Educational Technology Plan for K-12 Public Schools in Washington State

Appendices

Randy I. Dorn
State Superintendent of
Public Instruction

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2009 Legislative Report:
Educational Technology Plan for K-12 Public Schools in Washington State
Appendices

Table of Contents

Appendix I.   Educational Technology Advisory Committee (ETAC) Members and Working Groups, 2007-2008

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Terry Byington, American Engineering Association (AeA)
Kelly Green, Academic Program Manager, Microsoft

Department of Information Services
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School District Technology Directors
Mike Cullum, Technology Director, Northshore SD

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Steve Holland, Superintendent, Raymond SD

Teachers
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Laura Ferguson, Enumclaw Middle School, Enumclaw SD

Technology Access Foundation
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Technology Alliance
Bryan Chee, Director for Education and Technology, TA

Washington School Information Processing Cooperative
Marty Daybell, Executive Director, WSIPC

Washington State Library (Office of the Secretary of State)
Gary Bortel, IT Services Manager, Library Development, WSL

Workforce Training and Education Coordinating Board
Robert Hinsch, IT Manager, Chief Security Officer, WTECB

OSPI Staff
Anne Banks, Learning and Technology Program Manager
Molly Becker-Miller, Educational Technology Administrative Assistant
Cathy Davidson, Chief of Staff
Julia Fallon, Technology Integration Program Manager
Brian Jeffries, Senior Policy Advisor, Governmental Relations
Corrine McGuigan, Assistant Superintendent, Research and Educator Development
Dennis Small, Educational Technology Director
Georgia Talbert, Technology Standards Program Manager
Peter Tamayo, Chief Information Officer
Jacqueline Wyatt, Educational Technology Specialist

2007-08 ETAC Working Groups

As the issues related to online education and technology integration have entered public discussion in the K-12 sector, the Educational Technology Advisory Committee moved to develop a deeper understanding of these topics—research and analysis being the necessary first elements of sound decision making and policy development. Committee members directed OSPI staff to conduct a thorough examination of the complexities and opportunities educators face as teaching and learning adapt to the online environment.

Three working groups were formed with these specific areas of interest:
- Define the skills, expectations, roles and responsibilities for personnel who must be skilled technology users—certified administrators, teachers and teacher-librarians.
- Define online learning.
- Develop an inventory of research on educational technology.

Define the skills, expectations, roles and responsibilities for personnel who must be skilled technology users—certified administrators, teachers and teacher-librarians.

Becky Firth, Northwest ESD 189	Jennifer Maydole, North Central ESD
Brenda Sargent, Kelso SD	Jennifer Wright, Mercer Island SD
Cari Roderick, East Valley SD (Spokane)	Joan Cortlund, Sumner SD
Colleen Dixon, Issaquah SD	John Kelly, ESD 123
Deb Ramsay, ESD 101	Kim Mathey, Edmonds SD
Dennis McClellan, Kent SD	Laura Ferguson, Enumclaw SD
Dennis Small, OSPI	Mike Cullum, Northshore SD
Georgia Talbert, OSPI	Pam Jeter, White River SD
J. B. Fitzpatrick, Peninsula SD	Sharon DeMeyers, Clover Park SD
Jeff Allen, Olympic ESD 114	Sharron Heath, Naches Valley SD
	Susan Dively, Federal Way SD

2008 ETAC Working Groups

Define online learning

Anne Allen, ETDC	John Cohen, Steilacoom SD
Bruce Becker, Lake Washington SD	Judy Margrath-Huge, DLC
Carolyn Hinshaw, Bellingham SD	Lisa Holmes, Center to Bridge the Digital Divide
Conn McQuinn, PSESD	Mark Westerfield, White River SD
Debbie Tschirgi, ESD 112	Martin Mueller, OSPI
Dennis Small, OSPI	Ron Mayberry, Federal Way SD
Elisabeth Silver, Spokane SD	Sally Lancaster, Everett SD
Forrest Fisher, ESD 105	Shelby Reynolds, Northshore SD
Georgia Talbert, OSPI	Sherry Hahn, WSSB
Janet Harris, Central Kitsap SD	

Develop an inventory of research on educational technology

Ann Reed, Bellingham SD	John Newsom, Lakeside School
Anne Banks, OSPI	Julia Fallon, OSPI
Bre Urness-Straight, Oak Harbor SD	Karen Peterson, Puget Sound Center
Derry Lyons, South Kitsap SD	Kelly Green, Microsoft Corp.
Dick Barnhart, ESD 113	Randi Schaff, Office of the Governor
George Luginbill, Clover Park SD	Tony Jongejan, WWU
Ian Loverro, CWU	Tony Kahler, Highline SD
Jacqueline Wyatt, OSPI	Vicky Ragan, Puget Sound Center

Appendix II. Inventory of Research—Technology Integration in K-12 Public Schools

Developed by the ETAC working group—Create an Inventory of Research on Educational Technology

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Confronting the Challenges of Participatory Culture: Media Education for the 21st Century, 2006, http://www.digitallearning.macfound.org/atf/cf/%7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E%7D/JENKINS_WHITE_PAPER.PDF

Author: Henry Jenkins with Kate Clinton, Ravi Purushotma, Alice J. Robison, and Margaret Weigel

Key Ideas:
- Education leaders must reframe the digital divide. The issue is not *access* to technology. The issue is *opportunity to participate*.

- Children must develop the cultural competencies and social skills necessary for full involvement in a participatory culture.

- Participatory culture shifts the focus of literacy from individual expression to community involvement.

- Most new literacies involve social skills developed through collaboration and networking.

  - These skills are based on traditional notions of literacy and skill sets taught in the classroom—research, technological and critical thinking.

Effects of Using Instructional Technology in Elementary and Secondary Schools; What Controlled Evaluation Studies Say, 2003, http://sri.com/policy/csted/reports/sandt/it/Kulik_ITinK-12_Main_Report.pdf

Researchers: James Kulik (SRI International)

Key ideas:
- PD for teachers and easy access to the Internet for students and teachers enhance the learning effectiveness of instructional technology.

- Student familiarity and knowledge of computers influences the effectiveness of technology-based instruction.

- "Integrated Learning systems (ILS) have been producing positive results in mathematics programs for decades, and computer tutorials in natural and social science classes have had an almost uniformly positive record of effectiveness over the last three decades." (taken from CARET Review of Kulik's 2003 work)

Student Learning, 2005, http://caret.iste.org/index.cfm?fuseaction=evidence&answerID=6

Researchers: CARET (Center for Applied Research in Educational Technology) staff

Key idea:
- Commitment to technology integration (equipment, software, access, teacher development) can lead to increased test scores.

Studies Validate Project-Based Learning, 2001, http://www.edutopia.org/project-based-learning-research

Researchers: Edutopia Staff, George Lucas Education Foundation

Key idea:

- A growing body of academic research supports the use of project-based learning in schools as a way to engage students, cut absenteeism, boost cooperative learning skills and improve test scores. Those benefits are enhanced when technology is used in a meaningful way in the projects. This synopsis describes nine studies incorporating project-based learning implementations. Five of the studies included technology as a context.

Two examples:

- *Challenge 2000.* The project conducted a performance assessment designed to measure students' skills in constructing a presentation aimed at a particular audience. Students from Multimedia Project classrooms outperformed comparison classrooms in all three areas scored by researchers and teachers: student content, attention to audience and design. The Multimedia Project involves completing one to four interdisciplinary multimedia projects a year that integrate real-world issues and practices. Researchers observed increased student engagement, greater responsibility for learning, increased peer collaboration skills, and greater achievement gains by students who had been labeled low achievers.

