century media in ways that advance thinking, decision making, communication, and learning.
- **Information Literacy:** The ability to evaluate information across a range of media; recognize when information is needed; locate, synthesize, and use information effectively; and accomplish these functions using technology, communication networks, and electronic resources.
- **Multicultural Literacy:** The ability to understand and appreciate the similarities and differences in the customs, values and beliefs of one’s own culture and the cultures of others.
- **Global Awareness:** The recognition and understanding of interrelationships among international organizations, nation-states, public and private economic entities, socio-cultural groups, and individuals across the globe.

Best Practices in Technology and Learning with Technology

Fundamental Concepts and Outcomes

In a poll of registered voters conducted by Public Opinion Strategies and Peter D. Hart Research Associates on behalf of the Partnership for 21st Century Skills, it was revealed that Americans are deeply concerned that the United States is not preparing young people with the skills they need to compete in the global economy. A strong commitment to help educators and educational leaders implement 21st

century strategies in their schools is vital. Just what constitutes “best practices” in integrating 21st century skills, including technology, in classrooms, schools and/or districts? What should we look for?

- Professional communities of practice to disseminate technology best practices among teachers and administrators within buildings, within districts, and among districts.
- Focus on implementing higher-order teaching strategies followed by feedback, analysis, reflection, and necessary modifications

A closer look at the classroom and teacher exemplifying best practices:

(modified from Texas Center for Educational Technology)

- The teacher uses computers and peripheral devices transparently and regularly in the classroom. Use is integral to instructional and management functions. The teacher transfers skills to new tools with ease.
- The teacher uses technology in unique and creative ways, invents new ways to use existing technologies to meet classroom objectives, and actively seeks out technology solutions when evidence exists that specific technologies are likely to improve student learning.
- The teacher uses network resources transparently as an integral part of everyday teaching and decision-making. He or she uses multiple communication technologies at an advanced level.
- The teacher is skilled in engaging students in technology-enriched learning activities that are authentic, multidisciplinary, and directly related to academic standards. There is substantial use of technology-related, innovative teaching and learning strategies.
- The teacher consistently weaves technology into many learning situations, and most learning activities are highly interactive and responsive to student needs. Students are highly engaged in learning supported by technology.
- The teacher consistently uses the Arkansas Curriculum Frameworks as a part of the instructional program. Technology is systematically used to teach the skills and concepts of the district’s curriculum.
- The teacher acts as facilitator of learning, allowing students to construct their own meaning from the learning activities. He or she is often a co-learner and collaborator with students as they use appropriate technologies to explore the curriculum.
- The classroom technology is appropriate, sufficiently available, and used seamlessly by teachers and students in the course of daily teaching and learning. The teacher and students may frequently reorganize the classroom environment in response to a change in activities.
- The teacher uses a variety of technology tools to manage and communicate student progress. Students share responsibility for collection and reporting of their own progress information.

Dr. Jim Rowley of the School of Education at the University of Dayton has developed the “ADISC Model” for classroom technology integration. In this model, the use of technology in the classroom essentially supports five teaching and learning processes:

- (A) Technology supports learners in **adjusting, adapting, or augmenting** teaching and learning to meet the needs of individual learners or groups of learners.
- (D) Technology supports learners in **dealing effectively with data**, including data management, manipulation and display.
- (I) Technology supports learners in **conducting inquiries**, including effective internet-based

research.

(S) Technology supports learners in **simulating real world phenomena**, including modeling physical, social, economic, and mathematical relationships.

(C) Technology supports learners in **communicating and collaborating**, including the effective use of multimedia tools and on-line collaboration.

Technology Task Force

Recommended Criteria for Identifying Best Practices

How do we know 21st century education is happening? If we visited a classroom we would observe:

A teacher that:

- Sees professional development as a necessary undertaking in order to increase student achievement and to prepare students to learn 21st Century Skills. With the rapid development of 21st century tools and technology and research-based instructional strategies that work, professional development is needed to stay abreast of these tools and strategies in order to introduce them into the classroom.
- Is a literacy teacher no matter what the core subject assignment. The teacher has the skills necessary to teach all components of reading comprehension, composition, and note-taking and actively seeks out assistance to improve these teaching skills.
- Poses an **Essential Question** for every unit of study. An essential question is one that cannot be “Googled.” It will set the stage for further questioning which fosters the development of critical thinking skills and higher order capabilities such as problem-solving and understanding complex systems. A good essential question is the principal component of designing inquiry-based learning.
- Uses **inquiry-based lessons**. The inquiry approach is focused on using and learning content as a means to develop information through processing and problem-solving skills. Inquiry learning is concerned with in-school success, but it is equally concerned with preparation for life-long learning. http://www.thirteen.org/edonline/concept2class/inquiry/video_m4.html
- Creates a student-centered classroom that emphasizes project-based learning. The teacher is a facilitator of learning. There is more emphasis on “how we come to know” and less on “what we know.” The teacher is not presenting information from a stage as an “expert.” <http://www.edutopis.org/projectbasedlearning>
- Posts rubrics and completion directions for every assessed assignment on the teacher website. Assessment is focused on determining the progress of skills development in addition to content understanding. Many of the materials are created by the teacher based on student interest, the local community, and real life challenges. Choices are always presented alongside the assessment rubric. <http://www97.intel.com/en/AssessingProjects/AssessmentLibrary/index.htm>
- Uses a variety of print, video, and audio resources. In other words, the teacher is not dependent on a textbook.
- Locates an appropriate end of study audience. For example, for a study of environmental issues in the local community, a presentation would be made to a Chamber of Commerce member, an Audubon Society member, or local environmental consultants.

A student that:

- Achieves all ISTE National Educational Technology Standards (NETS) for Students through core subject assignments <http://www.iste.org/AM/Template.cfm?Section=NETS>
- Achieves all American Association of School Librarians (AASL) “Standards for the 21st Century Learning” to develop key abilities that are needed for understanding, learning, thinking, and mastering subjects.
<http://www.ala.org/ala/aasl/aaslproftools/learningstandards/standards.cfm>
- Builds upon core subject expertise and demonstrates competencies such as information and communication technology (ICT) literacy, critical thinking, communication, collaboration, global awareness, and business, economic, and civic literacy.
- Works with the teacher to select an assessment product that the teacher will mark for understanding.
- Works with 21st century communication tools such as the Internet, blogs, videoconferences, digital media, or collaborative web pages.
- Works in groups to solve problems. The resulting product of the study is created with collaborative tools and is media rich.
- Is engaged in a real-world problem solving for an end of project audience that can appreciate the student’s undertaking.
- Accomplishes the goals of ICT literacy within the context of the real world problem under study.

ICT Literacy Skills

ICT literacy skills (<http://www.ets.org/ictliteracy>) include the following:

- 1. To Define:** The ability to use digital tools to identify and represent information. Sample activities:
 - Creating an academic research topic to fit a particular information need
 - Asking questions to clarify a customer’s information need
 - Completing a concept map
- 2. To Access:** The ability to collect and retrieve information in digital environments. This includes the ability to identify sources and to retrieve information from those sources. Sample activities:
 - Searching through databases for information
 - Browsing through linked websites for information
 - Locating information through online Help
 - Downloading and installing a (simulated) video player
- 3. To Manage:** The ability to apply an existing organizational or classification structure. This ability focuses on reorganizing existing digital information from a single source using existing organizational formats. Sample activities:
 - Sorting e-mails into appropriate folders
 - Re-ordering a table to maximize efficiency
 - Documenting relationships using an organization chart
- 4. To Integrate:** The ability to interpret and represent digital information. This includes the ability to use ICT tools to synthesize, summarize, compare, and contrast information from multiple sources. Sample activities:
 - Synthesizing information from IM’s into a word-processing document

- Comparing and contrasting information from Web pages in a spreadsheet
5. **To Evaluate:** The ability to determine the degree to which digital information satisfies the needs of the assignment. This includes the ability to judge the quality, relevance, authority, point of view/bias, currency, coverage, or accuracy of digital information. Sample activities:
 - Selecting the best database for an information need
 - Determining the sufficiency of information in a website
 - Ranking web pages in terms of meeting particular criteria
 6. **To Create:** The ability to generate information by adapting, applying, designing, or inventing information in ICT environments. Sample activities:
 - Creating a graph that supports a point of view
 - Selecting text and graphics that support a point of view
 7. **To Communicate:** The ability to communicate. This includes the ability to gear digital information to a particular audience and to communicate knowledge in an appropriate venue. Sample activities:
 - Formatting a word processing document
 - Recasting an e-mail
 - Adapting presentation slides
 - Preparing a text message for a cell phone

Site Visit Reports

Technology Site Visit

NSBA Kent, WA School District

March 24-26, 2008

The National School Board Association's (NSBA) Education Technology Program has been hosting site visits to districts across the country for more than twenty years. A site visit is an opportunity to hear the philosophy, experience the culture, and see the technology connections of a very successful public school system where teachers, staff, and key leaders all strive for the same goal and focus on the core business of schools, providing quality work for students. These three-day meetings give participants the opportunity to see how various solutions and strategies function for faculty, students, and the district as a whole. The site visit is a showcase of innovative technology implementation and includes stimulating technology events and activities for technology leaders. After watching technology-integrated programs in action, participants have the opportunity to talk with the students and their teachers, focusing on both the process and the results. This type of professional development opportunity not only introduces a school team to new ideas from a model program, but also brings them together in planning a vision for their school.

During March of 2008, three representatives from Arkansas were sent by the Technology Task Force to Seattle, Washington for the NSBA Technology Site Visit to the Kent School District. The following reports of their visit illustrate the insights of the visit for a classroom teacher, school principal, and a district

instructional technology coordinator.

Teacher's Report

The use of technology to engage students in the classrooms of this school district is inspiring. Every classroom is equipped with an interactive white board, video projector, and a document camera. Not only are teachers using the technology, but it is placed in the hands of students. In fact, when a teacher attends technology professional development, he or she is accompanied by two students who will also be trained in the use of the technology. Since today's students are technology natives (have grown up using technology), they may serve as mentors or helpers for the classroom teacher. Ongoing professional development in "steps" is the backbone of the technology progress in the school district. Teachers have phone access for immediate help with classroom technology should a question or problem arises. An Instruction Technology teacher is available in each school. This teacher is the library/media teacher who works with content teachers during their common content planning time. (ex.: English)

The use of technology in the classroom is an integral part of student mastery of content. It is used for motivation, presentation, development, and assessment. By the end of the 2008-09 school year, every 7th and 8th grade student in the district will be a part of a one-to-one computer initiative. This means that each of these students will have a laptop checked out to them. Kent is responding by providing city-wide free wireless internet.

Speaking with students who have attended school in Kent throughout this integration of technology, they indicated that the benefits included "fun", active participation, better understanding of the content and sense of accomplishment. The learning seems more relevant to them because content is presented and learned in the method that is relevant to them – using technology.

At the high schools, students and community volunteers work to refurbish old school computers and donated computers for distribution to low income homes. The families apply and are notified of the annual distribution date. The high school students have now put over 600 computers into these homes, affecting over 1100 students. This and all the technology is funded through a district-wide tax passed specifically for school technology. An added bonus is that the whole family has access to the computer and of course the city-wide internet.

The use of Smart Technology in the band classes is exciting. Students can play and immediately receive feedback indicating if their playing is too fast, too slow, off key or, of course, just right.

One observation made was that the lab-based classrooms such as science, art, and band were quite large compared to those I have seen in our state. There was room to move comfortably between tables, areas where students could work on the floor, and plenty of storage facilities. This was true in both the older and newer schools.

Because the exemplary use of technology to improve student achievement in Kent is funded through a local tax, Kent is the exception and not the rule in the state of Washington. In order to implement the best practices found in the Kent School District throughout the state, a state level initiative and funding is needed.

How the Site Visit is Set-Up:

- Hotel with conference rate
- Bus transportation with district technology personnel on board to introduce day and answer questions
- Opening session first morning
- School tours each morning (participant choice of school)
- Lunch provided
- School tour after lunch
- Breakout session(s) of choice each afternoon
- Last day, one bus takes participants to airport, others return to hotel

*Report submitted by Kathy Prophet, Teacher
Hellstern Middle School, Springdale School District*

Principal's Report

The 2008 NSBA Technology Site Visit at the Kent School District was a great experience! During this visit, I saw a snapshot of students highly engaged in relevant learning activities and preparing for the world of problem solving through the use of technology. The district made a commitment to provide students, teachers and technology integration in their classrooms and demonstrated creative, hands-on opportunities for students to learn content information. As a middle school principal, I was very interested in the following: professional development, content integration, and methods of funding technology in their school district.

The most innovative idea involving the professional development process was the idea of including a teacher's students in the technology training. Students attended the technology workshops with their teachers in order to provide a support system in the classroom as the teacher learns to use the various resources. By the students attending the training with the teachers it also developed a level of accountability for the teacher to learn and implement new skills when he or she returns to the classroom.

Another interesting thing I learned about the technology professional development program was that the individual schools focused the whole year of professional development on learning how to use the equipment and integration of technology in content areas. This focused professional development proved successful because it was specific and given to teachers in small segments with ongoing support from the media specialists, students, and the technology staff.

While visiting the middle school's content classrooms, it was evident that the common thread throughout a student's learning was the integration of technology. Students were doing such relevant activities that were preparing them for the world in which they will work and the society in which they will contribute after graduation. The teachers displayed a mastery of academic knowledge and technology skills during classroom instruction. Teachers at Kent were creating learning experiences which encouraged critical and creative thinking, problem-solving, collaborative and higher order thinking skills through the use of technology. The level of student engagement in the 7th and 8th grade classrooms was incredible!

How did the Kent-Meridian School District provide students with several computer labs, laptops, interactive whiteboards, document cameras, and a video production class in all the middle schools? There is a technology tax in their school district that supplies the district with necessary money to buy the resources they need to implement their technology vision. I also noticed that the middle school budgets were substantial compared to my teaching materials budget. Even if we wanted to mirror the research-proven methods of using technology in Hellstern Middle School, it would be difficult to purchase the equipment on our limited budget.

We would be appreciative of any efforts made by our state leaders to help our public schools with the funding of student technology. After seeing the level of student technology skills, learning engagement in classrooms and problem solving-based learning at the Kent-Meridian School District, Arkansas schools cannot afford to neglect making technology a funding and professional development priority.

Thank you for allowing me to attend the site visit to Washington. My experiences there made me realize how technology can enrich every student's learning every day! At Hellstern Middle School, I am looking forward to doing whatever it takes to make purchasing and supporting technology a priority.

*Report submitted by Angela Coats, Principal
Hellstern Middle School, Springdale School District*

Technology Coordinator's Report

The Kent School District, spread over 71 square miles, includes 38 school sites, approximately 27,000 students, and 3,000 faculty and staff members. The ethnicity of the district is approximately half White and the remaining is divided among African American/Black, Hispanic/Latino, Asian, and other. English language learners comprise almost 15% of the student population while special education students are 12.5%. The technology landscape includes 13,000 computers, 1,700 interactive whiteboard/computer projector/document camera kits, 4,000 phones, 1,100 wireless access points, an information technology staff of 55 persons, and instructional technology staff of 10 persons.

The first evening event was a reception hosted by the Kent School District that gave participants the opportunity to meet district personnel. I had the opportunity to spend time with their Director of Instructional Technology, Dennis McClellan. Our conversation provided a deeper meaning of the site visit for me and also gave me a contact person for future questions. Ideas were also shared from a team of educators from the Calcasieu Parish Schools (Louisiana). They will be providing a site visit next year and have many successful technology programs in their district.

In the opening session on Tuesday morning, the President of Kent School District's Board of Directors welcomed the participants and stated, "Technology positively impacts students on a daily basis." The NSBA program director pointed out, "Technology in the hands of talented teachers makes a difference in the lives of students." The Washington District Association President spoke on gender equity and challenged the participants to "not forget the gift you have-the power to influence kids." Dr. Barbara Grohe, Kent Superintendent, explained the following key principles to their technology initiative:

1. Commitment by everyone in the district

2. Coherence with other district initiatives
3. Collaboration that included the critics

In the school tour at Glenridge Elementary, I saw interactive whiteboards being utilized in all classrooms-even in PE the students were watching a dance they were to about to learn. Laptops were available from three carts and were being used with ease for writing and blogging activities. A tour of Meeker Middle School revealed the first year of implementation of teacher web pages and the use of the interactive whiteboard in raising special education test scores. Mill Creek Middle staff members presented their one-to-one laptop program that included a technology academy of 90 students as well as all the seventh graders.

In little over a year, the Kent School District has installed 1,700 interactive whiteboard/computer projector/document camera multimedia bundles into classrooms, libraries, and meeting rooms. They used a train-the-trainer model of staff development to train the teachers so each building had local "experts."

They also designed special training for the administrators that includes performance indicators to use during classroom teacher evaluations. Fifty substitute teachers voluntarily participated in an interactive whiteboard training session.

The technical aspect of the one to one laptop program was clearly successful. Wireless internet availability throughout the entire school district, security and inventory software (Computrace), random internet history checks for students, immediate replacement program for troubled laptops, school-day lasting batteries, charging stations in place, laptop discipline hierarchy, parental informational meetings, student "driving test" requirements (for take home privileges), and the use of Moodle for an online learning community contributed to a promising implementation of technology. Training had been limited to laptop care, classroom management, computer applications, and appropriate use. Future training plans include lesson plan templates, integration ideas, and appropriate internet resources.

Students appeared very comfortable using the laptops in various classes and were eager to share their enthusiasm with visiting guests. Teachers seemed very comfortable lecturing while students were multi-tasking with their laptops.

One professional development program titled "eTip" gives teachers the opportunity to apply for the technology training of their choice. For example, two fifth grade teachers requested training to set up and to learn blogging activities for their classes. They were given two days to work with a specialist and then immediately implemented literacy blogging activities. Basically, a portion of professional development money was reserved for this and used to pay for the substitutes. An effective aspect of this program is the training topic is requested by the teacher.

Another innovative idea was described to me by Dr. Diane Mason, the Technology Training Center Coordinator for the Calcasieu Parish Schools in Louisiana. Since this was her 7th NSBA Technology Site Visit, she has gathered many best practice ideas. She had visited a school district that successfully dealt with a qualified teacher shortage by implementing online courses. Only one teacher was hired to facilitate all science courses that students took online. The student had contact with the teacher at least once a day, for supervision and instructional help. The students could take up to five online courses at

any one time and could move through the courses at an individual pace. Budgeted funds were used to pay for the online courses instead of hiring teachers. This same school district used online courses for alternative education. In this program the students were required to attend school for only two hours a week and could take up to five courses at any time. Again the cost of the courses was offset by the absence of paying teachers.

*Report submitted by Becky Hart, Director of Instructional Technology
Hot Springs School District*

C. Technology Infrastructure

Recommendation:

Manage Technology Infrastructure and Support Standards for Arkansas Schools

- Establish responsibility for ensuring that the standards for technology infrastructure and new facility technologies are followed. Such standards were included in the draft of the *Arkansas School Facilities Manual*, which used assessment rubrics (also included in the manual).
- Provide standards that ensure:
 1. Network bandwidth and bandwidth management techniques necessary for schools to engage meaningfully in 21st century learning techniques.
 2. Equipment, such as interactive whiteboards, computer projectors, and audio speakers, necessary for schools to provide 21st century learning environments.
 3. Technical support and instructional technology integration training to equip learners (students, parents, teachers, and administrators) with the skills necessary to function in 21st century learning environments.
 4. Classroom and laboratory equipment and materials adequate to meet the requirements of the Smart Core Curriculum and the teaching of current technology and 21st Century Skills across all curricula.
- Provide for periodic updates to these standards while ensuring that future funding of infrastructure and new construction is contingent on meeting these standards.
- Strengthen data collection and analysis that tracks the technology resources available in Arkansas schools in terms of quantity and quality, in order to assist in the assessment of technology infrastructure and compliance with standards by making permanent the data collection and analysis system developed as part of the 2008 eDATA (Education in Arkansas Technology Assessment) project.

Rationale: *Appropriate technologies are imperative to support enriched learning environments in which students can practice 21st Century Skills as they find and utilize current information and resources and apply their academic skills in solving real-world problems. Without an adequate technology infrastructure to support 21st Century Skills, students will enter the workforce and/or higher education without needed skills and experience. If there are no uniform standards, there will be potential inequality between schools and/or districts. Providing technology infrastructure in new buildings is less expensive than adding technology at a later date. Once the technology infrastructure is in place, it must be supported and maintained over time.*

Additional Materials:

- A Brief History of Technology in Arkansas Schools
- Future Infrastructure Recommendations
- School Board-Related Technology Policy Issues
- Evaluation of Technology in School Districts
- Summary of eDATA Project

A Brief History of Technology in Arkansas Schools

The state of Arkansas has a forty-plus year tradition of creating and sharing an infrastructure to support the instructional technology demands of educating students. This tradition started in 1966 when KETS signed on the air as the 124th educational television station in the nation. The Arkansas Educational Television Network's (AETN's) mission then and now is "to supply instructional programs to Arkansas' schools." As additional audio visual media, such as film strips, 16mm films, and VHS video tapes entered our educational programs, AETN worked with the Arkansas State Library (ASL) and the Arkansas Department of Education's (ADE's) network of educational service cooperatives to develop a media distribution network to efficiently deliver these resources to teachers' classrooms.

Act 528 of 1983 established the Commission on Improving Public Schools' Basic Skills through Technology, which in turn created IMPAC Learning Systems, Inc., a non-profit agency funded by ADE to provide structured programs and services to all Arkansas school districts in the area of technology, to assist schools with technology planning, and to provide educational research and analysis to ADE, the Governor's Office, and the General Assembly. IMPAC's computer labs enhanced the educational opportunities of students throughout the 1980s and 1990s. After IMPAC completed the installation of computer labs in all Arkansas schools, its mission was changed to assist with the wiring of classrooms for Internet access in the mid-1990s. The IMPAC project ended in 2002 and the remaining IMPAC funds were used to establish a permanent source of funding through the Arkansas Community Foundation for future educational technology projects affecting Arkansas schools. One project currently funded through the IMPAC Technology in Education endowment is the Hot Springs Technology Institute, Arkansas' statewide K-12 educational technology conference.

By 1992, Arkansas public schools had over 39,000 computers and 560 computer, distance learning and video library-based programs. In 1997 almost all Arkansas classrooms had VCR/television capability with cable or satellite access and, there were over 60,000 computers in the Arkansas public schools, although only 12,000 were multimedia capable. In recent years the momentum has continued as exemplified by such technology/telecommunications initiatives as:

- Statewide infrastructure projects related to wire and wireless technologies
- Establishment of fiber parts and plans for statewide implementation of ISDN
- Experimental ASDL and ATM projects
- Arkansas Interactive Video Network
- Information Network of Arkansas
- Arkansas Distance Learning/Telemedicine Projects
- State Telecommunications and Information Technology Fund
- School District Technology Planning Services

- Governor's Telecommunications and Technology Project
- Governor's Telecommunications and Information Technology Advisory Board
- Annual State Educational Technology Conferences
- Technology specialists for the state's education cooperatives
- Internet connectivity for all public schools, higher education institutions and government agencies
- Technology training and exemplary program activities offered by the Arkansas Leadership Academy, The Arkansas School for Mathematics, Sciences & the Arts, and the Arkansas Mathematics and Sciences State Systemic Initiative (SSI)
- Southwestern Bell Stipulation – 1994
- Telecommunications Summit – 1994-95
- Act 737 - Governor's Telecommunications Advisory Committee / Legislative Joint Committee – 1995
- Act 1139 – Information Network of Arkansas – 1995
- Act 842 – Education Service Cooperatives Technology Specialists – 1995
- Act 124 – Distance Learning Demo Project – 1995
- Arkansas Telecommunications Regulatory Reform Act of 1997
- The formation of a state association of technology specialists (ARKSTE)
- Incorporation of technology planning into a district's educational plan
- Enhancement of the AETN broadcast and satellite networks
- Expansion of AETN's telecommunications multi-user facility
- Liaison for Telecommunications – Governor's staff position
- Arkansas Telecommunications Regulatory Act of 1997

Arkansas' K-12 connection to the Internet arrived in 1992 with the creation of the Arkansas Public School Computer Network (APSCN). While this agency's primary mission was to implement a collection and management system for school financial and student management data, a very important tangential benefit was delivering Internet access to every school. In 1998 APSCN was absorbed by ADE and the Arkansas Department of Information Systems (DIS). These groups continue to provide Internet access, financial and student management systems, and local area network support services to Arkansas schools.

Synergy continues to build as new partnerships are formed. Along the way, the Murphy Commission, which includes 130 Arkansas business leaders, was established to study and make recommendations concerning the operations of state government. The Commission established a technology/telecommunications committee.

The central question in most states is how educational and political leaders can become more responsible and accountable by closing gaps between schools and communities. Arkansas has developed a tradition of cooperation from which everyone benefits. In the future, education, libraries, and community access information services will be driven by the belief that the whole is greater than the sum of its part and state and national infrastructures are critical to all aspects of economic development.

Guiding the various agencies and school districts over the past forty years in creating a unified, strategic vision for educational technology have been several planning documents, such as:

- June 1993: *Administrative and Instructional Uses of Computers in Arkansas School Districts* (IMPAC)
- November 1994: *A Guide to School District Technology Planning* (ADE)
- September 1995: *Enhancing Learning for All Arkansans: A State Technology Plan 1996-2001* (IMPAC)
- February 1999: *Arkansas K-12 School District's Electronic School District Technology Planning Guide* (ADE)
- July 2000: *Arkansas Education Technology Plan* (ADE)
- November 2004: *Considerations for Enhancing Education through Technology* (Technology in Education Task Force to the Joint Committee on Educational Facilities)

These planning documents have consistently demonstrated the need to maintain and expand the technology infrastructure necessary to support Arkansas' educational goals. The Technology in Education Task Force (TIETF), the most recent group to comprehensively review Arkansas' educational technology programs, interviewed over 100 knowledgeable people and more than eighteen state, federal, and private organizations to arrive at its list of recommendations. Many of the ideas proposed in the TIETF report have been implemented, including the creation of a portal for educational technology professional development and training (AETN's Internet Delivered Education for Arkansas Schools, or IDEAS), the creation of technology support and infrastructure standards for Arkansas schools, and improved statewide coordination for distance learning services. An additional effort underway is the 2008 eDATA (Education in Arkansas Technology Assessment) project. This project builds on the 2004 data assessment conducted by the Joint Committee on Educational Facilities of Arkansas school district. The technology infrastructure and IT support efforts within the report provide "the governor, the legislature, and Arkansas citizens with the information on the strengths and weaknesses of educational technology resources and usage." An additional goal is identifying "disparities between Arkansas schools, disparities between Arkansas and other states, and weaknesses in best practices."

Future Infrastructure Recommendations

To build on past instructional technology infrastructure work, the Technology Task Force recommends that future initiatives focus on the following three areas:

1. **Provide network bandwidth and bandwidth management techniques necessary for schools to engage meaningfully in 21st century learning techniques.** Bandwidth constraints are identified by multiple reports as a primary concern for Arkansas' educational technology programs. In addition to providing funding for additional bandwidth, procedures must be implemented to ensure the equitable distribution of bandwidth based on the priorities of ADE, schools, and other related education service providers. This may involve changing the funding model whereby ADE pays for the majority of bandwidth consumed by Arkansas' public schools to one where districts are held responsible for maximizing their bandwidth expenditures. Bandwidth management tools, such as systems to identify and prioritize traffic on a school network or to move high-volume content closer to the end user, should be provided and supported by DIS in an effort to avoid constant bandwidth upgrades.
2. **Provide equipment, such as interactive whiteboards, video projectors, and audio speakers, necessary for schools to provide 21st century learning environments.** Many of

the classroom teachers interviewed by the TIETF expressed frustration with having to share computer projection devices between classrooms. Since we are asking teachers to change *how* they teach in order to incorporate 21st century learning skills, we should equip all classrooms with the basic technology tools to accomplish this goal. The School eDATA project will provide the data necessary to evaluate the *quantity* and the *quality* of the computers available for use by students and teachers in Arkansas schools.

- 3. Provide technical support and instructional technology integration training to equip learners (students, parents, teachers, and administrators) with the skills necessary to function in 21st century learning environments.** Teachers interviewed by the TIETF stated that school district technical support is not keeping up with the extensive growth in school district technology infrastructure. Consistent, timely access to technical support for the repair and maintenance of instructional technology is necessary for teachers to effectively use 21st century teaching tools. The Joint Committee on Educational Facilities established a system for evaluating school district technical support programs. This process, based on the International Society for Technology in Education's Technology Support Index, should be implemented in all Arkansas school districts. The TIETF report and the eDATA project identify a need to ensure the relevancy of the instructional technology professional development initiatives provided to teachers. Close coordination among ADE's curriculum and instruction, professional development, and research and technology sections are necessary to ensure technology-related professional development is relevant to the desired instructional strategies necessary to teach 21st century and core content skills.

School Board-Related Technology Policy Issues

School districts should clearly articulate a long range plan for learning technologies to provide a vision of technology's role in the delivery of education services, to use funds effectively to ensure equitable access to technology, to eliminate redundancy, and maximize the connectivity of technology programs.

Separate, but directly related to a school district technology plan, is the need for a carefully planned relationship between the district's educational improvement plan and the long range educational technology plan. A school district's technology plan and its general educational improvement plan should be in harmony and provide a well-defined yet flexible road map for the ongoing development, refinement, and assessment of educational programs. In this context, technology-related policies will be needed to accelerate program development and implementation, and to remove road blocks that retard a reasonable approach to providing teachers and students with a practical and affordable technology-enriched teaching and learning environment.

The following policy categories should be reviewed and addressed as needed. A review of policy statements secured from other school districts on similar issues may be a meaningful step.

School District Technology Utilization and Assessment Processes

- Provide a process and procedure for the school board to receive, review, amend, and approve a school district technology plan.
- Provide guidelines for the coordination of the local school district technology plan with the state's technology plan and various aspects of federal initiatives in the area of educational technology.

- Encourage the successful use of technology in the assessment of program effectiveness, student learning, and instruction through collaboration among stakeholders addressing this issue at the state and local levels.

Funding, Equitable Access, and Programmatic Themes

- Provide funding for learning technologies on a priority basis.
- Ensure student and school personnel equitable access to technologies which are appropriate to their learning, teaching, and management needs.
- Provide direction for the district's appropriate utilization of federal, state, foundation, and private funds.

Intellectual and Copyright Issues and Guidelines for Professional Development Related to Curriculum Integration

- Establish or adopt well-defined statements regarding intellectual property and copyright laws with the objective to increase students' and school personnel's access to information and flexibility to manipulate the information for instruction and research purposes. Ensure that the owners and originators receive adequate recognition and financial reward.
- Encourage the development and use of information sources which are electronically accessible.
- Ensure that professional development activities provide teachers, administrators, and support staff with the skills necessary to integrate technology into schools.

Planning, Design, Implementation, and Support of Telecommunication Infrastructures and Programs

- Ensure that the school facility design requirements support the use of learning technologies. This includes the designs that provide for the use of learning technologies for new school construction or through the renovation of existing buildings. Critical elements include electrical outlets, video and data lines, student and library workstations, and teacher presentation stations.
- Make provisions for participating in the planning, design, and building of telecommunications networks at the state and district levels.
- Continue to evaluate guidelines for the selection and use of distance learning technologies.

Evaluation of Technology in School Districts

Assessment techniques should be used that realistically lead to program refinements by providing a way to evaluate the program's effect on classroom management, student learning, and the appropriate role of the teacher in interfacing regular instruction with technology-based instruction.

The following concepts should be at the core of the evaluation process.

Program Characteristics and Details

- Identify the components of each program and determine how refinements can be made to make the program more effective and functional
- Monitor all costs associated with the program and determine the program's cost effectiveness
- Pre-define and then validate the steps that define an implementation of each program in a similar setting
- Identify the characteristics of classroom management and effective scheduling techniques that maximize the application

Effects of Interaction Strategies

Measure the education outcomes focusing on the following:

- Identify the social skills and cooperative behaviors developed between students, between teachers, and between students and teachers
- Identify the changes in the relationships between teachers and students as a result of a specific project activity
- Determine the extent to which the project activity promotes individualized instruction, supplements regular instruction, or promotes cooperative learning

Curriculum, Staff Development, and Support Services

- Secure information concerning how teachers and curriculum specialists determine when there is a balance between curriculum and instructional components to insure that the educational goals are accomplished
- Identify the support services required for each program, maintain cost and response time information on these services, and gauge the effectiveness of the human interface required between teachers and support staff
- Develop training manuals for program-specific teacher training activities
- Demonstrate that school district technology planning enhances all aspects of appropriate uses of technology in schools by observing the increased overall effectiveness of the activities in programs over time

Summary of eDATA Project

The eDATA project involves 24 participants from several different State Government agencies that devoted several sessions during 2007-08 to establishing methodologies for assessing all current technology resources in the Arkansas Public School Districts and the best methods to provide internal access to all students. The groups included APSCN, DIS, the Authority, ADE, and the Governor's office. The group's charges flowed from a statement modeled by Governor Beebe in his State of the State Address:

"We will undertake an up-to-date assessment of all technology resources in our schools, showing us

where we need to improve and how these resources are used. With that, the Arkansas Department of Education and the Arkansas Department of Information Systems will formulate a timeline to ensure that every child has safe access to the online world.”

D. Shared Use of Facilities and Technology Resources

Recommendation:

Explore Shared Use of Facilities and Technology Resources

- Encourage all levels of education, including K-12, university, and workforce, to collaborate on ways to share facilities and technology resources to better meet the needs of the state.
- Collaborate with Connect Arkansas, and other partners, to provide technology access and support in all areas of the state.
- Encourage each school district to work with the eCommunity projects of Connect Arkansas as it identifies community needs for school improvement and economic development

Rationale: *In the 21st century, every community needs access to all levels of education in order to provide opportunities for individual improvement and economic advancement while supporting requirements of local industry and business. While distance learning and other tools have a place, hands on access to technology in classrooms, laboratories, and communities is also imperative.*

Education suitable for the 21st century is a requirement for community development and economic development in Arkansas. At the same time, limited financial resources mandate careful exploration of how money is spent for educational resources, including personnel, classrooms, and laboratories.

Often, very similar resources are required for all three levels of education. For example, very similar laboratory equipment and caliber of instruction is required for teaching chemistry in high school, two-year college, and university or workforce classes. Advanced Placement (AP) courses are considered college-level and some states offer college courses with college instructors in high school classrooms as an alternative to AP courses and tests. High school academies, two-year colleges, and workforce courses might offer the same professional certifications.

These are not new realizations. Some of today’s universities began as night classes in high schools. For example, what is now the University of Arkansas at Fort Smith (UAFS) began operation as night sessions at Fort Smith High School. Today the price tag for excellent facilities equipped for 21st century education is higher and the possible savings by shared resources are also higher. Maximizing the availability of education across the state requires coordination and planning among all levels of education, and economic and community development organizations. High quality shared facilities and resources for 21st century education are today’s equivalent to the industrial parks of the second half of the past century.

The Task Force suggests that funding for educational facilities and technology resources always involves how the facility or resource might be shared with other levels of education, and how the need might be met using existing resources as a base. We also suggest that an interagency task force might confer and produce guidelines for cooperation and sharing.

E. Task Force Membership/ Continued Citizen Involvement

Recommendation:

Authorize Continued Citizen Involvement.

- Establish a permanent advisory committee to the Arkansas Science & Technology Authority to review the activities above, to provide oversight, and to evaluate strategic direction and progress.
- Membership of this advisory committee shall include representatives of all stakeholders: state agencies, classroom educators and administrators, business community, and STEM professionals.

Rationale: *The Task Force would not have been possible without the volunteers that comprised it. Each one brought knowledge, experience, and wisdom to the task and collectively we emerged with a much broader and deeper picture of what Arkansas education could be in the 21st century. The following pages list those who were involved and their primary affiliations. As individuals and collectively they contributed significant amounts of personal time to meet the requirements of Act 2266 and to improve 21st century education in Arkansas.*

The benefits of having a diverse group of interested citizens look at the needs and trends in Arkansas education in the 21st century seem clear. Other similar task forces have done valuable work in the past but there is often a loss of forward motion after the reporting is complete. Each agency has its own priorities and efforts that touch multiple agencies and needs some source of independent enthusiasm and viewpoint.

This Task Force worked very well in cooperation with the Arkansas Science & Technology Authority (ASTA, or the Authority). The Authority has roles in both technology and education and cooperates with the related economic and education agencies at a cabinet level. The Task Force would like to see a continuing advisory committee to the Authority to continue work on 21st Century Skills and related efforts in education. We believe it is very important that this advisory committee include state agencies, classroom educators and administrators, the business community, and science, mathematics, engineering, and technology professionals.

It is possible that the continuing citizen involvement could be either through a new body or through modifications to the Advisory Committee on Educational Access to Technology set up through Arkansas code 6-16-409.

Task Force Members

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Dr. Tom Burnett	Director of Strategic Initiatives, Apple, Inc.	

Part III

Task Force Operations, Activities, and Related Topics

- A. Task Force Background
- B. Legislative Briefings, Presentations, and Development of
Legislative Recommendations
- C. Task Force Activities – Chronological Order
- D. Professional Development for Teachers
- E. Task Force Finances – Funding and Audit
- F. Referenced Goals, Objectives, and Outcomes from the
Arkansas Department of Education 2008-2012
Technology Plan

III. Task Force Operations, Activities, and Related Topics

A. Task Force Background

Arkansas Science & Technology Authority Strategy for Addressing Act 2266

Act 2266 (Arkansas Code Annotated Section 6-16-319-Acts of 2005) authorized the Arkansas Science & Technology Authority (ASTA, or the Authority) to develop a knowledge-based technology curriculum for use in grades seven through twelve. Towards this end, the Authority formed a Task Force to support the effort to evaluate the needs, plan strategies, and develop materials for integration of technology into the public school curriculum.

The Technology Task Force was organized by the Authority as a subcommittee of the Arkansas STEM Coalition (STEM – Science, Technology, Engineering and Mathematics) in order to incorporate a broader focus of business and industry participation and assistance in identification of the skills needed for 21st century knowledge-based jobs. The STEM Coalition appointed Mr. John Chamberlin (STEM Coalition Board member) to head this Task Force. Mr. Chamberlin then worked with the Authority to select a Steering Committee for the Technology Task Force. This Steering Committee helped to identify the sectors that should be represented on the Task Force and to nominate individuals with special expertise for the membership. The first meeting of the Task Force, with 38 members in attendance, was held November 8, 2005.

Attached to this report are copies of meeting minutes of significance that connect this program to the recommendations developed by the Task Force and a synopsis of the technology activities and materials related specifically to Act 2266. Included also in this report are a number of resource materials relevant to the work of the Task Force, members of the Task Force, and a synopsis of information from out-of-state consultants and national technology education specialists who have helped develop the body of the work produced for the Advanced Communication and Information Technology Committee of the Arkansas Legislature.

The Task Force Steering Committee and the Task Force members and its writing team have met over a thirty two month period of time (October 4, 2005 through May 15, 2008). Through their efforts, the Task Force has produced a report and an initial set of instructional materials for use by teachers and students in Arkansas schools. The Task Force's intent from its inception has been to build upon other related studies (including the work of the Technology in Education Task Force of 2004 and other educational initiatives), as well as discern the future landscape of change in the workplace and the changing innovations in technology. Acquiring a working definition of knowledge-based technology curriculum was recognized as the first major objective of the Task Force.

Act 2266 did not provide an official title for a report from an Authority work group but did use the term "technology curriculum" and "knowledge-based economy and technology-rich world," as well as the "integration of technology into the educational process," as descriptive language. The Authority, the STEM Coalition, and the official work group organized to develop a report on Act 2266, in an official memorandum dated June 25, 2007, refer to that work group as the Arkansas Task Force on Knowledge-Based Technology Curriculum. Over time, depending on the focus of various discussions and activities, this Task Force was described in various other ways

to achieve an “in context” meaning as to the work of the group. Therefore, the Arkansas Task Force on Knowledge-Based Technology Curriculum (the group’s official title) has sometimes been referred to as the Task Force for the Integration of Technology in Public School Education or just Technology Task Force. In the initial meeting of the group on October 4, 2005, the Authority, in its leadership capacity, referred to the work group as “The Task Force to Integrate Technology Into Public School Education.”

History of Act 2266

Arkansas Code: Section 6-16-139 Technology Curriculum

(a) In order to prepare public school students in the State of Arkansas for successful participation in a growing, knowledge-based economy and technology-rich world and to improve student achievement, the public school curriculum must integrate technology into the educational process.

(b)(1) In order to further the intent of this section, the Arkansas Science and Technology Authority shall develop a knowledge-based technology curriculum for use in grades seven through twelve (7-12). The curriculum shall be organized into a scope and sequence that constitutes a plan for achieving the educational objectives necessary for an adequate education as described in § [6-20-2302](#) and shall include the following components for each course in the curriculum:

(A) A collection of the substantive material used to teach a particular subject matter

(B) Lesson plans

(C) Recommendations for activities and other learning processes

(2) The curriculum shall be developed in sufficient time to allow for implementation in the 2007-2008 school year.

History. Acts 2005, No. 2266, § 1.

Underlying Assumptions about the Legislative Charge

The Steering Committee of the Technology Task Force interpreted the above statements and formulated the outcomes determined by the Task Force:

1. Develop a template for lesson plans related to 21st Century Skills for middle school science students and then adapt the template to mathematics and eventually to other high school subjects on a priority basis. The template should accommodate lesson development that includes technology integration and cooperative and engaged learning.
2. As the templates are completed, provide grants to the Arkansas Science and Mathematics Centers (12 regional resource centers at various colleges and universities in Arkansas) for the purpose of developing teacher workshops in which lesson plans are developed by teachers.
3. Examine the current status of technology infrastructure in Arkansas Public Schools and make recommendations relative to that infrastructure as related to the development and delivery of knowledge-based curriculum.

4. Establish and distribute staff development recommendations that are consistent with existing and expanded programs recommended by the Arkansas Department of Education, the State Education Cooperatives, and the regional mathematics and science centers in Arkansas. The recommendations would relate to the use of knowledge-based curriculum lessons via the SMART Web Portal, and establishing a response to perceived needs to integrate 21st Century Skills into the school curriculum. In addition, there would be consideration for the establishment of Best Practices Programs in the use of technology in Arkansas Schools, including the identification and recognition of pace-setter schools that meet identified and agreed upon criteria.
5. Since no funds were provided for the Technology Task Force and the funds raised by the Task Force have been utilized for Task Force operations (meetings, travel, writing team, conferences, the development of SMART lessons, etc.), activities implementation has been limited to the beginning use of the online SMART Web Portal mathematics and science lessons.

Background and Rationale in Addressing Act 2266

Act 2266 of the 2005 legislative session resulted in a directive which was targeted at *preparing Arkansas students to successfully participate in a knowledge-based economy and a technology-rich world and to improve student achievement*. The law stressed that the public school curriculum must integrate technology into the educational process. The law goes on to direct the Arkansas Science & Technology Authority to develop a knowledge-based technology curriculum which includes a collection of materials, lesson plans, and activities for this purpose. The Task Force envisioned the development of curriculum as sets of lessons that are supplementary to, but consistent with, the Arkansas Curriculum Frameworks.

The Task Force, which the Authority helped to organize in the fall of 2005, has approached this monumental task in a very positive way. The Steering Committee of this task force determined that the desired results called for in the act (improved achievement, ability to work in the knowledge-based economy and familiarity with various useful technologies) could best be achieved by integrating technology into the existing curriculum, not by adding a series of technology-specific courses. The present effort of the Technology Task Force builds on other efforts past and present, and is complimentary to those of the Department of Education, as well as efforts in Workforce Education, Economic Development, Higher Education, and the Arkansas Science & Technology Authority.

One critical focus area of the Task Force has been the relationship of the workforce skills of youths in our communities and the impact that the “lack of these skills” will have on community development. The Technology Task Force has worked with representatives of several knowledge-based companies in Arkansas to define the skill sets that will be required for employment in the 21st century workplace and to gain industry perspective on the technology skills that young people must possess in a competitive “global” economy. The Task Force recognizes that communities will need to focus on education and the development of 21st Century Skills. The proposed effort of the Task Force is merely a step in that direction. Students preparing for the 21st century workforce must have a balance of conceptual and procedural knowledge. Therefore, the Task Force is working with a list of 21st Century Skills related to technology use in the workplace that was developed by business and industry leaders in the United States who are coping with transitions in curriculum.

The Arkansas Department of Education (ADE) recently released a new set of benchmarks for student learning that also must be considered. The work of the Task Force is specific in its intent. The activities

and recommendations that will be outcomes will eventually impact Arkansas classroom teachers in most academic subjects. The activities will be designed to connect many learner outcomes to technology use. We believe this is one of the most direct ways to help students move towards being prepared for employment in a technology-based economy. This is one approach that can be replicated in Arkansas and shared with other states. Funding for the development of lessons correlated to curriculum standards over time was a practical consideration.

The Arkansas Department of Education (ADE) is assessing a multi-state initiative known as the Partnership for 21st Century Skills. This educational model and the instructional techniques employed incorporate the content, context, core subjects, and information-communication technology as well as assessment techniques that align classroom instruction with the knowledge-based skill sets needed for future workforce global competitiveness. The Task Force is committed to working with ADE to implement aspects of such a program and to help develop lesson materials that utilize these instructional techniques. The Task Force is also working closely with the Information Network of Arkansas (INA) and ADE/AETN to establish a professional development component within the SMART Portal related to development of lesson materials enriched with highly integrated technology skills.

Although the long-range goal is to impact the skill sets of Arkansas students and improve achievement, the short term goal of the Task Force is to produce a set of resource materials that will assist Arkansas teachers with the integration of technology skills into the curriculum. The Task Force determined that by building upon a web-based science and mathematics resource portal already under construction through an outside grant of the Authority, funded by the Winthrop Rockefeller Foundation (WRF), they could provide a set of deliverables tied into this web portal for easy teacher access. This independently funded web portal will house a cross-referenced database of “one-concept lesson plans” for science and mathematics known as the SMART portal (Science and Mathematics Accessible Resource Tool). The Task Force plans to produce an “*accessory database of technology activities*” tied to these science and math lesson plans and believes that these deliverables and the infrastructure to facilitate the delivery of these materials would be the beginning of a larger project (over time) that the Task Force envisions as a comprehensive resource tool to help teachers integrate technology into their classrooms. Additional funds will be required to accomplish the development of these materials and to enhance and maintain the SMART Portal.

Task Force Budget/Funding

Act 2266 that authorized the Arkansas Science & Technology Authority to develop a knowledge-based technology curriculum for use in grades seven through twelve did not provide a means for funding the effort. Therefore, once the Task Force was placed under the STEM Coalition, a subcommittee on budget and funding was established by the Task Force. At the May 30, 2006 Task Force Meeting, it was reported that funds and grants totaling \$100,050 had been placed in the Arkansas Community Foundation Task Force for Integrating Technology into Public School Curriculum Fund. The sources for these funds are listed in this report as well as the Task Force expenses and anticipated expenses.

B. LEGISLATIVE BRIEFINGS, PRESENTATIONS, AND DEVELOPMENT OF LEGISLATIVE RECOMMENDATIONS

Steering Committee Meeting with Senator Capps (1/11/06)

The Steering Committee of the Technology Task Force met with Senator John Paul Capps at the Capitol on January 11, 2006 from 1:00 p.m. – 3:00 p.m. Dr. Gail McClure and John Chamberlin, Chairman of the Task Force, made short presentations using handout materials that covered all aspects of the work of the Task Force, including the need for committee funding and informing members of the legislature about the work of the Task Force.

Senator Capps was provided the opportunity to gain information about the work the Authority had done that specifically related to Act 2266 of 2005. He was able to gain the connection between the work of the STEM Coalition and the various science grants and SMART programs conducted by the Authority.

As the meeting progressed, Senator Capps made phone calls and talked with his staff about getting a steering committee presentation on the agenda of the Joint Committee on Advanced Communications and Information Technology for Wednesday January 25 at 1:30 p.m. The meeting was later confirmed.

Meeting Agenda of Legislative Committee Meeting (1/25/06)

AGENDA Joint Committee on Advanced Communications and Information Technology

Wednesday, January 25, 2006

01:30 PM

Room 151, State Capitol

Little Rock, Arkansas

Sen. John Paul Capps, Chair
Sen. Gene Jeffress, Vice Chair
Sen. Sharon Trusty
Sen. Jerry Bookout
Sen. Mary Anne Salmon
Sen. Jim Holt
Sen. Bobby Glover

Rep. Daryl Pace, Chair
Rep. David Cook, Vice Chair
Rep. Stan Berry
Rep. Jeff Wood
Rep. Jim Medley
Rep. Mark Martin
Rep. Wilhelmina Lewellen
Rep. Pam Adcock
Rep. David Rainey
Rep. J. R. Rogers

Rep. Bill Pritchard, Alternate
Rep. Phillip Jackson, Alternate
Rep. David Evans, Alternate
Rep. James Norton, Alternate
Rep. Johnny Key, Alternate
Rep. Nancy Duffy Blount, Alternate
Rep. Roy Ragland, Alternate
Rep. Rick Green, Alternate
Rep. Mike Burris, Alternate
Rep. Robbie Wills, Alternate

A. Call to Order

B. Review and Approval of Minutes from August 30, 2005 Meeting

C. Arkansas Public School Computer Network (APSCN)

1. Bill Goff, Director of Arkansas Public School Computer Network, Arkansas Department of Education
2. Danita Hyrkas, Internal Affairs Manager, Arkansas Department of Education

D. Schools and Libraries Program of Universal Service Fund - "E-Rate"

1. Claire Bailey, Director, Department of Information Systems
2. Becky Rains, Strategic Funding Program Manager, Department of Information Systems
3. James Boardman, Assistant Director for Information and Technology, Arkansas Department of Education

E. Knowledge-Based Technology Curriculum for Public Schools (Act 2266 of 2005)

1. Gail H. McClure, Ph.D., Vice President of Research, Arkansas Science & Technology Authority
2. Dave Westmoreland, Deputy Associate Director for Curriculum, Assessment and Research, Arkansas Department of Education

F. Arkansas Wireless Information Network (AWIN)

1. Claire Bailey, Director, Department of Information Systems
2. Dale Saffold, AWIN Program Director

G. Other Business

H. Adjournment

Joint Committee on Advanced Communications and Information Technology Presentation (1/25/06)

The various projects assembled at or directed by the Authority, including all WRF funded or endowed science activities, were discussed as a part of the agenda of the Joint Committee on Advanced Communications and Information Technology completed on January 25, 2006 from 1:30 – 3:00 p.m. in Room 131 at the State Capitol.

Dr. Gail McClure (Arkansas Science & Technology Authority) and John Chamberlin (Chair of the Technology Task Force) made formal presentations and then answered several questions. It was established that the WRF has provided funding for numerous projects – each building toward a more comprehensive program in science in the middle school grades. These projects were then connected to the work of the STEM Coalition, the SMART website for teachers and the work of the Task Force.

Support and encouragement for all programs were sought and outwardly received based on the informal expressions to that affect by co-chairs Senator John Paul Capps and Representative Daryl Pace. Specifically, the WRF and the Authority, as well as the Task Force, were singled out for their leadership, funding, and accomplishments; the Arkansas Department of Education was asked to consider assisting in the work of the Task Force as well as providing some funding to defray various costs associated with the responsibilities of the Task Force.

There was an expectation established at the end of the questioning session that the Authority would provide a Task Force report to the Joint Committee on Advance Communications and Information Technology prior to the 2007 legislative session. There was an expectation that the report would be preceded by a demonstration of the SMART website's capability for delivering instructional materials to teachers. It was also anticipated that the Task Force would include various recommendations, which would assume consideration for program implementation, funding, and staff development for teachers related to the implementation of a technology curriculum in grades 7-12.

Presentation for Senate and House Education Committee (6/20/06)

Room 138, State Capitol

Interim Report - Task Force on Knowledge-Based Technology Curriculum

Arkansas Department of Education staff representatives reviewed its plan to establish a web portal from which teachers in Arkansas will have access to distance learning opportunities in numerous areas of need. This will include:

- Actual courses for teachers in critical areas of certification need (math, science, etc.).
- Contracted staff development from various services.
- Access to the technology institute program developed by AETN in a summer institute setting for Selected teachers (an application process).
- Web-based visits to historical places in Arkansas available to students.
- Training for teachers to access and use data services online from the University of Arkansas (teachers and administrators).

- Face-to-face training for principals and other supervisors of instruction.
- Electronic learning training for administrators.
- Coordination of distance learning programs – including efforts with the Authority and AETN.

The web portal will be directed by AETN and should be online during the fall of 2008.

Other topics covered by Department of Education staff included Arkansas comprehensive testing, Assessment and Accountability, and other statewide programs that impact student achievement.

All of the reports described above relate to and directly link to the STEM Coalition’s program in mathematics, science, and technology. There appeared to be a need to demonstrate the applications of the web portal. Face-to-face professional development opportunities at school regional cooperatives are aligned with the distance learning programs.

Dr. Gail McClure and John Chamberlin used Power Point notes to provide an update to the Education Committee. Topics discussed included:

- STEM Coalition’s leadership is critical to the direction of mathematics, science, technology, and engineering. The STEM Coalition is involved in numerous projects to that end.
- Technology Task Force
- Role of Steering Committee
- Committee Membership
- WRF grants for specific science programs
- SMART Web Portal
- Inquiry-driven, instructional activities in science and mathematics
- Links to technology incorporated into activity driven lesson plans
- Activities correlated to benchmarks/standards
- Smart Portal interface with user (teacher)
- Shortage of teachers in math and science
- Accelerate Arkansas - improving STEM education in Arkansas
- Middle school science and mathematics teaching
- Short term and long term funding for STEM education
- Role of the State Math/Science Centers
- WRF/ARCF endowments
- NSF EPSCoR Program
- Design of templates for lesson plans
- 21st Century Skills
- Symposium on teaching/learning and technology – consultants
- Industry leaders/Educational needs in technology – workplace education
- Budget/Fundraising (\$116,000)
- Continuations of reports to the House and Senate
- Legislative Report 2008 on Technology Curriculum

C. Technology Task Force Activities

Research, Formulation, and Assessment

Conference of Integrating Technology into Education
April 17, 2007 Doubletree Hotel, Little Rock, Arkansas

Executive Briefing – 21st Century Skills
May 17-18, 2006, Apple Inc., Cupertino, California

Formation of Writing Team
July 13, 2006, Cox Center, Little Rock, Arkansas

STEM technology draft of Subcommittee Goals
August 4, 2006

AETN Technology Institutes – Professional Development for 30 teachers (5 days) in technology integration
June 26-30, 2006 and July 24-28, 2006

Planning and coordination meeting, ASTA, INA, and AETN
July 28, 2006 (AETN)

National School Board Association Technology+Learning Conference
November 8-10, 2006, Dallas, Texas

Task Force meeting establishing Task Force working groups
December 1, 2006, State Police Headquarters, Little Rock, Arkansas

2007 Symposium for Scientist and Engineers – Inquiry Based Instruction and 21st Century Skills
April 10-13, 2007, Santa Fe, New Mexico

Energizing and Employing Arkansans for a Brighter Economic Future
September 5, 2007, Statehouse Convention Center, Little Rock, Arkansas

INA/ASTA Assessment Conference, SMART Web Portal
February 5, 2008, INA office, Little Rock, Arkansas

Task Force for Integrating Technology into Public School Education

Presents

Integrating Technology into Arkansas Education ~ Thinking Outside the Box

Monday, April 17, 2006

**Doubletree Hotel
Salon B, Second Floor Lobby
424 West Markham, Little Rock, AR**

AGENDA (Tentative)

9:00 - 9:30	Registration / Coffee
9:30 - 9:45	Welcome and Introduction of Speakers Dr. Gail McClure VP Research, Arkansas Science and Technology Authority
9:45 - 10:45	Ms. Susan Patrick Lascell, President and CEO North American Council for On-Line Learning <i>(Question and Answer Session)</i>
10:45 - 11:00	Break
11:00 - 12:00	Ms. Susan Brooks-Young Consultant And Specialist in Planning, Implementing and Evaluating Curriculum/Technology Plans <i>(Question and Answer Session)</i>
12:00 - 12:45	Lunch
12:45 - 1:45	Dr. Yvonne Spicer Associate Director for the Boston Museum of Science Director of National Center for Technological Literacy (NCTL) K-12 <i>(Question and Answer Session)</i>
1:45 - 2:00	Break
2:00 - 2:45	Panel Discussion & Audience Participation Task Force Planning for Integrating Technology into Arkansas Education
2:45 - 3:00	Debriefing and Summary Mr. John Chamberlin, Chair, Task Force Mr. Tim Taylor, Vice-Chair, Task Force

Integrating Technology Into Arkansas Education: Thinking Outside the Box – A Symposium (4/17/2006)

The Technology Task Force sponsored a symposium that provided an opportunity to gather information from various consultants in education as well as opportunities for educators and business and industry leaders to ask questions. The agenda provided for exchanges between participants and a panel experienced in developing and implementing technology plans at both the state and local levels.

Online distance learning, developing and evaluating curriculum and technology plans, and establishing literacy standards were discussed in detail by Susan Patrick Lascell, Susan Brooks-Young, and Dr. Yvonne Spicer.

It is important to note that as the session concluded and discussions continued for at least one hour, several participants recognized that the generation gap between some educators and most high school students creates various disconnects to communication, motivation, and learning. Susan Brooks-Young provided a summary of these disconnects in her presentation. An analysis of this information seems to suggest that staff development is a critical part in helping “digital immigrant teachers” to become “digital native learners” so that teachers may partner with students in collaborative learning – especially when technology is an aspect of the process.

The Task Force’s agenda over the next few months includes the formation of a writing team, another symposium involving the Steering Committee in a conference with educational technology specialists, and the opportunity to describe implementation procedures as well as proposed activities for consideration by the legislature.

Apple Executive Briefing (5/17/06-5/18/06) 1 to 1 Learning – iLife in the Curriculum 21st Century Skills – Technology Integration

Four members of the Task Force Steering Committee and the ASTA External Evaluator attended an Apple Inc. Executive Briefing in Cupertino, California. The agenda for the meeting had been developed by the Steering Committee and Dr. Tom Burnett, Manager, Strategic Educational Initiatives at Apple.

The major outcomes achieved included an examination of:

1. The present state of technologies in schools in terms of teaching and learning
2. Digital school projects such as mobile labs, equitable technology access and 1 to 1 learning initiatives (one student, one computer, software, internet access....)
3. Professional staff development in the use of technology as productivity, multimedia, and information mind tools
4. The Arkansas story as it relates to the recent initiatives by the WRF and the Authority in the area of science minigrants, interactive learning technologies, and the design of the SMART project as applied to science, mathematics, and technology teaching and learning activities
5. The identification of areas of need in program experimentation and program implementation

Funding for the collaboration of Apple educational consultants and Task Force leaders was provided by Apple as a part of corporate participation in providing support for the work of the Task Force in Arkansas.

Technology Task Force Writing Team – Cox Center (7/13/06)

The Technology Task Force writing team subcommittee met from 10:00 a.m. – 3:00 p.m., July 13, 2006 and formulated key issues and goals to be addressed in a report from the Task Force to the Joint Committee on Telecommunications relative to Act 2266. John Chamberlin and Dr. Gail McClure directed the work of the committee.

A brief overview of previous efforts related to state technology planning and program development were reviewed by the members of the subcommittee and it was agreed that following introductory statements about the purpose of the work of the Task Force and the structure of the report, three major themes would be developed. The writing team divided the work of the team into three parts: (1) Professional Development (Team Members: Susan Norton, Becky Hart, Dr. Cecil McDermott, and Kathleen Stafford Branton); (2) Infrastructure (Team Members: Paula Swaim, Tim Taylor, and John Chamberlin); and (3) Curriculum Content (Team Members: Dr. Gail McClure and Margaret Amps).

Each group developed and presented a group report on each of the areas: professional development, infrastructure, and curriculum content. It was agreed that Dr. McClure would develop a report on the work of the writing team and request feedback from the STEM Coalition Education Subcommittee. The input from that subcommittee would be reflected in a second draft by the writing team subcommittee. At that point, perhaps in September, the Task Force (Committee of the Whole) would receive the report, make suggestions, and a working draft would be provided for the Task Force members for its first full meeting for action.

The Writing Team Subcommittee used the following listings as a guide for their work.

- I. Introduction/Statement of Purpose
 - Background Information
 - Agency Roles
 - Administrators and teachers
 - Web Portals/Staff Development & Curriculum
 - Distance Learning
- II. Training on 21st Century Skills
 - Approach on Teaching 21st Century Skills
 - Standards that Define Levels of Integration
 - Task Skill Training for Teachers
 - Assessment of Student Learning
- III. Curriculum Content
 - Infrastructure
 - Staff Development
 - Proposed Legislative (To Do List by Priority)
- IV. Report's Impact on:
 - Technology Equipment Needs in Schools
 - Advancement in Infrastructure
 - Support Services for Teachers

- Certification Standards
- V. Other Areas of Concern
- Defining and establishing a position on 21st Century Skills by appropriate state educational groups
 - The coordination of overlapping technology-related issues and responsibilities by state agencies, school districts, and education cooperatives
 - Continuing organized support and input from business and industry leaders related to STEM Education

STEM Technology Subcommittee Legislative Recommendations Meeting (8/4/06)

Traditional educational practices no longer provide students with all the necessary skills for economic survival in today's workplace. Students must apply strategies for solving problems and use appropriate tools for learning, collaborating, and communicating. Our classroom learning environments must incorporate strategies and tools that prepare students for their futures and equip them to build a productive society for the future of their children and generations to come.

Enriched learning environments supported by technology are student-centered, multi-sensory, and allow for multi-path progression. They use multimedia, collaborative tools, and focus on information exchange and active/exploratory/inquiry-based learning. These environments promote critical thinking and informed decision making; they are practice, and based on authentic, real-world content. Promoting the achievement of digital literacy through effective use of these tools in the classroom can lead to an inspired curiosity and excitement for learning, creativity, inventive thinking, and the creation of new ideas.

GOALS

Goal 1

To provide enriched learning environments supported by technology. These learning environments provide opportunities for students to use 21st Century Skills to find and apply current information and resources and to apply their academic skills for solving real-world problems. They engage students in activities that have relevant curricular content interwoven with and enhanced by educational television skills.

Infrastructure recommendations:

- Define standards for the support of the technology infrastructure necessary to provide these information technology enriched environments in Arkansas schools. The infrastructure is distinct from professional development and support for teachers using technology. Provide funding for implementing these standards. (A recommended set of standards and an assessment rubric was included in the draft *Arkansas School Facility Manual*.)
- Define and update facility standards for technology infrastructure for new building construction resulting in long term cost savings. Provide funding for implementing these standards. (A recommended set of standards was included in the draft *Arkansas School Facility Manual*.)
- Establish a task force composed of interagency and public members to explore the benefits of community learning centers, facilities for enriched learning with technology resources (shared by K-12, higher, workforce), and lifelong education.

- Implement a data collection and analysis system to track the technology resources available in Arkansas schools. The data collected should track both quantity and quality of the resources.

Since every district is required to submit an inventory as part of their technology plan, I would think ADE could present us with some web-based interactive form in which to enter that data and compile it from there.

Goal 2

Develop lesson plans, activities, and materials that integrate knowledge-based skills and technologies to improve academic achievement for Arkansas students.

Content/curriculum recommendations:

- Construct a user-friendly database that allows teachers to do multi-level searches for knowledge-based and technology-rich lesson plans in all subject areas. *Estimated budget: INA costs*
- Identify and engage curriculum specialists to direct the development of integrated lesson plans that demonstrate 21st Century Skills and to direct exchange/sharing of lesson plans. *Estimated Budget: Personnel cost for curriculum specialists to assist or direct teachers who are creating the lesson materials and to provide an initial review of materials in order to provide feedback for improvement of materials.*
- Identify, train, and/or fund instructors to develop the lessons. *Estimated Budget: Financial compensation for development of lesson materials.*
- Assign ADE personnel to approve lesson plans aligned with Arkansas Curriculum Frameworks prior to download for quality control and to monitor the database for feedback, teacher rating, and safety issues. *Estimated Budget: Addition of curriculum integration specialists at ADE.*

Goal 3

Adopt the “Partnership for 21st Century Skills” methodologies to enhance professional development programs to provide quality 21st century education (www.21stcenturyskills.org) with digital literacy goals at its core.

Professional Development recommendations:

- Join the 21st Century Partnership and promote and define state leadership expectations for student achievement with digital literacy.
- List objectives, tactics, and metrics for implementing 21st Century Skills as a professional development focus. Develop a 21st century learning certification process for schools that identifies and acknowledges those that make progress towards providing 21st century education.
- Ensure that teacher education licensing includes 21st Century Skills competency in teacher education program accreditation.
- Develop the IDEAS portal to include training for teachers and administrators on 21st Century Skills.

- List objectives for aligning state content standards and assessments with 21st Century Skills.
- Create a Coordinating Council to ensure 21st Century Learning Skills objectives are met according to a timeline that is tied with education reform and fiscal support for these efforts.

AETN Technology Institute (7/24/06-7/28/06)

Conway, Arkansas

The AETN Technology Institute, now in its fourth year of funding by the Arkansas Community Foundation IMPAC Technology Endowment, was conducted July 24-28, 2006. There were two sessions of the Institute. Twelve teachers participated in the first workshop (June 26-30, 2006), and eighteen teachers participated in the second session.

The importance of this activity is becoming increasingly connected to the Math/Science and technology programs administered by the Authority, the Math/Science Centers, and the ARCF Affiliates. The Arkansas Department of Education, with encouragement by the Joint Senate and House Education Committee, has provided funding to AETN to coordinate online staff development for Arkansas public school teachers. Therefore, 2006-2010 will be critical years in developing the early, middle, and formative years of a new coordination effort that will impact the ARCF Affiliate Mini-grant and STUART Grant programs, the SMART Portal, and the programs developed based upon recommendations from the Technology Task Force.

The eighteen teachers were observed working in three groups. Each group made a lengthy presentation (multimedia) complete with lesson plans, benchmarks, and student evaluation materials. The groups used a common template comparable to the SMART template. The subject areas covered were high school physics, middle school English, and middle school social studies.

The AETN Technology Institute is expected to continue until it becomes a mainline supported activity with or without IMPAC Endowment funding. There are plans for an online version of the training objectives.

Planning and Coordination Meeting of AETN staff and ASTA (7/28/06)

Topic: AETN Online Staff Development & INA SMART Web Portal

A meeting between administrative representatives of the Authority and AETN was held at AETN July 28, 2006 to discuss and arrive at an understanding of the role of AETN (with directions from the Arkansas Department of Education as a part of a development and supervision grant) in coordinating online staff development activities, especially those receiving college degree credit and continuing education credit.

The first meeting of the Coordinating Committee is expected to be conducted within a few weeks.

National School Board Association (NSBA)

2006 Technology/Learning Conference

Dallas, Texas Convention Center

November 8-10, 2006

The Authority's External Evaluator, the chairperson of the Technology Task Force, and a staff person from the Authority directly involved in various STEM-related academic programs, attended the NSBA annual educational technology conference. Funding for this activity was provided through the ARCF Fund created to support the work of the Task Force.

The convention program centered around six major themes, each of which related to the various programs in which the Authority is directly involved:

- Leadership and Vision
- Learning and Teaching
- Productivity and Professional Practices
- Support, Management, and Operations
- Assessment and Evaluation
- Social, Legal, and Ethical Issues

Prior to the conference, on Tuesday November 7, 2006, the representatives of the Task Force observed programs in a high school, middle school, and elementary school in the Carrollton-Farmers Branch Independent School District in Carrollton, Texas.

The school district has implemented a technology training and integration model which concentrates on specific curriculum needs and various technologies selected to address those needs. The specific programs observed were directly related to programs of concern as identified by the Task Force.

In addition to the school visitation and observation program, the three representatives of the Task Force attended numerous workshops, roundtable discussions, lectures, and demonstrations. In addition, they attended an Interactive Town Hall meeting conducted by Ken Lay, Director of the Partnership for 21st Century Skills.

Vendor's displays of various technologies as well as "best practice sessions" provided a comprehensive overview of the current status of the integration of technology into the teaching and learning process related to numerous components of K-12 school curriculums including: virtual learning, wire and wireless technology infrastructure, distance learning, on-line staff development, interactive smart boards, technology use in math and science, on-line curriculum resources, student data management, and the leveraging of E-Rate dollars in the modernization of schools.

Task Force Meeting
State Police Headquarters, Room B
December 1, 2006, 1:00 PM

1. John Chamberlin, Chair of the Technology Task Force, called the meeting to order at 1:10 pm at the State Police Headquarters, Room B.
2. Task Force members attending the meeting: Linda Kellim, Mickey Bates, Becky Hart, Steve Emmons, Susan Choitz, John Chamberlin, Margaret Amps, Dr. Cecil McDermott, Drew Mashburn and Timothy Taylor.
3. John Chamberlin and Dr. Gail McClure reported that on November 28th, they presented at the meeting of the Joint Committee on Advanced Communications and Information Technology on behalf of the Technology Task Force. The presentation received very positive responses from the legislators. Chairs of the Joint Committee expressed their support to the Task Force efforts.
4. John Chamberlin stated the five Task Force Working Groups will be formed to work on different tasks. He encouraged Task Force members to sign up for one of the following Working Groups. The Technology Task Force will meet quarterly and Working Groups will meet between Task Force meetings.

Five Task Force Working Groups are:

- 1) Smart Portal (Group Leader: Dr. Gail McClure)
 - 2) Partnership for 21st Century Skills (Group Leader: John Chamberlin)
 - 3) Management of Technology Infrastructure Standards (Group Leaders: Tim Taylor & Drew Mashburn)
 - 4) Best Practices (Group Leaders: Susan Norton & Dr. Cecil McDermott)
 - 5) Task Force on Community Learning Centers (Group Leader: John Chamberlin)
(John Chamberlin will tentatively serve as group leader for groups 2 & 5)
5. John Chamberlin stated that he talked to Representative Cook about the management of the technology infrastructure standards in public schools. Representative Cook was aware that the standards have not been enforced and updated in the past years and was looking into the issue. John Chamberlin suggested Tim Taylor, Drew Mashburn and other members who will be working on this issue schedule a meeting with Representative Cook and relevant agencies.
 6. John Chamberlin stated that many schools in Arkansas are very successful in implementing technology in education. Susan Norton & Dr. Cecil McDermott will lead in efforts to document these success stories and make it into a video. The videos will be distributed to legislature and the public for them to better understand what the Technology Task Force is advocating.
 7. John Chamberlin reported that the Technology Task Force will be supporting creation of a Special Evaluation Task Force to determine the feasibility of setting up well equipped labs at the community colleges to form Community Learning Centers where high school students can study to receive associate degrees in various areas. This will be a legislative target of workforce education at AATYC.
 8. John Chamberlin, Dr. Cecil McDermott and Cathy Ma reported on the T + L Conference held in Dallas by National School Boards Association, November 7-9, 2006. They visited an elementary school, middle school and high school in Carrollton-Farmers Branch Independent School District. They are impressed by the extensive use of all kinds of technologies in classrooms, professional development

opportunities schools provided teachers and how technologies have improved teaching and learning.

9. Jim Boardman reported on the conference of the Partnership for the 21st Century Skills. He stated that he was very interested in the 21st century skills, but the Department of Education will need some time to carefully discuss whether they will recommend the state to join the Partnership. If the state decides to adopt the Partnership for the 21st Century Skills, there will be a big change in the areas of curriculum, professional development, content, standards, frameworks, etc. Mr. Boardman highly praised the state's EAST Program which he stated can also teach students 21st century skills in every subject.
10. The Technology Task Force members agreed that the Task Force should spend more time and efforts to educate the public on the importance of teaching 21st century skills in every subject.
11. Next Technology Task Force meeting: March 2, 2007

Technology Task Force Working Groups

Technology Task Force Working Groups

1. SMART Portal (Group Leader: Dr. Gail McClure)
Members: Margaret Amps; Tom Burnett; Sue Choitz
2. Partnership for 21st Century Skills (Group Leader: John Chamberlin)
Members: Tim Taylor; Tom Burnett
3. Management of Technology Infrastructure Standards (Group Leaders: Tim Taylor & Drew Mashburn)
Members: Steve Emmons
4. Best Practices (Group Leaders: Susan Norton & Dr. Cecil McDermott)
Members: Mickey Bates; Linda Kellim
5. Task Force on Community Learning Centers (Group Leader: John Chamberlin)

2007 Symposium for Scientist & Engineers Santa Fe, New Mexico April 10-13, 2007

Attendees

185 participants from 23 states

Arkansas:

1. John Chamberlin, STEM Coalition and Chairman of the State Technology Curriculum Task Force
2. Cathy Ma, Program Manager, ASTA
3. Dr. Cecil McDermott, External Evaluator, ASTA

Purpose of Conference

To engage participants in developing a shared vision of effective K-16 science learning and teaching, including conversation about the agenda presented in the “Rising Above the Gathering Storm Report.”

Conference Focus

- Curriculum & Instruction in Science
- Inquiry-Based Science
- Student Assessment
- Professional Development
- Materials Support Systems
- Development of State and Local Administrative & Community Support
- Planned Systemic Change
- Inquiry-Based Science Instruction
- Access student prior knowledge and understanding of science concepts, guide questions, promote collaborative learning, provide opportunities for open-ended investigation, foster critical thinking skills, and provide real-world connections and concept integration with other subjects

Connections to Existing Science Programs

- Standards & Benchmarks
- Testing Programs
- Textbook Adoptions & Resource Materials
- ARCF Affiliate Science Minigrant Program
- STUART e-Instruction Program
- SMART Web Portal-Inquiry Based Lessons

Life Skills

- Leadership
- Ethics
- Accountability
- Personal productivity

- People skills
- Adaptability
- Personal responsibility
- Self direction
- Social responsibility

21st Century Assessment

- Performance-based (individual and group)
- Standardized where applicable
- Classroom assessment
- Balance among assessment tools
- Team functionality and outcomes

The Task Force supports the following efforts:

1. The SMART web portal and its advancement of technology integration through quality lesson plans in core subjects for use by Arkansas teachers in middle schools and high schools.
2. The establishment of a technology best practices program that makes the use of technology a meaningful part of teaching and student learning.
3. A statewide 21st Century Skills program that resides within the state's education curriculum framework and incorporates the curriculum frameworks of each core curriculum subject.
4. The infrastructure for the accommodating technologies and staff development in schools is an appropriate response (as presented in the set of legislative recommendations) to the state's needs in the areas of concern that have been cited and is the committee's approach to responding to Act 2266 of 2005.