- *Co-nect.* Students using the Co-nect program, which emphasizes project-based learning and technology, improved test scores in all subject areas over a two-year period on the Tennessee Value-Added Assessment System. The Co-nect schools outperformed control schools by 26 percent.

ACOT (Apple Classrooms of Tomorrow) Library, 1985—1995, http://ali.apple.com/acot2/references/

Compilation of research

Key ideas:

- In ACOT classrooms, students and teachers had immediate access to a wide range of technologies: computers, videodisc players, video cameras, scanners, CD-ROM drives, modems and online communications services. In addition, students could use an assortment of software programs and tools, for example word processors, databases, spreadsheets and graphics packages.

- In ACOT classrooms, technology was viewed as a tool for learning and a medium for thinking, collaborating and communicating.

- ACOT's research demonstrated that the introduction of technology into classrooms can significantly increase the potential for learning, especially when it is used to support collaboration, information access, and the expression and representation of students' thoughts and ideas. Realizing this opportunity for all students, however, required a broadly conceived approach to educational change that integrated new technologies and curricula with new ideas about learning and teaching, as well as with authentic forms of assessment.

- ACOT's mission was to advance the understanding of teaching and learning in global, connected communities of educators and learners. This included investigating how teaching and learning change when people have immediate access to technology as well as helping people better understand how technology can be an effective learning tool and a catalyst for change.

Qualities Shared by Five Technology-Rich Schools, 1996,
http://rand.org/pubs/monograph_reports/MR682/ed_ch2.html#RTFToC12

Researchers: Thomas K. Glennan, Jr., Arthur Melmed

Key ideas:
Five schools with different objectives, serve different populations, and use technology in quite different ways. But they share common practices important for public policy development.
We note the following:

- Each of the schools is "learner-centered," placing emphasis on the individual treatment of students according to their needs and capabilities. Perhaps the most explicit attention to this issue is found at the Taylorsville school where a computer-based instructional management system is used to support the development and use of individual student instructional strategies. Northbrook emphasizes clusters of students and teachers who stay together for several years so that they can know one another well. East Bakersfield has students develop individual portfolios that help them understand what they know and need to know to find productive roles after graduation.

- Each of the schools seemed to utilize and emphasize curriculum frameworks to ensure that the goals for student outcomes were clearly understood. The Christopher Columbus school program was put in place after an effort of several years to develop a curriculum framework and strategy by the Union City district. Taylorsville used standards developed by the Modern Red School House design team at the Hudson Institute to guide its educational offerings. Blackstock used the California frameworks that were in existence before the school reform started. In the view of the authors, the workshop was notable for the emphasis each of the school leaders placed on the learning that was to take place as opposed to focusing on the features of the technology that existed.

- Each of the schools had a density of computers that far exceeds that which is common in schools today. In fact, in all cases but one, the density exceeded the average density of the top 4 percent of schools, which is 3.9 students per computer. The ubiquitous access to computers in most of these schools makes many of their programmatic features possible.

- All the schools had restructured their programs substantially. Class periods were lengthened and interdisciplinary programs introduced to retain necessary subject coverage. Project-based learning received considerable attention, but several of the schools also made use of more traditional drill and practice programs. Blackstock and Northbrook had substantially modified their buildings to facilitate and exploit the use of technology.

- Each of the school programs appeared to be the product of a fairly concentrated development effort. The character of the school had not simply evolved over time as more and more equipment arrived. Instead, explicit, focused development efforts were undertaken. Some were whole school developments, as was the case with Taylorsville, Northbrook, and Christopher Columbus. Alternatively, some had initially focused on one facet of a larger vision, as appears to have been the case in Blackstock and East Bakersfield.

- Each school's development was pushed forward by an initial increment of external funding. The sources were varied. The California schools received funds from a state technology program. The Christopher Columbus school had Chapter I and private sector funds. The Taylorsville school received funding from New American Schools Development Corporation. Northbrook got initial startup funds from its district and has sustained its development with additional grants and Chapter I funds. Thus the

creation of a radically changed school (whether or not it is technology rich) requires an initial investment that defrays the exceptional costs of startup--both training and the technology itself.

- Relations among adults in the schools appeared changed. While this issue was not addressed by all the school leaders, several noted that there was considerably more consultation among teachers about the curriculum and about the progress of individual students. At Blackstock, the lead teachers in the smart classrooms appear to have adopted roles of assisting other staff with issues related to technology, curriculum, and instruction.

- School outcomes were described in rich ways. While it appears that all the schools showed some or major improvement against traditional accountability measures, many other indicators were used. Increased student and parent engagement, better job placement success, strong support from students and parents, and improved attendance were all cited.

- And not least, the annual per-student technology and technology-related cost for these pioneer technology-rich schools ranges between under three and over five times the average $70-$80 per student for all U.S. schools.

These schools model some of the best practices across the nation. The whole school has been involved, not just one or two teachers. The instructional program has been changed to exploit technology. Each of these schools is reported to have improved the learning of substantial portions of its students. Whether these schools are representative of high tech schools of the future is an open question, however. Technology is changing rapidly, and educators are still in the comparatively early stages of exploring ways in which learning can be enhanced by the application of technology.

Oversold & Underused: Computers in the Classroom, 2001, http://books.google.com/books?id=sdSutyVQfzYC
Author: Larry Cuban
Key Ideas:

- Even with large investments in technology in schools, it has not substantially changed the way teachers and students work in classrooms (p. 189).

- Students and teachers had access to technology and were not afraid of using it, but found that technology was not integrated effectively into the classroom (pp. 132-134).

- Changes in teacher's beliefs, practices, and infrastructure will… shift from the prevailing teacher-centered to a **student-centered practice** (p. 155).

- Offers solutions and policy recommendations which include speeding up process to make computers readily available to students, eliminate the gap in Internet access between urban and suburban schools, invest more in **online curriculum** and **distance learning**, increase on-demand technical support for teachers, and offer more **professional development** (pp. 179-180).

Factors that Affect the Effective Use of Technology for Teaching and Learning, Lessons Learned from the SEIR*TEC Intensive Site Schools, June 2007, http://www.serve.org/seir-tec/publications/lessondoc.html

Researchers: SEIR*TEC staff

Key ideas:

- Leadership is the key ingredient.

- If you don't know where you're going, you'll end up someplace else.

- Technology integration is a *s-l-o-w* process.

- No matter how many computers are available or how much training teachers have had, there are still substantial numbers who are "talking the talk" but not "walking the walk."

- Effective use of technology requires changes in teaching, and the adoption of a new teaching strategy can be a catalyst for technology integration.

- Each school needs easy access to professionals with expertise in technology and pedagogy.

- While many of the barriers to using technology to support learning are the same for all poor communities, some populations have some additional issues.

- In some schools, infrastructure remains a serious barrier to technology adoption.

- Educators can benefit from tools that help them gauge the progress of technology integration over time.

Foundations for Success: 4. Report of the Task Group on Instructional Practices, March 2008, http://www.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf

Researchers: Russell Gersten, Joan Ferrini-Mundy, Camilla Benbow, Douglas H. Clements, Tom Loveless, Vern Williams, Irma Arispe, Marian Banfield

Key idea:

- Existing research, and the many available reviews of this body of research, suggests that specific categories and uses of educational technology can make a significant, positive contribution to students' learning of mathematics. The Task Group conducted its own meta-analyses to evaluate those conclusions of previous reviews.

An experimental study of the effects of Cognitive Tutor Algebra I on student knowledge and attitude, May 2002, http://www.carnegielearning.com/wwc/originalstudy.pdf

Researchers: Pat Morgan, Moore Independent School District and Steven Ritter, Carnegie Learning

Key ideas:

- An analysis of variance (ANOVA) indicated that overall, Cognitive Tutor students did significantly better than students in traditional classes. This is true at all four of the schools that used Cognitive Tutor.

- A finer grained ANOVA focused on the six teachers who taught both types of classes reveals this is not consistent across teachers.

- The strongest advantage for Cognitive Tutor was found among the teachers with the lowest results in their traditional classes.

Analysis of 2005 MAP Results for eMINTS Students, January 2007,
http://www.emints.org/evaluation/reports/map2005.pdf

Researchers: Lance Huntley and Tracy Greever-Rice

Key ideas:

- The analysis of student MAP scores in the FY04 cohort of eMINTS schools shows significant differences by eMINTS enrollment status on the MAP Communication Arts and Mathematics tests.

- Analyses of MAP scores for special education students, students receiving Title I services and students receiving free and reduced lunch suggest that eMINTS enrollment significantly increases their scoring on the MAP tests.

- These results support previous analyses of eMINTS cohorts.

Examining 25 Years of Technology in U.S. Education, Volume 45, Issue 8 (August 2002),
http://portal.acm.org/citation.cfm?id=545166&dl=GUIDE&dl=ACM

Researchers: C. Norris, E. Soloway, T. Sullivan

Key ideas:

- Conditions must be met for technology to have a positive effect on teaching and learning in primary and secondary grades. Conditions include sufficient access to technology, adequate teacher preparation, effective curriculum, supportive school/district administration, and supportive family/community.

- As the number of computers available in classroom increases, so does use of computers.

- The digital divide in the US continues to put children at considerable risk.

- One option to address access issues—other than a 1:1 PC ratio might be handhelds.

Educational Technology in Indiana: Is it Worth the Investment? Education Policy Brief, Volume 4, Number 4, Spring 2006, 2003,
http://eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED491297&ERICExtSearch_SearchType_0=no&accno=ED491297

Researchers: Vincent J Palozzi, Terry E. Spradlin

Key ideas:

- Grade 8 students in Cincinnati, Ohio, public schools are now able to apply to the district high school of their choice via computer, resulting in more educational options to better match students' long term career goals.

- Michigan requires high school students to take at least one credit or non-credit online course as part of their graduation requirements.

- Indiana reported that Maine found that providing home wireless networking and take-home laptops to students, who would otherwise be without access due to economic hardship, can increase student performance.

Teacher Professional Engagement and Constructivist-Compatible Computer Use, 2000, Report no. 7, http://www.crito.uci.edu/tlc/findings/report_7/report7.pdf

Researchers: H. J. Becker, M.M. Riel, (2000)

Key ideas:

- Professionally engaged teachers who also train other teachers tend to involve students in communicating, producing, and presenting ideas using computers.

- Teachers who work in collaborative settings and who take the initiative to change their teaching environment create collaborative work settings and student-initiated activities in their classrooms.

- Teachers who exhibit traits considered important for effective teaching will make more effective use of technology. Those teachers seem to make more effective use of most any relevant educational resource.

Appendix III.   Define Online Learning

Developed by the ETAC working group—Define Online Learning

The working group based its definition on the reporting categories assigned by the Office of Financial Management for institutions of higher education:

- **Online Course**: a course that uses web-based tools, and where 100 percent of the instruction and interaction between instructor and student is done online.
- **Hybrid Course**: a course that displaces some, but not all face-to-face class time with web-based instruction. Note: the current funding model in K-12 schools does not support this category.

Basic Definition

The ETAC working group defined online learning this way for K-12 schools: **a teacher-facilitated course for credit delivered over the Web**.

Characteristics of Online Courses

- Like a traditional course, which could integrate online content or tools, an online course comprises rigorous academic content that covers a specific body of knowledge, aligns with state standards, and involves a high degree of student interaction and involvement with the online teacher.
- The content of an online course could be stand-alone or include supplementary materials.
- The course is delivered synchronously or asynchronously, or is structured with a combination of synchronous and asynchronous segments

Related Definitions

Supplementary Materials. The virtual equivalent of online textbooks or resource materials, not intended to form the basis of a self-contained course. In higher education, OFM defines a Web Enhanced Course as one that *does not replace any face-to-face seat time, and access to web-based tools are required.*

Use of these materials is growing rapidly in K-12 classrooms. Here are several examples in use today.

E-books	Just-in-time Web-based tutorials
WebQuests	Streaming video
One-time videoconferences	Webinars, wikis and podcasts

Synchronous. Online interaction that takes place live, in real time. Here are several examples of synchronous interactions in use today.

Traditional trainer-led classrooms	Whiteboard sessions
Conference calls	Online classrooms/ classroom software
Instant-messages	Videoconferences

Asynchronous: Online interaction that takes place over time, rather than real time. Here are several examples of synchronous interactions in use today.

Email	Video Blogs
Blogs	Threaded Discussions
Wikis	Similar forms of online communication
Podcasts	

Appendix IV.   The Essential Conditions for Effective Technology Integration

Researchers and educators with ISTE (International Society for Technology in Education) conduct an ongoing and comprehensive investigation into the many dimensions of technology in education. They have developed *essential conditions* that optimize the likelihood that technology integration will make a positive contribution to teaching and learning.

Generally, the schools that succeed as learning environments in which technology integration is an effective support for teaching and learning put these big ideas into place:
1. The expectation that educators will use technology as a teaching partner that can adapt to different styles and strengthen student engagement.
2. Sufficient time and money for professional development compatible with this expectation.
3. Adequate funding for Information and Communication Technology (ICT).

Shared Vision	Curriculum Framework
Proactive leadership develops a shared vision for educational technology integration among school personnel, students, parents and the community.	Educators use content standards and have access to related digital curriculum resources.
Implementation Planning	**Student-Centered Learning**
A systemic plan that aligns with the shared vision (above).	Educators use ICT to facilitate engaging approaches to learning.
Consistent and Adequate Funding	**Assessment and Evaluation**
Ongoing funding that supports technology infrastructure, personnel, digital resources and staff development.	Continuous assessment of, and for, learning. Evaluation of ICT use and the application of digital learning resources.
Equitable Access	**Engaged Communities**
Robust and reliable access to current and emerging technologies and digital resources, connectivity for all students, teachers, staff and school leaders.	Partnerships and collaboration within the community that support and fund the use of ICT and digital resources.
Skilled Personnel	**Support Policies**
Educators and support staff are skilled ICT users relative to job responsibilities.	Policies, financial plans, accountability measures, and incentive structures to support the use of ICT in learning and in district and school operations.
Ongoing Professional Learning	**Supportive External Context**
Educators develop technology-related professional learning plans, and have the time and opportunity to practice and share ideas.	Policies and initiatives at the national, regional, and local levels to support schools in the effective implementation of technology for achieving curriculum and technology.
Technical Support	
Consistent and reliable assistance for maintaining, renewing and using ICT and digital resources.	