INA/ASTA Assessment Conference SMART Web Portal (2-5-08)

Participants

- Janet Grard, General Manager, INA
- Kassandra Mize, INA
- Dr. Gail McClure
- Cathy Ma
- Chuck Meyers
- Dr. Cecil McDermott

The development of the SMART Web Portal has not advanced to the operational level for several reasons impacted over time by priorities in other areas for the Authority and INA. Factors defining its current status include:

- The development of acceptable lessons in science and mathematics of sufficient quality to place on the Web Portal.

- The development of a process that defines a lesson template; the structural elements of a lesson plan as defined by specialist at the Arkansas Department of Education; a procedure for lesson review and approval acceptable to the Arkansas Department of Education with respect to curriculum and the state's frameworks.
- The Arkansas Department of Education's provision for the Arkansas Higher Education Math and Science Center specialist to receive instruction related to the conduct of a training workshop in the area of lesson development (including technology links to the lessons as enhancements). That training has now provided math and science center specialists with a fundamental perspective as to how to train experienced teachers in preparing SMART lessons.
- INA's establishment of a base website for SMART at INA that accommodates teacher log-in, activities and lesson plans, links to external sites, levels of entry, etc.

The participants in the assessment conference worked through the various features of the website and then focused on a mutually agreeable agenda that would result in a preview of the website early in May 2008. The group was mindful of the importance of enhancing communication between the two organizations in order to achieve the agreed upon goals.

Finally, there was recognition that aspects of the development of the SMART Web Portal may require the formal establishment of a coordinating committee that accommodates the interest of the Authority, Arkansas Department of Higher Education, Arkansas Department of Education, and AETN. This effort would build upon an earlier conversation related to the accommodation of staff development credits at the public school and higher education levels.

ASTA/INA Planning Session SMART Web Portal (3-13-08)

Dr. Gail McClure, Arkansas Science & Technology Authority Program Director for the SMART Program, and Cassandra Mize, INA Project Manager, met March 13, 2008 with assembled Authority staff to discuss the status of the web portal demonstration scheduled for April 1 at 5:30 p.m. in the ASTA Board Room. In addition, the Authority requested that INA prepare a proposal on interfacing EPSCoR researchers with the National Science Foundation Fast Lane Internet Technologies.

It was agreed that the Authority and INA are on schedule to conduct a demonstration of the SMART website on April 1 for the Mathematics/Science Specialist from the regional centers at various higher education campuses. Lessons are being downloaded and tests of the user interface and gathering of various data on the users accessing SMART are being conducted at INA.

There was discussion of online mini-grant applications being completed by both the science mini-grant and STUART grants for March 1, 2008. This is considered a high priority for the Authority – to move away from paper. INA indicated that the organization would prepare a Statement of Work (SOW) rather than a Memo of Understanding (MOU). The goal for both the Authority and INA was to move much of the science mini-grant, STUART, and SMART programs online through the SMART Web Portal. Others attending and participating in the meeting were Cathy Ma, Sharon Whitlock, Tatum Branaman, Chase Conyer, Alison Page, and Dr. Cecil McDermott (ASTA External Evaluator).

D. Professional Development for Teachers

A Perspective on Teaching and Learning: Aspects of Education in the 21st Century

1. Background and History for the Change in Education that Must Occur

For much of the 20th century, serious attempts have been made to change traditional American schools. Change no longer tied to the agricultural cycles or the requirements of the industrial revolution has been sought. Change that is not limited to a 180-day school year or a six hour school day, class periods, bells, and traditional progression through grade “levels” seems almost imperative.

That traditional school and classroom began to appear by the 1700s. The printing press had helped awaken the common person. If you became literate and had access to books and libraries you could become educated. This type of self-education began to occur quickly for those with leisure. The essence of successful schools from 1700 until today has been determined by the ability of a teacher to guide students through the knowledge and experiences of society recorded in books placed in private and public libraries. The literate person with access to books could explore the stored wisdom of a society. Photography added to the print message in the 1800s. It was only after the American Civil War that textbooks used drawings and pictures. The ability to store and retrieve knowledge and experiences essentially created the discipline-based, textbook- centered traditional school.

The American Civil War was the first that was projected into the average home through pictures taken on the battle fronts. Pictures in newspapers began to bring information to people on a mass basis. The First World War was covered by newspapers. The sinking of the Titanic was a newspaper special event. During World War II, the radio allowed people to be at the war front. Edward R. Murrow reported events in gripping details with background noises so that the audience could envision the realities of bomb shelters. The Vietnam War was brought into the living rooms of American homes through television. Desert Storm was carried to the entire world in stunning detail almost in real time.

The expansion of communication science has enabled average citizens to come close to actually experiencing the significant events affecting their lives. The last half of the 20th century has seen worldwide information systems explode so that nowhere in the world can one remain isolated. Worldwide news services are there and ready to bring you every teardrop of happiness, sadness, or tragedy. Space adventures are experienced in real time and through the eyes of the astronauts in space circling the earth or moon. Society has a rich and expanding array of communications technologies that can place a person in a vicarious experience that is almost more real than the experience itself. Virtual experiences are almost as intense as the real world. Moreover, the designs of the virtual experiences have the luxury of creating experiences in which the user controls time. Time can either be sped up or slowed down. The virtual experience can be slowed down and examined in detail. The “Incredible Voyage” actually allows the viewer to travel through the blood stream of a human body.

The creation of virtual experiences expands the roles of the teacher and increases the learning options of the student. In the 21st century, the student will have grown up in a world of information. From the time an infant is born, television, radio, audio, and telephone signals will have bombarded the child’s sensory world. By six months, the child will be able to locate the television in the room, and by two years he or she can seek out the program they want to watch. In most homes, through modern technologies, the child will know many songs and sing along with their favorite singer. Before the child comes to school he or she will have developed an understanding of the virtual world that surrounds him or her. Language basics will have been developed relative to the child’s local culture. He or she will be

surrounded in a sea of programmed experiences. In a home that does not monitor virtual input, the child will have been exposed to random experiences which may be totally inappropriate. This is why it is critical for elementary education to include well-selected, common, technology-based experiences. Schools that develop this educational component with appropriate, valid assessment procedures will be the pacesetters of the 21st century.

If the school of the 21st century is no more than yesterday's 1926 or 1956 replica, then the learner is not likely to be attentive. The competing messages the learner receives at home from television, radio,

telephones, video games, and computers will be so strong that the learner may be overwhelmed and block out the humdrum stimuli of the average classroom. The 21st century school will not try to duplicate the performing arts of the entertainment world but will try to use the technologies of the home, library, and other community centers to reinforce the lessons of the teacher. This does not imply a school where learners are glued to computers or televisions sitting alone in the home, labs, or classrooms. Envisioned is a combination of on-site instructional programs delivered and controlled by telecommunications technologies. Envisioned are learners developing contracts with the schools to reach definable levels of competencies. Schools will therefore require a new method of record keeping that tracks student progress but is no longer tied to traditional semester frameworks. Also envisioned are teachers empowered by desktop access to the learning materials available through telecommunications and interactive whiteboards.

In general, schooling will take place in schools, homes, school buses, learning centers, libraries, and various other places. Most schools will still have buildings and teachers and, in most cases, buses will still bring students to schools and pick them up. Some extracurricular activities will be provided by schools including athletics, plays, bands, etc. In general, however, extracurricular activities will be year-round and emphasize as their primary purpose the development of leadership training and physical fitness. These will take place in clubs or within private and public organizations in the community. Across communities, intramurals will become the norm rather than the exception.

In studying the U.S. Constitution, a student in a 21st century school will be able to link to discussions information about the Federalist papers and examine the positions of Jefferson, Franklin, Adams, and others in simulated debates over the details of the Declaration of Independence and the Constitution. In most instances, they will be able to hyperlink to speeches as well as the text of the position taken by various framers of the Constitution as they disagreed over the details. Different classroom groups will have studied the roles and positions of each of the thirteen colonies and will be able to conduct classroom deliberations. Using various technologies, the group from South Carolina will be able to present their position using large screens in classrooms. The group representing Massachusetts will be able to do the same thing but the elements of style and manner of presentation will vary. At the end of the lesson, the teacher will have the technologies to record the student interactions on a multimedia platform so that the teacher and students can review the large group activity and provide an analysis of the information and judge the effectiveness of the presentations.

Schools of the future will encompass a number of independent study activities with individual and small group research conducted through telecommunications. Content will be a window of opportunity for numerous types of engagement. In the physics and mathematics classes, students might create a voyage to Mars. Individual and small groups would be involved in the planning and development of the voyage. Class simulation software with "what if" features would actually create the voyage. The teacher could create a crisis of both a technical and social nature for the students to overcome. Part of the students' grade would come from how well they handle the unexpected crises that arise on the trip. In this setting, the structure of the academic subjects will be even more important as theory meets the applied, face to face, every day.

It is expected that the crew for the voyage to Mars would be composed of several people from different countries. In this context, the school would become a virtual school. How will the crew develop team synergy? Will the different cultural groups create special challenges? The voyage to Mars is an exciting concept because it has science and mathematics content, but also engages students in a wide range of social and cultural issues. Communication skills and foreign languages become a natural component motivated by need and purpose. The number of such projects is unlimited.

Another example of the characteristics of the 21st century school can be described through a project in a course in government involving a science fiction story. Suddenly, far into the future, life expectancy has grown to 200 years. For the middle 100 years people can maintain the body of a 45 year old. The childbearing years of women extend well into the 125-year range. While men and women have had to fight for food, clothing, and shelter for most of the history of humankind, in this new era food, clothing, and housing are easily available for all citizens. Such science fiction themes will be viewed as practical. After all, students' grandparents will already be experiencing the impact of increased life expectancy. In 1890, the average woman's life expectancy was 47 years and she had 6.5 children. In 1996, a woman's life expectancy was past 80 and she had 2.3 children. In this century, we have seen dramatic changes in the position of women in society. The institutions of marriage and homemaking have been altered by the change in women's lifestyles and longer life spans. Similarly, men's roles have shifted to include more occupations and responsibilities that just a few generations ago would have been labeled as traditionally "female." What do such changes mean for world population growth, education, government, marriage, and work? What about the balance of natural resources and the quality of the environment in general? The physical well-being of women and men, if their life spans were to double, would be dramatic and so realistic that students would view such an activity as challenging and practical.

It is reasonable to assume that schools will have a number of applied problems that can be the foundation for various courses of study. A student might actually take a traditional classroom course to acquire the knowledge needed to work or they might acquire the information through independent study. The combination of in-depth, well-structured academic courses and practical applications within educative experiences derived from "virtual projects" may well be the basis of academics in the 21st century within schools. Vendors of technologies and software developers that grasp this will be the ones that produce the operating systems, programming languages, and the Internet search engines of tomorrow. Each of these in turn will support the type of educational program that has been described or others that will emerge.

At any rate, the twenty-first century school will differ significantly from our traditional brick and mortar schools of today. The buildings and resources will be those needed to accommodate a wide range of learning activities that apply practical knowledge to real time problem solving. Students will know how to search for information and assimilate that information into team projects with members making decisions and taking action.

The Technology Task Force believes that educators are taking steps now, and exploration of ideas will continue over the next several years to accommodate 21st Century skills and examine and establish best practice programs in technology. These must be examined in relationship to a modern perspective on teaching and learning and human functionality in the workplace (wherever that might be) in a global interdependent society.

2. Guidelines for Professional Development for 21st Century Teachers

Technology Professional Development for the 21st century teacher must be an on-going process that continually prepares teachers to create meaningful learning experiences for their students. Just as the teachers must change their teaching to reflect 21st Century skills, the method of dispensing professional

development must also change. No longer can teacher training be limited to one room at one time with one leader with one idea.

The following examples are from other states and illustrate the variety of new methods of collaborative or web-based 21st century professional development:

Online resources and lesson plans

ALEX, the Alabama Department of Education's interactive web portal, provided through the Alabama Supercomputer Authority, is a rich assortment of interactive activities and resources linked to the searchable Alabama Courses of Study. Most of these activities are supplied by the Verizon Foundation's Thinkfinity.org, with over 2,000 lesson plans supplied by Alabama teachers. These resources are designed to engage students and teachers in 21st century learning and expand new opportunities. <http://alex.state.al.us/>

Training

Concept to Classroom features a series of free, self-paced workshops covering a wide variety of topics in education, such as inquiry-based learning, multiple intelligences, and WebQuests. The workshops are developed by Thirteen Ed Online, an online professional development site of the Educational Resources Center at Thirteen/WNET New York. <http://www.thirteen.org/edonline/concept2class/inquiry/index.html>

West Virginia Department of Education Professional Development provides an interactive professional development model for training teachers in the 21st century. The professional development model can be used to train large groups of teachers or individuals. Training materials include an introduction to 21st century education issues, videos of best practices in the state, a blog, a wiki and links to other relevant resources.

The George Lucas Foundation Technology Integration module allows access to *Edutopia* articles, videos, and other resources, and now allows users to post comments and start discussions. These free teaching modules were developed by education faculty and professional developers. They can be used as extension units in existing courses or can be used independently in workshops and meetings. Each module includes articles, video footage, PowerPoint presentations, and class activities. They draw from the wealth of GLEF's archives of best practices and correlate with ISTE/NCAT/NETS standards. <http://www.edutopia.org/teaching-module-technology-integration>

Online degree program

San Diego State University's two-year degree masters program covers many facets of education technology, such as integrating podcasts and blogs into a lesson, designing web pages, creating games and simulations, and planning a video development lesson. Although the content is focused on California standards, any teacher can apply for the program and the entire course can be completed online, if necessary. <http://edtec.sdsu.edu/comet.htm>

E-mentoring

The New Teacher Center provides early career middle and high school science teachers with science-specific mentoring and professional development through an online learning community. This model connects novice science teachers with more experienced science teachers and research scientists. Each

new teacher receives support from a mentor who has taught the same content at the same grade level and is from the same state, in order to ensure that conversations about standards, assessment, and curricula are relevant and useful. The mentors themselves receive extensive training in online interactions, content, pedagogical coaching skills, and best practices in science. There is also a similar program for math teachers. <http://newteachercenter.org/eMSS/index.php>

Teacher coaches in the schools

West Virginia State Department of Education's professional development initiative provides a Technology Integration Specialist at schools to assist with implementing 21st century learning. The TIS program provides intensive professional development for educators to become the school specialist to assist other educators in implementing 21st century learning. The literacy coaches receive state of the art training and share instructional best practices with teachers in the schools. <http://www.governor.state.nc.us/educationAgenda/21stCentury.htm>

Partnerships with business leaders

North Carolina created a Center for 21st Century Skills. The Center is a public-private partnership that works actively with business leaders, educators, and policymakers to create new curricula, new assessments, and new ways of linking student work in the classroom to the workplace in the 21st century

National Science Teachers Associations (NSTA) Web Seminars is an online professional development program where teachers can interact with NSTA Press authors, scientists, engineers, and education specialists from NSTA government partners. During these 90 minute seminars teachers can use online tools to take notes on presentation materials, share their documents, and chat with other participants. <http://learningcenter.nsta.org/products/webseminars.aspx>

In the February 2008 issue of *Learning and Leading with Technology* (an ISTE publication), Judi Harris reports that in a national survey conducted by CDW-G, 80% of the teachers see computer use as important to their success. Only 37% of the same teachers actually use computers with their students daily. She concludes, "So despite very positive opinions about the importance and efficacy of educational technology use, most teachers probably have not had sufficient time or opportunity to engage in the kinds of professional learning necessary to help them to use educational technologies in new ways to assist their students' learning." As the need for more technology and new skills grows, so does the need for effective professional development.

In addition to individual school district professional development initiatives, presently all Arkansas teachers are provided technology professional development from *Arkansas IDEAS* (Internet Delivered Education for Arkansas Schools), provided by the Arkansas On-line Professional Development Initiative through a committed partnership of the Arkansas Educational Television Network and the Arkansas Department of Education. The regional educational cooperatives provide face-to-face workshops throughout the school year and in the summer months.

Another state-wide technology association that provides professional development opportunities is The Technology Information Center for Administrative Leadership. TICAL is made up of professional development coordinators, superintendents, principals and teachers throughout the state who provide professional development resources on the TICAL web site (www.portical.org) and annually host with the Arkansas Association of Educational Administrators (AAEA) a 3 day workshop for technology integration and leadership at all levels. The Hot Springs Technology Institute (HSTI) provides two days of hands-on workshops and two days of conference activities for teachers, administrators, technical staff

members, and school technology coordinators. Among HSTI's supporters are Arkansas Society of Technology in Education (an ISTE affiliate), Arkansas Educational Television Network, Arkansas Department of Education, Arkansas Community Foundation, Arkansas Department of Information Systems and Hot Springs School District.

To create 21st century learning environments in Arkansas, there is a need for professional development models and resources that unite the standards based curriculum with 21st Century Skills. These models should not only incorporate specific technology skills, but must blend those skills, content, and 21st century teaching methods.

E. Task Force Finances – Funding and Audit

Task Force Budget/Funding

Act 2266 that authorized the Arkansas Science & Technology Authority (ASTA, or the Authority) to develop a knowledge-based technology curriculum for use in grades seven through twelve did not provide a means for funding the effort. Therefore, once the Technology Task Force was placed under the STEM Coalition, a subcommittee on budget and funding was established by the Task Force. At the May 30, 2006 Task Force meeting, it was reported that funds and grants secured would be placed in the Arkansas Community Foundation Task Force for Integrating Technology into the Public School Curriculum Fund. The sources for these funds are listed on the next page as well as the Task Force expenses and anticipated expenses. A copy of the Arkansas Community Foundation gift form is included for the record.

Taskforce for Integrating Technology into the Public School Curriculum Fund (TFITPS)

Gifts		Non-Gifts
Curr Fiscal Year - 2008:	\$0.00	\$0.00 See Details
Last Fiscal Year - 2007:	\$2,000.00	\$0.00 See Details
Cumulative ¹ (since 1/23/2006):	\$102,050.00	\$0.00 See Details
Grants Paid		
Curr Fiscal Year - 2008:	\$4,709.05 See Details	
Last Fiscal Year - 2007:	\$13,828.22 See Details	
Cumulative ¹ (since 1/23/2006):	\$32,985.12 See Details	
Grants Pending		
Total:	\$0.00 See Details	
Spendable Balance as of 05/07/2008		
Total:	\$67,252.55	
Market Value² as of 04/30/2008		
Total:	\$67,252.55	

Arkansas Community Foundation
Gift Form

Fund Information

Donor Name:
Fund to Receive Gift Taskforce for Integrating Technology into the Public Schools Curriculum Fund
Donor Phone:
Donor Address:

Cash Contribution

Check: \$ _____ Make payable to ARCF/Taskforce for Integrating Technology into the Public Schools Curriculum Fund
--

Upon deposit of the gift, ARCF will send a written acknowledgement to the donor that the gift has been received. Please mail this form with check to:

**Arkansas Community Foundation
700 S. Rock Street
Little Rock, AR 72202**

To the best of my knowledge, all information presented in connection with this form is accurate. I will notify ARCF of any changes.

Signature

Date

Print Name

Audit Procedures Discussion
STEM and Task Force Expenditures
Arkansas Community Foundation
Task Force Fund – March 21, 2008
ASTA/Hazeslip and Associates CPA, Inc.

Dr. Gail McClure, Dr. Cecil McDermott, Cathy Ma, and Sharon Whitlock met with Lynn Hazeslip, CPA in the Authority's boardroom from 10:00 a.m. – 11:00 a.m. on March 21, 2008.

The scope of an audit to be conducted was perceived to cover over a 28-month time period, beginning in November of 2005 and ending March 31, 2008, with an amendment through June 2008. The work outlined was related to funds (donations, contribution, and conference fees) residing at the Arkansas Community Foundation (ARCF) for the purpose of costs associated with the STEM Coalition's Rising Above the Gathering Storm Conference in September of 2007 and various Technology Task Force meetings, conferences, etc. over about a 32-month time period.

Records of various materials were shared with Mr. Hazeslip: Conference registration forms, lists of expenses incurred and paid, minutes of STEM Coalition and Task Force meetings, records available from the Authority and ARCF, and contact information critical to an audit.

It was established that the audit should be completed by May 15, 2008 at a cost of approximately \$3,500. The audit cost would be allocated between STEM activities and Task Force activities. The funds audited were estimated at \$146,000.

Arkansas Task Force to Integrate Technology into Public School Education (Technology Task Force)

Accountants' Report and Financial Statement

May 31, 2008

**Arkansas Task Force to Integrate Technology into Public School
Education (Technology Task Force)**
May 31, 2008

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Independent Accountants' Report

Board of Directors
Arkansas Task Force to Integrate Technology into Public School Education (Technology Task Force)
Little Rock, Arkansas

We have audited the accompanying statement of cash receipts and disbursements of the **Arkansas Task Force to Integrate Technology into Public School Education (Technology Task Force)** for the two years and six months ended May 31, 2008. This financial statement is the responsibility of the Organization's management. Our responsibility is to express an opinion on this financial statement based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statement. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

As described in *Note 1*, the Organization's financial statement was prepared on the basis of cash receipts and disbursements, which is a comprehensive basis of accounting other than accounting principles generally accepted in the United States of America.

In our opinion, except for the effects of using an other comprehensive basis of accounting as discussed in the preceding paragraph, the financial statement referred to above presents fairly, in all material respects, the cash receipts and disbursements of the **Arkansas Task Force to Integrate Technology into Public School Education (Technology Task Force)** for the two years and six months ended May 31, 2008.

June 19, 2008

**Arkansas Task Force to Integrate Technology into Public School
Education (Technology Task Force)
Statement of Cash Receipts and Disbursements
Two Years and Six Months Ended May 31, 2008**

Cash Receipts	
Grants	\$ 70,050
Donations and Gifts	<u>47,000</u>
Total cash receipts	<u>117,050</u>
Cash Disbursements	
Workshop expenses	12,085
Meetings – airfare	2,888
Meetings – mileage reimbursement	5,899
Meetings – hotel	15,176
Meetings – food	3,242
Speakers	1,256
Consultants	3,926
Office expenses/materials/postage	929
Banking fees	1,741
Miscellaneous	656
Total cash disbursements	<u>47,798</u>
Excess of Cash Receipts over Disbursements	69,252
Cash balance, January 1, 2006	<u>0</u>
Cash balance, May 31, 2008	<u>\$ 69,252</u>

See Notes to Statement of Cash Receipts and Disbursements

Arkansas Task Force to Integrate Technology into Public School Education (Technology Task Force)

Notes to Statement of Cash Receipts and Disbursements

May 31, 2008

Nature of Operations and Summary of Significant Accounting Policies

Nature of Operations

Arkansas Task Force to Integrate Technology into Public School Education (Technology Task Force) “the Organization” is a steering committee of the Arkansas Science, Technology, Engineering and Mathematics Coalition “STEM Coalition”. ACT 2266 authorized the Arkansas Science and Technology Authority “ASTA” to develop a knowledge-based technology curriculum for use in grades seven through 12. Toward this end, ASTA formed a Task Force to support the effort to evaluate the needs, plan strategies, and develop materials for integration of technology into the public school curriculum. The Organization was organized, as a subcommittee of the Arkansas Science, Technology, Engineering and Mathematics Coalition “STEM Coalition” in order to incorporate a broader focus of business and industry participation and assistance in identification of the skills needed for 21st Century knowledge-based jobs. The first meeting of the Organization was held November 8, 2005. The primary office for the Organization is located in Little Rock, Arkansas.

The primary source of funding for the Organization was an originating grant of \$70,500 from the Arkansas Department of Education.

Basis of Accounting

The Organization prepares its financial statement on the basis of cash receipts and disbursements. Consequently, revenue is recognized when received rather than when earned and expense is recognized when paid rather than when the obligation is incurred.

Income Taxes

As an Authority organized by legislative action, the Organization is exempt from income taxes under Section 115 of the Internal Revenue Code and a similar provision of state law.

F. Referenced Goals, Objectives, and Outcomes from the *Arkansas Department of Education 2008-2012 Technology Plan*

The *Arkansas Department of Education Technology Plan 2008-2012*, published in February 2008 and available online at http://arkansased.org/tech_resources/, addresses critical aspects of the “details regarding specific technology solutions for all levels of the educational system.” As stated in the introduction to the plan, “the primary focus of the plan is using technology to enhance instructional opportunities and increase achievement.”

The ADE Technology Plan unfolds through the use of six primary sections:

1. Vision and Mission Statements
2. Goals
3. Local Technology Plans
4. Professional Development
5. State Infrastructure
6. Technology Funding

The Task Force writing team, seeking criteria and guidelines in the development of this report, sought some direction from previous Arkansas state technology plans as well as various infrastructure and state facilities studies. Information was also gathered from recent academic and professional development reports.

The ADE Technology Plan, through the use of goals, recommendations, and other categorical types of information, provided a means within its six major sections around which the Task Force could organize and place in categories statements that link the ADE Technology Plan to the Task Force’s recommendations. This was especially true with regard to the SMART Web Portal for lesson plans, staff development for teachers, 21st century technology tools and learning skills, and advancement in state and local infrastructure provisions for K-12 schools. Such information also provided clarification in the areas of professional development for administrators and teachers, ways to engage in dialogue within groups of influence about 21st century education as it unfolds, the establishment of site visit programs between school districts as recognized “best practices programs” as the use of technology in teaching and learning becomes better defined and demonstrates educational and cost effectiveness, and the shared use of facilities and technology resources.

The system of cross references used in this section of the report makes use of 58 applicable statements from the ADE Technology Plan: five related to Mission (M), five to Goals (G), ten to Local Technology Plans (LTP), eighteen to Professional Development (PD), ten to Infrastructure (I), and ten to Funding (F). The numbering system used to organize the statements from the ADE Technology Plan was created by the Task Force. The Task Force’s recommendations are in **bold text**, followed by the corresponding items from the ADE Technology Plan addressed by the recommendation.

A. Accelerate SMART Portal development in partnership with AETN, ADE, and ASTA.

1. Expand the development of resources for the SMART Portal.

- M.2: Empower faculty to use technology as a tool to enhance learning.
- PD.3.14: Investigate the process of mapping local curriculum with the use of technology-mediated resources that are aligned with the Arkansas Curriculum Frameworks to establish a process for identifying and locating accessible digital media.

2. Integrate STEM curriculum across all curricula.

- M.2: Empower faculty to use technology as a tool to enhance learning.
- G.2.1: Each school district will develop, implement, and evaluate a plan for technology use that supports high performance standards for technology literacy for students, teachers, and other educational professionals.
- LTP.1.1: Each district will develop a comprehensive technology plan that supports the school improvement plan of each school within the district.
- LTP.1.3: Educational technology applications will promote student engagement and will improve student achievement by enabling students to access and analyze information, solve problems, collaborate with others, and communicate their thoughts and ideas.

3. Provide professional development resources for teachers delivered via the SMART Portal.

- M.3: Ensure that students and faculty become technology literate and productive in a digital society.
- LTP.3.1: Professional development should be a coordinated set of planned, research-based, best practice learning activities for teachers and administrators, which are standards-based and continuous.
- PD.1.1: Technology will be integrated into all aspects of teaching and learning utilizing professional development as a mechanism of change.
- PD.1.3: Support teacher technology initiatives by providing sufficient time and follow-up support for the mastery of new technology strategies and the integration of these strategies into practice.
- PD.1.4: Improve the preparation of all educators, both pre-service and in-service, in the use of technology using the ISTE NETS guidelines.
- PD.2.1: Educators must have access to tools required to support professional development, curriculum, instruction, and assessment, such as laptop computers, classroom Internet connectivity, presentation devices, document cameras, and interactive whiteboards.
- PD.3.8: Require a minimum of 12 hours of annual educational technology professional development for faculty in education preparation programs related to the integration of technology into instruction.
- PD.3.9: Encourage technology professional development beyond basic education technology application, moving towards integration into instruction.

- PD.3.10: Require a minimum of 6 hours of annual educational technology professional development related to the integration of technology into instruction for all certified staff.
- PD.3.13: Continue to offer quality professional development programs for educators on technology integration into teaching and learning, instructional management, and administration.
- PD.3.19: Encourage faculty and staff to engage in professional development during the school day.

4. Provide professional development models and resources that unite STEM curriculum standards and 21st Century Skills.

- M.3: Ensure that students and faculty become technology literate and productive in a digital society.
- PD.1.1: Technology will be integrated into all aspects of teaching and learning utilizing professional development as a mechanism of change.
- PD.1.3: Support teacher technology initiatives by providing sufficient time and follow-up support for the mastery of new technology strategies and the integration of these strategies into practice.
- PD.1.4: Improve the preparation of all educators, both pre-service and in-service, in the use of technology using the ISTE NETS guidelines.
- PD.2.1: Educators must have access to tools required to support professional development, curriculum, instruction, and assessment, such as laptop computers, classroom Internet connectivity, presentation devices, document cameras, and interactive whiteboards.
- PD.3.8: Require a minimum of 12 hours of annual educational technology professional development for faculty in education preparation programs related to the integration of technology into instruction.
- PD.3.9: Encourage technology professional development beyond basic education technology application, moving towards integration into instruction.
- PD.3.10: Require a minimum of 6 hours of annual educational technology professional development related to the integration of technology into instruction for all certified staff.
- PD.3.13: Continue to offer quality professional development programs for educators on technology integration into teaching and learning, instructional management, and administration.
- PD.3.19: Encourage faculty and staff to engage in professional development during the school day.

5. Provide sufficient funding to accomplish the activities needed.

- G.4: Arkansas state funds and federal technology funding streams will be aligned with other state efforts to support high-need and low-resource schools in obtaining

the fiscal resources needed to purchase, install, and maintain up-to-date technology hardware and software.

- F.1.1: Provide adequate funding to assure that all public school students and personnel will have access to and develop proficiency in the use of technology in the teaching and learning process.
- F.2.1: Develop innovative methods of funding, with statewide implications, to convert and sustain teaching and learning through educational technology.
- F.2.2: Provide appropriate new and flexible models of budgeting for technology.

B. Participate in the Partnership for 21st Century Skills.

1. Adopt state standards that incorporate 21st century tools and learning skills; articulate 21st Century Skills expectations for all grade levels.

- M.3: Ensure that students and faculty become technology literate and productive in a digital society.
- LTP.1.3: Educational technology applications will promote student engagement and will improve student achievement by enabling students to access and analyze information, solve problems, collaborate with others, and communicate their thoughts and ideas.
- LTP.1.4: Effective use of learning technologies will allow students to become self-directed, self-motivated, and lifelong learners.
- LTP.2.1: Local plans must address the state technology standards for teachers, students, and administrators, as well as technology-specific courses.
- LTP.2.2: Local plans must address which technology courses will be required and how students' proficiency in technology will be assessed.
- PD.1.4: Improve the preparation of all educators, both pre-service and in-service, in the use of technology using the ISTE NETS guidelines.
- PD.3.1: Adopt the ISTE National Education Technology Standards for Educators (NETS*A).

2. Embed digital literacy skills into current standards, curricula, and assessments for core subjects.

- M.3: Ensure that students and faculty become technology literate and productive in a digital society.
- LTP.1.3: Educational technology applications will promote student engagement and will improve student achievement by enabling students to access and analyze information, solve problems, collaborate with others, and communicate their thoughts and ideas.
- LTP.1.4: Effective use of learning technologies will allow students to become self-directed, self-motivated, and lifelong learners.

- LTP.2.2: Local plans must address which technology courses will be required and how students' proficiency in technology will be assessed.
 - PD.3.14: Investigate the process of mapping local curriculum with the use of technology-mediated resources that are aligned with the Arkansas Curriculum Frameworks to establish a process for identifying and locating accessible digital media.
- 3. Create state and local infrastructure (bandwidth, hardware, software, intelligent classroom devices) that supports a 21st century education by providing funding for equitable access to technology.**
- M.1: Promote student-centered learning environments that are rich in technology.
 - M.5: Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.
 - G.3: The state and school districts will develop a robust and reliable security network infrastructure that is capable of supporting advanced information and educational technology for learning, teaching, and research.
 - LTP.1.2: Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.
 - PD.2.1: Educators must have access to tools required to support professional development, curriculum, instruction, and assessment, such as laptop computers, classroom Internet connectivity, presentation devices, document cameras, and interactive whiteboards.
 - I.1.1: Provide sufficient bandwidth for each school system's growing needs and evolving Internet-based applications, such as video streaming and teleconferencing.
 - I.2.4: Enrich and extend the telecommunications infrastructure.
 - I.3.1: Significantly increase bandwidth capacity in K-12 institutions in Arkansas over the next two years.
 - I.3.2: Encourage school districts to implement campus-area networks.
 - I.3.5: Provide scalable, robust, and reliable academic systems infrastructure.
 - F.1.2: All students and staff will have access to a modern and effective infrastructure which enhances quality learning.
 - F.2.2: Provide appropriate new and flexible models of budgeting for technology.
- 4. Provide professional development paths for administrators and teachers that are strategically aligned to support the goal of offering effective 21st Century Skills in all Arkansas Curriculum Frameworks.**
- M.3: Ensure that students and faculty become technology literate and productive in a digital society.

- LTP.3.1: Professional development should be a coordinated set of planned, research-based, best practice learning activities for teachers and administrators, which are standards-based and continuous.
- LTP.3.2: The professional development plan should help in developing and sustaining the technology skills of educators, which will enhance teaching, learning, management, and leadership in the education community.
- PD.1.1: Technology will be integrated into all aspects of teaching and learning utilizing professional development as a mechanism for change.
- PD.1.2: Ensure administrative support for the technology professional development needs and goals related to technology integration.
- PD.1.3: Support teacher technology initiatives by providing sufficient time and follow-up support for the mastery of new technology strategies and the integration of these strategies into practice.
- PD.1.6: Provide practicum and mentor experiences for students and educators to successfully integrate technology into instruction.
- PD.3.8: Require a minimum of 12 hours of annual educational technology professional development for faculty in education preparation programs related to the integration of technology into instruction.
- PD.3.9: Encourage technology professional development beyond basic education technology application, moving towards integration into instruction.
- PD.3.10: Require a minimum of 6 hours of annual educational technology professional development related to the integration of technology into instruction for all certified staff.
- PD.3.11: Implement or support the development of Instructional Technology or Technology Integration Specialist positions at all levels.
- PD.3.17: Provide opportunities, incentives, and support for educators to develop models of best practices using technology.
- PD.3.19: Encourage faculty and staff to engage in professional development during school day.
- F.1.1: Provide adequate funding to assure that all public school students and personnel will have access to and develop proficiency in the use of technology in the teaching and learning process.
- F.2.2: Provide appropriate new and flexible models of budgeting for technology.
- F.3.1: Fund one local technology integration specialist for each education service cooperative.
- F.3.2: Require school districts to hire a technology integration specialist in each Local Education Agency for every 1,100 students.

5. **Engage educators, employers, community members, parents, and policy makers in an ongoing dialogue that provides recommendations and advice concerning 21st century education.**
 - M.4: Engage education and community-based technology providers in collaboration efforts.
 - PD.3.5: Candidates in programs for teacher education demonstrate basic computer literacy before initial licensure.
 - F.2.1: Develop innovative methods of funding, with statewide implications, to convert and sustain teaching and learning through educational technology.
 - F.2.2: Provide appropriate new and flexible models of budgeting for technology.
6. **Encourage site visits to NSBA selected schools and develop opportunities closer to home for visits to schools and districts that practice 21st Century Skills in the classroom.**
 - M.1: Promote student centered learning environments that are rich in technology.
 - PD.3.15: All persons presenting professional development should model best practices in effective use of technology for instruction to engage the learner whenever appropriate.
 - PD.3.17: Provide opportunities, incentives, and support for educators to develop models of best practices using technology.
 - F.2.1: Develop innovative methods of funding, with statewide implications, to convert and sustain teaching and learning through educational technology
 - F.2.2: Provide appropriate new and flexible models of budgeting for technology.
 - F.3.4: Leverage discretionary funds to foster innovation in teaching, learning, and assessment in traditional and electronic learning environments.
7. **Develop a video introduction to 21st Century Skills in the classroom as a basic introduction to concepts and practices.**
 - PD.3.15: All persons presenting professional development should model best practices in effective use of technology for instruction to engage the learner whenever appropriate.

C. Manage Technology Infrastructure and Support Standards for Arkansas Schools.

1. **Establish responsibility for ensuring that the standards for technology infrastructure and new facility technologies are followed. Such standards were included in the draft *Arkansas School Facility Manual*. Other standards are implied in the Arkansas Curriculum Frameworks, calling for equipment for classroom and laboratory use specific to the standards. This category of equipment was categorized in the report to the legislature known as the *Unattached Equipment Manual* and must be implemented and funded.**
 - M.5: Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.

- G.3: The state and school districts will develop a robust and reliable security network infrastructure that is capable of supporting advanced information and educational technology for learning, teaching, and research.
- LTP.1.2: Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.
- LTP.5.1: The district must have access to competent and timely technical support.
- LTP.5.2: The district plan must include a strategy for the installation, replacement, and maintenance of hardware, software, and networking.
- I.1.2: Ensure that the network reflects standards for transferring and securing information.
- I.2.1: Develop a robust and reliable security infrastructure.
- I.2.5: Coordinate and promote staff technical training.
- I.3.1: Significantly increase bandwidth capacity in K-12 institutions in Arkansas over the next two years.
- I.3.5: Provide scalable, robust, and reliable academic systems infrastructure.

2. Provide standards to ensure:

a. Network bandwidth and bandwidth management techniques necessary for schools to engage meaningfully in 21st century learning techniques.

- M.5: Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.
- G.3: The state and school districts will develop a robust and reliable security network infrastructure that is capable of supporting advanced information and educational technology for learning, teaching, and research.
- I.1.1: Provide sufficient bandwidth for each school system's growing needs and evolving Internet-based applications, such as video streaming and teleconferencing.
- I.1.3: Purchase, install, and use network monitoring software to measure bandwidth use, and to promote maximum use and security.
- I.3.1: Significantly increase bandwidth capacity in K-12 institutions in Arkansas over the next two years.
- I.3.2: Encourage school districts to implement campus-area networks.
- I.3.5: Provide scalable, robust, and reliable academic systems infrastructure.
- F.1.2: All students and staff will have access to a modern and effective infrastructure which enhances quality learning.

b. Equipment, such as interactive whiteboards, video projectors, and audio speakers, necessary for schools to provide 21st century learning environments.

- M.1: Promote student-centered learning environments that are rich in technology.
- M.5: Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.
- LTP.1.2: Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.
- LTP.5.2: The district plan must include a strategy for the installation, replacement, and maintenance of hardware, software, and networking.
- PD.2.1: Educators must have access to tools required to support professional development, curriculum, instruction, and assessment, such as laptop computers, classroom Internet connectivity, presentation devices, document cameras, and interactive whiteboards.
- F.1.2: All students and staff will have access to a modern and effective infrastructure which enhances quality learning.

c. Technical support and instructional technology integration training to equip learners (students, parents, teachers and administrators) with the skills necessary to function in 21st century learning environments.

- M.5: Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.
- LTP.5.1: The district must have access to competent and timely technical support.
- PD.3.11: Implement or support the development of Instructional Technology or Technology Integration Specialist positions at all levels.
- I.2.5: Coordinate and promote staff technical training.
- F.3.1: Fund one local technology integration specialist for each education service cooperative.
- F.3.2: Require school districts to hire a technology integration specialist in each Local Education Agency for every 1,100 students.

d. Classroom and laboratory equipment and materials adequate to meet the requirements of the Smart Core curriculum and the teaching of current technology and 21st Century Skills across all curricula.

- M.1: Promote student-centered learning environments that are rich in technology.
- M.5: Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.

- LTP.1.2: Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.

3. Provide for periodic updates to these standards, while ensuring that future funding of infrastructure and new construction is contingent on meeting these standards.

- M.4: Engage education and community-based technology providers in collaboration efforts.
- I.3.1: Significantly increase bandwidth capacity in K-12 institutions in Arkansas over the next two years.

4. Strengthen data collection and analysis that tracks the technology resources available in Arkansas schools in terms of quantity and quality, in order to assist in the assessment of technology infrastructure and compliance with standards by making permanent the data collection and analysis system developed as part of the 2008 eDATA (Education in Arkansas Technology Assessment) project.

- G.2.3: Each school district will develop, implement, and evaluate a plan for technology use that ensures every school has access to digital content and professional development in using technology across the curriculum.
- F.2.3: Continuously assess and evaluate technology investments and implementations.

D. Explore Shared Use of Facilities and Technology Resources.

1. Encourage all levels of education, including K-12, university, and workforce, to collaborate on ways to share facilities and technology resources to better meet the needs of the state.

- M.4: Engage education and community-based technology providers in collaboration efforts.
- LTP.1.2: Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.
- PD.3.5: Candidates in programs for teacher education demonstrate basic computer literacy before initial licensure.
- I.1.1: Provide sufficient bandwidth for each school system's growing needs and evolving Internet-based applications, such as video streaming and teleconferencing.
- F.1.2: All students and staff will have access to a modern and effective infrastructure which enhances quality learning.
- F.2.1: Develop innovative methods of funding, with statewide implications, to convert and sustain teaching and learning through educational technology.
- F.2.2: Provide appropriate new and flexible models of budgeting for technology.

- F.3.1: Fund one local technology integration specialist for each education service cooperative.
 - F.3.4: Leverage discretionary funds to foster innovation in teaching, learning, and assessment in traditional and electronic learning environments.
 - F.3.5: Solicit federal funding and private grant foundations for innovative educational technology projects.
- 2. Collaborate with Connect Arkansas and other partners to provide technology access and support in all areas of the state.**
- M.4: Engage education and community-based technology providers in collaboration efforts.
 - I.1.1: Provide sufficient bandwidth for each school system's growing needs and evolving Internet-based applications, such as video streaming and teleconferencing.
- 3. Encourage each school district to work with the eCommunity projects of Connect Arkansas as it identifies community needs for school improvement and economic development.**
- M.4: Engage education and community-based technology providers in collaboration efforts.
 - F.2.1: Develop innovative methods of funding to convert and sustain teaching and learning through educational technology, and build local, regional, and statewide capacity.
 - F.2.2: Provide appropriate new and flexible models of budgeting for technology.

E. Authorize Continued Citizen Involvement

- 1. Establish a permanent advisory committee to the Arkansas Science & Technology Authority to review the activities above, to provide oversight, and to evaluate strategic direction and progress.**
- M.4: Engage education and community-based technology providers in collaboration efforts.
 - G.4: Arkansas state funds and federal technology funding streams will be aligned with other state efforts to support high-need and low-resource schools in obtaining the fiscal resources needed to purchase, install, and maintain up-to-date technology hardware and software.
 - PD.3.5: Candidates in programs for teacher education demonstrate basic computer literacy before initial licensure.
 - I.2.2: Advanced information and educational technology in support of learning and discovery.
 - F.2.1: Develop innovative methods of funding, with statewide implications, to convert and sustain teaching and learning through educational technology
 - F.2.2: Provide appropriate new and flexible models of budgeting for technology.

- F.3.3: Coordinate funding processes to maximize benefits to schools in the acquisition, maintenance, and use of technology.
- F.3.5: Solicit federal funding and private grant foundations for innovative educational technology projects.

2. Membership of this advisory committee shall include representatives of all stakeholders: state agencies, classroom educators and administrators, business community, and STEM professionals.

- G.5: The Arkansas Department of Education will seek ongoing input, feedback, and assistance from representatives of all sectors of the education community, as well as community-based technology providers, to collaboratively develop, implement, evaluate, and revise the educational technology plan for Arkansas.
- PD.3.5: Candidates in programs for teacher education demonstrate basic computer literacy before initial licensure.



Authorization and General Initial Proceedings and Recommendations

Arkansas Code Annotated Section 6-16-319-Acts of 2005

6-16-139. Technology curriculum.

(a) In order to prepare public school students in the State of Arkansas for successful participation in a growing knowledge-based economy and technology-rich world and to improve student achievement, the public school curriculum must integrate technology into the educational process.

(b)(1) In order to further the intent of this section, the Arkansas Science and Technology Authority shall develop a knowledge-based technology curriculum for use in grades seven through twelve (7-12). The curriculum shall be organized into a scope and sequence that constitutes a plan for achieving the educational objectives necessary for an adequate education as described in § [6-20-2302](#) and shall include the following components for each course in the curriculum:

(A) A collection of the substantive material used to teach a particular subject matter;

(B) Lesson plans; and

(C) Recommendations for activities and other learning processes.

(2) The curriculum shall be developed in sufficient time to allow for implementation in the 2007-2008 school year.

History. Acts 2005, No. 2266, § 1.

Executive Summary

Act 2266 (Arkansas Code Section 6-16-319 – Acts of 2005) was passed to address the challenges for education, economic development and community development brought on by the emerging global economy of the 21st Century. As a step toward meeting these challenges Act 2266 authorized the Arkansas Science and Technology Authority (ASTA) to develop a knowledge-based technology curriculum, with lesson plans and related materials, for use in Arkansas Public Schools, grades seven through twelve. ASTA, in cooperation with the Arkansas Science Technology Engineering and Mathematics (STEM) Coalition, established a Task Force of volunteers to assist in the process and to develop further legislative recommendations in this area. This is a progress report on that endeavor.

At the time of the last report to the Advanced Communications and Information Technology Joint Committee, the Task Force and ASTA had determined an approach to the curriculum. Rather than attempt creation of a series of new technology courses that would soon become dated, the Task Force selected an appropriate new technology and media, a web Portal, to host continually updated lesson plans and materials that met three criteria for content.

- (1) They address objectives in the Arkansas frameworks for core educational content;
- (2) They have a technology component that will assist in preparing Arkansas students for a technology rich world.
- (3) They include practice of knowledge-based or 21st Century skills that prepare students for the emerging challenges of a global economy. (The wording “21st Century Skills” is more common in educational usage than “knowledge-based” skills and is used by the Task Force for this reason).

Since Act 2266 had no accompanying appropriation, ASTA provided some funds and leveraged existing grants to develop the portal. The Task Force took on the task of raising private funds to cover other expenses, including involving teachers in the process. With the help of the Arkansas Community Foundation, the IMPAC Technology in Education Endowment and other sources, the funds were raised. The Arkansas Department of Education (ADE) contributed funds for professional development for teachers contributing or utilizing the portal.

During 2006 the Task Force was involved in many activities as detailed in the body of this report. These activities involved a large and varied group of individuals from state agencies, school districts, business and philanthropy and included:

- Over two dozen Task Force, Steering Committee and sub-committee meetings of various types, involving dozens of volunteers and presenters,
- Industry panel, which focused on helping the Task Force understand the skills needed in 21st Century enterprises,
- A symposium held in April 2006 called “Thinking Outside the Box” with nationally known guest speakers.

To gain broader insight into technology and education, Task Force members attended several meetings or conventions, for views of the future of technology and the role of 21st Century thinking skills in education. These events included:

- The annual National Educational Computing Conference (NECC) meeting, sponsored by the International Society for Technology in Education (ISTE) held in July 2006 San Diego, California,
- Apple Computer R & D facility visit,
- The annual National School Board Association T+L educational technology meeting held in Dallas, TX in November 2006,
- The Hot Springs Technology Conference, held in Hot Springs, AR in June 2006, and
- Site visits to schools with significant investment in educational technology

Several of the Task Force meetings focused on construction of the SMART Portal, including meetings with the developer, Information Network of Arkansas (INA). This chain of activities led to the actual construction of the web site. To develop the initial lesson plan content two teacher workshops were held --one at UALR and a second at UAF, to initially develop approximately 80 lesson plans for the Portal. The Portal currently is capable of providing access to lesson plans, organized by course and by the specified elements of the Arkansas educational frameworks. Additional information in the database covers how the lesson plans integrate technology and practice on 21st Century Skills. Several web pages illustrating the Portal in operation are included as an Appendix to this report.

Improvements to the Portal continue. Additional workshops are planned to add lesson plans and materials and after the initial focus on Science and Mathematics, other subjects will be added. Professional development efforts will include training in how to develop lesson plans for inclusion in the Portal database, and development of on-line training units for classroom teachers on the use of the Portal. ASTA has held coordination meetings with ADE and AETN to guide the way toward the eventual integration of the SMART Portal into other ADE and AETN online portals.

Early in the history of the Task Force the group decided to look for similar efforts elsewhere. This search found the Partnership for 21st Century Skills, a broad national coalition formed to address the educational and economic challenges of this century. These challenges include:

- The nature of education is changing internationally.
- The nature of competition is changing internationally.
- The nature of workforce, jobs, and skill demands is changing internationally.

The Partnership has a very useful web site, www.21centuryskills.com, and has published reports and materials. Some of the basic materials are included in the Appendix to this report. Others can be downloaded or ordered from their website. The Partnership's concerns are parallel to the thrust of Act 2266. They addressed competency in Core academic subjects, coupled with literacy in information and communications technology, and development of advanced learning and thinking skills. To these categories the Partnership adds 21st Century content in global awareness; financial, economic, business and entrepreneurial literacy, civic literacy, and health and wellness awareness. They also provide a means of assessment for the success of programs based on their vision. Multiple states, including North Carolina and West Virginia, have adopted the methods and standards of the Partnership.

Partnership for the 21st Century materials have been presented at Task Force meetings and at the symposium, and Task Force members have met with the Partnership Executive Director and

hope to invite representatives of the Partnership to Arkansas to talk to key individuals and organizations. At the same time ADE has been exploring the Partnership. Jim Boardman of ADE will speak at the December 1, 2006 Task Force meeting on this topic.

In addition to Portal development issues and exploration of the Partnership for 21st Century Skills, the Task Force held a writing retreat at the Cox Building in Little Rock in July. The focus of this retreat was to articulate recommendations that would advance the integration of technology and 21st Century skills in Arkansas classrooms. The group narrowed its focus to the four recommendations that follow in the next section of this report. Briefly, the recommendations are:

1. Accelerate SMART Portal Development
2. Participate in the Partnership for 21st Century Skills
3. Manage Technology Standards in Schools
4. Explore Community Learning Center concept

The Task Force believes that quality education is the pathway to Arkansas' future on a broader international playing field. Several Arkansas school districts are experiencing success in providing quality education in positive learning environments where most students have strong parental and community support. These schools have generally introduced traditional as well as technology based curriculum enhancements. Some are embracing the 21st Century skills for K-12 learners developed by the Partnership for 21st Century Skills. Emerging models, including the SMART program currently being developed in Arkansas, are providing additional ways for school districts to achieve superior academic results and to better prepare learners for the challenges of the 21st Century.

The initial proceedings provide the reader with an accounting of the work of the Task Force from October 4, 2005 through November 10, 2006.

Legislative Recommendations of the Technology Committee

A. Accelerate SMART Portal development in partnership with AETN, ADE & ASTA

The Technology Committee advocates and endorses the continued development of the SMART Portal database of lesson plans and materials for teachers. This database is linked to the Arkansas Frameworks and enhanced through the development of skills in the use of technology and the acquisition of knowledge-based skills required for the 21st Century. This will require funds in the budgets of the cooperating departments to supplement costs covered during the past year by grants and public donations secured by the Committee.

B. Participate in the Partnership for 21st Century Skills

The Technology Committee endorses efforts by ADE to move Arkansas into full participation in the Partnership for 21st Century Skills, joining other states, including North Carolina and West Virginia. The Partnership for 21st Century Skills is an established coalition that supports well-defined educational strategies for full participation in the 21st Century global economy. The Technology Committee believes the direction of the Partnership is consistent with the goals expressed in Arkansas Act 2266 of 2005.

C. Manage Technology Infrastructure Standards for Arkansas Schools

- Assist in establishing responsibility for ensuring that the standards for technology infrastructure and new facility technologies are followed. Such standards were included in the draft *Arkansas School Facilities Manual*, which used assessment rubrics (also included in the manual).
- Provide periodic updates to these standards, as well as ensuring that future funding of infrastructure and new construction is contingent on meeting these standards.
- Reinstate data collection and analysis that tracks the technology resources available in Arkansas schools in terms of quantity and quality, in order to assist in the assessment of technology infrastructure and compliance with standards.

Rationale: Appropriate technologies are imperative to support enriched learning environments in which students can practice 21st Century skills as they find and utilize current information and resources and apply their academic skills in solving real-world problems. Without adequate 21st Century skills and their technology infrastructure, students will enter the workforce and/or higher education without needed skills and experience. If there are no uniform standards, there will be potential inequality between schools and districts. Providing technology infrastructure in new buildings is less expensive than adding technology at a later date.

D. Explore Community Learning Center Concept

Assist in establishing a task force with interagency and public members to explore the concept of community learning centers. These facilities are for enriched learning with technology resources, shared by K-12 education, higher education, workforce education, and life long education to promote efficiency and foster synergy.

Rationale: In the 21st Century every community needs access to all levels of education in order to provide opportunities for individual improvement and economic advancement while supporting requirements of local industry and business. While distance learning and other tools have a place, hands on access to technology in classrooms and laboratories is also imperative. It may be advantageous to invest in shared facilities and staff, rather than duplicate facilities and staff. Other states have established similar learning centers for use by community colleges and local high schools. It is one possible approach to providing equal access to advanced facilities with prudent fiscal management.

**Overview and Rationale for Act 2266
Relative to a Grade 7-12 Knowledge Based
Technology Curriculum**

OVERVIEW

Arkansas Science & Technology Authority Strategy for Addressing Act 2266

Act 2266 (Arkansas Code Annotated Section 6-16-319-Acts of 2005) authorized the Arkansas Science and Technology Authority (ASTA, or the Authority) to develop a knowledge-based technology curriculum for use in grades seven through twelve. Toward this end, ASTA formed a Task Force to support the effort to evaluate the needs, plan strategies, and develop materials for integration of technology into the public school curriculum. The Task Force to Integrate Technology into Public School Education (Technology Task Force) was organized, as a subcommittee of the Arkansas STEM Coalition (STEM – Science, Technology, Engineering and Mathematics) in order to incorporate a broader focus of business and industry participation and assistance in identification of the skills needed for 21st Century knowledge-based jobs. The STEM Coalition appointed Mr. John Chamberlin (STEM Coalition Board member) to head this Task Force. Mr. Chamberlin then worked with the Authority to select a Steering Committee for the Technology Task Force. This Steering Committee (listed on the first page of the Chronological Meeting Minutes and Subcommittee Reports, which follows the Overview) helped to identify the sectors that should be represented on the Task Force and to nominate individuals with special expertise for the membership. The first meeting of the Task Force (38 members attending) was held November 8, 2005.

Attached to this report are copies of meeting minutes of significance that connect this program to the recommendations developed by the Task Force, and a synopsis of the technology activities and materials related specifically for Act 2266. Included also in this report are a number of resource materials relevant to the work of the Technology Task Force, members of the Task Force and synopsis of information from out-of-state consultants and national technology education specialists that communicate the body of the work produced for the Advanced Communication and Information Technology Committee of the Arkansas Legislature.

The committee has met approximately every other month over a thirteen month period of time with the steering committee meeting beginning three months earlier, and meeting much more frequently. Through this body of work the Task Force has produced a report to a legislative subcommittee and an initial set of materials for use by teachers in Arkansas schools. The Task Force's intent from its inception has been to build upon other related studies (including the work of the Technology in Education Task Force of 2004 and other educational initiatives) as well as discern the future landscape of change in the workplace and the changing innovations in technology. Acquiring a working definition of knowledge-based technology curriculum was recognized as the first major task of the Task Force.

Background and Rationale in addressing Act 2266

ACT 2266 of the 2005 legislative session resulted in a directive which was targeted at *preparing Arkansas students to successfully participate in a knowledge-based economy and a technology-rich world and to improve student achievement*. The law stresses that the public school curriculum must integrate technology into the educational process. The law goes on to direct the Arkansas Science and Technology Authority (the Authority) to develop a knowledge-based technology curriculum which includes a collection of materials, lesson plans, and activities for this purpose.

The Task Force for the Integration of Technology into Public School Education (Technology Task Force), which the Authority helped to organize in the fall of 2005, has approached this monumental task in a very positive way. The Steering Committee of this Technology Task Force determined that the desired results called for in the act (improved achievement, ability to work in the Knowledge-Based Economy, and familiarity with various useful technologies) could best be achieved by integrating technology into the existing curriculum, not by adding a series of technology specific courses. The present effort of the Technology Task Force builds on other efforts past and present, and is complimentary to those of the Department of Education, as well as efforts in Workforce Education, Economic Development, Higher Education and Arkansas Science and Technology Authority.

One critical focus area of the Technology Task Force is the relationship of the workforce skills of youths in our communities and the impact that the “lack of these skills” will have on community development. The Technology Task Force has worked with representatives of several knowledge-based companies in Arkansas to define the skill sets that will be required for employment in the 21st Century Workplace and to gain industry perspective on the technology skills that young people must possess in a competitive “global” economy. The Task Force recognizes that communities will need to focus on education and the development of 21st Century Skills. The proposed effort of the Task Force is a step in that direction. Students preparing for the 21st Century Workforce must have a balance of conceptual and procedural knowledge. Therefore, the Arkansas Technology Task Force is working with a list of 21st Century Skills related to technology use in the workplace that was developed by business and industry leaders in the United States who are coping with transitions in curriculum.

The Arkansas Department of Education (ADE) recently released a new set of benchmarks for student learning that also must be considered. The work of the Technology Task Force is specific in its intent. The activities and recommendations that will be outcomes will impact Arkansas classroom teachers in most academic subjects. The activities will be designed to connect many learner outcomes to technology use. We believe this is one of the most direct ways to help students move toward being prepared for employment in a technology-based economy. This is one approach that can be replicated in Arkansas and shared with other states.

The Arkansas Department of Education (ADE) continues to monitor the multi-state initiative known as the Partnership for 21st Century Skills. This educational model and the instructional techniques employed incorporate the content, context, core subjects and information-communication technology as well as assessment techniques that align classrooms with the knowledge-based skill sets needed for future workforce global competitiveness. The Technology Task Force applauds this decision and is committed to working with ADE to implement this program and to help develop lesson materials that utilize these instructional techniques. The

Technology Task Force is also working closely with the Information Network of Arkansas (INA) and ADE/AETN (TRIAND product) to establish a professional development component within the SMART Portal related to development of lesson materials enriched with highly integrated technology skills.

*Although the **long-range goal** is to impact the skill sets of Arkansas students and improve achievement, the **short term goal** of the Technology Task Force is to produce a set of resource materials that will assist Arkansas teachers with the integration of technology skills into the curriculum.* The Technology Task Force determined that by building upon a web-based science and mathematics resource portal already under construction through an outside grant of the Authority funded by the Winthrop Rockefeller Foundation (WRF), they could provide a set of deliverables tied into this web portal for easy teacher access. This *independently funded web portal* will house a cross-referenced database of “one-concept lesson plans” for science and mathematics known as the SMART portal (Science and Mathematics Accessible Resource Tool, SMART). The Technology Task Force plans to produce an “**accessory database of technology activities**” tied to these science and math lesson plans and believes that these deliverables and the infrastructure to facilitate the delivery of these materials would be the beginning of a larger project that the Technology Task Force envisions as a comprehensive resource tool to help teachers integrate technology into their classrooms. Additional funds will be required to accomplish the development of these materials and to enhance and maintain the SMART Portal.

Chronological Meetings and Subcommittee Reports

CHRONOLOGICAL MEETING MINUTES & SUBCOMMITTEE REPORTS

Steering Committee membership:

Chair. Mr. John Chamberlin is an entrepreneur and businessman with expertise as a software developer. His technology background includes a Masters degree in engineering from MIT. In addition, he has many years of experience in the education field as a volunteer in state and local educational activities, included service on the board of the *IMPAC* program, and on the Southern Technology Council. He is innovative in his approach to the Task Force activities, knowledgeable of the impact of education on economic development, and is well-known and recognized within the state for his technology expertise.

Vice-Chair. Mr. Tim Taylor is technology coordinator for Marion School District. Tim has years of experience with systems technology management and the educational and professional needs of teachers within school districts. He is a state leader in promoting educational technology, was a member of the Technology in Education Task Force of 2004, and is the past president of the Arkansas Society for Technology in Education.

Steering Committee Member. Dr. Drew Mashburn is the Chief Enterprise Architect Arkansas Office of the Executive CIO. Dr. Mashburn has experience in educational software having worked with the *IMPAC* program in earlier years and was the past state chairman of the Technology in Education Task Force of 2004.

Steering Committee Member. Ms. Becky Hart is Director of Instructional Technology for the Hot Springs School District. She has worked with teachers for many years examining the individual curriculum taught within the classroom and assisting teachers with innovative ways to utilize technology within the classroom activities. She has also provided extensive professional development for teachers within her school district and was a contributor to the Technology in Education Task Force of 2004.

Steering Committee Member. Dr. Dave Westmoreland is Director of Curriculum, Assessment and Research, Arkansas Department of Education. He has been directly involved with the development of the state's educational framework and assessment of student achievement. Dave served as the liaison with the Arkansas Department of Education in the unified effort.

Steering Committee Member. Dr. Gail McClure is Vice President Research, Arkansas Science and Technology Authority. She was a medical researcher and scientist at UAMS for many years before joining the Authority and also was a public school teacher in her earlier career. As a science professional and an educator, she understands the need to strengthen science and mathematics curriculum in K-12 education. She is also responsible for addressing the Authority's directives under Act 2266.

Evaluator. Dr. Cecil McDermott is a recognized educator, evaluator, and consultant with many years of experience in both curriculum and technology. He has served as State Supervisor of General Education & Mathematics, Hendrix University Professor of Mathematics, Director of *IMPAC* State Technology Program, and evaluator of numerous state and federal grants.

Two steering committee members have retired from the steering committee due to employment demands and changes. 2007 new steering committee members have been added.

New Steering Committee Member. Ms. Margaret Crank Amps is replacing Dr. Dave Westmoreland as liaison for the Arkansas Department of Education. Ms. Amps has technology expertise, having served as a media specialist and senior supervisor in curriculum and assessment. She will continue the coordination of efforts between the task force and ADE.

New Steering Committee Member. Ms. Susan Cromwell Norton is replacing Ms. Becky Hart. Ms. Norton is Chief Information Officer at the Fayetteville School District. She has been active in education and technology efforts in both public and private sector jobs, in local, state and national roles.

At the University of Arkansas from 1988-1997, she oversaw the development of the statewide ARKnet Network Information Center and staffed President Clinton's National Information Infrastructure Advisory Council (NIIAC). She was also the state's first Director of the Office of Information Technology between 1997-2001 prior to joining the Fayetteville School District.

Dr. Drew Mashburn, due to a career change, was unable to continue serving in the final planning efforts of the steering committee and could not participate in the completion of the task force report.

Organizational meeting – Orientation with Steering Committee (10/4/05)

Arkansas Science & Technology Authority Conference Room

(9:30- 4:00)

Committee members attending: John Chamberlin, Tim Taylor, Drew Mashburn, Becky Hart, Prentice Dupins, Dave Westmoreland, Gail McClure

Agenda:

Discuss what integrating technology into the curriculum means

Define directives of Act 2266

Determine how we wish to interpret directives for purpose of taskforce initiatives

Define Mission, Timeline, and Resources needed

Mission Statement:

Projected timeline & regular meeting schedule (for taskforce & for steering committee)

Resources needed for the tasks (resources needed by steering committee, by taskforce & by school districts for later implementation)

Topics discussed during the day:

Define Vision of the Task Force

What benefit integrating technology into curriculum will produce for Arkansas.

How Arkansas will be different in 10 years.

The vision in the act is section A. It wants to 1) improve student achievement and 2) students need the skills to participate in a knowledge-based, technology-rich world.

What does “knowledge-based” mean? Is it the replacement for “skill-based” or “trade-based”?

CEOs say this means people with a broad understanding, good communication skills, team-based thinker and problem solver, creative and flexible in finding solutions in new situation, good at developing skills of how to obtain helps.

The following questions raised by the committee during the ensuing discussion:

What national/international programs have been developed to teach information literacy and computer technology literacy to students?

Is this the model that ISTE NETS promotes? What about the EAST model?

How would this model work with our high-stakes testing model, which is focused on the mastery of a body of content knowledge?

Is it possible to ask the legislature what it intended in this act or are we to just interpret it?

How many established, defined frameworks are available from ADE and ADWE?

How do we integrate this into the existing stuff (frameworks, assessments) and not add anything else on top?

How do we develop lesson plans to help teach curriculum?

How to develop or collect materials and activities that will be easier for teachers to find and use in their teaching?

How do we list in broad terms, the basic technology skills that students need (how to analyze data in databases, how to do multimedia presentations, etc.) and then build lesson plans around the skills?

Define the term “knowledge-based” in relation to K12 and higher education curricula and technology, economic development, and business issues.

Define the capabilities/skills needed to address the definition of “knowledge-based”
Broadly as something along the line “CEOs say this means people with a broad understanding, good communication skills, team-based, thinker and problem solver, flexible in finding solutions.” (knowledge-based skills)
Specifically, the application of technology-based tools and resources (presentation tools, communication tools, data analysis and manipulation tools, information management and analysis, research) (technology tools)

Locate in the existing curriculum frameworks potential areas to appropriately and effectively integrate knowledge-based skills and technology tools. The criteria for determining appropriateness and effectiveness are to improve student achievement and to prepare students for 2 A. and B.

Identify and/or develop resources (lesson plans, materials, activities, or professional development) for teachers to implement the curriculum required by Act 2266. (ASTA’s SMART information can be used in the area of science.)

Develop the project plan, including broad applications for all frameworks and specific application for science, technology, engineering, and mathematics (STEM) areas, for implementation during the 2007-2008 academic year.

Is there anything that can be measured from this plan? Possibilities include an assessment of the students in meeting 2 A. and/or B. or the usage data from the tools provided by #4.

Define Taskforce Structure & potential candidates to fill positions (Stakeholders):

Legislative committees (to whom report will go)

ADE & State Board of Education

ASTA Board

Arkansas STEM Coalition Board

ADED / Accelerate Arkansas (business leaders)

AETN

Educational cooperatives

Interested foundations (WRF, ARCF, Arkansas for Educational Reform, Walton Family Foundation)

Technology & curriculum integration coordinators

ADHE & Higher Ed Institutions

Teachers, principals, superintendents

Related state agencies DIS, ADWE

Arkansas Science Teachers Association & Arkansas Council of Teachers of Mathematics, Arkansas School for Math, Science & Arts

Curriculum Specialists

Business leaders-Knowledge-based Industries** (significant participation)



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October 25, 2005

Mr. Joe Smith
Affiliation
Mailing Address
City, State, Zip

Dear Mr. Smith:

The Arkansas Science & Technology Authority (Authority) invites you to participate in the formation of a Task Force to Support the Integration of Technology in Public School Curriculum. The common characteristic of individuals in this Task Force is a desire to promote and enhance public school education while addressing the directives of Act 2266 (Arkansas Code Annotated Section 6-16-139). A copy of ACA 6-16-139 is enclosed for your review. The work of the Task Force will be attuned to the need to integrate technology into public school core curriculum courses and to develop sound educational plans and activities that will meet that need. This is a particularly critical time in our state since educational reform is a central focus of policy makers.

The Task Force will be composed of leaders from major Arkansas businesses, leaders of the Arkansas legislature and state agencies, and numerous educational leaders with experience in curriculum, technology and the integration of these two fields. The purpose of the Task Force is to:

- determine the action to be taken under ACA 6-16-139;
- serve as a think-tank for sharing and brainstorming ideas to address the means for integrating technology into public school education;
- promote educational skills that will affect our future workforce;
- advocate educational technology models that have proven success in classrooms;
- produce a set of deliverables that will allow integration of technology into core curriculums; and
- influence educational policy in support of integrating technology into curriculum to strengthen education.

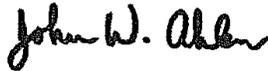
The Authority is promoting the formation of the Task Force because it recognizes that educational reforms will improve skills in math, science and technology thereby strengthening the workforce knowledge base and leading to economic benefits for Arkansas. It is evident that economic development, now more than

ever before, is heavily tied to global competition and the knowledge base of our workforce.

The Authority is hosting this initial meeting and we hope you will support this effort by your presence as well. The initial organizational meeting is planned for **Tuesday, November 8**, from 10:00 A.M. until 2:00 P.M at the **Arkansas State Police Headquarters Building**. The Headquarters is located in Little Rock off I-30 at the Geyer Springs Road exit. The meeting will be in classroom C. A photo ID is required for admission into the building.

This endeavor is important to Arkansas. Your participation in this endeavor is critical and your input will be valued. If you are **unable to attend** this important organizational meeting, we hope you will **appoint a designee**. If you, or your designee, are willing to contribute time and talent to this effort, please contact Dr. Gail McClure at (501) 683-4400 so we can plan the appropriate number of lunches and prepare nametags. Future meetings of the Task Force will probably occur every other month through the next year. We hope you will participate in this worthwhile project and look forward to seeing you November 8 at the organizational meeting.

Sincerely,



John W. Ahlen, Ph.D.
President



Gail Y. H. McClure, Ph.D.
Vice President Research

GYM

Enclosures

Steering Committee Meeting (10/18/05)

John Chamberlin will prepare the Powerpoint presentation for the Nov. 8th first taskforce meeting (State Police Headquarter, Room C). He encourages other steering committee members to send him their suggestions via emails. John's presentation will include the following items:

- Identify the taskforce, its missions and goals
- Lay out the timeline
- Form subcommittees
- Identify subcommittees' responsibilities

Business: Gail will contact people in business areas, SBC (Belinda), Acxiom, Alltel, Trinity and BEI.

Drew Mashburn will contact Apple for a possible representative. The committee suggests 6 business representatives in the taskforce board.

School: Gail will contact the Malvern retired principal and Math/Science specialists and Pam at Fordyce school. Drew will contact language art & social science specialists.

Nov. 8th meeting agenda will include:

- Orientation (summary of the Act, Taskforce goals and missions, timeline, raise the question of funding)
- Approach (discussion of the 5 points from the first Steering committee, feedbacks from the taskforce members)
- Lunch break
- Brainstorming on "knowledge-based"

ASTA will send out an invitation letter to all members who are being invited to the taskforce board. ASTA will also send a letter to all Teachers'/specialists' principals to inform them of the taskforce and ask their permissions of their teachers' representation.

Timeline:

- 05-06: Define/Plan/Budget
- 06-07: Sell/Fund
- 07-08: Execution
- 05-07:** Develop/Roll out and get ready for 07-08 execution
 - technology tool/skill inventory
 - math framework
 - science framework
 - resources (put links to the available resources)

Budget:

- Ideal: \$100,000
- Okay: \$30,000-\$60,000
- Volunteer: \$10,000

Task Force Planning Meeting (11/08/05)
Arkansas Police Headquarters
10:00 a.m. – 1:30 p.m.

John Chamberlin, Chair of Technology Steering Committee, called the meeting to order at 10:00 a.m. at the State Police Headquarters, Room C.

Thirty Task Force members attended the meeting. (see the attached page for member names)

Introduction of task force members

John Chamberlin explained the background of the task force:

- Background – Economic
- Knowledge-based definitions
- Stakeholders in Knowledge-based economy
- Organizations in education
- Background – educational
- Arkansas Math, Science and Technology Coalition and its missions/goals
- Task Force composition
- Task Force purposes

Knowledge-based definitions: it was pointed out by business representatives at the task force that from business perspectives the application of technology based tools (e.g. Presentation and media tools, communication and networking tools) are not knowledge-based but are simple basic skills/applications. Task force also agreed that the integration of technology in curriculum should start at earlier grades instead of in 7th grade (as described in the Act)

One of the important functions of the task force is to encourage teachers to incorporate technology applications in their classes.

The task force agreed that it is important to train teachers and administrators first, so that they understand the importance of the integration of technology in curriculum and know how to teach. AETN is cooperating with ADE on an online professional development project. Tim Taylor gave an overview of resources that have standards available as guides for Task Force planning.

Gail McClure introduced the SMART grant program of the Authority. The SMART website is under construction but could be used as a base for the educational portal needed to support a technology enhancement initiative. Currently, the SMART program is designed only to cover the subjects of math and science. The Steering Committee anticipates that this program could be expanded to include technology and other subjects. With this resource tool teachers across the state can easily access this site for ideas of how to integrate technology into their learning. The Task Force agreed that could be a great resource tool for the teachers in the state and a base on which to build.

Task Force agreed to present the preliminary product (the expansion of SMART website) to the legislature when it is available. The Task Force hopes to get further direction by getting on the legislative agenda to give Task Force update at education committee meeting and to

seek financial support at 2007 legislature session. Discussion also focused on how to gain immediate necessary funding for the collection and preparation of the technology materials that would be incorporated into the SMART website.

Subcommittees were appointed:

Funding Committee: Cecil McDermott (Chair), Gail McClure, John Chamberlin and Melinda Faubel.

Resource Committee: Tim Taylor (Chair), Karen Chisholm, Robin Finley, Kathleen Stafford and Tom Burnett

Science Committee: Sue Choitz (Chair), Vicky Timmons, Kathy Prophet, Linda Kellim, Brian Monoson and Rebecca Reed

Math Committee: Brad Roberts (Chair), Barbara Wilder and Sheryl Cox

Knowledge-based definition/defining skills: Keith Harris (Chair), Drew Mashburn, Elizabeth Bowles and Tom Burnett

Next meetings:

Nov. 30, 2005: The Steering Committee and subcommittee chair meeting will be held at the Authority's conference room, 10:00 a.m. – 1:00 p.m.

Jan. 17, 2006: Task Force Meeting will be held at the State Police Headquarters, Room B, 1:00 p.m. – 4:00 p.m.

Infrastructure Subcommittee of Task Force meeting with INA (11/30/05)

On November 30, 2005, the Task Force Steering Committee on Knowledge Based Curriculum (ACT 2206-05) appointed a subcommittee to work on infrastructure related issues. The infrastructure subcommittee met December 7, 2005 in the ASTA Board Room and discussed the relationship between the delivery of curriculum as it relates to technology curriculum and the SMART program as it relates to science curriculum. Cathy Heath, Project Manager for the INA (Information Network of Arkansas) attended the subcommittee meeting as a consultant.