Appendix V.   Crosswalk—Essential Conditions and Four Strategies for 21st Century Teaching & Learning

Consistent and Adequate Funding	Strategy One
Ongoing funding that supports technology infrastructure, personnel, digital resources and staff development.	Establish a sustainable funding system for technology integration across Washington State public schools.
Instructional Resources & Assessments	**Strategy Two**
Educators use ICT to facilitate engaging approaches to learning. Continuous assessment of, and for, learning. Evaluation of ICT use and the application of digital learning resources.	Develop instructional resources and assessments that help teachers to integrate the standards for educational technology into K-12 core subject areas as directed by 2SHB 1906.
Ongoing Professional Learning	**Strategy Three**
Educators develop technology-related professional learning plans, and have the time and opportunity to practice and share ideas.	Develop and deliver professional development programs that promote technology integration as support for learner-centered instruction.
Student-Centered Learning & Equitable Access	**Strategy Four**
Educators use ICT to facilitate engaging approaches to learning. Robust, reliable access to digital resources, and current and emerging technologies, connectivity for all students, teachers, staff and school leaders.	Develop and deliver a leadership strategy for online education across Washington State that supports the provisions and deliverables of SB 5410.

Appendix VI. Tiers of Technology Integration for Teachers

	Tier 1: Teacher Focus on Personal Productivity	Tier 2: Instruction for Group Learning and Student Productivity	Tier 3: Technology-Empowered Learning Activities
Observable Indicators	Teachers: · Locate standards using electronic tools to align lessons *(e.g., use the online Grade-Level Resources site and locate EALRs/GLEs on OSPI website).* · Find instructional resources on the Internet *(e.g., find lesson resources at Marco Polo, district, or state websites).* · Produce, store, and retrieve learning materials electronically *(e.g., create lesson plans in Word and store them on file server, create and print handouts for students that can be saved and modified in future years).* · Keep/organize student information, grades more effectively *(e.g., use electronic gradebook, extract achievement data from student information system, graph student progress using Excel).* · Communicate information to parents and students via web or e-mail *(e.g., post upcoming events or assignments on school webpage).* · Communicate quickly with e-mail *(e.g., respond to e-mail from parents, learn about school meetings and events via internal e-mail).*	Teachers: · Conduct one-computer classroom lessons *(e.g., use software such as Decisions, Decisions and Timeliner by Tom Snyder, lead virtual field trips to museums using K-20 Network).* · Deliver presentations with graphics and sound *(e.g., teachers use software such as PowerPoint, Keynote, or audio production software).* · Lead students in brainstorming and sharing ideas *(e.g., teachers use word processing programs or software such as Inspiration, use Intel Visual Ranking website).* · Represent information visually *(e.g., teachers create graphs in Excel or with a graphing calculator to visually represent chemical interactions).* · Facilitate group discussions and lessons *(e.g., teachers use interactive whiteboards, LCD projectors, student response systems).* · Have students write papers and reports on assigned topics using computers or "smart keyboards" such as AlphaSmarts *(e.g., require that all student papers must be word-processed).* · Create scaffolding for student projects *(e.g., teachers provide students with writing prompts or project templates).* · Facilitate students using technology for assessment *(e.g., teachers use online quizzes or diagnostic tools, graph and analyze progress with class using Excel).* · Interactively communicate with parents and students *(e.g., teachers initiate and respond to e-mail, conduct on-line surveys, interact through website).*	Teachers enable students to: · Create and use online resources to facilitate inquiry *(e.g., students create and use online resources such as WebQuests).* · Engage in inquiry-based projects driven by essential questions *(e.g., students create major research projects such as Big 6 essential question projects).* · Direct their own use of technology *(e.g., students stay current with new information through tools such as RSS feeds).* · Research, analyze data and problem-solve in a global context *(e.g., student engage in projects such as ThinkQuest with classrooms in other states or countries).* · Engage in individual or collaborative project-based learning *(e.g., students engage in real-world projects and problem-solving using email or websites).* · Use modeling and simulations *(e.g., students conduct simulations using online resources).* · Write, develop and publish individual and collaborative products *(e.g., students publish projects online to be reviewed by parents or peers).* · Invent products through programming or production *(e.g., students produce how-to videos or movies to share with others).* · Create scaffolding for their own projects *(e.g., students create writing prompts or project templates).* · Are involved with their parents and teachers in the analysis of student data and meeting standards, or participate in developing their own learning plans *(e.g., students use classroom-based assessments and assess their own work).* · Initiate communication with parents, teachers, community members, or other students *(e.g., students display self-directed communication through tools such as weblogs).*

Appendix VII. Tiers of Technology Literacy for 8th-Grade Students

	Tier 1: Personal use and communication	Tier 2: Access, collect, manage, integrate and evaluate information	Tier 3: Solve problems and create solutions
	Personal Productivity	Technology for Research and Presentations	Technology for Problem-Solving and Product Creation
1. Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.	Students know how to connect and use a wide variety of input and output devices and common peripherals and how to access networked resources *(e.g., connect a mouse, keyboard, portable storage device, or digital camera to the computer, connect to a shared network drive).*	Performance Indicator does not apply.	Students demonstrate understanding of strategies for identifying, solving, and preventing routine hardware and software problems that occur during everyday technology use *(e.g., can problem-solve when a web page is non-responsive, force-quit a non-responsive program).*
2. Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.	Performance Indicator does not apply.	Performance Indicator does not apply.	Students recognize, discuss, and analyze changes in information technologies and the effect those changes have on the workplace, society, and/or themselves *(e.g., understand the implications of Moore's Law, difference between data and knowledge).*
3. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.	Students are acquainted with the legal and ethical issues related to use and misuse of information and communication technology *(e.g., follow the school/district's Acceptable Use Policy).*	Students demonstrate understanding of issues related to acceptable and responsible use of information and communication technology such as privacy, security, copyright, file sharing, plagiarism, issues of personal safety *(e.g., correctly formatted citations for copyrighted materials).*	Students identify and develop scenarios or examples that illustrate ethical behaviors for use of copyrighted media and analyze the consequences of unethical use of information and communication technology *(e.g., hacking, spamming, consumer fraud, virus setting, intrusion).*
4. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.	Students apply common software features to promote productivity *(e.g., use spellchecker, thesaurus, create basic spreadsheet charts, and insert media).*	Students select and use information and communication technology tools and resources to collect, evaluate and manage information and report results on an assigned hypothesis or research question *(e.g., gather and record data from scientific probes, using content-specific web resources).*	Students define problems or essential questions, then use and/or adapt content-specific technological tools to gather data, visualize information, or conduct investigations *(e.g., access primary source data to refute or support an original hypothesis, create and conduct surveys and analyze results).*

	Tier 1: Personal use and communication	Tier 2: Access, collect, manage, integrate and evaluate information	Tier 3: Solve problems and create solutions
	Personal Productivity	Technology for Research and Presentations	Technology for Problem-Solving and Product Creation
5. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.	Students use specific tools to support personal productivity and enhance learning in different subjects *(e.g., keyboard effectively to a minimum level, use word processing and other productivity software to prepare assignments).*	Performance Indicator does not apply.	Students work individually or in teams to use hardware and software tools to support learning and creativity in all subject areas. *(e.g., use personal information management (PIM) software, personal digital assistants (PDAs), concept-mapping software, timeline development software, digital still and video cameras, probes, graphing calculators, digital microscopes).*
6. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.	Performance Indicator does not apply.	Students create, publish and/or present products for an assigned project *(e.g., create effective PowerPoint or digital video presentations, post webpages of class work).*	Students initiate projects, design and develop content, and construct web-based and/or other electronic products *(e.g., construct and publish a WebQuest, create a Flash movie).*
7. Collaborate with peers, experts, and others using telecommunications and colla-borative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.	Performance Indicator does not apply.	Students use telecommunications tools to access or exchange information for an assigned project *(e.g., email a subject-matter expert).*	Students work collaboratively using technology to develop and share ideas or information *(e.g., use web-based collaborative tools such as wikis, discussion boards, weblogs, use interactive whiteboard for classroom brainstorming).*
8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.	Students select from a limited set of technology tools to complete assigned work *(e.g., use a spreadsheet to represent data).*	Students select from a variety of teacher-defined technology tools to solve specific problems or present results *(e.g., choose between PowerPoint and iMovie to present information to the class).*	Students identify, evaluate, and select appropriate technology tools to solve problems or create products *(e.g., some students select MovieMaker to create a video presentation while others select Publisher to create a brochure).*