The infrastructure subcommittee embraced the goals and objectives of the SMART Project and envisioned its expansion to include an information delivery system for aspects of a technology curriculum for public schools. In fact, there were suggestions that perhaps over time the SMART website would relate to grades 5-12 curriculum/activities/resources for science, mathematics and technology. The committee decided to pursue this idea in order to clarify the technical aspects of the SMART website and those of an expanded website at some future date that might accommodate such a progression.

On December 9, 2005, Cathy Heath, INA Project Manager for the SMART website provided the technical requirements for the SMART Project. Therefore, ASTA was in a position to receive input from the Task Force Subcommittee on Infrastructure as ASTA continues its contractual relationship with INA for the development of the SMART website. This interest by the members of the Infrastructure Subcommittee with technical experience has led to a small "think tank" of persons that are essentially pursuing a common goal.

The work and recommendations of the Infrastructure Subcommittee of the Knowledge Based Curriculum Task Force will be monitored by the ASTA External Evaluator as to the value of the ideas as it relates to science minigrant and STUART Grant programs as well as the SMART website and the development of hands-on activities for teachers. It is reasonable that the defining characteristics for teacher developed activities under the SMART program should reflect a broader perspective on similar materials in science, mathematics and technology. The descriptors of the various components of a format for presenting hands-on activities will need to be technically linked to aspects of the website user interface.

Current members of the subcommittee include Dr. Gail McClure (ASTA), Joel Rush (Hot Springs School District), Ed Darbonne (East Project) and Drew Mashburn (Arkansas State Government – Executive CIO)

Task Force Steering Committee and Subcommittee Chair Meeting (11/30/05)
Arkansas Science & Technology Authority Conference Room

Gail McClure reviewed the Authority's minigrant program. The minigrant provides \$500 awards to middle school teachers to purchase consumable science materials and science kits. After four years of minigrants, minigrant teachers have accumulated many valuable activities which can be disseminated to other teachers as the database for SMART project is developed.

Gail reviewed her visit to the Learning Institute at Hot Springs. Mr. Joel Rush, the director of the Institute, is very experienced and will help the committee with the organizational framework and structuring of the database website.

Gail suggested establishing another subcommittee under the task force – infrastructure committee. This committee will be made up of: Ed Darbone, Cathy Heath, Joel Rush, Elisabeth Bowles, Tim Taylor, Gail McClure and Drew Mashburn. Gail and Drew will co-chair the committee. The function of this committee is to determine how the database should be structured to make it efficient, robust, and user friendly, and still retain the capacity to be expanded in the future. The suggestion was approved by the steering committee.

Keith Harris stated that the mission/tasks of the Knowledge-based definition/defining skills committee will include: 1) an understanding of the meaning of “knowledge-based”; 2) and inventory of the skills that are necessary to compete in the world/marketplace; and 3) a definition of skills in each grade level. The skills include not only technical skills but also the skills that employers are looking for, like higher-level thinking and problem solving skills. It was recognized that the mission is dynamic and constantly changing. Sue Choitz suggested the committee seek more information from other states. Maine and Massachusetts have done something similar which can be a useful model for our state.

Gail suggested presenting an overview of the Task Force's activity to date to legislators (the Joint IT Committee). The Task Force can then seek confirmation of future plans and suggestions if available.

Sue Choitz stated that the mission of Science committee is to examine the products of Keith's committee and determine how to apply them to science framework. If necessary, they may wish to revise the knowledge-based definition. The Science committee will work closely

with Math/Science resource centers to select master science teachers and good activities and to identify common technologies and technologies that future employers expect students to master.

Barbara Wilder stated that the mission of the Math committee will be similar with that of Science committee. She reported that Brad Roberts and Sheryl Cox were planning to start working with Math committee.

Becky Hart suggested inviting nationally known experts in math/science areas for brainstorming.

Cecil McDermott reported the progress the funding committee has achieved for far. The Funding committee has secured \$10,000 from endowment funds from ARCF (Arkansas Community Foundation). The committee is still in discussion with ARCF concerning contracts for administration of this funding and future fund. John Chamberlin will report to the STEM Coalition on the issue of contracts/administration of funding. The committee suggested reporting this to the legislators to insure that they are aware of how the Task Force is attempting to address the lack of appropriation for the work required.

John Chamberlin will contact Tim Taylor about the Resource Committee activities and report for the next Task Force meeting (January 17).

Drew Mashburn stated that he will work with Gail to get the infrastructure committee together and formulate the mission of the committee.

Agenda and Jan. 17 Task Force Meeting:

Subcommittee reports—email the one-page report to Gail prior to the meeting

Redesign the resource database diagram

Discussion of the visit with Joint IT Committee

Infrastructure Committee Meeting (12/7/05)

Arkansas Science & Technology Authority Conference Room

Members in Attendance: Drew Mashburn, Ed Darbonne, Joel Rush, Cecil McDermott, Gail McClure, Cathy Heath

Guests: Lecia Willis and Cathy Ma

Drew Mashburn called the meeting to order at 11:20 a.m. Mr. Mashburn stated that the Infrastructure Committee was established at the Steering Committee and subcommittee chair meeting on November 30, 2005. The Infrastructure Committee will work with other subcommittees (Funding, Resource, Science, Math and Knowledge-based Committees) to complete goals of the Task Force – to develop a knowledge-based technology curriculum for grades 7-12 for the **2007-2008** school year; including substantive materials, lesson plans and resources. The Infrastructure Committee's work will be focusing on the portal design and construction aspects of this project.

Gail McClure reviewed the Authority's SMART Grant (Science and Mathematics Accessible Resource Tool). The focus of the SMART Grant is to develop an online access tool for statewide sharing of a series of one-concept lesson plans that incorporate materials generated from the Authority's minigrant projects. The SMART grant is a web-based accessible resource tool which can grow vertically for grade levels and/or expand horizontally to other disciplines. INA (Information Network of Arkansas) is working on the SMART grant website.

Dr. McClure stated that the SMART website can be used as a base to build the database by integrating technology. Lesson plans will be generated by teachers who received minigrants in the past. Lesson plans will also be imported from other sources. If lessons are secured from other sources, it is important to screen, review and select the best lesson plans. Also, it is essential to obtain permission to use them on the website and keep them updated.

Cathy Heath introduced the technical aspects of the SMART grant. The SMART website is a password protected site. Teachers are required to fill in some basic information (name, school, email, grade level, etc.) when they first visit the site. The information will be used for the Authority's evaluation and continuing assessment of this program. Also, updated information of new activities on the site will be sent to teachers on a regular basis via email (e.g. weekly newsletters).

Joel Rush suggested that each activity should contain a framework code and a technology code. Activities could be tagged with information that is searchable by subject, technology, instructional setting (lab, team work...), framework number, grade level.

Dr. McClure commented that teachers who attended the summer SMART workshop will code each lesson plan with its correlated science framework. The ADE (Arkansas Department of Education) will check the accuracy of the codes. Some good resource links (e.g. Eisenhower Clearinghouse for Mathematics and Science) will be added to the SMART website. These links will give teachers who visit the SMART site an opportunity to review similar sites.

Mr. Mashburn encouraged committee members to email Cathy Heath their minimal requirements for the technology website.

Next meeting:

Time: Jan. 18, 2006, from 9:00 to 10:00 a.m.

Place: INA conference room

Pre-INA meeting: Ed Darbonne, Joel Rush, Gail McClure, Drew Mashburn and Elizabeth Bowles will meet (before INA meeting) to prepare some materials for discussion at the INA meeting.

Infrastructure Committee: Drew Mashburn, Gail McClure, Ed Darbonne, Joel Rush, Tim Taylor, Elizabeth Bowles, Cathy Heath, Kim Cooney, and Cecil McDermott (SMART External Evaluator).

Task Force Steering Committee Meeting (1/17/06)

11:45 a.m. – 12:45 p.m.

Attendance: John Chamberlin, Drew Mashburn, Gail McClure, Becky Hart and Tim Taylor
Guests: Cecil McDermott (program evaluator) and Cathy Ma (Authority staff)

Cecil McDermott reviewed his conversation with Dr. Tom Burnett about the visit to the Apple Headquarters in Cupertino, CA. Dr. Burnett, Director of Strategic Initiatives at Apple Computer, Inc., invited the Steering Committee members to visit the headquarters between March and April this year. They talked about where the technology is heading in the future and how that will affect schools and curricula.

Gail McClure will draft a plan for the summer teacher workshop to examine curriculum and technology. The estimated cost for one two-week workshop with six teachers is \$10,000.

The Committee agreed that the portal is a tool complimentary to the state curricula.

The Committee will exchange ideas before the Legislative Technology Committee meeting on January 25, 2006. John Chamberlin encouraged all steering committee members to attend the meeting. At the meeting, the Committee will report the work that the Task Force has done so far and the estimated cost of the entire task. The Committee hopes to receive comments and direction from the legislative technology committee.

Task Force Meeting (1/17/06)

John Chamberlin, Chair of Technology Steering Committee, called the meeting to order at 1:10 pm at the State Police Headquarters, Room B.

Twenty-six Task Force members and guests attended the meeting. (See the attached page for attendance).

Task Force members introduced themselves.

Task Force approved the minutes from Task Force Planning Meeting on Nov. 8, 2005.

John Chamberlin's presentation on Integrating Technology in Public School Classrooms:

- Task Force is organized to address the act 2266.

- SMART portal will be used as a base to build technology database.

- Six Committees are established under Task Force to work on the task—Science, Math, Funding, Resource, Defining Terms and Infrastructure Committees.

- External Resources –AAAS, Skills for 21st Century, Museums, etc.

John Chamberlin asked the Task Force members to email him any comments concerning his presentation. He will make a presentation to the Legislative Technology Committee at 1:30 pm on Jan. 25, in Room 151 at the Capitol.

Gail McClure reported on her meeting with Senator John Paul Capps. Senator Capps was very supportive of the approach the Task Force is taking to address Act 2266.

Infrastructure Committee Report – Gail McClure & Drew Mashburn.

Gail McClure reviewed the SMART grant the Authority received from the Winthrop Rockefeller Foundation to build one-concept lesson plans. Each lesson plan will include objectives of the activity, materials needed, a detailed strategy involved in the activities and performance measures. Each activity will be cross-referenced to the state science framework.

Drew Mashburn reviewed the Infrastructure committee meeting with INA on December 7, 2005 about the basic construction aspects of the web portal and the structural framework that should be developed to accommodate the future needs of this portal. There will be another Infrastructure Committee meeting with INA on January 18 about the technical aspect of the portal. Drew Mashburn encouraged Task Force members to attend the meeting if they are interested.

Defining Terms Committee – Keith Harris.

Keith reported that the committee has been researching knowledge-based skills and technology curricula across the nation. He shared with the Committee an example of North Carolina on Computer/Technology Skills – Focus Areas by Grade (K-8)

Task Force raised the following questions and comments:

How to place us in the global economy?

Where will the society head to under the influence of technology?

Students should not only know how to use technology but also how to apply it to complicated business situations and use technology to participate in the economy. The job of the Task Force is to help students realize this goal.

A list of technology and a list of higher thinking skills (team work, statistic analysis, etc.) need to be generated.

Funding Committee – Cecil McDermott

Cecil McDermott reported that the agreement to establish “The Task Force for Integrating Technology into the Public School Curriculum Fund” at the Arkansas Community Foundation is in the process of being fine tuned. Once the agreement is signed, there will be \$10,000 moved to the Task Force fund from IMPAC.

Gail McClure estimated that the major part of the Task Force fund will be spent on the summer workshops. She expected to have some jobs done by spring 2006 in order to be ready for the FY07 legislative session. Gail stated that she will present the Task Force’s work at Accelerate Arkansas meetings. She hopes to gain more business and industry support.

Science Committee – Sue Choitz

Science committee has not met yet. There is no committee report.

Math Committee – Brad Roberts

Brad Roberts reported the Math Committee will work on the following:

Examine the current framework.

Recommend the best places to incorporate technology.

Develop good in-service to show teachers how to incorporate technology.

Technology is always a tool, it will not replace curriculum but it will help students better understand curriculum

Subcommittee Discussions

Next Task Force Meeting:

March 13, 2006: State Police Headquarters, Room B, 1:00 pm – 4:00 pm.

Subcommittee on Funding Report (1/17/06) Technology Task Force

Projected budget needs related to the work of the Technology Task Force--\$60,000. This does not include any implementation cost.

ASTA has some funds that can be used to meet cost associated with the work of the Task Force.

An agreement establishing “The Task Force for Integrating Technology into the Public School Curriculum Fund” at the Arkansas Community Foundation (ARCF) is in the process of being fine tuned. Once the agreement is signed by the principle parties, ARCF will be authorized to move \$10,000 into the Task Force Fund. This request will be made by the IMPAC Fund advisors, John Chamberlin and Cecil McDermott.

The Subcommittee on Funding is in the process of acquiring the administrative documents necessary to begin approaching various organizations and companies about assisting with the work of the Task Force. It is anticipated that each contributor will choose to do so relative to the accomplishment of a specific area of interest as well as some general costs.

The documents include:

ARCF official tax exempt status letter from the IRS

List of objectives of the Task Force

Budget outline

Copy of the Task Force Fund agreement

Appropriate letters of endorsement

The Task Force Fund administrators will process invoices approved by ASTA and make payments to the payees. Records will be maintained in order to assure that contributors will have a record of all activities conducted by the Task Force that make use of the Task Force Fund.

The Task Force Steering Committee will participate in two meetings with members of the legislature who have an interest in the work of the Task Force. The budget needs of the Task Force will be presented to those legislators prior to additional work being accomplished by the Subcommittee on Funding.

Infrastructure Committee Meeting (1/18/06)
INA Conference Room

Members in Attendance: Drew Mashburn, Joel Rush, Gail McClure, Cathy Heath, Bob Sanders, Jennifer Peper (for Elizabeth Bowles), Tim Taylor and Cecil McDermott (external evaluator)

Guests: Elaine Zhou (Central High student), Michelle Dobson (Central High student) and Cathy Ma (Authority staff). Ken L., joined the meeting via phone.

Drew Mashburn called the meeting to order at 9:10 am.

Drew Mashburn stated that the focus of the Infrastructure Committee is the design of the web portal and the technical functions of the website. INA will design and maintain the portal.

Cathy Heath expressed her concerns of some portal requirements listed in the Requirements for Knowledge Based Curriculum Web Portal. She stated that some of the requirements are out of the original scope of the SMART contract.

The Committee agreed that INA will be in charge of the technical aspect of the database. Cathy Heath stated that INA will design the database in a correct way so that the future updates and expansion will be much easier.

Tim Taylor expects the database has the ability of optional routing traffic of K-12 public schools through the state network.

The Committee agreed that followings are some of the important features of the database:

- Function of the database
- How to organize database contents
- Requirements for search the database
- Maintain database

Joel Rush suggested the database should include more subjects and activities should be developed based on the five strands. He stated it is important to organize contents and search activities on the database.

Gail stated that Arkansas Educational Television Network (AETN) and EAST Lab in Central High have developed many good video clips in STEM areas. She thought some of them would be very helpful to teachers if included in the database. The Committee agreed but stated that if video clips or flashes are being posted on the database, written transcripts will need to be posted.

Discussions of the “Requirements for Knowledge Based Curriculum Web Portal”:
The second item under “Presentation Requirements” will be revised as: “The Portal structure shall be maintained in a database.”

Last bullet under “Page Components”: “A section of headlines of the latest news, updates, articles, events and services”, the Committee agreed that the database should be updated regularly. All activities will be dated. Date will be one of the searchable elements.

The Committee will provide INA a detailed list of the required functionality of the portal before Feb. 1. INA will examine the list and decide whether the requirements lie in the original scope of the contract. The Committee will address any concerns that INA might have. Drew, Gail and Joe will work on the list. After reviewed by the Committee, the list will be discussed at the math/science centers workshop which will be held on Feb. 10.

The portal will be ready for a demonstration in May-June teacher workshop.
The portal will be ready for teachers to download in Sept.-Fall, 2006.

When teachers access the web portal for the first time, they will be asked some questions (no more than 10). The information will be collected for future reports.

The meeting was adjourned at 11:00am.

Steering Committee Meeting (1/25/06)

The Steering Committee of the State Task Force on Knowledge Based Curriculum met in an ADE conference room immediately after the meeting of the Joint Committee on Advanced Communications and Information Technology at the Capitol.

In general, the committee was appreciative of the warm welcome extended by the co-chairs of the legislative committee, attendance, interest shown and the significance of the questions that were asked. Matters of concern by the State Technology Task Force had been addressed.

The steering committee devoted their time to discussing the critical information needed by the Information Network of Arkansas. The information related to the homepage of the website, initial teacher interaction, keywords, etc. In addition there was concern for subcommittee assignments to be well-defined based upon agreed processes and procedures that essentially assure the completion of well-defined tasks in a timely manner.

Time was devoted as to how to get a working draft of curriculum topics that would define a Knowledge Based Technology Curriculum. Developing such a list prior to the March Task Force meeting was established as a priority. Finally, the Steering Committee discussed the need for the involvement of business or telecommunication executives (each represented on the Task Force). It was suggested that time be provided for selected individuals to make presentations to the entire Task Force Committee that are designated to stay within the framework of a working draft of curriculum topics. The Steering Committee seemed to express the view that a vision of the future of technology should include the workplace as well as current and new technologies.

Subcommittee Report on Technology Based Lessons Applied to Science (2/1/06)
Susan Choitz & Brad Roberts

On **February 1, 2006**, Brad Roberts and Susan Choitz met to discuss the math and science content of the lessons teachers will develop along with the selection process of the teachers and their training.

LESSONS

It was agreed the lessons should be inquiry based and make use of modeling. The NSES (National Science Education Standards) brought attention to the concept of modeling when they recommended that models be a focus of instruction, helping students to understand the use of evidence in science, to make and test predictions, to use logic, and to assemble their own understanding of how things work. Furthermore, the NSES emphasize the use of models in science instruction by making it one of the five unifying concepts of science, applicable to all grade levels.

Technology should enhance a lesson, while not distracting or replacing its content. Lessons should encourage the integration of math and science. All SLE's (Student Learning Expectations) from the Arkansas frameworks should be listed. Lessons would contain adaptations for additional SLE's and grade levels if possible. The database would sort and cross-reference lessons by SLE.

TEACHERS

Some concern is expressed regarding the selection process for teachers. Both an application and a selection rubric will be needed. Some terms and thoughts required include:

Application

- Resume
- Number of years teaching
- Technology highlight/strengths
- Why should we consider you for this committee
- Why do you personally want to be involved in developing lessons
- Certification/courses/grade levels taught
- Letter of recommendation from administrator, tech coordinator, curriculum coordinator, etc.

Selection rubric

- Good teacher
- Teach literate
- Team player
- Submit simple lesson plan – one they already use, that uses technology
- Submit a technology intervention as a critical part of a lesson

There should be pre-meetings with teachers to provide the basis for a quicker start-up in the actual workshops. At this meeting teachers would be given a binder that contains:

- Explanation of the project
- Lesson plan model

- Sample lesson plans
- Articles important to this project
- Educational technology standards
- List of technology available to participants

Participants would be able to read and understand and have a chance to ask questions before a workshop so that they are ready to start working when they arrive.

SUMMER SESSION

The teachers need to be notified of application process. Teachers will begin to fill their summers and the best teachers seem to make plans early. Thursday – Saturday workshops should be given some consideration.

Task Force Steering Committee (2/3/06)

9:30-10:30 a.m., February 3, 2006

Attendance: John Chamberlin, Drew Mashburn, Gail McClure, Becky Hart and Dave Westmoreland

Guests: Cecil McDermott (program evaluator) and Cathy Ma (Authority staff)

Gail McClure stated that John Ahlen will visit with Legislative Education Committee at the Arkansas Tech University on February 22. Dr. Ahlen will update the Education Committee on the Authority's grants and explain how STEM education is important to the state's economy.

Gail McClure and Dr. Ahlen will draft a letter to Senator Capps. When the draft is ready, the letter will be sent to the Committee for review.

John Chamberlin suggested the committee set an appointment with Senator Argue to update him on the efforts of the Task Force. This may be done around May or June.

Cecil McDermott updated the Committee on his discussion with Tom Burnett about the visit to Apple's headquarters. Tom Burnett will contact Gail McClure about more details of the Apple trip. Cecil suggested schedule a 15-minute presentation from Tom Burnett at the next Task Force meeting. Cecil discussed the option of visiting Apple in conjunction with the National Educational Computing Conference 2006 (NECC) which will be held in July in San Diego. Problems with this option were discussed.

Becky Hart requested that the Task Force hear more from business on technology needs and definitions of knowledge-based. She suggested this happen as soon as possible.

Drew Mashburn updated the Committee on the Infrastructure Meeting on January 18. Drew stated that INA will be in charge of the technical aspects of the portal. Infrastructure Committee will concentrate their efforts on the capabilities of the portal.

Cecil McDermott updated the Committee on the recent meeting with Dr. Gayle Potter (Arkansas Department of Education, ADE). Dr. Potter suggested Margaret Amps, media service specialist at ADE, serve on the Infrastructure Committee.

John Chamberlin will work with Keith Harris on the list of technical tools aligned with the 21st century skills.

Becky Hart updated the Committee on the following planning for the summer teachers workshop:

The workshop will be held in Hot Springs, on Monday-Friday schedule

Five teachers will be selected (with two alternates)

The workshop will produce a balance of activities (covering different grade levels)

April 15 will be the deadline for application

Applicants are required to list three references who are currently in public schools

Applicants are required to provide three examples of activities

Awarded teachers will be contacted individually by Task Force

Dave Westmoreland encouraged Task Force Math and Science Committees and Math/Science Centers to work with teachers before the workshop.

Gail will write a grant proposal to be submitted to Apple to fund the workshop.

The next Steering Committee conference call is scheduled on Feb. 17, 9:30-10:30 a.m.

Arkansas Department of Education and ASTA Coordination Meeting (2/16/06)

Dr. Gail McClure and the ASTA External Evaluator met with Jim Boardman, Arkansas Department of Education Coordinator for Educational Technology. The meeting was held from 1:00 p.m. – 2:00 p.m. Thursday, February 16, 2006 in room 103B (ADE).

Dr. McClure connected all ASTA activities relative to science minigrants, STUART grants, the SMART program, involvement in various programs by the Math/Science Centers and the ARCF Affiliates as well as the work of the Technology Task Force on Knowledge Based Curriculum. This provided background information for an ADE official to consider a request from Senator John Paul Capps and Representative Daryl Pace, co-chairs of the Joint Committee on Advanced Communications and Information Technology, that ASTA staff review the State Task Force's budget and funding needs.

Jim Boardman and Dr. Gail McClure considered the various budget items and other fund raising efforts by the Task Force Steering Committee and the options of ADE to assist in completing the work of the Task Force as prescribed by legislation set forth in Act 2266.

It was agreed that various specified information would be provided by ASTA to Jim Boardman's office over the last two weeks of February in order to expedite a request for assistance with the cost of the work of the Task Force.

Task Force Steering Committee (2/17/06)

9:30 – 10:30 a.m.

The Steering Committee of the Task Force on Knowledge Based Technology Curriculum participated in a teleconference by telephone. Those participating included: John Chamberlin

(chairperson), Becky Hart, Drew Mashburn, Gail McClure, Tim Taylor, Keith Harris, David Westmoreland, Cecil McDermott and Cathy Ma.

The major outcomes were the following:

Report on budget and program coordination issues discussed between representatives of ADE and ASTA on February 16, 2006.

Report from Infrastructure subcommittee on standards for the SMART website

Fund raising efforts and grant proposals critical to the success of the work of the Task Force

Outline of an agenda for the March 13, 2006 Task Force Committee in Little Rock. Committee reports and presentations by industry leaders on 21st Century skills followed by committee discussion was proposed. Details to accomplish the agenda were assigned to various steering committee members.

A means was established by which industry leaders including Microsoft and Apple Corp (each with a lengthy history in education K-12) could share information from various sources directly to the committee. This includes 21st Century workplace skills and a vision of future advances in technology that will impact a technology curriculum.

The development of guidelines for summer workshops in math/science/technology in which teachers develop instructional materials that relate to academic subjects and involve the use of technology

A report from Dr. Gail McClure on four summer workshops funded by the WRF including activities in: 8th grade science, 7th grade science, grades 5-6 science and grades 7-8 in mathematics. Teachers would develop activities that could be placed on the SMART website and enhanced by specialists in educational technology.

Legislative update relative to a letter of support from the Joint Committee on Advanced Communications and Information Technology.

Task Force Steering Committee Meeting (3/3/06)

8:35am-9:20am

Attendance: John Chamberlin, Drew Mashburn, Gail McClure, Becky Hart, Tim Taylor, Dave Westmoreland, Cecil McDermott, Brad Roberts and Keith Harris.

Guests: Tom Burnett (Apple)

Cathy Ma (Authority staff)

The Committee discussed the 21st Century Skills which John Chamberlin sent to the Committee. The Committee agreed that the Category list which is included in the 21st Century Skills should be forwarded to INA as soon as possible for them to start designing the web portal. After the business/industry panel discussion at the March 13th Task Force meeting, Drew Mashburn and Joel Rush (Infrastructure Committee member) will revise the category

list. John Chamberlin will insert technology elements into the initial list Tim sent to the Committee.

Gail will revise the grant proposal to visit the Headquarter of the Apple Computer Inc. Tom Burnett asked the Committee to email him what the Committee's expectations of the Apple trip on April 26-28, 2006. There will be more discussion on this topic at the lunch meeting at El Chico at 12:00 pm on March 13th.

Tom Burnett agreed to participate, together with other business/industry representatives, in the panel discussion of 21st Century skills at the March 13th Task Force meeting. The panel will talk about what their (business/industry) expectations of their employees/new hires and other issues.

The Committee discussed the agenda for March 13 Task Force meeting. The agenda includes:

- Panel Presentation on 21st Century skills from the industry/business perspectives

Panel Members: Bob Priebe (Alltel)
 Melinda Faubel (AT&T)
 Tom Burnett (Apple)
 Bob Wallis (Acxiom)
 Elizabeth Bowles (Aristotle)
 BEI (still in contact)
 Brad Greenway (ADED)

- Break
- Discussion of the panel presentation
- Task Force subcommittee reports
- Web portal skill set

Cecil McDermott reported his meeting at the Arkansas Community Foundation on Feb. 22nd. \$10,000 IMPAC fund was deposited in the Task Force funds. On the same day, a letter was sent to Jim Boardman at ADE for possible funding support. Cecil plans to work with 2-3 business/industry people to raise funds for the Task Force.

The support letter from Senator John Capps and Representative Daryl Pace will be distributed to business/industry representatives at the March 13th meeting.

Becky updated the Committee on the preparation for the summer workshop held in Hot Springs. The application forms will be sent to teachers nominated by the Task Force members. The estimated cost for the workshop is around \$24,000. Applications will be sent out to teachers as soon as the funding is available. There will be an update on the workshop at the March 13 meeting.

Gail reported that Dr. Yvonne Spicer is very enthusiastic about the Task Force meeting on April 17th (there is no charge for her talk). Tim will contact Dr. Terry Crane for possible attendance at the meeting as a guest speaker. Tim will contact a third guest speaker—Susan Brooks-Young, an independent consultant on education technology issues for the possible talk and the cost. If she is unable to travel to Little Rock, she may join the meeting via video conferencing. The Task Force will update the STEM Coalition for their involvement/co-sponsor of the event. Gail will try to find a meeting place for the April 17th meeting.

Next Meetings:

The next Steering Committee and Chairs meeting is on March 13, 12:00 pm at El Chico.

Task Force meeting is on March 13, 2006, State Police Headquarters, Room B

Task Force meeting is on April 17, 2006, location undecided.

Task Force Steering Committee Meeting (3/13/06)
12:15pm-12:55pm

Attendance: Drew Mashburn, Gail McClure, Becky Hart, Tim Taylor

Guests: Cecil McDermott (program evaluator)

Tom Burnett (Apple)

Cathy Ma (Authority staff)

Tom Burnet reviewed Steering Committee's schedule to Apple Headquarters in Cupertino, California. The Apple briefing is scheduled on May 18th. Tom expected the Steering Committee members to email him what their expectations from the Apple trip. Apple offers lots of opportunities (300) for people who attend the briefing. Tom introduced some educational features of the iPod/iTunes Apple offers (can be found on Apple's website).

Cecil McDermott stated that the estimated budget for Hot Springs summer workshop is around \$24,000. He will be working with people in business/industry areas for possible funding support.

Tom suggested the Steering Committee to contact Jerry Smith at Apple, who will be interested in supporting Task Force efforts.

The Committee exchanged ideas of how to conduct the panel discussion and the Task Force members discussion in the afternoon meeting.

Task Force Meeting (3/13/06)
State Police Headquarters, Room B
1:00 P.M.

Tim Taylor, Vice Chair of Technology Steering Committee, called the meeting to order at 1:10 pm at the State Police Headquarters, Room B.

22 Task Force members and guests attended the meeting.

Task Force approved the minutes from Task Force Meeting on Jan. 17, 2006.

Tom Burnett, panel moderator, called the panel discussion to order. The panel, composed of Bob Priebe (Alltel), Melinda Faubel (AT&T) and Elizabeth Bowles (Aristotle), discussed what skills their companies would like to expect from their future employees.

Melinda Faubel stated that AT&T is a telecommunication company where all employees are required of certain levels of technical background. She stated that basically all AT&T employees are knowledge workers, but there are different levels of knowledge workers.

Bob Priebe introduced Alltel and its employment requirements. He stated that only maintenance and clerical jobs at Alltel require high school graduates. All other jobs require different levels of technical skills.

Elizabeth Bowles introduced Aristotle.net, a web design and internet focus company. She stated that every Aristotle employee is required of certain levels of knowledge skills. She stated that Aristotle expected new employees to have technical skills that the jobs require. In addition, the company expects employees to be flexible in learning (trainable). She stated that only trainable employees can keep up with the rapid technology development in IT business.

Elizabeth Bowles stated that logic thinking, collaboration/team work and communication skills (writing and speaking) are also very crucial for employees. Companies expect their employees to be open-minded to different opinions and be cooperative when working with a team.

Elizabeth Bowles stated that kids' early exposure to technology will significantly reduce their intimidation of technology when they grow up.

Steve Emmons suggested the applicable math and science classes should be taught in classes rather than making students memorize a ton of equations.

Cecil McDermott stated that we need a fundamentally basic way to combine the (math) skill and the language. Generative Core Curriculum is what the term is referred to in education.

Barbara Wilder stated that one of the major problems is that teachers teach the way they were taught and because of this most of them don't welcome innovation and change. She declared that unless teachers get the training and professional development necessary to integrate technology into the curriculum we are still going to be behind.

"3 C's" means:

- Communication – several different ways to communicate;
- Collaboration – nobody should do anything alone; and
- Construction – building something from something and the entire learning process involved in doing so.

A comment was made regarding the EAST initiative and its struggle to deal with accountability due to the fact that some of the things they do are hard to measure. The Task Force should avoid running into this problem.

It was also suggested that we not create a lesson plan and put on the site that doesn't involve what the panel of business/corporate people discussed.

Cecil McDermott said we should make learning real to the real world using mind tools and these mind tools are technology and anything else that brings everything together as a whole in the scheme of the curriculum.

The Partnership for 21st Century Skills wants to be catalyst for developing a new 21st century model for bringing schools and the curriculum up to date.

The Task Force talked about middle and high school contents should be relevant to students' lives. Some of the content area that needs to be changed and/or brought into the curriculum are:

- Global awareness
- Financial, economic and business literacy
- Civil literacy

The Task Force responded to the 21st Century Skills diagram:

Elizabeth Bowles stated that "In a broad scope, it's fair. Giving them the tools and a logic thought process will allow them to do better standardized tests."

Bob Priebe said that his "concern is that as you add more stuff to it, the core subjects become lessened."

Tim Taylor asked the panel members, "What can you share from your industries that will make change applicable to the 21st Century model?"

Bob Priebe said, "Business is a risk and you have to be able to adapt and change. That's one of the most important things you can get young people to realize about the business and the real world."

Elizabeth Bowles stated, "The key to adapting to change is the teach flexibility. If you're webbed to an idea then you aren't flexible to make changes. Teachers have to buy in to teaching logic thought processes and flexibility."

Tim Taylor believed that "professional developing is going to be a major part of ALL of this."

Elizabeth Bowles suggested that the Task Force "Write a letter to the appropriate businesses and ask them to get with the proper legislators and insist that they motivate and promote the education system to keep up.

Kathy Prophet stated that, "Teachers will be more than likely to start with the frameworks when searching the Smart Portal.

Sue Choitz suggested that we use the italicized portion of the 21st Century Outline for the learning skills

The four 21st Century Skills that the Task Force agreed upon:

- Problem Solving
- Data Analysis
- Management
- Communication

There will be five categories in defining INA Smart Web Portal:

- Frameworks (Instructional Strategies)
- 21st Century Skills (Workplaces)
- Technologies (Wire & Wireless)
- Resources (Cost & Accessibility)
- Literacy

Gail McClure briefly introduced the summer math and science workshops hosted by the four Math/Science Centers located on university campuses. She also introduced the summer workshop which will be hosted by Task Force in Hot Springs.

Drew Mashburn and Joel Rush(from the Infrastructure Committee) will work together to translate the 21st Century skills at the web portal.

Next Task Force meeting: April 17, 2006

Location: undecided.

Funding Subcommittee Report (3/13/06)

Co-Chairs: John Chamberlin & Cecil McDermott

Other Members: Gail McClure & Melinda Faubel

Established ARCF/Task Force for Integrating Technology into the Public Schools Curriculum Fund (2-22-06)

Transferred \$10,000 as a grant generated from the IMPAC Technology Endowment to the ARCF/Task Force Fund (2-22-06)

Assisted in developing an ARCF Gift Form as a means to help accommodate other funds for grants and donations

Secured permission to use the ARCF Agreement (Establishing the Task Force for Integrating Technology into the Public Schools of Arkansas Fund) in efforts to secure funding support

Developed cost estimates of Task Force expenses (\$66,000-\$73,000) that include:

---Travel for regular Task Force meetings

--- Conference calls

---Cost for guest speakers

---Institute for Technology Integration

---Technology/Curriculum specialists at the Smart Math/Science workshops

---Miscellaneous expenses

---Infrastructure for Portal at Website

Provided documentation and a letter of request to ADE to consider providing assistance in securing funding of various Task Force activities(2-22-06)

Secured letter of support from Joint Committee on Telecommunications relative to work of the Task Force and its fund raising efforts

Received a grant proposal for the Task Force Steering Committee for a Teacher Institute for Technology Integration at Hot Springs to be used in discussions with various industry and business representatives for funding support

Task Force Steering Committee Meeting (5/12/06)

11:00am-11:55am

Attendance: Drew Mashburn, Gail McClure, Becky Hart, Dave Westmoreland and John Chamberlin

Guest: Cathy Ma (Authority staff)

Becky updated the Committee that there are only 5 applications received for the summer Hot Springs workshop. The goal of the workshop is to get 10 teachers attending with 2 alternates. Gail suggested extending the application deadline to May 15, 2006 and also starting to accept applications from math teachers. ASTA will contact the recommended teacher list (Dave will email the list to Gail) to notify teachers the deadline extension and encourage more teachers to apply.

John stated that if there are not enough candidates for the May workshop, the Committee should consider postpone the workshop date to fall this year when teachers are back in schools.

Task Force Steering Committee Meeting (5/24/06)

1:30pm-2:20pm

Conference call

Attendance: Gail McClure, Becky Hart, Tim Taylor, Dave Westmoreland, Cecil McDermott and John Chamberlin

Guest: Cathy Ma (Authority staff)

Becky updated the Committee that there are 7 applications received for the summer Hot Springs workshop, but 2 of them are disqualified because they are for 5th grade. One application is excellent.

Becky will notify all applicants of the summer workshop and also will contact Susan Cromwell for possible candidate recommendations and update the Committee on any progress.

Gail updated the Committee on the two SMART grant workshops which will be held in summer at UALR and UA Fayetteville. After the lesson plan Templates are finalized at the two workshops, they are ready to demo for legislature.

Gail updated the Committee on the recent progress of Task Force funding. ADE made a commitment to fund the Task Force but the funding is focusing on the professional development to improve the classroom teaching. Dave Westmoreland will email the committee the ADE's award letter. \$10,000 has been transferred to Task Force account from IMPAC and another foundation endowment.

Dave Westmoreland announced he would step down from the Committee due to job change. He will contact Dr. Julian at ADE for his replacement.

Task Force meeting is scheduled for May 30, 2006 at the State Police Headquarters. INA will demonstrate the web portal at the meeting.

The Committee will meeting at 11:00am on May 30 at El Chico.

Task Force Steering Committee Meeting (5/30/06)

11:30am-12:30pm

Attendance: Gail McClure, Becky Hart, Tim Taylor, Cecil McDermott and John Chamberlin

Guests: John Ahlen and Cathy Ma (Authority staff)

Becky stated that she talked with Susan Cromwell about the summer Hot Springs workshop and they agreed that it is important to first finalize templates and format of lessons plans.

Becky will update the Task Force on this issue.

Task Force meeting agenda:

Becky's report on summer workshop

INA web portal demo – INA & Gail McClure

Review of Apple trip -- Tim Taylor

Financial report – Cecil

Preparations on legislative initiatives – John Chamberlin

Organization of writing teams (three focus areas and the report is less than 10 pages, 2-3 pages for each area)

John Ahlen suggested the Steering Committee to be strategic in planning/preparations for the legislative sessions. John Ahlen stated that the Steering Committee might like to contact the coordination of educational efforts (this is not the accurate name, John Ahlen will email John Chamberlin the name of the organization) to discuss how to prepare for the next legislative session.

Gail McClure stated that Apple is interested in setting up pilot projects with STEM education. The Committee is will work with Apple on pilot projects but agreed that the projects should not be exclusively focused on Apple technology.

Meetings:

The Task Force will meet at 1:00pm on May 30 at State Police Headquarters.
Steering Committee might meet sometime in summer via conference call

Task Force Meeting (5/30/06)

State Police Headquarters, Room B

1:00 PM

John Chamberlin, Chair of Task Force, called the meeting to order at 1:10 pm at the State Police Headquarters, Room B.

Task Force members attending the meeting: Linda Kellim, Becky Hart, Steve Emmons, Keith Harris, Susan Choitz, John Chamberlin, Margaret Amps, Cecil McDermott, Becky Rains, Paula Swain, Timothy Taylor, Mickey Bates, Robin Finley and Cathy Heath (INA).

The Task Force approved the minutes from the last Task Force Meeting on March 13, 2006. Becky Hart reported that the Hot Springs summer workshop will be postponed to a later date when templates and formats of lesson plans have been finalized. Becky thanks all Task Force members who recommended candidates for the workshop.

Funding Committee report by Cecil McDermott

Cecil reported that the following funds and grants (a total of \$100,050) have been placed in the ARCF Task Force for Integrating Technology into the Public School Curriculum Fund.

\$10,000	IMPAC Endowment Fund
\$5,000	IMPAC Endowment Fund
\$5,000	Chamberlin Family Foundation Fund
\$10,000	ARCF Giving Tree Grant
\$70,050	Arkansas Department of Education Staff Development Fund-Online Education

Cecil stated that the funding committee is still working hard to secure more funds from businesses and industries.

Review of Apple Trip by Tim Taylor

Tim reported that the Steering Committee members visited Apple Headquarters in California during May 17-19, 2006. Tim stated that Apple is one of the few technology companies that put the money and resources back into schools and education. Apple is very interested in Task Force's efforts and is willing to collaborate with the Task Force. Overall, it was a very productive trip for the Steering Committee and the Committee is looking forward to working with Apple and putting their suggestions to work. Tim stated that he had a print out of things discussed at the Apple meeting and would be happy to email to members who are interested.

Updates on SMART web portal by Gail McClure

Gail stated that there will be two summer workshops hosted by the Regional Math & Science Centers located on UALR and UA Fayetteville campuses. At the workshop, teachers will develop lesson plans for science 5-8 grades. Currently, the web portal only contains lesson plans for science & math. In the future, it will be expanded to other subjects. Teachers may submit their lesson plans to the Authority. The Authority will forward them to ADE for content verification.

Web Portal Demo by Cathy Heath

Cathy showed the current SMART web portal which is a password protected site. All lessons will be posted in PDF format for easy accessibility. Teachers may search lessons by key words, Arkansas SLE code and other advanced search features.

The Task Force suggested:

- 1) Add "21st Century Skills" as a searchable item.
- 2) Post two versions of each lesson plan – one with technologies and one without, teachers would have an option if technologies are not available.
- 3) Accurately reference lesson plans to avoid any possible copyright law suits.

Legislative Initiative by John Chamberlin

John Chamberlin stated that the STEM Coalition asked its subcommittees (Task Force is one of them) to prepare for the next legislative session by providing the committee's recommendations. The Task Force will focus its efforts on the following three areas:

- Content Area (curriculum, SMART portal, workforce future etc.)
- Professional Development
- Infrastructure

John encouraged Task Force members to form groups of 2-3 members working on short proposals. The final Task Force proposal will not exceed 10 pages with 1-2 pages for each area. John encouraged members to think of long-term budget items for Task Force and indicate how the stakeholders can invest in the Task Force efforts.

Members who will work on the focus areas:

Infrastructure

Steve Emmons
Becky Rains
Paula Swaim

Professional Development

Mickey Bates
Linda Kellim
Sue Choitz
Robin Finley

Content

Margaret Amps
Gail McClure

Next Task Force meeting: September, 2006

Technology Task Force Steering Committee Meeting (6/24/06)

1:30 p.m. – 2:30 p.m.

The Steering Committee chaired by John Chamberlin discussed a number of issues that were to be reflected in the agenda for the Task Force Committee meeting May 30, 2006. Issues and topics discussed included the following:

- the Hot Springs Technology Workshop scheduled for July was moved to September using a Thursday, Friday and Saturday format with fewer participants – each to receive training and a template to be used to develop lessons linked to technology in various grades 7-12 subjects.
- a discussion of the status of the funding for the Task Force budget. A total of \$30,000 had been raised with anticipation that at least another \$12,000 was possible.
- a discussion of a grant from the Arkansas Department of Education for online staff development in the technology curriculum area and technical procedural matters that would need to be considered.
- the content of the presentation of INA as an update on the SMART Portal
- the need for a steering committee meeting May 30, 2006 from 11 a.m. – 12 noon to review the steps required to achieve the outcomes anticipated by the legislative committees that will receive the Task Force Report.

Infrastructure Subcommittee Task Force/INA Administrative meeting (8/29/06)

1:00PM

INA Meeting Room

Before a lesson plan is posted on the portal, it will go through the following 4 tiers of evaluation:

- a. First-Tier Evaluation – subject specialists will polish the lessons and conduct a preliminary check of all aspects of the lessons.

- b. Second-Tier Evaluation – the Authority will review all the lessons past first-tier evaluation.
- c. Third-Tier Evaluation – Department of Education will review all lessons for its accuracy of contents and SLE coding.
- d. Forth-Tier Evaluation – the Authority will add 21st Century Skills and technology components to all lessons before they are uploaded to the website.

References should be added to the lesson template.

The Authority will finalize lesson template and send to INA.

59 science lessons have been uploaded to the database.

Each lesson should clearly state the name of the person who submitted the lesson and who modified the lesson.

Task Force Steering Committee Meeting (9/5/06)

1:00 pm-2:30pm

Conference call

Attendance: Gail McClure, Becky Hart, Tim Taylor, Cecil McDermott, Drew Mashburn and John Chamberlin

Guests: Cathy Ma (Authority staff)

Gail McClure updated the Committee on the lesson plans that science teachers developed at the UALR and UAF SMART workshops during summer. About 80 science lesson plans have been developed and majority of them have been uploaded to the INA link for the web portal. All lessons include 21st century skills but they should be carefully checked by Task Force members. Lessons do not include the technology component. Technology specialists will be hired to integrate technology component into these lessons.

Gail McClure suggested Task Force members from Math and Science Subcommittees design a standardized lesson template for lessons in other subjects for the future expansion of the web portal.

John Chamberlin reported that the legislative report, which was developed in July by Task Force volunteers, was presented at the STEM Coalition Board meeting on August 28th, 2006. The STEM Coalition Board will forward this report to the Accelerate Arkansas. John Chamberlin will set an appointment with Senator Argue. John Chamberlin will draft a formal letter with the legislative report included. The letter will be sent to John Ahlen, President of the Authority, September 13th..

The tentative agenda for the next Task Force Meeting on September 21, 2006. Agenda items include:

- Legislative report
- Infrastructure (update on Apple's involvement in the Task Force efforts.)
- Content/curriculum (update on web portal, some example lessons)
- Professional Development
- Volunteers to help prepare for the final legislative report (10-12 pages)
- Volunteers to develop a generic lesson template for other subjects

Gail McClure updated the Committee on the progress of the SMART Grant Math Workshop. Math Workshop will be hosted on the campus of Arkansas Tech University. Six teachers will

receive \$1000 stipends for the two 2-day workshops to develop lesson plans for grades 5-8. The two workshops will be held on October 6-7 and December 1-2, 2006. Teachers will continue to write lessons between the workshops.

The Committee agreed it is important to communicate with other agencies/organizations for future collaboration. John Chamberlin and Cecil McDermott will schedule a meeting with Apple Computer to discuss the company's role in the Task Force effort. There will be a meeting set up with ADE Facility Commission to talk about the standards for new building constructions.

The Committee agreed it is important to educate legislators, state agency leaders and the public what the 21st century skills are why they are important. Task Force will plan a special event at the end of the year for that purpose.

Meetings:

The Task Force will meet at 1:00pm on September 20 at State Police Headquarters.

Steering Committee will meet at 12:00pm on September 20.

Technology Task Force Meeting (9/21/06)

1-4 pm

Arkansas State Police Headquarters Building
Little Rock, Arkansas

Call to Order

A meeting of the Task Force for Integrating Technology was held on September 21, 2006, at 1 pm.

Committee members present: Steve Emmons, Sheryl Cox, Karen Bushy, Kathy Prophet, Mickey Bates, Barbara Wilder, Cecil McDermott, Drew Mashburn, Neill Hitchcock, Susan (Cromwell) Norton, Robin Finley, Jim Yeager, Timothy Taylor, John Chamberlin (Committee Chairman), Margaret Amps

Staff members present: Gail McClure and Sharon Whitlock

Task Force Discussion

An agenda was provided by the Steering Committee that focused on providing an opportunity for Task Force members to discuss; the current status of the SMART Portal Project, a draft of the critical ideas for inclusion in the Legislative Report that is being developed by the Task Force, and the internal details of that report including; technology infrastructure for schools, curriculum content and a Partnership with 21st Century Skills.

John Chamberlin, Task Force chairman, opened the meeting with a brief discussion of the organizational structure that was developed by ASTA that has provided a means for addressing and defining the scope of the requirements of Legislative Act 2266 (2005). The Task Force essentially is a subcommittee formed by the STEMS Coalition Board with the responsibility of recommending to the STEMS Board a response to a request from the STEMS' Board for an appropriate proposed response to a legislative request (Act 2266).

Therefore, he indicated that the Task Force was working cooperatively with the STEMS Coalition (which includes persons with diverse interest and experience from all regions of the state). Hence, the TASK Force will submit its report to the Coalition for review and comments before moving the report to ASTA and its Board for final consideration. The Task Force report would then be submitted to the Joint Committee on Advanced Communications and Information Technology by ASTA.

The Task Force Steering Committee reported that Becky Hart and David Westmoreland have indicated that due to new work assignments they can no longer assume the responsibility of serving on the Task Steering Committee. Margaret Crank Amps and Susan Cromwell have accepted positions on the Steering Committee.

Dr. Gail McClure reported on the SMART web portal being developed by the Information Network of Arkansas (INA).

- Two summer workshops have been completed conducted (at UALR and Fayetteville).
- Teachers participating in the workshops developed about 80 lessons that are ready for review using an appropriate procedure.
- The template used in the development of lessons is specific to Science but will be revised this fall to accommodate mathematics lesson plans.
- INA has requested a generic template that can be used in the development of lessons regardless of the subject matter.
- Task Force representatives have met with the INA development team and requested that the interface provide greater user flexibility. Dr. McClure indicated that this is especially true with regard to levels of access to lessons and the entry of lesson plans directly by teachers that have been approved for access to certain features of the SMART portal.
- A SMART workshop in Mathematics will be conducted at Arkansas Tech during and between two split Friday/Saturday weekends during October and December.

Tim Taylor reviewed the history of infrastructure development in public schools relative to information technology (wire and wireless). He cited and provided copies of documents developed by various groups in Arkansas that addressed infrastructure needs and standards. He described current efforts to evaluate and establish standards for new construction in schools -especially for libraries and classrooms.

Tim noted efforts at the national level to define technical support and levels of support. Task Force members cited personal experiences with the progression of job descriptions, qualifications and assignment of various personnel to deal with various aspects of keeping school networks and technologies “up and running”. He cited North Carolina and West Virginia as leaders in some of these areas.

The curriculum discussion was lead by Susan Cromwell. She made a case for the adoption of the 21st Century Skills program by Arkansas. She cited the need to be open to expectations and needs established by business and industry, including formally established work force education programs. The committee accepted, in principle, that correlating 21st Century Skills to the Arkansas Curriculum Framework could be achieved because each accommodates the structure of the other.

**Task Force on Knowledge Based
Technology Curriculum
Writing Team – Cox Center July 13, 2006**

The Task Force writing team subcommittee met from 10:00 a.m. – 3:00 p.m., July 13, 2006 and formulated key issues and goals to be addressed in a report from the Task Force on Knowledge Based Technology Curriculum to the Joint Committee on Telecommunications relative to Act 2216. John Chamberlin and Dr. Gail McClure directed the work of the committee.

A brief overview of previous efforts related to state technology planning and program development were reviewed by the members of the subcommittee and it was agreed that following introductory statements about the purpose of the work of the Task Force and the structure of the report – three major themes would be developed. Therefore, the writing team divided the work of the team into three parts: (1) Professional Development (Team Members: Susan Norton, Becky Hart, Cecil McDermott and Kathleen Stafford Branton); (2) Infrastructure (Team Members: Paula Swaim, Tim Taylor and John Chamberlin); and (3) Curriculum Content (Team Members: Gail McClure and Margaret Amps).

Each group developed and presented a group report on each of the areas; professional development, infrastructure and curriculum content. It was agreed that Dr. McClure would develop a report on the work of the writing team and request feedback from the STEM's Coalition Education Subcommittee. The input from that subcommittee will be reflected in a second draft by the writing team subcommittee. At that point, perhaps in September, the Task Force (Committee of the Whole) will receive the report, make suggestions and a working draft will be provided for the Task Force members for its first full meeting for action.

The Writing Team Subcommittee used the following listings as a guide for their work.

- I. Introduction/Statement of Purpose
 - Background Information
 - Agency Roles
 - Administrators and teachers
 - Web Portals/Staff Development & Curriculum
 - Distance Learning

- II. Training on 21st Century Skills
 - Approach on Teaching 21st Century Skills
 - Standards that Define Levels of Integration
 - Task Skill Training for Teachers
 - Assessment of Student Learning

- III. Curriculum Content
 - Infrastructure
 - Staff Development
 - Proposed Legislative (To Do List by Priority)

IV. Report's Impact on:

- Technology Equipment Needs in Schools
- Advancement in Infrastructure
- Support Services for Teachers
- Certification Standards

V. Other Areas of Concern

- Adoption of 21st Century Skills by Arkansas State Board of Education
- Need for a State Coordinating Council to Coordinate interagency school district, Education Cooperation
- Support of Business and Industry other than Task Force Committee membership

**Telephone Conference
State Technology Task Force
Steering Committee Planning
September 12, 2006 1:00 p.m. – 3:00 p.m.**

John Chamberlin, Task Force chairperson, led a planning discussion about the agenda for the State Technology Task Force meeting planned for September 20 at the State Police Headquarters in Little Rock. Those participating were Dr. Gail McClure, Becky Hart, Kathy Ma, Drew Mashburn, Tim Taylor and Dr. Cecil McDermott.

The agenda items affirmed were:

- Development of the format for the legislative report on Knowledge Based Technology Curriculum
- Formulation of an editing team
- Report on the status of INA/ASTA SMART Web Portal
 - Workshops and lessons produced
 - Template for lessons
 - Core 21st Century Skills
 - Planned Math/Science and other subject area workshops in which technologies are linked to the frameworks
- Infrastructure issues especially where there is new construction in schools
- Apple Computer invitation to assist in demonstrating various aspects of technology integration into the curriculum
- Enforcement of standards
- Professional development at various levels
- STEM Coalition leadership in accomplishing support for the adoption of a definition of 21st Century Skills and the role of technology in skill development

The steering committee explored various ways of partnering with various groups that have an interest in the Task Force legislative report. There were also discussions of budget as related to staff development, infrastructure and curriculum materials as related to recommendations for program implementation through actions deemed appropriate by the legislature.

Several committee members recognized that twenty first century skills in information technology are addressed by both curriculum standards defined by state frameworks and 21st Century Skills. There was committee consensus that together these sets of expectations addressed in greater detail the job of addressing the needs of the 21st Century work force in their and at their places of work and the communities in which they live.

Professional development was discussed in terms of emerging and continuing roles of school districts, ADE, Education Cooperatives, AETN and Higher Education. The committee seemed to sense the need for the development of structured on-line staff development that would be critical to the integration of technology into teaching and learning.

John Chamberlin, in closing the meeting, indicated the need for the Task Force to assist other interested groups in building support for various aspects of the goals eventually laid out in the Task Force Report to the legislature. He encouraged committee members to assist in efforts to continue work on the SMART portal, the development of lesson plans that integrate technology into instruction, the defining of various infrastructure issues, a greater awareness of the scope and breadth of 21st Century Skills and the drafting of the final report of the Task Force for Integrating Technology into Public School Curriculum.

Next scheduled meeting: November 13th, in the afternoon.

Arkansas STEM Coalition Board Meeting (10/16/06)
ADHE Conference Room
Little Rock, Arkansas 10:00 a.m. – 1:00 p.m.

This regular meeting of the Arkansas STEM Coalition (Science, Technology, Engineering and Mathematics) consisted of subcommittee reports.

Technology Task Force

Eighty lessons have been prepared for use on the SMART Web Portal. AETN/ASTA and the Arkansas Department of Education (ADE) are cooperating in the design and development of the Web Portal by INA. It was recommended that legislative funding be considered for a position in the ADE to help provide quality assurance for lessons and services via the Web Portal.

There were two other matters of concern – school infrastructure related to technology (state guidelines and standards) and the need to define 21st Century Technology Skills by becoming an active member of the organization of educators and business and industry leaders that has developed the 21st Century Technology Skills Program.

Elementary/Secondary Education

The issues discussed related to incentives for teachers of science and mathematics in Arkansas public schools and curriculum enhancements is K-8 schools related to science and mathematics. Co-related to these issues was technology training for teachers, including summer technology institutes for teachers at the district level and special sessions at the annual state technology conference at Hot Springs.

Undergraduate/Graduate Degree Programs

The focus was on developing strategies to stimulate interest in students completing undergraduate and graduate degree programs in the STEM's curriculum areas and qualifying as teachers in the public schools. A new federal program (The Gathering Storm) in these areas was cited by Dr. John Ahlen from ASTA. Efforts are being made to bring together a group of business and academic leaders in Arkansas to determine the opportunities for Arkansas to participate in the program.

The role of business, industry and education related to the need for technology based industries and more teachers in the STEM's curriculum areas is an important part of the mission of STEMS. ASTA's work in the area of science and mathematics for the last four years has enhanced the coalition's interest and concerns.

October 18, 2006 Task Force Steering Committee Meeting

1. John Chamberlin will prepare the Powerpoint presentation for the Nov. 8th first task force meeting (State Police Headquarter, Room C). He encourages other steering committee members to send him their suggestions via emails. John's presentation will include the following items:
 - Identify the task force, it's missions and goals
 - Lay out the timeline
 - Form subcommittees
 - Identify subcommittees' responsibilities
2. Business: Gail will contact people in business areas, SBC (Belinda), Axciom, Alltel, Trinity, and BEI??
Drew Mashburn will contact Apple for a possible representative. The committee suggests 6 business representatives in the task force board.
3. School: Gail will contact the Malvern retired principal and Math/Science specialists and Pam at Fordyce school. Drew will contact language art & social science specialists.
4. Nov. 8th meeting agenda will include:
 - Orientation (summary of the Act, Task force goals and missions, timeline, raise the question of funding)
 - Approach (discussion of the 5 points from the first Steering committee, feedbacks from the task force members)
 - Lunch break
 - Brainstorming on "knowledge-based"
5. ASTA will send out an invitation letter to all members who are being invited to the task force board. ASTA will also send a letter to all teachers/specialists' principals to inform them of the task force and ask their permissions of their teachers' representation.
6. Timeline:
 - 05-06: Define/Plan/Budget
 - 06-07: Sell/Fund
 - 07-08: Execution
 - 05-07: Develop/Roll out and get ready for 07-08 execution
 - Technology tool/skill inventory
 - Math framework
 - Science framework
 - Resources (put links to the available resources)
7. Budget:
 - A) Ideal: \$100,000
 - B) Okay: \$30,000 - \$60,000
 - C) Volunteer: \$10,000

**National School Board Association (NSBA)
2006 Technology/Leadership Conference
Dallas, Texas Convention Center
November 8-10, 2006**

The ASTA External Evaluator, the chairperson of the Arkansas Task Force for Integrating Technology into the Arkansas Public School Curriculum (Task Force) and a staff person from ASTA directly involved in various STEM related academic programs, attended the NSBA annual educational technology conference. Funding for this activity was provided through the ARCF Fund created to support the work of the Task Force.

The convention program centered around six major themes – each of which related to the various programs in which ASTA is directly involved:

- Leadership and Vision
- Learning and Teaching
- Productivity and Professional Practices
- Support, Management and Operations
- Assessment and Evaluation
- Social, Legal and Ethical Issues

Prior to the conference, on Tuesday November 7, 2006, the representatives of the Task Force observed programs in a high school, middle school and elementary school in the Carrollton-Farmers Branch Independent School District in Carrollton, Texas.

The school district has implemented a technology training and integration model which concentrates on specific curriculum needs and various technologies selected to address those needs. The specific programs observed were directly related to programs of concern as identified by the Task Force.

In addition to the school visitation and observation program, the three representatives of the Task Force attended numerous workshops, roundtable discussions, lectures and demonstrations. In addition, they attended an Interactive Town Hall meeting conducted by Ken Lay, Director of the Partnership for 21st Century Skills.

Vendor's displays of various technologies as well as "best practice sessions" provided a comprehensive overview of the current status of the integration of technology into the teaching and learning process related to numerous components of K-12 school curriculums including; virtual learning, wire and wireless technology infrastructure, distance learning, on-line staff development, interactive smart boards, technology use in math and science, on-line curriculum resources, student data management and the leveraging of E-Rate dollars in the modernization of schools.

Task Force Meeting

State Police Headquarters, Room B

1:00 PM

December 1, 2006

1. John Chamberlin, Chair of Technology Task Force, called the meeting to order at 1:10 pm at the State Police Headquarters, Room B.
2. Task Force members attending the meeting: Linda Kellim, Mickey Bates, Becky Hart, Steve Emmons, Susan Choitz, John Chamberlin, Margaret Amps, Cecil McDermott, Drew Mashburn and Timothy Taylor.
3. John Chamberlin and Gail McClure reported that on November 28th, they presented at the meeting of the Joint Committee on Advanced Communications and Information Technology on behalf of the Technology Task Force. The presentation received very positive responses from the legislators. Chairs of the Joint Committee expressed their support to the Task Force efforts.
4. John Chamberlin stated the five Task Force Working Groups will be formed to work on different tasks. He encouraged Task Force members to sign up for one of the following Working Groups. The Technology Task Force will meet quarterly and Working Groups will meet between Task Force meetings.

Five Task Force Working Groups are:

- 1) Smart Portal (Group Leader: Gail McClure)
 - 2) Partnership for 21st Century Skills (Group Leader: John Chamberlin)
 - 3) Management of Technology Infrastructure Standards (Group Leaders: Tim Taylor & Drew Mashburn)
 - 4) Best Practices (Group Leaders: Susan Norton & Cecil McDermott)
 - 5) Task Force on Community Learning Centers (Group Leader: John Chamberlin)
(John Chamberlin will tentatively serve as group leader for groups 2 & 5)
5. John Chamberlin stated that he talked to Representative Cook about the management of the technology infrastructure standards in public schools. Representative Cook was aware that the standards have not been enforced and updated in the past years and was looking into the issue. John Chamberlin suggested Tim Taylor, Drew Mashburn and other members who will be working on this issue schedule a meeting with Representative Cook and relevant agencies.
 6. John Chamberlin stated that many schools in Arkansas are very successful in implementing technology in education. Susan Norton & Cecil McDermott will lead in efforts to document these success stories and make it into a video. The videos will be distributed to legislature and the public for them to better understand what Technology Task Force is advocating.
 7. John Chamberlin reported that the Technology Task Force will be supporting creation of a Special Evaluation Task Force to determine the feasibility of setting up well equipped labs at the community colleges to form Community Learning Centers where high school students can study to receive associate degrees in various areas. This will be a legislative target of workforce education at AATYC.

8. John Chamberlin, Cecil McDermott and Cathy Ma reported on the T + L Conference held in Dallas by National School Boards Association, November 7-9, 2006. They visited an elementary school, middle school and high school in Carrollton-Farmers Branch Independent School District. They are impressed by the extensive use of all kinds of technologies in classrooms, professional development opportunities schools provided teachers and how technologies have improved teaching and learning. Cecil McDermott commented that technology should support school curriculum not to replace it.
9. Jim Boardman reported on the conference of the Partnership for the 21st Century Skills. He stated that he was very interested in the 21st century skills, but the Department of Education will need some time to carefully discuss whether they will recommend the state to join the Partnership. If the state decides to adopt the Partnership for the 21st Century Skills, there will be a big change in the areas of curriculum, professional development, content, standards, frameworks, etc. Mr. Boardman highly praised the state's EAST Program which he stated can also teach students 21st century skills in every subject.
10. The Technology Task Force members agreed that the Task Force should spend more time and efforts to educate the public on the importance of teaching 21st century skills in every subject.
11. Next Technology Task Force meeting: March 2, 2007

Technology Task Force Working Groups

Smart Portal (Group Leader: Gail McClure)

Members: Margaret Amps; Tom Burnett; Sue Choitz

Partnership for 21st Century Skills (Group Leader: John Chamberlin)

Members: Tim Taylor; Tom Burnett

Management of Technology Infrastructure Standards (Group Leaders: Tim Taylor & Drew Mashburn)

Members: Steve Emmons

Best Practices (Group Leaders: Susan Norton & Cecil McDermott)

Members: Mickey Bates; Linda Kellim

Task Force on Community Learning Centers (Group Leader: John Chamberlin)

Steering Committee Meeting
March 1, 2007
11:30 am.
El Chico Restaurant/State Police Headquarters

Attendance: Gail McClure, Cecil McDermott, John Chamberlin, Drew Mashburn, Tim Taylor, Susan Norton, Sharon Whitlock.

Brief discussion over the reasons cited in the Democrat Gazette and the Commercial Appeal as to why the Toyota plant was given to Mississippi

Gail spoke about the detailed budget expense for FY06 and FY07. The first part shows all expenses paid and the following pages show the budget broken down into categories. Professional development monies were charged to the ADE budget.

Best Practices – Cecil spoke about his visit to Marion, with role playing between Cecil and the schools' administration.

Elementary Integration of Technology in the state. Tim mentioned that with the need for Digital Media specialists the media specialist is a valuable source of assistance.

Drew and Tim spoke about their meeting with Dr. Chuck Stein, assistant director of the Facilities Division of the Arkansas Department of Education (ADE). Currently this agency is too overwhelmed to monitor or enforce any compliance standards. The need for standards in technology in facilities and infrastructures will evolve out of the work of the Task Force.

There is a need to get an agency/department (such as ADE) to start monitoring the portal. Quality control of the lesson plans and portal database are needed for a long term basis.

2007 National Symposium for Scientists and Engineers: A strategic program to develop informed leadership for changing the course of K-16 science education. April 10-13, 2007. To be held in Santa Fe Trip, N. Mexico. There are funds in the state travel budget to send one person, may be a good idea to request from the Task Force and Workforce to sent additional individuals.

Next meeting: 1st part of May or the 1st part of June at El Chico Restaurant/State Police Headquarters.

Task Force Meeting

State Police Headquarters, Room B

1:00 PM

March 2, 2007

John Chamberlin, Chair of the Technology Task Force, called the meeting to order at 1:00 p.m. at the State Police Headquarters, Room B.

Task Force members attending the meeting: John Chamberlin, Drew Mashburn, Cecil McDermott, Timothy Taylor, Linda Kellim, Mickey Bates, Steve Emmons, Susan Choitz, Cathy Mackey, Karen Busby, Susan Norton, Tom Chilton, Kathy Prophet and Sheryl Cox.

Update on the STEM Coalition Legislative Recommendations

1. Funding for science specialist – it is expected that this will be a line item in the ADE's budget.
2. The grant project for providing extra funding to science and math teachers is in committee and is expected to pass. The funds will require teacher application.
3. John Chamberlin stated that the Vision for the Future of Elementary 12 Science Education in Arkansas (subtitled Elementary Education Vision for Arkansas) has passed the House vote and moving to the Senate for voting. It can be found at the following website: <http://www.arkleg.state.ar.us/ftproot/bills/2007/public/SCR14.pdf>
This bill is sponsored by Representative Edwards and Senator Laverty

Technology Task Force Financial Report

John Chamberlin updated the Task Force members on the Task Force's financial account. Task Force received five grants totaling \$100,050. As of January 25, 2007, the total Task Force expenses are \$18,976.97, which leaves an account balance of \$81,073.03. Task Force expenses are shown in the following four categories:

- Members travel & lodging to national conferences
- Members travel to Task Force meetings and substitute teachers cost
- Travel & lodging cost for the three consultants (for 2006 April Task Force Symposium)
- Food (including food cost for the 2006 April Symposium)

Reports from the Task Force Five Working groups

SMART Portal

Gail McClure reported that there are about 160 math & science lesson plans. The SMART Portal group will be working on integrating technology into each of the lesson plans. Susan Norton reported that she has been working on this project with Marianne Hauser, a technology consultant at the Fayetteville School District. Workshops will be hosted at Fayetteville for teachers to check the quality of each lesson and then expand the lessons with an appropriate technology portion. Some of the expenses of this project will be covered by the Giving Tree Grant which the Task Force received from the Arkansas Community Foundation. Susan asked the Task Force members to help identify teachers who have expertise in using technology in teaching.

Partnership for 21st Century Skills

John Chamberlin reported that the Governor will need to make the final decision whether or not the state will join the 21st Century Skill Partnership. Currently, the Arkansas Department of Education has joined CCSSO in looking into the issues they as a department must address if the state takes on this contract.

Management of Technology Infrastructure Standards

Drew Mashburn and Tim Taylor reported on their meeting with Dr. Chuck Stein, assistant director of the Facilities Division of the Arkansas Department of Education (ADE). Currently this agency is too overwhelmed to monitor or enforce any compliance standards. The need for standards in technology in facilities and infrastructures will evolve out of the work of the Task Force.

Currently the Arkansas School Facilities Manual is addressing required building standards but not in regard to technology. The handbook is available online at <http://arkansasfacilities.com>. The Task Force would like to see two levels in the standards: required and recommended.

Jim Boardman – ADE & Technology is collecting data through cycle reports on the quality and quantity of technology initiatives and exploring the need to consider implementing the ISTE standards. Next step would be to provide a liaison, who would provide vital input into updating the standards.

Best Practices

Susan Norton reported that the main focus of this working group is to identify the schools/school districts/classrooms in the state that have been very successful in implementing technology education. With the help of AETN, the Task Force will consider documenting school programs on video or CD. Portions of the videos/CDs could be shared with the legislature to clarify what the State Technology Curriculum Task Force is advocating. Susan stated that she will draft some criteria for the best practice schools/classrooms.

Task Force on Community Learning Centers

No report

Report on Site Visit to South Carolina

Kathy Prophet reviewed her visit to the Richland School District Two in Columbia, South Carolina during February 25-28, 2007. She reported on visits to an elementary school, 2 middle schools and one high school in the school district. She observed that there were different types of technologies in each classroom. In each school, there was a technology teacher who is a classroom teacher experienced in providing technology training to other teachers in the school.

Kathy Prophet will present a detailed written report to the Task Force.

Updates on the STEM Coalition Industry/Education Summit

Gail McClure reported that there are plans for a Technology Summit scheduled for the fall of 2007 at the Little Rock State House Convention Center. The National Academies for the Sciences is helping the STEM Coalition plan for the event. Education, industry and economic development will be some of the main topics of the event. Accelerate Arkansas and many of the state agencies will be the co-hosts for the event.

Next Meeting

The next Technology Task Force meeting is scheduled for Friday, May 4, 2007 at the Arkansas State Police Headquarters Building in Little Rock.

**2007 Symposium
for Scientist & Engineers
Santa Fe New Mexico
April 10-13, 2007**

Attendees: 185 participants from 23 states

Arkansas: John Chamberlin – STEMS Coalition
and Chariman of the State Technology Curriculum Task Force
Kathy Ma – Program Manager – ASTA
Cecil McDermott – External Evaluator – ASTA

Purpose of Conference: To engage participants in developing a shared vision of effective K-16 science learning and teaching including conversation about the agenda presented in the “Rising Above the Storm Report”.

Conference Focus:

- Curriculum & Instruction in Science
- Inquiry Based Science
- Student Assessment
- Professional Development
- Materials Support Systems
- Development of State and Local Administrative & Community Support
- Planned Systemic Change
- Inquiry Based Science Instruction
- Access student prior knowledge and understanding of science concepts, guide questions, promote collaborative learning, provide opportunities for open-ended investigation, foster critical thinking skills and provide real-world connections and concept integration with other subjects.

Connections to Existing Science Programs:

- Standards & Benchmarks
- Testing Programs
- Textbook Adoptions & Resource Materials
- ARCF Affiliate Science Minigrant Program
- STUART e-Instruction Program
- SMART Web Portal-Inquiry Based Lessons

Task Force Meeting

State Police Headquarters, Room A

1:00 PM

May 4, 2007

Tim Taylor, Vice chair of the Technology Task Force, called the meeting to order at 1:00 pm at the State Police Headquarters, Room A.

Task Force members attending the meeting: Drew Mashburn, Gail McClure, Cecil McDermott, Timothy Taylor, Linda Kellim, Mickey Bates, Steve Emmons, Susan Choitz, Tom Chilton, Margaret Amps, Keith Harris and Kathy Prophet.

Update on Accelerate Arkansas and STEM Coalition – Jerry Adams

Jerry Adams stated that the Accelerate Arkansas is a statewide group of volunteers that was formed as a result of the ADED Task Force for the Creation of Knowledge-based jobs. Accelerate Arkansas' mission is to foster economic growth in Arkansas.

Jerry Adams briefly introduced the following eight items on the Accelerate Arkansas's 2007 Legislative Agenda to Grow the Tax Base with Higher Paying Jobs.

1. Create the Arkansas Research Alliance to support job-creating research
2. Fully fund existing or previously funded knowledge-based research programs
3. Authorize the Arkansas Science & Technology Authority to help with creation of the Arkansas Risk Capital Matching Fund to provide financial assistance to Arkansas-headquartered knowledge-based companies
4. Provide additional funding for the Seed Capital Investment Program
5. Create and organization, Innovate Arkansas, to provide support to start-up companies
6. Establish STEM Supplemental Income Grants
7. Enhance the Consolidated Incentive Act
8. Request a task force to study a new governmental structure with a broad focus on 21st Century economic development

Jerry Adams stated Technology Task Force is one of the eight sub-committees of the STEM Coalition. The goal of the STEM Coalition – to promote STEM education in Arkansas, is closely related to Accelerate Arkansas's mission.

New Business

Gail McClure informed the Task Force that AT&T sent out a call for proposals for the 2007 AT&T Excelerator competitive technology grants program. A proposal has been drafted by the Authority staff with a budget request at \$15,000.

**Review of SMART Math/Science
Lesson Plans October 1, 2007
University of Central Arkansas
Conway, Arkansas**

Curriculum specialists in mathematics and science (Chris Barnes, Sue Choitz and Cathy Mackey) conducted a workshop for the Arkansas Math/Science Specialist located at the various higher education centers in Arkansas. The following is an outline of their presentation:

Effective Lesson Planning Process (PowerPoint)

- Scientific Process
- Writing Process
- Lesson Planning Process
 - Scope
 - Content
 - Teaching strategies
 - Draft of lesson
 - Peer review
 - Implementation of lesson
 - Self-reflection of revisions

Guidelines for Lesson Planning (Support Document)

- Frameworks
- Objectives
- Problem Question
- Background Information
- Timeline
- Teacher Preparation
- Procedure
- Materials
- Extensions
- Modifications
- Cross-Curriculum
- General considerations

Following the review Jannie Trautwein, chairperson for the Network of Centers for Mathematics and Science Education led the group in organizing the task for the day: review SMART lessons in Math and Science and provide appropriate feedback to ASTA about the lessons status with regard to placement on the web portal. Some lessons were rejected outright, revised and assigned for additional work, and reviewed and immediately ready for examination by teachers. There were a total of 98 lessons reviewed – 35 (mathematics) and 63 (science). There were 13 science and 8 mathematics reviewers. The evaluators should have approximately 50 lessons ready for the website – revisions completed October 15, 2007 – November, 2007.

**Technology Task Force
Writing Team Conference Call
November 11, 2007**

John Chamberlin, chairman of the Task Force on Knowledge Based Curriculum, conducted a conference call with the writing team – steering committee (Tim Taylor, Susan Norton, Margaret Crank, Becky Hart, Cecil McDermott and Kathy Prophet (absent)).

The committee agreed upon the sections of the final report on the work of the Task Force due July 1, 2008 to various legislative committees. The sections included a summary of the work conducted by the Task Force, funding, the SMART Portal to deliver lessons to teachers for classroom use, School Best Practices in the area of technology integration in the curriculum, Infrastructure, 21st Century Skills issues, audit of funds and expenditures and assignments with deadlines and guidelines for the writing team were indicated.

An outline of the report; linear ordering and suggested sections and guidelines for content was provided November 14, 2007 for review by the writing team.