	Tier 1: Personal use and communication	Tier 2: Access, collect, manage, integrate and evaluate information	Tier 3: Solve problems and create solutions
	Personal Productivity	Technology for Research and Presentations	Technology for Problem-Solving and Product Creation
9. Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.	Students understand basics of file storage, file formats, and networking *(e.g., understand the use of "save as" to change file format; back up files regularly).*	Performance Indicator does not apply.	Students explore various ways that information and technology resources can be combined, personalized, or re-purposed to develop and promote understanding *(e.g., edit content and change format of audio file to create a podcast).*
10. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.	Students apply search strategies to find relevant online information *(e.g., conduct a Boolean search to find information for an assignment).*	Students search, collect, and evaluate the accuracy and relevance of information from electronic resources *(e.g., check the credentials of the online source or look for supporting evidence).*	Students evaluate information from a variety of electronic resources for appropriateness, comprehensiveness, and bias *(e.g., understand the potential bias of a sponsored link).*

Appendix VIII. Technology Proficiencies of Certified Administrators, Teachers & Teacher-Librarians

With the launch of Washington State's standards for educational technology, December 2008, there has been a corresponding attention given to the technology integration skills of certified administrators, teachers and teacher-librarians.

The rapid surge of interest in technology-enriched teaching and learning is prompted, in part, by federal (Title II, Part D) reporting requirements: states must give an account of the technology integration skills of its K-12 teachers. These factors initiated the ETAC working group to develop the comprehensive skills-and-expectations matrices detailed below.

The key assumption that frames the matrices for certified administrators, teachers and teacher-librarians is simple—those who lead our classrooms must be proficient users of digital technologies as well as highly capable technology integrators whose instructional practice is compatible with a student-centered, project-oriented learning environment. Drawn up as "skills and expectations," each matrix addresses one of six important skill sets within the context of teaching and learning:
- Operation
- Troubleshooting
- Classroom Management
- Common Applications
- Instructional Tools
- Professional Development

Under the category "certified administrator" we include superintendents, district program directors and building administrators. In the matrices below, references to hardware and software apply only if these items are available to the teacher or teacher-librarian.

Operation		
Category	Basic	Proficient
Hardware	Operate the equipment available in their classroom. Locate and operate computer switches and keys. Locate and use all computer ports. Charge, replace and manage the life-cycle of a battery. Save, backup and retrieve a file to/from the desktop, hard drive and USB flash drive.	Read the indicator lights. Examples: power, battery charging, wireless connection. Change and set display resolution.
Peripherals	Connect and use classroom peripherals. Examples: mouse, projector, speaker, document camera and printer.	Connect and operate peripheral. Examples: digital cameras, probeware, student response systems, video cameras. Transfer operational knowledge to new peripherals.
Operating System	Startup, shutdown and restart a computer. Use basic desktop management tools. Examples: task bar, dock, shortcuts. Manage files. Examples: save to specific folders, set up drop boxes and organize and label multiple folders on a server. Log off a computer. Lock the screen when leaving a computer. Manage power settings. Recover a computer from sleep mode. Create application shortcuts on the desktop. Know the difference between a workstation operating system and other software. Example—Microsoft Office 2003 installed on a Microsoft XP workstation. Know the file extensions for standard applications. Examples: .doc, .xls, .pdf, .ppt, .jpg, .wav, .mp3.	Set display resolution Use the control panel functions. Examples: display, sounds, wireless. Use advanced shortcuts. Examples: function keys, control key shortcuts.

Technology Proficiencies of Certified Administrators, Teachers & Teacher-Librarians

Operation

Category	Basic	Proficient
Network navigation	Make wireless connections to the network. Determine if the system is logged in to the network or to the workstation only. Locate and use network drives and printers. Maintain an effective organization of files and folders in a personal directory. Understand, and act on, dialogue boxes. Teach students to save files in the assigned network location. Understand and practice network security function. Examples: set secure passwords, log off, log on. Explain the impact of viruses and provide information on prevention. Example—use caution if opening an e-mail attachment from an unknown source.	Read a file path to determine its location on the network. Upload files to a shared folder, digital locker or Web space. Copy, cut and paste files to a storage disk. Create and name a new folder to organize documents. Access network files, email or voice messages from home.

Troubleshooting

Category	Basic	Proficient
Self-help	Reestablish connection to the network—hardwire and wireless. Make sure power is on and cabling is connected correctly. Recover documents. Use Ctrl+Alt+Del or OpenApple+Option+ESC to end a task, force quit or restart the computer. Resolve wireless connection problems. Use the correct terms to report a hardware or software problem. Follow district procedures for technical support.	Reconnect network printer, replace ink cartridges and clear paper jams. Convert, resize and edit image files. Know when to do a soft reboot. Troubleshoot wireless peripheral problems. Examples: wireless printers, PDAs.

Classroom Management

Category	Basic	Proficient
Policy, rules & online learning	Direct students in the use and care of desktops and laptops. Create classroom rules for responsible use of technology. Enforce the district's Acceptable Use Policy. Abide by district policy as a supervisor of computer use. Follow district rules that govern filtering—Web and e-mail.	Use applications that manage computer use by students. Reset student passwords. Check the history utility of a Web browser to track student use of the Internet.

Common Applications

Category	Basic	Proficient
Word processing	Use a word processing application to create, edit, format, save, share and print documents. Use word processing for personal productivity. Examples: letters home to parents, course syllabi, flyers, worksheets. Save files in the correct format. Examples: .doc, .dot, .pdf, .rtf.	Use track changes and formatting tools for group editing and feedback to students. Create templates for learning activities. Create tables for personal productivity and instruction.

Common Applications

Category	Basic	Proficient
Spreadsheet software	Create simple spreadsheets for personal productivity and instruction. Create charts and graphs from data within spreadsheet. Copy and paste a chart or graph into another application. Use basic formulas to calculate data. Format cells to control the look and function of a spreadsheet. Know the difference between a workbook and a worksheet.	Analyze data dynamically. Use complex formulas to calculate data. Use comments to clarify or label. Use sort and filter to search spreadsheets and examine data.
Organizing and brainstorming software	Transfer visual diagrams to outline form and back to diagram form. Use graphic organizer software for multiple purposes. Examples: brainstorm, develop concept maps, organize ideas, collect research, demonstrate note-taking techniques, activate past knowledge.	Create research templates with hyperlinks and selected resources. Use additional features, such as audio, video or a checklist.
Data collection tools	Connect and use probeware and a microscope for health, science or math. Connect and use a classroom response system.	Create surveys to collect data. Create charts or graphs from data collected in a survey.
Multimedia	Create basic presentations. Embed digital images in a presentation. Practice techniques for effective presentations and sharing information.	Participate in videoconferencing and virtual fieldtrips. Include audio, video, and interactive features to a presentation. Create non-linear presentations to differentiate instruction. Choose the best presentation software for the task.