Task Force Subcommittee

Task Force Report: Best Practices & 21st Century Skills

Hot Springs High School 11/30/07

Hellstern Middle School 12/5/07

Reviewed Task Force Report outline and timeline including Best Practices and 21st Century Skills. The scope of the entire report was discussed based upon the expectations of the committee. Those participating were Kathy Prophet, Beck Hart, Susan Norton and the External Evaluator.

The committee focused on appropriate ways to summarize 21st Century Skills and propose ways to effectively help school districts implement the skills. The role of the STEM's Coalition, Task Force follow up activities, direction from the Arkansas Department of Education and the National Association of State School Officers as well as the legislature were discussed.

The process and importance of SMART lesson plans on a web portal were reviewed. The committee received a report on the training provided by the Arkansas Department of Education for the Math/Science Center Specialist on how to train and coordinate the work of the teachers that received SMART grants to develop lesson plans and provide links to 21st Century Skills.

The committee devoted considerable time to Technology/Teaching and Learning Best Practices programs in Arkansas and other neighboring states.

Best Practices programs were those considered to be defined by: specific criteria, grade level and are subject specific, staff development and support services and provide for evaluation procedures to measure the effectiveness of the program. School staff visitation programs should be scheduled in such a way that there is an agenda and scope and sequence in the day's activities. Most Best Practices programs in a school should include at least three Best Practices. Implementation guidelines would need to be developed. Appropriate before and after communications between the school personnel making the visit and the school personnel with the Best Practices program is imperative.

The need in Arkansas for special subject specific professional conferences that stress a specific discipline (such as math or science), the teaching of that subject and student learning with attention to Best Practices programs was discussed.

Video presentations of Best Practices, staff development, school visitation grants and the identification of "leadership school districts" in Arkansas with respect to technology integration into teaching and learning, staff development and support services for technology use were discussed relative to consideration by the Arkansas Legislature.

**Information Network of Arkansas (INA)
and ASTA Planning Conference
on SMART Web Portal (2-5-08) – 11 a.m.**

ASTA staff – Dr. Gail McClure, Cathy Ma, Alison Page and Chuck Meyers as well as John Chamberlin, Chair of the Task Force on Knowledge-Based Curriculum and Dr. Cecil McDermott, ASTA External Evaluator, met with INA Program Administrators Janet Grard and Kassandra Mize at the INA headquarters office in Little Rock.

Both parties presented a brief summary of their perception of the status of the agreement between ASTA and INA to implement the SMART Web Portal that essentially provides teachers in Mathematics and Science the opportunity to download lesson plans developed in workshops at various math/science centers in Arkansas.

Topics covered included:

Roles of Arkansas Department of Education, Arkansas Educational Television Network, ASTA and the Math/Science Center Specialist

The purposes of the Web Portal as related to staff development activities for credit and instruction enhancement

The relationship between the Arkansas Task Force on Knowledge-Based Curriculum and the SMART Workshops at Math/Science Centers that generate lesson plans for instructional enhancement, including the tools of technology

The design and user interface of the portal and its various levels of entry

Options for links to other sites through the World Wide Web

Online training tools and tutorials for teachers seeking enrichment lessons, especially in mathematics and science

Immediate steps required by both parties to get the project back on track to begin delivering lessons – a trial run by May 2008 and online functionality by July 1, 2008

Establishing tracking mechanisms related to the users accessing the services available and the acquisition of information about the users (school district, subjects taught, lessons downloaded, etc.)

Follow up communications – first from Kassandra Mize, Project Manager, followed by a brief statement by Dr. Gail McClure as to agreement by the two parties as a consensus for the project to move forward, especially as related to uploading the available lesson plans and preparation for a test run of the web portal by May 2008.

**Math/Science Centers
Program Director's Conference
February 5, 2008
Harding University, NLR Campus**

Cathy Ma, Research Program Manager, Alison Page, STEM Intern and Dr. Cecil McDermott, ASTA External Evaluator, attended the regular Math/Science Program Director's Conference February 5, 2008. The group provided an opportunity for Cathy Ma to present and the group to discuss several aspects of programs at ASTA in which the Math/Science Center Specialists are involved.

A status report on the SMART lessons was provided. The report described the work sessions completed relative to various subjects in mathematics and science, as well as the number of lessons completed and reviewed and lessons completed and in the process of being reviewed.

The status of the online minigrant and STUART grant application process was discussed including a recent meeting between ASTA and INA (Information Network of Arkansas) administrators and program planners. It was anticipated that manual applications may need to be used by 2008-2009 applicants but some aspects of the application process may be completed online.

The Math/Science Center Directors were encouraged to secure more applications for STUART grants, especially from Math/Science Centers from which few applications have been received during the six year 2002-2008 grant period.

Revised application forms were discussed and suggestions incorporated into the forms (minigrant and STUART).

It was anticipated that ASTA/INA staff would have online SMART lessons operational in May 2008.

It was agreed that instead of ten - \$7,000 STEM Professional Development grants – that there should be six - \$12,000 grants. The smaller amount had not covered the cost of the professional development programs that had been offered in previous years.

It was agreed that Arkansas Department of Education staff would be invited to provide another training workshop for SMART Lesson Development and that Math/Science Center Specialists will read and make corrections in the SMART lessons developed by teachers.

Preview of SMART Web Portal

ASTA/INA – Math/Science Center Specialist

Participants: five staff members/ASTA

INA Presenter – nineteen specialists - April 1, 2008

ASTA Board Room – 7:00 p.m. – 8:30 p.m.

Meeting was coordinated by the program directors at ASTA, Dr. Gail McClure and INA, Kassandra Mise.

Discussion of the SMART Integrating Technology Workshop May 5 & 6, 2008 to be held at the Holiday Inn Presidential Conference Center in Little Rock was lead by Dr. McClure. Professional education consultants include Dan Morris, Bethany Hudnut and Jeff Krause.

Regional Math/Science specialist, teachers that participated in the SMART workshops, classroom teachers, regional Math/Science Center Specialists and some content specialists in school districts will receive invitations to attend.

The workshop is approved for Professional Development Technology credit hours from the Arkansas Department of Education.

Kassandra Mise demonstrated the SMART Web Portal and discussion ensued about various aspects of its functionality. The various features included:

- Front Page
- PDF files
- Printing documents
- Definition of SMART Program
- SMART Workshop Schedules (updated)
- Grant Opportunities (updated)
- Maintain mailing list (update postings)
- Acknowledgements
- Contact us (help/directions – etc.)
- Classroom activities
- Lessons by subject
- Lesson List by Standards/SLE (drop down box)
- Arkansas Frameworks
- Search by (SLE, grade level, other attributes)
- Framework Core Subjects
- Template used for developing lessons
- Workshop to develop lessons (grants)
- Technology integration
- Edit a lesson/credit for lesson
- Flag lesson with Errors (temporarily unavailable)
- Store favorite lessons
- Identify Lessons with a rating scale

**Technology Task Force Writing Team Meeting
ASTA Conference Room
April 7, 2008
10:00 AM**

Review Status of Task Force Report

Examination of Reference Document Materials

Consideration of Alignment with State Education Technology Plan (2008-2012)

Examination of Consistency Between ADE Plan and Task Force Report

Inclusion of Reports Based Upon Washington State Site Visits

Agreement Upon Writing Team Editing Process

Special Focus on Executive Summary and Expansion of Recommendations Section

Provide Electronic Copy to Writing Team and Other Members of the Task Force

**Procedure for Securing Approval of Task Force Report by the Task Force Committee at
May 9th General Board Meeting**

**Task Force on Knowledge Based Curriculum
Writing Team Telephone Conference (4-29-08)**

Participants: John Chamberlin (Chairperson), Dr. Gail McClure, Becky Hart, Tim Taylor, Susan Norton, Kathy Prophet and Dr. Cecil McDermott

The Writing Team addressed four issues.

1. Writing Team assignments to Address Gaps in the Task Force Report
2. Video to enhance the Task Force Report
 - Coordinate Contractor's work
 - Use existing video from Hot Springs, Fayetteville and Springdale schools for in class activities
 - Video the SMART Technology Workshop May 5, 6 at the Clinton Presidential Center
 - Verify the script and its relationship to purpose
3. Task Force document
 - Executive Summary and Recommendations
 - Rationale
 - Special Events and Meetings
 - Committee Members
 - Reference Materials including a timeline and description of Task Force Activities
4. Agenda for May 9, 2008 Task Force Meeting
 - Executive Summary and Recommendations
 - Report on STEM Coalition Legislative Recommendations
 - Panel Discussion on the Task Force Content and Recent Subcommittee Activities
 - Future Activities Related to SMART, STEM activities and ASTA – staying connected

**Task Force on Knowledge Based Curriculum
Into Public School Curriculum
State Police Headquarters, Room A
May 9, 2008 1:00 p.m.**

The Task Force members in attendance had received a copy of the Task Force Executive Summary. They had the opportunity to review the draft copy of the Task Force's final report to the legislature. The agenda was followed at the meeting.

Task Force Recommendations:

- A. Accelerate SMART Portal development
- B. State participation in the Partnership for 21st Century Skills
- C. Manage technology infrastructure and support standards for Arkansas schools
- D. Explore shared use of facilities and technology resources
- E. Authorize continued Citizen Involvement in the above recommendations

The Executive Summary of recommendations prepared by the STEM Coalition was provided for review. A procedure will be implemented by Accelerate Arkansas, the STEM Coalition and the Task Force to assemble recommendations to the legislature.

In other discussions, Best Practices programs in schools, staff development and school accreditation issues were highlighted as well as the need for informed superintendents and directors of instruction. Aspects of school accreditation as related to technology were assessed.

The Task Force is in the process of a professional audit of all gifts received and Task Force expenditures. The audit summary will be included in the Task Force report.

A plan was developed as to how to proceed in completing the final set of activities required to complete the work of the Task Force.

- Edit SMART lessons for use in a demonstration with Legislative Committees
- Complete and edit all aspects of the report and update all supporting materials in the Task Force Report
- Develop a PowerPoint Presentation on the Executive Summary of the Task Force Report and the activities of the Task Force such as the Gathering Storm and Teacher Workshop held during the last year
- Develop and produce copies of the Task Force Report

Legislative Briefings, Presentations and Development of Legislative Recommendations

LEGISLATIVE BRIEFINGS, PRESENTATIONS AND DEVELOPMENT OF LEGISLATIVE RECOMMENDATIONS.

Steering Committee Meeting with Senator Capps (1/11/06)

The Steering Committee of the State Task Force on Knowledge Based Curriculum met with Senator John Paul Capps at the Capitol January 11, 2006 from 1:00 p.m. – 3:00 p.m. Dr. Gail McClure and John Chamberlin, Chairman of the Steering Committee, made short presentations using handout materials that covered all aspects of the work of the Task Force including the need for committee funding and informing members of the legislature about the work of the Task Force.

Senator Capps was provided the opportunity to gain information about the work ASTA had done that specifically related to Act 2266 of 2005. He was able to gain the connection between the work of the STEM Coalition and the various science grants and SMART programs.

As the meeting progressed, Senator Capps made phone calls and talked with his staff about getting a steering committee presentation on the agenda of the Joint Committee on Advanced Communications and Information Technology for Wednesday January 25 at 1:30 p.m. The meeting was later confirmed.

Meeting Agenda of Legislative Committee Meeting (1/25/06)

AGENDA Joint Committee on Advanced Communications and Information Technology

Wednesday, January 25, 2006

01:30 PM

Room 151, State Capitol
Little Rock, Arkansas

Sen. John Paul Capps, Chair
Sen. Gene Jeffress, Vice Chair
Sen. Sharon Trusty
Sen. Jerry Bookout
Sen. Mary Anne Salmon
Sen. Jim Holt
Sen. Bobby Glover

Rep. Daryl Pace, Chair
Rep. David Cook, Vice Chair
Rep. Stan Berry
Rep. Jeff Wood
Rep. Jim Medley
Rep. Mark Martin
Rep. Wilhelmina Lewellen
Rep. Pam Adcock
Rep. David Rainey
Rep. J. R. Rogers

Rep. Bill Pritchard, Alternate
Rep. Phillip Jackson, Alternate
Rep. David Evans, Alternate
Rep. James Norton, Alternate
Rep. Johnny Key, Alternate
Rep. Nancy Duffy Blount,
Alternate
Rep. Roy Ragland, Alternate
Rep. Rick Green, Alternate
Rep. Mike Burris, Alternate
Rep. Robbie Wills, Alternate

A. Call to Order

B. Review and Approval of Minutes from August 30, 2005 Meeting

C. Arkansas Public School Computer Network (APSCN)

1. Bill Goff, Director of Arkansas Public School Computer Network, Arkansas Department of Education
2. Danita Hyrkas, Internal Affairs Manager, Arkansas Department of Education

D. Schools and Libraries Program of Universal Service Fund - "E-Rate"

1. Claire Bailey, Director, Department of Information Systems
2. Becky Rains, Strategic Funding Program Manager, Department of Information Systems
3. James Boardman, Assistant Director for Information and Technology, Arkansas Department of Education

E. Knowledge-Based Technology Curriculum for Public Schools (Act 2266 of 2005)

1. Gail H. McClure, Ph.D., Vice President of Research, Arkansas Science & Technology Authority
2. Dave Westmoreland, Deputy Associate Director for Curriculum, Assessment, and Research, Arkansas Department of Education

F. Arkansas Wireless Information Network (AWIN)

1. Claire Bailey, Director, Department of Information Systems
2. Dale Saffold, AWIN Program Director

G. Other Business

H. Adjournment

Joint Committee on Advanced Communications and Information Technology Presentation (1/25/06)

The various projects assembled at or directed by ASTA (including all WRF funded or endowed science activities) were discussed as a part of the agenda of the Joint Committee on Advanced Communications and Information Technology completed on January 25, 2006 from 1:30 – 3:00 p.m. in Room 131 at the State Capitol.

Dr. Gail McClure (ASTA) and John Chamberlin (Chair of the Task Force on Knowledge Based Technology Curriculum) made formal presentations and then answered several questions. It was established that the WRF has provided funding for numerous projects – each building toward a more comprehensive program in science in the middle school grades. These projects were then connected to the work of the STEM Coalition, the SMART website for teachers and the work of the Task Force on Technology Curriculum.

Support and encouragement for all programs were sought and outwardly received based on the informal expressions to that affect by co-chairs Senator John Paul Capps and Representative Daryl Pace. Specifically, the WRF and ASTA, as well as the Task Force Technology Curriculum Committee, were singled out for their leadership, funding and accomplishments; the Arkansas Department of Education was asked to consider assisting in the work of the Task Force Technology Curriculum Committee as well as providing some funding to defray various costs associated with the responsibilities of the Task Force.

There was an expectation established at the end of the questioning session that ASTA would provide a Task Force report to the Joint Committee on Advance Communications and Information Technology prior to the 2007 legislative session. There was an expectation that the report would be preceded by a demonstration of the SMART website's capability for delivering instructional materials to teachers. It was also anticipated that the Task Force would include various recommendations would assume consideration for program implementation, funding and staff development for teachers related to the implementation of a technology curriculum in grades 7-12.

Presentation for Senate and House Education Committee (6/20/06) Room 138, State Capitol Interim Report - Task Force on Knowledge Based Curriculum

Arkansas Department of Education staff representatives reviewed its plan to establish a web portal at which teachers in Arkansas will have access to distance learning opportunities in numerous areas of need. This will include:

- actual courses for teachers in critical areas of certification need (math, science, etc.)
- contracted staff development from various services
- access to the technology institute program developed by AETN in a summer institute setting for selected teachers (an application process)
- web based visits to historical places in Arkansas available to students
- training for teachers to access and use data services online from the University of Arkansas (teachers and administrators)
- face to face training for principals and other supervisors of instruction
- electronic learning training for administrators
- coordination of distance learning programs – including efforts with ASTA and AETN.

The web portal will be directed by AETN and should be online during the fall of 2006.

Other topics covered by Department of Education staff included Arkansas comprehensive testing, Assessment and Accountability and other statewide programs that impact student achievement.

All of the reports described above relate to and directly link to the STEM's program in mathematics, science and technology. There appeared to be a need to demonstrate the applications of the web portal. Face to face inservice training opportunities at school regional cooperatives are aligned with the distance learning programs.

Dr. Gail McClure and John Chamberlin used Power Point notes to provide an update to the Education Committee. Topics discussed included:

- STEM's leadership is critical to the direction of mathematics, science, technology and engineering. The STEM's Coalition is involved in numerous projects to that end.
- Technology Task Force/Act 2266
- Role of Steering Committee
- Committee Membership
- WRF grants for specific science programs
- SMART Web Portal
- Inquiry driven instructional activities in science and mathematics
- Links to technology-incorporated into activity driven lesson plans
- Activities correlated to benchmarks/standards
- Smart Portal interface with user (teacher)
- Shortage of teachers in math and science
- Accelerate Arkansas - improving STEM education in Arkansas
- Middle School science and mathematics teaching
- Short term and long term funding for STEM education
- Role of the State Math/Science Centers
- WRF/ARCF endowments
- NSF Epscor Program
- Design of templates for lesson plans
- Twenty First Century Skills
- Symposium on teaching/learning and technology – consultants
- Industry leaders/Educational needs in technology – workplace education
- Budget/Fundraising (\$116,000)
- Continuation of reports to the House and Senate
- Legislative Report 2008 on Technology Curriculum

STEM Technology Subcommittee Legislative Recommendations Meeting (8/4/06)

Traditional educational practices no longer provide students with all the necessary skills for economic survival in today's workplace. Students must apply strategies for solving problems and use appropriate tools for learning, collaborating and communicating. Our classroom learning environments must incorporate strategies and tools that prepare students for their futures and equip them to build a productive society for the future of their children and generations to come.

Enriched learning environments supported by technology are student-centered, multi-sensory and allow for multi-path progression. They use multimedia, collaborative tools, and focus on information exchange and active/exploratory/inquiry-based learning. These environments promote critical thinking and informed decision making; they are practice, and based on authentic, real-world content. Promoting the achievement of digital literacy through effective use of these tools in the classroom can lead to an inspired curiosity and excitement for learning, creativity, inventive thinking and the creation of new ideas.

GOALS

Goal 1 – To provide enriched learning environments supported by technology. These learning environments provide opportunities for students to use 21st Century skills to find and apply current information and resources and to apply their academic skills for solving real-world problems. They engage students in activities that have relevant curricular content interwoven with and enhanced by educational television skills.

Infrastructure recommendations:

- Define standards for the support of the technology infrastructure necessary to provide these information technology enriched environments in Arkansas schools. The infrastructure is distinct from the professional development and support for teachers using technology. Provide funding for implementing these standards. (A recommended set of standards and an assessment rubric was included in the draft *Arkansas School Facilities Manual*.) Estimated budget:
- Define and update facility standards for technology infrastructure for new building construction resulting in long term cost savings. Provide funding for implementing these standards. (A recommended set of standards was included in the draft *Arkansas School Facilities Manual*.) Estimated budget:
- Establish a task force with interagency and public members to explore the concept of community learning centers, facilities for enriched learning with technology resources, shared by K-12, higher, workforce and life long education for potential efficiencies. Estimated budget:
- Implement a data collection and analysis system to track the technology resources available in Arkansas schools. The data collected should track both quantity and quality of the resources. Estimated budget:

Since every district is required to submit an inventory as part of their technology plan, I would think ADE could present us with some web-based interactive form in which to enter that data and compile it from there.

Goal 2 – Develop lesson plans, activities and materials that integrate knowledge based skills and technologies to improve academic achievement for Arkansas students.

Content/curriculum recommendations:

- Construct a user friendly database that allows teachers to do multi-level searches for knowledge based and technology rich lesson plans in all subject areas. *Estimated budget: INA costs*

- Identify and engage curriculum specialists to direct the development of integrated lesson plans that demonstrate 21st century skills and to direct exchange/sharing of lesson plans. *Estimated Budget: Personnel cost for curriculum specialists to assist or direct teachers that are creating the lesson materials and to provide an initial review of materials in order to provide feedback for improvement of materials.*
- Identify, train and/or fund Instructors to develop the lessons. *Estimated Budget: Financial compensation for development of lesson materials.*
- Assign ADE personnel to approve lesson plans aligned with Arkansas State Frameworks prior to download for quality control and to monitor the database for feedback, teacher rating and safety issues. *Estimated Budget: Addition of curriculum integration specialists at ADE.*

Goal 3 – Adopt the “Partnership for 21st Century Skills” methodologies to enhance professional development programs to provide quality 21st century education (www.21stcenturyskills.org) with digital literacy goals at its core.

Professional Development recommendations:

- Join the 21st Century Partnership and promote and define state leadership expectations for student achievement with digital literacy.
- List objectives, tactics and metrics for implementing 21st century skills as a professional development focus. Develop a 21st Century Learning certification process for schools that identifies and acknowledges those that make progress toward providing 21st century education.
- Ensure that teacher education licensing includes 21st century skills competency in teacher education program accreditation.
- Develop the IDEAS portal to include training for teachers and administrators on 21st century skills.
- List objectives for aligning state content standards and assessments with 21st century skills.
- Create a Coordinating Council to ensure 21st Century Learning Skills objectives are met according to a timeline that is tied with education reform and fiscal support for these efforts.

AGENDA
Joint Committee on Advanced Communications
and Information Technology

Tuesday, November 28, 2006

09:00 AM

Room 130, State Capitol
Little Rock, Arkansas

Sen. John Paul Capps, Chair
Sen. Gene Jeffress, Vice Chair
Sen. Paul Bookout
Sen. Bobby Glover
Sen. Jim Holt
Sen. Mary Anne Salmon
Sen. Sharon Trusty

Rep. Daryl Pace, Chair
Rep. David Cook, Vice Chair
Rep. Pam Adcock
Rep. Stan Berry
Rep. Wilhelmina Lewellen
Rep. Mark Martin
Rep. Jim Medley
Rep. David Rainey
Rep. J. R. Rogers
Rep. Jeff Wood

Rep. Nancy Duffy Blount, Alternate
Rep. Mike Burris, Alternate
Rep. David Evans, Alternate
Rep. Rick Green, Alternate
Rep. Phillip Jackson, Alternate
Rep. Johnny Key, Alternate
Rep. James Norton, Alternate
Rep. Bill Pritchard, Alternate
Rep. Roy Ragland, Alternate
Rep. Robbie Wills, Alternate

Call to Order

The Committee Chairpersons respectfully request that members, staff, visitors, and guests please observe proper decorum at all times during legislative committee proceedings. Remember to silence your cell phones, watch for areas designated for "members and staff only," and please keep your personal conversations to a minimum. These common courtesies will expedite our business, and these rules will be enforced.

C. Consideration to adopt July 25, 2006 minutes (Exhibit C)

D. Update on Arkansas Wireless Information Network (AWIN)

1. Claire Bailey, Director, Department of Information Technology
2. Dale Safford, AWIN Program Director

E. Update on Schools and Libraries Program of Universal Service Fund - "E-Rates" - Number of secondary schools that have applied for reimbursement

1. Claire Bailey, Director, Department of Information Technology
2. Becky Rains, Strategic Funding Program Manager - Department of Information Technology

F. Recommendations from the Knowledge-Based Technology Task Force (established by Act 2266 of 2005)

1. John Chamberlain, Chairman, Task Force for the Integration of Technology into Public School Education
2. Gail H. McClure, Ph.D., Vice President of Research, Arkansas Science and Technology Authority
3. Dr. James Hendren, Chairman, Arkansas Science, Technology, Engineering and Math (STEM) Coalition, Arkansas Science and Technology Authority

Dr. John Allen attended for Dr. Hendren

G. Discussion of possible merger between Department of Information Systems and Office of Information Technology/Executive Chief Information Officer

1. Claire Bailey, Director, Department of Information Systems
2. Doug Elkins, Executive Chief Information Officer (ECIO), Office of Information Technology

H. Other Business

I. Adjournment

**Joint Committee on Advanced Communications
and Information Technology
Tuesday, November 28, 2006
Room 130, State Capitol
Little Rock, Arkansas**

The Joint Committee on Advanced Communications and Information Technology met from 9:00 a.m. – 11:00 a.m. Reports on E-rate infrastructure funds and the Arkansas Wireless Information Network were presented. John Chamberlin, Chairman, Task Force for the Integration of Technology into Public School Education (established by Act 2266 of 2005), and Dr. Gail H. McClure, Vice President of Research, Arkansas Science and Technology Authority, provided an update of the Task Force and made recommendations submitted by the Task Force members. Dr. James Hendren, Chairman, Arkansas STEM Coalition, submitted legislation recommendations from the STEM's Coalition in writing.

The report on the work of the Task Force for the Integration of Technology into Public School Education included a detailed report on the Task Force's activities and meetings, the SMART staff development portal, Partnership for 21st Century Skills, legislative recommendations and the current role of the STEM's Coalition in improving mathematics, science, technology and engineering programs in Arkansas.

Knowledge-Based Technology Curriculum Task Force Act 2266 of 2005

Update and Recommendations
November 28, 2006

Background

- Act 2266 directed ASTA to develop a knowledge-based technology curriculum and materials
- ASTA convened a Task Force to assist
 - Selected a lesson plan and materials web portal as means to end (SMART Portal)
 - Used existing grants and raised private funds for 2005-2006 expenses
 - Presented to this committee in Jan. 2006

Task Force Efforts To-Date

- Involved 40+ participants from business, education and government
- Held 20+ meetings including an industry panel, a symposium, site visits, and lesson plan workshops at UALR and UAF
- Developed the initial SMART Portal
- Found national coalition with similar goals
- Held retreat to develop recommendations

Today's Intent

- Give a brief demo of the SMART Portal
- Introduce the Partnership for 21st Century Skills, the national group with similar goals
- Present four recommendations
- Give you a written report to take with you
- Brief statement from Arkansas STEM Coalition chair, Dr. James Hendren

Smart Portal

- Access to lesson plans and materials
 - Based on Arkansas Educational Frameworks
 - Incorporation of technology into core subjects
 - Integrated practice of 21st Century Skills
- Access from any school
- An expansion of best practices

Smart Portal Demo

Partnership for 21st Century Skills

- Addresses challenges for 21st Century education and economy
 - The nature of education is changing internationally
 - The nature of competition is changing internationally
 - The nature of workforce, jobs and skill demands is changing internationally

Partnership for 21st Century Skills

- Broad coalition to address educational and economic challenges
- Concerns parallel to Act 2266
 - Core subjects
 - Learning & thinking skills
 - Information and communications technology literacy
- Multiple states use as a basis for policy

Partnership for 21st Century Skills video

Recommendations

- **Accelerate SMART Portal development in partnership with AETN, ADE & ASTA**
 - Convene workshops to develop lesson plans
 - Create professional development component
 - Complete existing grants
 - Participating agencies need funds in budgets

Recommendations

- **Arkansas participation in the Partnership for 21st Century Skills**
 - Endorse ADE membership initiative
 - Plan framework for progress in education and economic development for the 21st Century

Recommendations

- **Enforce/Audit technology infrastructure standards as established in Arkansas Schools Facilities Manual**
 - Standards adopted with no approval/oversight
 - Cost of technology built in is less than retrofit
 - Possible equity issue with some districts following the standards, others ignoring them
 - There must be a mechanism for updating

Recommendations

- Establish a task force with interagency and public members to explore the concept of community learning centers.
- Such centers provide technology enriched learning environments, shared by K12 education, higher education, life long and workforce education promoting efficiencies and fostering synergies.

Recommendations

- Accelerate Smart Portal Development
- Participate in Partnership for 21st Century Skills
- Manage technology standards in schools
- Explore community learning center concept

Written Report

- Executive Summary
- Recommendations
- Chronological Activity Reports
- Appendices
- Partnership for 21st Century Skills material

Arkansas STEM Coalition

Special Events and Meetings with Consultants and Stakeholders

SPECIAL EVENTS AND MEETINGS WITH OUTSIDE CONSULTANTS AND STAKEHOLDERS

Industry Panel: Defining Knowledge Based Skills Presentation at Task Force Meeting (3/13/06)

Bob Priebe
Staff Manager – State Government Affairs
ALLTEL Corporation

Bob Priebe has been employed by ALLTEL since 1985 and has held positions in various disciplines including engineering, customer services, industry relations, regulatory and state government affairs. He received a BSBA from Henderson State University in 1979 and an MBA from UALR in 1984.

Melinda Faubel
Director – External Affairs
AT&T Arkansas

Melinda Faubel, director, external affairs at AT&T, is responsible for the contributions budget, sponsorships, and local advertising for SBC in Arkansas. She is also the SBC Foundation liaison for Arkansas and works on education and economic development projects for SBC in Arkansas. A native of Little Rock, Arkansas, Melinda holds a bachelor's degree of science in Industrial Engineering from the University of Arkansas in Fayetteville, and a Masters of Business Administration from the University of Dallas.

Tom Burnett, Ph.D
Manager of Strategic Initiatives
Apple

Tom Burnett serves as Manager of Strategic Initiatives for Apple. In this role, he is responsible for working with education leaders at state, regional and national levels on issues of strategic planning, education/technology policy and research. Most recently, Tom was Vice President for Product/Business Development and co-founder of ArticulateLearn, and e-learning company based in Austin, TX. Tom holds a Ph.D. in Educational Administration with emphasis in Computer Science & Research from the University of Missouri – Columbia; a M.A. in Educational Research and Psychology from the University of Missouri – Kansas City; and, a B.S. in Education – Secondary Math, from the University of Missouri – Columbia.

Brad Greenway
Technology Development Manager
Arkansas Department of Economic Development

Brad Greenway, MBA major, is a results-driven executive with broad-based business and technical expertise which has been used to transform corporate vision and strategy into profitable reality. A proven track record in planning, building, and launching successful commercial products receiving industry accolades. Keen, in-depth understanding of technologies and trends and a solid background in all core business functions – finance, marketing, and operations. Exceptional client relationship and management skills; relates and interfaces easily at the top executive levels.

March 23, 2006

The Arkansas Science & Technology Authority (Authority) and the Task Force for Integrating Technology into Public School Education invite you to participate in a special symposium and panel discussion to be held on Monday, April 17 at Doubletree Hotel, Salon B, Second floor lobby, in Little Rock. This symposium, beginning at 9:00 a.m., will feature three special guests who will be focusing on the topic, **“Integrating Technology into Arkansas Education: Thinking Outside the Box.”** The presentations of each of our special guests and the panel/audience interactions that follow will provide information on unique educational models from other states of our nation, other nations of the world, and educational strategies needed to stay competitive in a global economy. This is a particularly critical issue in our state since educational reform is a current focus of policy makers.

The guest speakers for the symposium are quite impressive and each brings unique expertise to the discussion.

- Dr. Yvonne Spicer is the new Associate Director for the Boston Museum of Science and directs the National Center for Technological Literacy (NCTL) K-12. Dr. Spicer was directly involved in the development the Massachusetts Science & Technology/Engineering Curriculum Framework and is an expert in disseminating and integrating technology and engineering into their school curricula. The National Center for Technological Literacy was founded by the Museum of Science, Boston in an effort to prioritize the betterment of technology and engineering education across the United States. Massachusetts has been a leader in integrating technology and engineering into its state educational standards.
- Ms. Susan Brooks-Young, S.J. Brooks-Young Consulting, is a specialist in the development and implementation technology plans in educational settings. She has many years of experience in developing plans that integrate technology use throughout the curriculum, anticipating needs for professional development and infrastructure, and developing plans that monitor and evaluate activities within a realistic budget.
- Ms. Susan Patrick-Lascell is President and CEO of North American Council for On-Line Learning and former Director of the Office of Educational Technology at the U.S. Department of Education. Ms. Patrick-Lascell managed the federal government’s educational technology policies and produced two Secretary’s Technology Leadership Summits: Empowering Accountability and Assessment Through Technology and Increasing Options through E-Learning. She served as Co-chair of the federal government’s Advanced Technologies Working Group for Education and Training; and served as a member of the Secretary’s Rural Education Task Force. The mission of the North American Council for Online Learning (NACOL) is to increase educational opportunities and enhance learning by providing collegial expertise and leadership in K-12 online teaching and learning.

The Task Force is hosting this event, and we hope you will support this effort by your presence as well. The agenda for the program and a registration form are attached. Please email (Lecia.Willis@arkansas.gov) or

fax (501.683.4420) the registration form to Ms. Lecia Willis so that we may prepare lunches and name tags. We hope you will participate in this worthwhile project and look forward to seeing you at the Task Force meeting on April 17, 2006.

Sincerely,

A handwritten signature in black ink that reads "Gail McClure". The signature is written in a cursive, flowing style.

Gail Y. H. McClure, Ph.D.
Vice President Research

GYM

2 Enclosures

Task Force for Integrating Technology into Public School Education

Presents

Integrating Technology into Arkansas Education ~ Thinking Outside the Box

Monday, April 17, 2006

**Doubletree Hotel
Salon B, Second Floor Lobby
424 West Markham, Little Rock, AR**

AGENDA (Tentative)

- | | |
|---------------|--|
| 9:00 - 9:30 | Registration / Coffee |
| 9:30 - 9:45 | Welcome and Introduction of Speakers
Dr. Gail McClure
VP Research, Arkansas Science and Technology Authority |
| 9:45 - 10:45 | Ms. Susan Patrick Lascell, President and CEO
North American Council for On-Line Learning
<i>(Question and Answer Session)</i> |
| 10:45 - 11:00 | Break |
| 11:00 - 12:00 | Ms. Susan Brooks-Young
Consultant And Specialist in Planning, Implementing and Evaluating
Curriculum/Technology Plans
<i>(Question and Answer Session)</i> |
| 12:00 - 12:45 | Lunch |
| 12:45 - 1:45 | Dr. Yvonne Spicer
Associate Director for the Boston Museum of Science
Director of National Center for Technological Literacy (NCTL) K-12
<i>(Question and Answer Session)</i> |
| 1:45 - 2:00 | Break |
| 2:00 - 2:45 | Panel Discussion & Audience Participation
Task Force Planning for Integrating Technology
into Arkansas Education |
| 2:45 - 3:00 | Debriefing and Summary
Mr. John Chamberlin, Chair, Task Force
Mr. Tim Taylor, Vice-Chair, Task Force |

Integrating Technology Into Arkansas Education: Thinking Outside the Box – A Symposium
(4/17/2006)

The Arkansas Task Force for Integrating Technology into Public School Education sponsored a symposium that provided an opportunity to gather information from various consultants in education as well as opportunities for educators and business and industry leaders to ask questions. The agenda provided for exchanges between participants and a panel experienced in developing and implementing technology plans at both the state and local levels.

Online distance learning, developing and evaluation curriculum and technology plans, and establishing literacy standards were discussed in detail by Susan Patrick Lascell, Susan Brooks-Young and Dr. Yvonne Spicer.

It is important to note that as the session concluded and discussions continued for at least one hour, several participants recognized that the generation gap between some educators and most high school students creates various disconnects to communication, motivation and learning. Susan Brooks-Young provided a summary of these disconnects in the attached chart. An analysis of this information seems to suggest that staff development is a critical part in helping “digital immigrant teachers” to become “digital native learners” so that teachers may partner with students in collaborative learning – especially when technology is an aspect of the process.

The Task Force’s agenda over the next few months includes the formation of a writing team, another symposium involving the Steering Committee in a conference with educational technology specialists and the opportunity to describe implementation procedures as well as proposed activities for consideration by the legislature.

Apple Executive Briefing (5/17/06-5/18/06)
1 to 1 Learning – iLife in the Curriculum
21st Century Skills – Technology Integration

Four members of the Arkansas Task Force on Knowledge Based Curriculum Steering Committee and the ASTA External Evaluator attended an Apple Computer Corp. Executive Briefing in Cupertino, California. The agenda for the meeting had been developed by the Steering Committee and Dr. Tom Burnett, Manager, Strategic Educational Initiatives at Apple.

The major outcomes achieved included an examination of:

- the present state of technologies in schools in terms of teaching and learning
- digital school projects such as mobile labs, equitable technology access and 1 to 1 learning initiatives (one student, one computer, software, internet access,....),
- professional staff development in the use of technology as productivity, multimedia and information mind tools,
- the Arkansas story as it relates to the recent initiatives by the WRF and ASTA in the area of science minigrants and interactive learning technologies and the design of the SMART project as applied to science, mathematics and technology teaching and learning activities, and
- the identification of areas of need in program experimentation and program implementation.

Funding for the collaboration of Apple educational consultants and Task Force leaders was provided by Apple as a part of corporate participation in providing support for the work of the Task Force in Arkansas.

Hot Springs Technology Conference (6/14/06)
SMART Program (workshop)

Dr. Gail McClure spoke at a session of the Hot Springs Technology Conference. She presented an overview of Legislative Act 2266 of 2005, the work of the Task Force on Technology Curriculum. She then focused on the SMART summer workshops and the connections between all of the WRF supported science programs at ASTA.

The establishment in 2005-2006 of the SMART Web Portal and workshops for qualified teachers in Grades 5-8 for the purpose of developing lesson plans was discussed in detail. Those in attendance were encouraged to help circulate information about opportunities for teachers to help develop lesson plans for the Web Portal at INA through various grants. Teachers, especially in grades 5-8 science classes, will be able to download lesson plans based upon an Arkansas Department of Education Template during the summer and fall of 2006.