Common Applications

Category	Basic	Proficient
World Wide Web	Launch and use Internet browser. Locate specific state standards on OSPI's online Grade-Level Resources Web site. Use online search strategies and tools to locate information. Use online databases. Examples: Discovery Education streaming, netTrekker, CultureGrams, eLibrary, ProQuest. Locate online instructional resources. Examples: district or state web sites, Thinkfinity. Follow guidelines for copyright and fair use. Explain and model legal use of online content marked by copyright. Cite electronic sources correctly. Explain and model proper citation technique for online content. Add favorites to the Internet toolbar or bookmark manager.	Use advanced search strategies and tools to locate information online. Examples: Boolean searches, targeted search engines and customized databases. Gather, validate, evaluate, organize and share high quality web-based resources.
Communication software	Use district email software for sending and receiving messages and attachments. Follow district policy and procedures for email use. Use email folders to manage and archive messages. Communicate with families, students and colleagues using available communication tools. Create email distribution lists and groups.	Use district software to manage personal and shared calendars. Use flags and follow-up reminders to manage personal productivity and email content. Use web-based tools to expand communication. Examples: blogs, online journals, classroom web sites, podcasting, shared writing, social bookmarking, social networking, wikis.

Instructional tools

Category	Basic	Proficient
Student Information System (SIS)	Use the SIS to: ■ Take attendance and post grades according to district policy. ■ Locate student information. ■ Print grade book, standard progress reports and seating charts.	Use the SIS to print reports—custom and end-of-year.
Learning management	Distribute and collect files on the network drives. Post assignments, information and announcements on the school or district Web site.	Use course environment software to collaborate, assess student performance and communicate. Examples: Moodle, Blackboard. Use course environment software to support a community of learners.
Professional development	Use help menus. Use tutorials. Collaborate with coach or peers to integrate new skills. Use online resources to gather new ideas and learn new skills. Identify needs and implement a personal PD strategy to expand technological skills.	Understand the role of technology in student learning. Identify needs and implement a personal PD strategy related to technology integration—refer to the Tiers of Technology Integration on the OSPI Web site, http://www.k12.wa.us/EdTech/TechLiteracy/TechIntTiers.aspx

Roles & Responsibilities of Certified Administrators

Leadership that supports and resources 21st century teaching and learning is critical to its success and sustainability. Administrators are the high-profile reinforcement of direction and accountability for every technology integration initiative regionally, and at the district and school levels. Developed by an ETAC (Education Technology Advisory Committee) working group, these expectations set the bar for the high-level guidance and direction vital to our K-12 leadership.

Inspiration for Excellence
Schools cultures in which powerful teaching and tech integration are recognized and supported depend on leadership —administrators who can inspire a shared vision for the comprehensive use of technology for learning, teaching and operations.

The superintendents, district program directors and building administrators who understand how technology can promote creativity, collaboration and innovation inspire excellence at all levels of the organization and establish the *Essential Conditions* for 21st century teaching and learning. (Appendix IV)

Roles & Responsibilities of Certified Administrators

Leadership

Bring educators, administrators and community members together to develop a shared vision for 21st century teaching and learning:
- Communicate the **value and importance** of this shared vision.
- Develop a **strategy for sustainability** that guarantees the vision will guide the long-term development of policy and programming.
- Promote a culture of **responsible risk-taking**.
- Support **innovation at all levels** of district organizations.
- Promote **research-based best practices** for technology integration.
- Advocate, at the state and national levels, for policies, programs and funding that support the **technology integration and school reform activities** of the district technology plan.

Leadership		
Superintendent	District Program Director	Building Administrator
Establish a culture that promotes technology integration balanced with responsible risk-taking and accountability for results.	Align program initiatives with the shared vision for 21st century teaching and learning.	Participate in the development of a shared vision for 21st century teaching and learning.
Maintain high expectations of technology fluency among staff at all levels.	Represent program interests in the strategic planning process.	Help to define expectations of technology integration.
Offer staff development opportunities to support high expectations.	Promote promising practices for tech integration that have a high chance of reaching program goals.	Develop a collaborative, technology-rich school improvement plan, grounded in research and aligned with the district strategic plan.
Use ICT for communication, schedule and resource management, performance assessment and professional development.		Promote highly effective tech integration practices among all staff.

Roles & Responsibilities of Certified Administrators

Learning & Teaching

- Make certain that curricular design, instructional strategies and the classroom learning environments **use the right technologies** to optimize teaching and learning.

- Place the focus on learning—**identify, evaluate and promote technology**, which enriches instruction and standards-based curricula.

- **Use technology** in your own work.

- Reward **technological innovation** that supports teaching and learning.

- Support **collaborative, technology-rich learning experiences** for staff and students.

- Provide for the **learning needs of all staff**, including those who need assistive technology.

- Encourage the use of technology as support for **higher-level thinking, decision making and problem solving**.

- Encourage the development of **district-specific best practices**.

- Offer **high-quality professional development**, validated by research and data, to improve the technology integration skills of teachers.

Roles & Responsibilities of Certified Administrators

Learning & Teaching		
Superintendent	District Program Director	Building Administrator
Provide access to technologies that enhance learning and promote productivity. Communicate the expectation that technology will be an integral part of learning and teaching. Include tech integration skills as a criterion for the performance evaluation of instructional staff. Align policy and budget with your focus on technology integration for operations and instruction.	Make available digital resources that align with curricula. Offer high-quality professional development that supports technology integration to improve student performance. Make sure that curricula and instructional support materials integrate technology. Use multiple measures and flexible assessment strategies to evaluate technology proficiencies and guide the development of PD programs.	Help teachers document and interpret student performance data, and make necessary changes to instructional practice. Promote and provide high-quality professional development that supports technology integration to improve student performance. Align the district's vision for technology integration with the instructional practice of its teachers. Evaluate teacher progress as technology integrators, and staff productivity and efficiency with technology.

Culture, Law & Ethics

- Make certain that all learners and educators have **equal access** to the technological resources that empower teaching and learning.

- Enforce **social, legal and ethical practices** that promote responsible use of technology and respect diversity and different learning styles.

- Enforce policies that address the need for **confidentiality, privacy, security and safety** in the online environment.

- Enforce policies that **respect copyright law and intellectual property** developed with district resources.

- Enforce technology-related practices that are **health-promoting and safe for the environment**.

Culture, Law & Ethics		
Superintendent	District Program Director	Building Administrator
Make sure that every student can access and participate in technology-enriched learning experiences. Enforce policies and procedures that protect the security and integrity of network infrastructure and its data. Enforce policies and procedures that protect the rights and privacy of students and staff.	Make sure that all students and teachers have equal access to the program portfolio. Train staff on legal, ethical, and health and safety issues related to the use of technology. Hold staff accountable for their use of the network and district technological resources. Keep the leadership informed about program-specific issues that relate to privacy, confidentiality and the reporting of information that could impact IT systems and policies. Make certain service providers protect the privacy and security of district data.	Make available technological resources that help teachers address different learning styles. Enforce policy related to acceptable use, security and copyright. Model correct use by example.

Roles & Responsibilities of Certified Administrators

Professional Practice & Productivity

- Use technology to **raise your own productivity** level and that of others.

- Evaluate technology for **learning, communication and productivity** in a variety of settings.

- **Mentor staff** in the routine and effective use of technology. Lead by example.

- Implement a **personal strategy for professional learning** related to technology.

- Collect and analyze performance data, interpret the results and **communicate findings with ICT**.

- Use technology to **communicate and collaborate** with colleagues, staff, parents, students and community members.

- Use technology to **evaluate and improve** administrative and operational systems.

- Be aware of **emerging technologies** and their potential application to education.

Professional Practice & Productivity		
Superintendent	District Program Director	Building Administrator
Establish a culture in which staff are able to take responsible risks with technology: - Maintain accountability for results. - Implement assessments that measure the ability of certified school administrators to meet technology standards. - Promote technology fluency as a norm for all staff. - Offer training to support your high expectations. - Use up-to-date ICT for communication, schedule management, performance assessment and professional learning.	Access, analyze and interpret campus data to support initiatives that improve student learning and productivity. Promote, by example, the benefit of this approach. Improve school programming: - Use ICT to share promising strategies and case studies. - Use ICT to communicate learning opportunities for staff and students. - Model technology-based high productivity for presentation development, record keeping, data analysis, research and communications. - Build and engage online PLCs (professional learning communities).	Access, analyze and interpret campus data to support initiatives that improve student learning and productivity. Promote, by example, the benefit of this approach. Build and engage online PLCs (professional learning communities).

Roles & Responsibilities of Certified Administrators

Support, Management & Operations

- Enforce policies and guidelines that **ensure the compatibility** of technologies.

- Implement **technology-based management and operations systems**. Promote, by example, the benefit of this approach.

- Allocate **sufficient financial and human resources** to guarantee the successful and implementation of the strategic technology plan.

- **Integrate all strategic plans**—business, technology, school improvement—to optimize staff activities and the distribution of resources.

- Drive **continuous improvements to the IT system** including industry standard replacement cycles.

Support, Management & Operations		
Superintendent	District Program Director	Building Administrator
Promote technology-based management systems that support learning and teaching. Promote, by example, the benefit of this approach. Provide staffing, funding and related resources to support a robust IT infrastructure and effective technology use across the district. Align district technology usage with overall improvement efforts in instructional management and operations.	Promote the use of technology-based management systems to support learning, teaching and operations: ■ Promote, by example, the benefit of this approach. ■ Make sure programs inform, and align with, the district technology plan. ■ Support the goals and implement the strategies of the district technology plan. ■ Allocate program resources that help staff conduct the school improvement related activities of the district technology plan.	Promote the use of technology-based management systems to support learning and teaching: ■ Promote, by example, the benefit of this approach. ■ Make sure the school improvement plan informs, and aligns with, the district technology plan. ■ Allocate program resources and set the timeline that will help staff conduct the school improvement related activities of the district technology plan.

Roles & Responsibilities of Teacher-Librarians

Teacher-librarians have always inspired information and media literacy. In 21st century public education, these are the professionals who can make the essential connection between what a student asks and how to find the answer − on the shelf or across the digital universe. Our teacher-librarians represent a human resource and source of expertise that has never been more important.

When students know how to find and use information responsibly, they can solve problems, deepen understanding, and absorb and internalize new ideas to build knowledge. When students understand how mass media works and how it inflects culture and behavior, the issues of relevancy and truth that imperil uninformed judgment, become the frontline filters of well-reasoned decisions.

Current Environment
Washington State does not have formal standards for the integration of ICT (information and communication technology) that apply to the work of teacher-librarians. However, educators know that teacher-librarians are often the driving force behind the development and support of technology-rich learning environments.

Mission
Promote learning environments that optimize digital technologies for teaching and life-long learning by integrating a full range of learning resources into teaching and learning—publications, periodicals, online curricular material and web-based content that has educational value.

Operating Principles
- Digital technologies frame the infrastructure of 21st century life. It is critical that students graduate as proficient technology users who understand the responsibilities of digital citizenship.
- All students, regardless of socio-economic or cultural background, must be able to access technology at school. Technological fluency is the basic skill that enables participation in a global economy.
- Digital technologies have great potential to support powerful teaching and student-centered learning environments.
- Digital technologies support skill sets and competencies that have direct application to the world students will encounter at graduation.

Roles & Responsibilities of Teacher-Librarians

Technology Proficiency
Teacher-librarians must meet the standards for proficiency and technology integration described in the Skills & Expectations of Certified Administrators, Teachers and Teacher-Librarians.

Leadership for Teaching & Learning
- Be aware of **emerging technologies** and their potential to enrich teaching, learning and personal productivity.

- Define and promote a **student-centered, technology-rich** learning environment.

- Organize physical and virtual library environments that **extend and deepen the learning experience** at school and beyond class hours and school walls.

- Guide teachers and administrators as they **evaluate the potential of technology integration** to enrich teaching and learning.

- **Mentor and guide teachers and administrators** as they build technology-enriched learning environments.

- **Identify, evaluate, use and promote digital technologies** that support powerful teaching and learning.

- Model and promote practices in teaching and learning that **engage different learning styles** and **respect cultural difference**.

Collaborate with teachers to:
1. Integrate technology within standards-based curricula.
2. Establish new technological literacies within standards-based curricula.
3. Integrate on and offline information sources that benefit the learning process.
4. Integrate communication technology that supports collaborative learning.
5. Integrate communication technology that supports learning at school and beyond school walls.
6. Know and communicate the tenets of policy that address copyright law, intellectual property rights and fair use.
7. Understand, promote and practice the tenets of the district's acceptable use policy.
8. Model and promote legal, responsible and ethical use of technology.
9. Guide students, families and community members in the practice of safe, legal and responsible use of online information and digital communication tools.
10. Model the routine, intentional and effective use of technology for personal productivity, teaching and administration.
11. Mentor colleagues in the routine, intentional and effective use of technology for personal productivity, teaching and administration.

Roles & Responsibilities of Teacher-Librarians

Collection—Build the Library

- Evaluate, select and maintain a **collection of teaching and learning resources** that support the educational goals of the school.

- **Integrate electronic information services** and systems that support the educational goals of the school and community.

- Apply the principles of library management to the **power of digital information networks** to create fast, easy access to educational information and resources.

- Establish **equitable access to the technology**—hardware, software, applications—that support teaching and learning.

Build Literacy—the Art & Science of Information

Partner with Educators
- Promote information and communication technologies that have value for teachers.
- Encourage and support independent research and study—demonstrate a variety of on- and off-line resources that enable educators to retrieve, analyze, interpret, organize, evaluate, synthesize and present information and ideas.
- Work with educators to evolve their understanding of the role of digital technology in 21st century life and the dynamics of its relationship to a democratic society.

Work with educators to evolve their understanding of the legal rights held by owners of intellectual property and copyright:
- Why do we need the legal provisions that govern fair use of content for educational purposes?
- What is the meaning of *public domain*?

Work with educators to evolve their understanding of individual privacy, confidentiality and personal safety.

Work with educators to build 21st century curricula:
- Research-based lessons and instructional materials that align with standards for academics, information literacy and educational technology.
- Variety of assessment strategies—digital and paper-based − to measure how well students understand, and can apply, what they learn about information media.
- Lesson plans that integrate effective research practice.
- Strategies for targeted information searches.
- Strategies for gathering, validating and evaluating information.
- Techniques to identify relevant information sources—digital and paper-based.

Roles & Responsibilities of Teacher-Librarians

Partner with Students

Promote effective research practice as the key to optimal use of ICT:

- Teach students the basic principles of effective research.
- Teach students how to select the most effective ICT for research.
- Teach students how to evaluate the quality and reliability of the results.
- Demonstrate the value of dedicated online information sources for research and study as an alternative to general purpose search engines.