Dr. McClure stressed plans by the State Task Force on Knowledge Based Curriculum to use the SMART website to store and retrieve lessons in all subjects with links to various technologies – especially those that are useful in problem solving or conducting research.

Participants at the Hot Springs Technology Conference were also encouraged to share information about the four-year WRF Affiliates Middle School Minigrant and STUART grant programs in Arkansas public schools.

UALR SMART Workshop (7/24/06-7/29/06)
SCLB Room 165

Dr. Keith Harris, science specialist with the UALR Math/Science Center directed a SMART workshop for six middle school science teachers July 24-29, 2006. The ASTA External Evaluator attended a session of the workshop July 27, 2006.

A brief assessment of the program includes:

- teachers were spirited, on task and well coached
- workspaces including various technologies were very adequate
- reference materials available in sufficient quantity, including personal materials brought by teachers
- technical support and assistance to teachers in design and layout were sufficient
- participant qualifications and readiness were apparent
- a SMART template was being refined based on the work of a subcommittee of the Task Force on Knowledge Based Curriculum
- the number of lessons projected from each teacher was 5-8
- the recognition that the first SMART workshop was a learning experience for ASTA and what was learned will be shared with other workshop directors.

AETN Technology Institute (7/24/06-7/28/06)
Conway, Arkansas

The AETN Technology Institute, now in its fourth year of funding by the Arkansas Community Foundation IMPAC Technology Endowment was conducted July 24-28, 2006. There were two sessions of the Institute. Twelve teachers participated in the first workshop June 26-30, 2006 and eighteen teachers participated in the second session.

The importance of this activity is becoming increasingly connected to the Math/Science and technology programs administered by ASTA, the Math/Science Centers and the ARCF Affiliates. The Arkansas Department of Education, with encouragement by the Joint Senate and House Education Committee, has provided funding to AETN to coordinate online staff development for Arkansas public school teachers. Therefore, 2006-2010 will be critical years in developing the early, middle and formative years of a new coordination effort that will impact the ARCF Affiliate Minigrant and STUART Grant programs, the SMART Portal and the programs developed based upon recommendations from the Arkansas Task Force on Knowledge Based Curriculum.

The eighteen teachers were observed working in three groups. Each group made a lengthy presentation (multimedia) complete with lesson plans, benchmarks and student evaluation materials. The groups used a common template comparable to the SMART template. The subject areas covered were high school physics, middle school English and middle school social studies.

The AETN Technology Institute is expected to continue until it becomes a mainline supported activity with or without IMPAC Endowment funding. There are plans for an online version of the training objectives.

Planning and Coordination Meeting of AETN staff and ASTA (7/28/06)
Topic: AETN Online Staff Development & INA SMART Web Portal

A meeting between administrative representatives of ASTA and AETN was held at AETN July 28, 2006 to discuss and arrive at an understanding as to the role of AETN (with directions from the Arkansas Department of Education as a part of a development and supervision grant) in coordinating online staff development activities – especially those receiving college degree credit and continuing education credit.

It was decided that a small committee with representatives from AETN, ASTA and INA will establish guidelines and procedures to follow in order to achieve a joint coordinated effort as each entity works toward common overlapping goals as well as reflecting the eventual goal of a web portal that serves the need of the Arkansas Department of Higher Education in the area of online staff development.

The first meeting of the Coordinating Committee is expected to be conducted within a few weeks.

UAF SMART Workshop (8/6/06-8/11/06)
Center for Math and Science Education
Fayetteville, AR
August 6-11, 2006

The ASTA External Evaluator attended the UA SMART Workshop in Fayetteville on August 10, 2006. The workshop agenda and template used by the participants are included in this summary. There were five teachers in the workshop and each teacher devoted over fifty hours to developing and editing lesson plans. A science specialist coordinated the workshop and reviewed the lesson plans.

The template used in the workshop was refined after the UALR SMART Workshop July 23-29, 2006 was completed. The functionality of the software and the Twentieth Century Skills were added. The instructional model was based upon five concepts that provide structure for a lesson; Engage, Explore, Explain, Elaborate and Evaluate. The teachers in the UA SMART Workshop were able to begin writing lesson plans by the second day of the workshop.

The UA Math and Science Center is located on the first floor of a building on the east side of the campus. There was sufficient room for several offices, a large classroom (50 ft. x 30 ft.), two work areas and several small rooms for the storage of activity resource materials for math, science, technology and various instructional materials.

The following is a list of some of the lesson topics for which lesson plans were developed:

- Waves and energy transfer – grades 6-8
- Soil Analysis – grade 8
- Heredity (Birds) – grades 6-8
- Global Warming – grade 8
- Human Digestive System – grade 7
- The Electromagnetic Spectrum – grade 8
- Magnetic Fields – grade 7
- Skull Taxonomy – grade 8
- Conversion of Matter – grade 6
- Newton's First Law – grade 7

A survey completed by teachers participating in the SMART Workshops at UALR and UA Fayetteville indicates that a teacher should be able to complete (using a Microsoft Word template) and edit (after a review by a science specialist) about 8-12 lessons in a five day time period. A lesson with which the teacher is experienced and has adequate details as to organization and materials list may be completed in 4-6 hours. Otherwise, a lesson transferred to a template will take 10-12 hours. This assumes the availability of reference materials and assistance from support staff.

There is an aspect of the SMART program that is very critical to the overall quality of the program. The subject matter specialist must be knowledgeable and efficient with regard to the process of editing and offering suggestions for improvements in lesson plans. It's almost as if the skills and talents of a wordsmith, curriculum specialist and experienced classroom teachers are called into play numerous times a day. The impact of the interaction between the person that reviews lessons and offers suggestions and the workshop participants that develops lesson plans should not go unnoticed as to its importance. The quality of that interaction over the first two days of the SMART workshop could very well determine the quality of the lesson plans.

Lesson plans developed in SMART Workshops are forwarded to ASTA, reviewed by an Arkansas Department of Education curriculum specialist and placed on the SMART Web Portal.

National School Board Association (NSBA) 2006 Technology / Learning Conference (11/8/06-11/10/06)

Dallas, Texas Convention Center

The ASTA External Evaluator, the chairperson of the Arkansas Task Force for Integrating Technology into the Arkansas Public School Curriculum (Task Force) and a staff person from ASTA directly involved in various STEM related academic programs, attended the NSBA annual educational technology conference. Funding for this activity was provided through the ARCF Fund created to support the work of the Task Force.

The convention program centered around six major themes -each of which related to the various programs in which ASTA is directly involved:

- Leadership and Vision
- Support, Management and Operations

- Learning and Teaching
- Assessment and Evaluation

- Productivity and Professional Practices
- Social, Legal and Ethical Issues

Prior to the conference, on Tuesday November 7, 2006, the representatives of the Task Force observed programs in a **high school, middle school and elementary school in the Carrollton-Farmers Branch Independent School District in Carrollton, Texas**. The school district has implemented a technology training and integration model which concentrates on specific curriculum needs and the various technologies best suited to address those needs. The specific programs observed were directly related to programs of concern as identified by the Task Force.

In addition to the school visitation and observation program, the three representatives of the Task Force attended numerous workshops, roundtable discussions, lectures and demonstrations. In addition, they attended an Interactive Town Hall meeting conducted by Ken Lay, Director of the Partnership for 21st Century Skills.

Vendor's displays of various technologies as well as "best practices sessions" provided a comprehensive overview of the current status of the integration of technology into the teaching and learning process related to numerous components of K-12 school curriculums including; virtual learning, wire and wireless technology infrastructure, distance learning, on-line staff development, interactive smart boards, technology use in math and science, on-line curriculum resources, student data management and the leveraging of E-Rate dollars in modernization of schools.

**Arkansas State University
SMART Biology Workshop
Agenda**

Friday, November 30, 2007

- 9:00 Getting to know each other; paperwork
- 9:45 Presentation by Cathy Mackey on the 5 E lesson plan
- 11:00 LUNCH
- 12:00 Examine Biology Frameworks and decide who would write a lesson for which SLE; participants choose 7 SLE's each to write lessons for; participants begin to write lessons
- 4:00 End of Day

Saturday, December 1, 2007

- 9:00 Examine a few of the lessons from Friday
- 10:00 Continue writing lessons
- 11:00 LUNCH
- 12:00 Continue writing lessons
- 3:00 Review work accomplished; reinforce assignments
- 4:00 End of Day

Friday, January 25, 2008

- 9:00 Paperwork
- 9:30 Each participants presented 2 copies of 7 lessons each
- 10:00 Each lesson reviewed twice by other participants
- 11:30 LUNCH
- 12:30 Review continued
- 4:00 End of day

Saturday, January 26, 2008

- 9:00 Review continued; corrections made
- 11:30 LUNCH
- 12:30 Review & corrections continued
After all corrections are made, each lesson is saved on a thumb drive by each participant & Trautwein
- 3:30 End of day

**Arkansas State University
SMART Biology Workshop Participants:**

Patrick Brown – Searcy
Linda Clark – Jonesboro
Michelle Guinn – Paragould
Linley Lyerly – Fayetteville
Cheryl Massengale – Stuttgart
Sharon Rondone – Paragould

EXECUTIVE SUMMARY

“Rising Above the Gathering Storm: Engaging and Energizing *Arkansans* for a Brighter Economic Future”

Recommendations prepared by:
Arkansas Science, Technology, Engineering and Mathematics Coalition
(STEM Coalition)

Executive Summary and Recommendations

Background.

On September 5, 2007, four hundred leaders from throughout Arkansas gathered at the Statehouse Convention Center in Little Rock, Arkansas to address the topic, "Rising Above the Gathering Storm: Energizing and Employing *Arkansans* for a Brighter Economic Future." The conference, hosted by the Arkansas STEM Coalition, featured national and state leaders that provided a range of information related to the dilemma in STEM education, the economy from a national perspective, competition issues in a global economy, and state issues related to economic development. Arkansas leaders connected these central themes to similar concerns in Arkansas issues.

- Dr. Gail Cassell, Eli Lilly, reviewed the Executive Summary of the 2005 report from the National Academies which centered on recommendations for STEM education critical to preparing America's youth for global competition.
- Mr. Jerry Adams, Acxiom, gave an overview of the Accelerate Arkansas' strategic plan with focus on knowledge based job creation; raising capital for investment; and creation of venture capital funds.
- Dr. Ruth Wooden, Public Agenda, related that national surveys indicate that changing prevailing student attitudes or cultural opinions that relate to STEM education require influencing parents' existing perspectives.
- Governor Mike Beebe gave the keynote address at lunch and reiterated that education and economic development are interconnected.
- Ms. Mary Jo Waits, Pew Trust, explained that the states must focus on the areas where there are strengths and foster collaboration and cited the axiom, "It is not about how much you spend but how you spend it."
- The Arkansas Foundation roundtable had two summary points: Foundation funds must be used to both bring groups together and leverage partnerships and also to help define schools for the 21st Century.

As a result of the input sought from conference participants and information from STEM Coalition focus groups and data collection, the following is an overview of recommendations related to:

- I. Why STEM education is important
- II. How STEM education influences economic development
- III. Recommendations that resulted from the Conference and STEM Coalition research

Why STEM Education Is Important

There is growing concern that the United States is not preparing a sufficient number of students, teachers, and practitioners in the areas of science, technology, engineering, and mathematics (STEM). A large majority of secondary school students fail to reach proficiency in math and science, and many are taught by teachers who either lack adequate subject matter knowledge or lack passion for the subjects.

When compared to other nations, the math and science achievement of U.S. students and the rate of STEM degree attainment appear inconsistent with a nation considered to be the world leader in scientific innovation. In a recent international assessment program of 15-year-old students from the top 57 advanced countries (30 OECD member nationals and 27 partner nations), the U.S. ranked 28th in math literacy and 24th in

science literacy. Moreover, the U.S. ranks 20th among all nations in the proportion of 24-year-olds who earn degrees in natural science or engineering.

Arkansas, like most other states, faces a major dilemma in developing a workforce that meets the needs of economic development now and in the foreseeable future. The key to unlocking the progress lies in the preparation of students and other adult workers to be proficient in a workforce that is dependent on emergent skills from STEM disciplines.

Nationally -

- Only 40% of American workers have the technical skills and learning skills required by employers.
- U.S. Business spends \$62 billion per year to upgrade basic skills.
- American 12th graders ranked near the bottom of 21 nations participating in the Third International Mathematics and Science Survey.
- Congress has been forced to raise the ceiling on H1-B visas to allow skilled foreign workers to fill critical high-tech jobs in the United States.
- The U.S. faces a critical and worsening shortage of qualified science, mathematics and technology teachers and workers.
- All Americans need and deserve to receive the best possible education in mathematics, science, and technology for their personal and civic lives.

(From National Alliance of State Science and Mathematics Coalitions website, <http://www.nassmc.org/>)

In Arkansas –

- Almost 40% of 2007-08 freshmen entering Arkansas universities needed remediation.
- Over 75% of all 2007-08 freshmen entering two-year colleges needed remediation.
- Arkansas has an average per capita income just over \$30,000 (47th) and less than 20% of our population have a bachelor's degree or higher. (Correlate: No state with a low proportion of Bachelor's degrees has a high per capita income.)

(Purcell, presentation, February 13, 2008)

STEM Education and Economic Development

Economic development at the local, state, national and international levels depends on the ability of workers to fill the current available positions and for entrepreneurs to develop jobs for the future. Up to 50 percent of America's adult population today lack the advanced skills that are the foundation for most future high-paying jobs in today's complex knowledge economy (Gordon, 2010 Meltdown). The skills and tools that must be possessed by workers trained in science, technology, engineering and mathematics include critical thinking coupled with content knowledge. The level of proficiency necessary depends on the individual placement of the worker into the economic scheme. When addressing the needs of Arkansans, we must look at our current workforce, the present needed skills, and those needed for the economy of the future. The strengths of the current workforce cluster around skills necessary for an economy that is basically agrarian and manufacturing.

Dr. Gail Cassell pointed out in her address that future economic development depends upon how the U.S. resolves issues of competition in securing its place in the 21st Century. Four recommendations were made:

- a. Increase America's talent pool by improving K-12 science and math education.
- b. Develop and retain the best students.
- c. Strengthen the long-standing federal investment in basic research in the physical sciences.

- d. Ensure the United States as the premier place for innovation by modernizing the patent system and realigning tax policies.

Current Economy Needs. Most manufacturing and farm jobs now require skills that can best be described as college level mathematics with some computer skills. While these current jobs often resemble positions that have been around for many years, over the last few decades skill requirements have evolved, and tasks accomplished by manual labor have been replaced with more technological solutions. Such positions today most often require more technical training with a minimum of an associate's degree.

Dr. Jim Purcell, ADHE, recently unveiled a plan designed to increase the number of Arkansans with post-secondary training through advanced skill sets for a technology-driven Arkansas economy. His philosophy is built on "Speed to Market and Close to Customer." The components include:

- Implement a series of initiatives that expedite the number of degrees produced and the speed at which degrees are produced.
- Enhance the production of degrees in high-demand programs that are needed for the modern Arkansas economy.
- Create incentives for students to complete a degree and to work in Arkansas.

Future Economy Needs. Creating the jobs of the future will require entrepreneurs and innovation leaders. These are typically people with high achievement in mathematics, science and engineering. Coupled with financial support, the ideas of these creative minds will enable development of knowledge-based skills. The marketplace need for these skills calls for the coupling of education and economic development. It also calls for the creation of a culture that attracts creative people from outside Arkansas (and from outside the USA). Government regulation is necessary here for creation of more H1-B visas.

Universities are critical in economic development and entrepreneurial growth by establishing and maintaining the research environment that leads to new discoveries and coupling this creativity with business acumen that comes from our students and faculty in business curricula. Arkansas is actively developing and supporting the collaborations between our higher education providers that are necessary to reach a "critical mass" of knowledge skills for economic development. Significant technology startups also come from spin offs in the private sector. These entrepreneurs also require the same higher education degree program skills. We also need a workforce in which people have higher quantitative and logic skills.

In a recent conference (University of Arkansas at Little Rock 4th Annual Regionalism Conference) Mr. C. Michael Cassidy of the Georgia Research Alliance stressed the need for collaboration of universities, business and government to build the necessary workforce for future growth. The Southern Growth Policies Board, in their March 2008 report *Supporting Sector Strategies in the South* (by Dexter Ligot-Gordon, Sandra Johnson, Ravinder Mangat, Jack Mills, and Ray Taylor), make the point that it is necessary to "engage political leadership to make sector workforce and economic development a priority" and that we need to select sectors of the economy most likely to lead to economic success. It is obvious that the "high tech" areas are among those sectors that need to be targeted in Arkansas now and well into the future.

Education Necessary to Produce Workers. The students in Arkansas currently are approximately average with regard to national ranking (see National Science Foundation Science S & E Indicators 2008). However, the long history of education in Arkansas has resulted in a relatively low level of college graduates. The percentage of Arkansans over age 25 who had a bachelor's degree actually dropped from 2002 to 2003 from 19.7 percent to 19.0, despite Arkansas

having the fastest growth in college graduates from 2000 to 2003 (Black Issues in Education, Feb 10, 2005), and has continued to hover at just above 19 percent to present. Since 2001-02, a total of 2,912 additional baccalaureate degrees (+24.7%) have been awarded across the state system (Dr. Jim Purcell presentation, Possibilities for Success, Arkansas Legislature, January 17, 2008). However, during this same period, the enrollment increased 21% with state population growth, and Arkansas continues to lag well below the national average in college graduate as a percentage of total population, according to new U.S. Census estimates.

Recommendations

The basis for STEM education recommendations come from several sources.

- Arkansas' conference on Rising Above the Gathering Storm: Energizing and Employing Arkansans for a Brighter Economic Future in September, 2007, had breakout sessions by regions of the state to collect recommendations. This conference was sponsored by the Arkansas STEM Coalition. These recommendations were reviewed, categorized, consolidated and reported by a working committee of the Arkansas STEM Coalition.
- Accelerate Arkansas has recently completed work on STEM education in which a workgroup reviewed, added to, and prioritized recommendations made from statewide strategic planning focus groups made up of a cross section of business, education, economic development, and other experts in the field.
- The Milken Institute, under contract with Accelerate Arkansas, performed a comprehensive baseline study of the economic status and future of Arkansas entitled "Arkansas' Position in the Knowledge-based Economy", September, 2004, in which significant emphasis was placed on STEM education.
- The Institute of Economic Advancement at the University of Arkansas at Little Rock conducted a study for Accelerate Arkansas concerning the characteristics of high growth and high achieving communities and states, as well as, best practices for rural development. The study was entitled "Closing the Gap, An Examination and Analysis of Per Capita Personal Income in Arkansas". This report also addressed the importance of STEM education and correspondent characteristics that the state needs to accomplish for economic growth.
- The University of Arkansas at Little Rock sponsored the 4th Annual Regionalism Conference entitled "Help Wanted: Who will fill the jobs for Arkansas' future?" in February 2008, that considered the economic future and certain needs for the central Arkansas region. A number of the topics discussed include STEM education and recommendations relative to improving STEM education.
- The Arkansas STEM Coalition organized six statewide STEM study groups in 2006. Each group studied different areas of STEM education needs and made associated recommendations.

This report takes the results of the Arkansas STEM Coalition's Rising Above the Gathering Storm conference, includes information from these other sources and consolidates the most relevant parts into the following recommendations.

Enhance Excellence in the STEM Classroom:

- Pay high-quality STEM teachers an income competitive with other industries in order to:
 - o Encourage students to enroll in and remain in four-year STEM education degree programs,

- Encourage good teachers to stay in the classroom, and
- Demonstrate that Arkansas STEM teachers are an important economic development resource.
- Develop an elementary science STEM education degree program, subject to design and approval by the ADHE, and implement the program in Arkansas' Education Colleges.
- Begin STEM education in early grades (K-6).
- Train and encourage teachers to facilitate exploration of STEM with hands-on project driven activities.

State Education Policy:

- Eliminate the "opt out" option currently available to parents and students to avoid the Smart Core Curriculum in Arkansas' high schools.
- Give the Department of Higher Education the authority and budget control to organize and prioritize the scarce resources of the state to create specialized campuses and focus resources on quality programs for economic development and reduce the emphasis of 'all programs for all campuses'.

Create More STEM Students and Teachers:

- Create an aggressive loan forgiveness program focused on four-year STEM education degree programs for graduates that teach in Arkansas independent of where a degree was earned.
- Establish a supplemental summer program for STEM teachers and four-year STEM students to work with industry and higher education in established research programs.
- Create need-based scholarships for STEM students, including STEM education majors.
- Support the funding of extracurricular education opportunities to expose students to opportunities in STEM occupations (e.g. Aegis).

Curriculum:

- Create a comprehensive, integrated STEM curriculum that encourages STEM to be taught across the curriculum. This means integrating concepts of quantitative reasoning and critical thinking, along with basic science and mathematical concepts, into non-STEM as well as STEM courses and programs.

Facilities:

- Provide STEM specific laboratories and laboratory equipment in middle and high schools to improve the learning opportunities and to encourage teachers to remain in teaching via providing them the tools that they need. STEM facilities are also needed at a simpler level for elementary schools.
- Insure all new school facilities, from pre-K through university, are built with technology infrastructure that insures availability of technologies in the classroom that support advancing STEM courses.

Funding:

- It is critical that appropriate and sufficient funding be appropriated and released in order to implement the recommendations in this report. This funding is needed at all levels of educational institutions (primary through graduate university) as well as at state agencies that support the STEM mission.
- It is important that significant funding be provided for implementing recommendations expected to be made by the Arkansas Research Alliance for centers of excellence in research that will lead to commercialization of innovations by new entrepreneurial companies, create high paying jobs, and rely on comprehensive STEM education programs to provide a globally competitive workforce.

Conclusion

Improved STEM education is critical to the economic future of Arkansas. Input was collected from numerous high quality studies, conferences and focus groups. The highest priority recommendations that were generated from these activities are presented here. The data strongly demonstrates the need for significantly improved STEM education, improved quality in the classroom, and funding for implementation of the recommendations for a 21st Century educational infrastructure.

13 Arkansans invited to science meeting

Thirteen economic “influencers” and college students from Arkansas were among those invited to a convocation in Washington, D.C., sponsored by the National Academies, an organization addressing the nation’s critical needs in science, engineering and medicine.

The group was invited to a meeting on the growing challenges of the country’s economy. The Arkansans were chosen for their participation in the Arkansas Science, Technology, Engineering and Math Coalition and the Arkansas Advancing and Supporting Science, Engineering and Technology Initiative.

Among the Arkansans invited were Greg Nabholz of Nabholz Construction; Mike Gealt, dean of the College of Science & Mathematics at the University of Arkansas at Little Rock; Jerry Adams, executive director of the Arkansas Research Alliance; James Hendren, software developer and entrepreneur; Suzanne Mitchell, instructor at Arkansas State University; and Gail McClure, vice president of the Arkansas Science & Technology Authority.

Also invited were Maureen C. Dolan, Earl Benjamin III and Ellis T. Benjamin, instructors at Arkansas State University; and students Alison Page and Tatum Branaman from the University of Central Arkansas and Michael Wolverton and Daniel Rucker from the University of Arkansas at Little Rock (04/30/2008).

**SMART Portal: Integrating Technologies
Into Lesson Plans – Teacher Professional
Development Workshop May 5 & 6, 2008
8:30 a.m. – 4 p.m. Schedule**

This workshop was designed to help mathematics and science teachers correlate various technology tools into the instructional aspects of lesson plans correlated to the Arkansas Curriculum Standards. Approximately 175 teachers, observers and support staff registered to attend at least one workshop session.

Introduction

The digital progressions (1985-2008) were surveyed. Key capabilities include: customized learning, access to information, wireless access and open collaboration. Students are engaged in technology – mostly in unstructured situations – driven by social media. Email and text messaging are rival choices.

21st Century Skills learning better defines technology integration. These skills are closely tied – in their application – to learning and job creation. Increasingly, teachers are supporting educational goals, engaging students and promoting higher order thinking skills using technology tools and 21st Century Skills in combination.

The process of technology literacy and adaptation of technologies to instructional applications over time is an expectation that teachers must live with to function in a pragmatic world – transforming tools, environments and student learning. These ideas presented by three consultants were the foundation of the workshop and were introduced primarily using online activities.

A portion of the workshop was devoted to computation and modeling applications of technologies (dynamic models). The models can be applied to teaching or new models can be constructed. Assumptions about the factors affecting certain social and natural outcomes can be controlled and uncontrolled outcomes studied. Computational skills can be motivated through modeling and such skills can enhance lifelong learning. The fundamental principles of inquiry and data analysis as well as conclusions are viewed as a critical part of many 21st Century Skills in combination. Computation errors in models are issues for the teacher and learners to understand and control as a part of the exploration process.

Science and mathematics as pattern recognition and characterization suggest computation is much more than symbol manipulation. Technology, therefore, is a vital tool especially in the context of models with discrete representation.

One consultant used the predator/prey model and was able to view population change (grass, predator and prey) over time and vary the initial conditions. The online tools used were essentially Excel based including graphic models of the simulation.

The functionality of the various programs used to illustrate technology applications was affected by the network (loading new software programs) and how well the program runs. The data could be fine tuned. “What if” questions sometimes resulted in poor displays and distorted the results.

Some lesson plans were demonstrated. The templates varied but most had similar components. Most lessons linked to technology tools. The lessons varied based upon the science and math content and the tools used – especially in the application area.

Finding Internet links to use in a lesson is often an endless search – if one is not skilled in conducting such searches. However, it appeared to be critical that the functionality of the material presented through links help teach the lesson. This suggests that teachers developing lessons work together and draw upon common

and different experiences. Formal investigative search programs may need to be used to isolate “best” links to most lessons.

The afternoon workshops focused on bringing to completeness current SMART Lessons (those that have been completed in SMART workshops at math/science centers) by enhancing the lessons using links to technology applications (and every day – enrichment activities). The task of organizing this portion of the workshop was time consuming. Groups were formed in science and groups were formed in mathematics – five edited and completed lessons in each group was the objective of the group work. The individuals in the groups then had to focus on their personal skill development sufficient to carry out this task. The group, collectively, had to work from the groups’ knowledge base to assure quality lesson enhancements. Some groups choose to stay in the large room and work. Other groups found a quiet place in a remote area or in a participant’s hotel room.

The workshop directors continued to teach, manage and demonstrate relative to each group and each lesson. The products of all of these efforts were retained so that the lessons may eventually be loaded on the SMART Web Portal.

The various groups that enhanced the SMART lessons with technology applications devoted most of the second day of the workshop searching for ideas, selecting and editing. Each group prepared for presentations of lessons to other groups in the workshop. Some technologies were demonstrated by the consultants that helped make more efficient group work occur through various Internet tools.

In summary, a major event occurred May 5-6, 2008 at the Holiday Inn – Presidential Center in Little Rock. What was achieved was not a model program but a collaboration of consultants, participants and sponsors to acquire experience in bringing teachers and technologies together for specific purposes related to teaching and learning with technology, including the development of well scripted lesson plans. The diversity of expectations, skill levels, computers and experiences in such a setting – each affected the perception of what was achieved by any given participant.

There were 175 people in attendance including sponsors, evaluators and technical and logistical support staff. The number of participants receiving credit for each of the four – three hour sessions in time order Monday AM/PM and Tuesday AM/PM was 132, 122, 102 and 85.

**SMART Portal: Integrating Technologies Into Lesson Plans
Teacher Professional Development Workshop**

May 5 & 6, 2008

Monday May 5

8:30-9:00am – Introductions and Agenda Overview

Objectives:

- **Explore 21st Century skills and applications for teaching science and mathematics**
- **Enhance existing math and science lessons using appropriate technologies**

9:00-10:00 - Presentation 1 - 21st Century Learning Tools and Strategies

10:00-10:15 - Break

10:15-11:15 – Presentation 2 -Tools to support quantitative reasoning and inquiry in mathematics

11:15-12:15pm – Presentation 3 - Tools to support quantitative reasoning and inquiry in the sciences

12:15-1:15 – Lunch

1:15-3:15 - Group Work (3 break-out rooms)

- **Brainstorming of ideas**
- **Work on enhancing lessons**
- **Prepare ideas to share**

3:15-3:30 – Break

3:30-4:00 – Gallery Walk of “ideas”

Tuesday May 6

8:30-Noon Group Work continues (break included)

- **Work on enhancing lessons**

Noon-1:00pm - Lunch

1:00-3:00 - Group Work and Final Products Uploaded/Collected

- **Work on enhancing lessons**
- **Prepare for sharing of plans**
- **Final plans collected**

3:00-3:15 – Break

3:15-3:45 – Gallery Walk of Plans

3:45-4:00 Wrap-up/Evaluation/Closing

**Arkansas Department of Education
Technology Plan 2008-2012
Summary of Goals and Objectives**

Goal #	Goal Description
M.1	Promote student centered learning environments that are rich in technology.
M.2	Empower faculty to use technology as a tool to enhance learning.
M.3	Ensure that students and faculty become technology literate and productive in a digital society.
M.4	Engage education and community-based technology providers in collaboration efforts.
M.5	Allow school personnel appropriate and timely access to the tools, data, and information needed to assist in making educational decisions.
M.6	Serve as the documentation required by the United States Department of Education to obtain federal technology funding.
G.1	School districts will equitably allocate fiscal, staff, and professional development resources to ensure that the acquisition, maintenance, and use of high-quality learning technologies are available to support student achievement.
G.2.1	Each school district will develop, implement, and evaluate a plan for technology use that supports high performance standards for technology literacy by students, teachers, and other educational professionals.
G.2.2	Each school district will develop, implement, and evaluate a plan for technology use that includes federally mandated protection from inappropriate materials.
G.2.3	Each school district will develop, implement, and evaluate a plan for technology use that ensures every school has access to digital content and professional development in using technology across the curriculum.
G.3	The state and school districts will develop a robust and reliable security network infrastructure that is capable of supporting advance information and educational technology for learning, teaching, and research.
G.4	Arkansas state funds and federal technology funding streams will be aligned

Goal #	Goal Description
	with other state efforts to support high-need and low-resource schools in obtaining the fiscal resources needed to purchase, install, and maintain up-to-date technology hardware and software.
G.5	The Arkansas Department of Education will seek ongoing input, feedback, and assistance from representatives of all sectors of the education community, as well as community-based technology providers, to collaboratively develop, implement, evaluate, and revise the educational technology plan for Arkansas.
LTP.1.1	Each district will develop a comprehensive technology plan that supports the school improvement plan of each school within the district.
LTP.1.2	Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.
LTP.1.3	Educational technology applications will promote student engagement and will improve student achievement by enabling students to access and analyze information, solve problems, collaborate with others, and communicate their thoughts and ideas.
LTP.1.4	Effective use of learning technologies will allow students to become self-directed, self-motivated, and lifelong learners.
LTP.2.1	Local plans must address the state technology standards for teachers, students, and administrators, as well as technology-specific courses.
LTP.2.2	Local plans must address which technology courses will be required and how students' technology proficiency in technology will be assessed.
LTP.3.1	Professional development should be a coordinated set of planned, research-based best practices, learning activities for teachers and administrators, which are standards-based and continuous.
LTP.3.2	The professional development plan should help in developing and sustaining the technology skills of educators, which will enhance teaching, learning, management, and leadership in the education community.
LTP.4	Teaching and learning must be supported by management tools that are appropriate, efficient, and cost-effective for the district.

Goal #	Goal Description
LTP.5.1	The district must have access to competent and timely technical support.
LTP.5.2	The district plan must include a strategy for the installation, replacement, and maintenance of hardware, software, and networking.
LTP.6.1	Technology plans will be updated yearly.
LTP.6.2	Technology plans will be submitted yearly to the Arkansas Department of Education.
PD.1.1	Technology will be integrated into all aspects of teaching and learning utilizing professional development as a mechanism of change.
PD.1.2	Ensure administrative support for the technology professional development needs and goals relating to technology integration.
PD.1.3	Support teacher technology initiatives by providing sufficient time and follow-up support for the mastery of new technology strategies and the integration of these strategies into practice.
PD.1.4	Improve the preparation of all educators, both pre-service and in-service, in the use of technology using the ISTE NETS guidelines.
PD.1.5	Ensure that every educator knows how to use data to drive instruction.
PD.1.6	Provide practicum and mentor experiences for students and educators to successfully integrate technology into instruction.
PD.2.1	Educators must have access to tools required to support professional development, curriculum, instruction, and assessment, such as laptop computers, classroom Internet connectivity, presentation devices, document cameras, and interactive whiteboards.
PD.2.2	Arkansas teachers should have around-the-clock access to professional development activities, including peer and mentor support at the building level, learning-centered training that encourages collaboration, and access to ADE-approved, innovative, technology-mediated professional development opportunities at the district, cooperative, and state levels.
PD.3.1	Adopt the ISTE National Education Technology Standards for Educators (NETS*A).

Goal #	Goal Description
PD.3.2	Allocate at least 25% of technology budgets for professional development.
PD.3.3	Apply for e-rate reimbursements to assist with technology funding.
PD.3.4	Investigate leveraging the purchase of technology tools to support technology professional development and integration at all levels.
PD.3.5	Candidates in programs for teacher education demonstrate basic computer literacy before initial licensure.
PD.3.6	Candidates in programs for teacher education demonstrate basic data examination and analysis skills before initial licensure.
PD.3.7	Provide training in data examination and analysis to ensure that every educator knows how to use data to drive instruction.
PD.3.8	Require a minimum of 12 hours of annual educational technology professional development for faculty in education preparation programs relating to the integration of technology into instruction.
PD.3.9	Encourage technology professional development beyond basic education technology application, moving toward integration into instruction.
PD.3.10	Require a minimum of 6 hours of annual educational technology professional development relating to the integration of technology into instruction for all certified staff.
PD.3.11	Implement or support the development of Instructional Technology or Technology Integration Specialist positions at all levels.
PD.3.12	Monitor the needs for professional development in technology at all levels, including staff development for local personnel responsible for technical support to educators.
PD.3.13	Continue to offer quality professional development programs for educators on technology integration into teaching and learning, instructional management, and administration.
PD.3.14	Investigate the process of mapping local curriculum with the use of technology-mediated resources that are aligned with the Arkansas Curriculum Frameworks to put in place a process for identifying and locating accessible digital media.

Goal #	Goal Description
PD.3.15	All persons presenting professional development should model best practices in effective use of technology for instruction to engage the learner whenever appropriate.
PD.3.16	Provide state-of-the-art training facilities at all levels.
PD.3.17	Provide opportunities, incentives, and support for educators to develop models of best practices using technology.
PD.3.18	Integrate technology professional development opportunities into all classroom, building, and district planning efforts, including ACSIP.
PD.3.19	Encourage faculty and staff to engage in professional development during the school days.
I.1.1	Provide sufficient bandwidth for each school system's growing needs and evolving Internet-based applications, such as video streaming and teleconferencing.
I.1.2	Ensure that the network reflects standards for transferring and securing information.
I.1.3	Purchase, install, and use network monitoring software to measure bandwidth use, and to promote maximum use and security.
I.2.1	Develop a robust and reliable security infrastructure.
I.2.2	Advance information and educational technology in support of learning and discovery.
I.2.3	Support the development of simplified business processes and services for students, faculty, and staff.
I.2.4	Enrich and extend the telecommunications infrastructure.
I.2.5	Coordinate and promote staff technical training.
I.3.1	Significantly increase bandwidth capacity in K-12 institutions in Arkansas over the next two years.
I.3.2	Encourage school districts to implement campus-area networks.
I.3.3	Require school districts to apply for E-Rate funds. Deny ADE technology

Goal #	Goal Description
	funding to those that do not apply for E-Rate funds.
I.3.4	Require school district to refund any E-Rate funds that must be returned to USAC due to non-educational usage in accordance with E-Rate guidelines.
I.3.5	Provide scalable, robust, and reliable academic systems infrastructure.
F.1.1	Provide adequate funding to assure that all public school students and personnel will have access to and develop proficiency in the use of technology in the teaching and learning process.
F.1.2	All students and staff will have access to a modern and effective infrastructure which enhances quality learning.
F.2.1	Develop innovative methods of funding, with statewide implications, to convert and sustain teaching and learning through educational technology.
F.2.2	Provide appropriate new and flexible models of budgeting for technology.
F.2.3	Continuously assess and evaluate technology investments and implementations.
F.3.1	Fund one local technology integration specialist in each education service cooperative.
F.3.2	Require school districts to hire a technology integration specialist in each Local Education Agency for every 1,100 students.
F.3.3	Coordinate funding processes to maximize benefits to schools in the acquisition, maintenance, and use of technology.
F.3.4	Leverage discretionary funds to foster innovation in teaching, learning, and assessment in traditional and electronic learning environments.
F.3.5	Solicit federal funding and private grant foundations for innovative educational technology projects.
F.3.6	Coordinate funding for maintenance and upgrades for the K-12 state infrastructure network.
F.3.7	Develop, promote, and provide technical assistance for administrative applications for technology, including interactive reports, online standardized

Goal #	Goal Description
	testing, e-grants program, student information systems, online data collections, and web-enabled consolidated application for funding.

Note: This document was not prepared by ADE. It is a summary of goals and objectives from the *Arkansas Department of Education Technology Plan 2008-2012*. "Goal #" is the creation of Tim Taylor <ttaylor@msd3.org>. Last updated: 8 May 2008.

Appendix: 21st Century Skills

Part IV

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