Encourage and support independent research and study:

- Demonstrate a variety of on- and off-line resources that enable students to retrieve, analyze, interpret, organize, evaluate, synthesize and present what they know and can do.

Teach students how to learn and work collaboratively using digital media—on- and off-site:

- Engage and work collaboratively with peers from different cultures using social networking technologies.
- Engage peers to develop and discuss new ideas.

Appendix IX.   Regional Support for Technology Integration

Operating within every Educational Service District are Educational Technology Support Centers (ETSC), which offer a comprehensive resource base of professional development and technical support for district educators and administrators.

ETSC directors stand at the front line of technology integration. They help educators connect curricula to real-world problem solving. They guide and advise administrators and teachers as they transform the traditional stand-and-deliver pedagogy into new, research-based instructional practices enriched by technology. They support school initiatives that move learning out of the lecture-style classroom and into a web-enabled, collaborative environment able to engage the 21st century learner.

However, the operative dimension of Washington's ETSCs cloaks their greater value—region-based leadership for strategic technology integration and research-based professional development. As a statewide program, there are a number of key initiatives and activities that constitute the duties of all nine ETSC directors.

Technology Planning
- Support, information and guidance for districts completing their three-year technology plans through the online School Improvement Plan application. Approved technology plans make sure districts remain eligible for E-rate discounts and Title II dollars.

Professional Development
- *Enhanced Peer Coaching.* Intensive training for teachers, tech directors and principals introduces powerful new instructional practices that integrate standards-based curricula and digital technologies into classroom activities. When the training ends, novice peer coaches join a community of practice that sustains and grows this new expertise. Funded federally through EETT[1].
- *Thinkfinity.* Tech integration training for teachers. Thinkfinity's vast resources offer a rich digital learning platform for course content and professional development.

Leadership & Support for Technology Integration
- Develop the necessary skills among teachers to meet the provisions of the NCLB related to technology integration.
- Support teachers as they raise the level of technology literacy among 8th-grade students. The data is reported as a requirement of the NCLB.
- Lead scheduled opportunities for district technical staff and curriculum directors to learn, exchange ideas and best practice, review programs and develop new initiatives.

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[1] Enhancing Education Through Technology is a component program of Title II, Part D funding for K-12 schools. OSPI staff launched the grant-based Enhanced Peer Coach Training Program with EETT's *competitive* dollars. Teachers apply for grant awards that fund training (peer coaching and technology integration) and equipment.

Regional Support for Technology Integration

Computers 4 Kids
- Oversee the distribution of computers and monitors to needy districts. The hardware is sourced from state agencies who donate off-lease, surplus equipment to public schools. Annually, the program places over 5,000 standards-based computers in schools for instructional use.

E-rate Training
- One-to-one and group session help for districts navigating the complexity of the E-rate program.

Region-by-Region Snapshot of the ETSC Program

ESD 101
- Located in Spokane, Spokane County.
- Serves a seven-county region of Eastern Washington—Adams, Ferry, Lincoln, Pend Oreille, Spokane, Stevens and Whitman.
- Serves 88,951 K-12 students across 265 public and 45 private schools.
- 59 public school districts.

	Impact—800+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**PD/Internet Safety Training & Education**. Train-the-trainers program for teachers, media specialists, technology coordinators, principals, school board members and students. Staff train an average of 180 educators and 40 students across 18 districts each year. **Technology Review & Marketing**. Active participant in the Washington Learning Source (WLS) Advisory Board. WLS works to make sure all school districts have access to competitively priced, high quality technologies and software products for teaching and learning. Advisory board members provide product review, regional marketing and project planning for WLS.
Incubator	**Moodle Online Course Platform**. In development—a Moodle site able to host training for members of ESD 101's Instructional Resources Cooperative. These educators are exploring Moodle's potential as a CMS (course management system) to support regular classroom instruction and as a stand-alone platform on which to develop and deliver online courses.
Innovation	**eMentoring**. Pilot program designed to offer an online option for new teachers and their mentors. Several technology platforms in play − Moodle for anytime-anywhere collaboration and document sharing; videoconferencing; Skype and GoToMeeting for real-time communication and collaboration. The pilot establishes a partnership between OSPI and ESD 101's Teacher Mentor/Teacher Assistance Program coordinator. **PD/Internet Safety Training**. Department of Justice grant awarded to the Spokane County Sheriff's office makes it possible to provide internet safety training to sheriffs serving as school resource officers. The $500k DOJ grant activities integrate with another partnership between the ESD 101 ETSC and the Northeast Washington Education Council. The council has a $300,000 grant to develop the Project Safe Childhood Internet Safety Training and Education Program, which makes internet safety training and resources available to educators statewide. Working across these two partnerships expands the reach and resources teachers can leverage as they develop course content on internet safety.

ESD 105

- Located in Yakima, Yakima County.
- Serves a four-county region in South Central Washington—Yakima, Kittitas, Klickitat and Grant.
- 58,276 K-12 students across 122 public and 23 private and tribal schools.
- 25 public school districts.

	Impact—1,180+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**PILOT**. Development and support for this professional development resource that helps educators identify their strengths and weaknesses relative to technology integration. Teachers build an online skills development plan through the application.
Incubator	**Tech Standards Integration**. In process − building the new standards for educational technology into peer coach training. Presentation of the new curriculum slated for the Peer Coaching Summit in February 2009.
Innovation	**SHARE**. Home of the 5 Minute Web site. Grant-funded project provides easy-to-use tools for educators that support most common classroom activities − announcements, curriculum, homework, student projects and more. Content adds easily to a class-built Web site. The project partners 23 Central Washington school districts, 103 other school districts around the state, 2,201 teachers and 39,618+ students with the ETSC. Underway now is an expansion that will integrate a Moodle platform into the teaching and learning environment and an upgrade of the online security features.

ESD 112
- Located in Vancouver, Clark County.
- Serves a six-county region in Southwest Washington—Clark, Skamania, Cowlitz, Wahkiakum, Klickitat and Pacific.
- 96,267 K-12 students across 195 public and 23 private schools, plus the Washington State School for the Blind and the Washington School for the Deaf.
- 30 public school districts.

	Impact − 630+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**PD/ Student Learning Plan**. Hands-on or online, training for curriculum directors, principals and teachers. The SLP clarifies roles and responsibilities for schools, families and the student on the path to academic achievement. Training sessions introduce the step-by-step structure of a learning plan and demonstrate how to design the plan to meet individual needs. Online training is popular with educators who can save the time and expense of travel. Training sessions average 70 teachers each year. **PD/Reading in the Elementary Sustainable Classroom**. K-4 teachers learn how to use interactive whiteboards, document cameras and clickers to support their instructional practice for reading. Based on 5 highly regarded, research-based methods of instructional practice for reading. Trains an average of 26 teachers each year. **PD/The Sustainable Classroom Project**. Designed for secondary teachers who want to integrate interactive whiteboards, document cameras and clickers into research-based instructional strategies. Based on the concepts published in "Classroom Instruction That Works" (Marzano, Pollock and Pickering, ASCD, 2001). Trains an average of 16 teachers every year.
Incubator	**PD/Moodle**. Web 2.0 tool that supports regular classroom instruction and acts as a stand-alone platform on which to develop and deliver online courses. Training focuses teachers on how the Moodle works as a learning management system within a hybrid—face-to-face and online—learning environment.
Innovation	**PD in Cyberspace**. Transition project to convert some of the ETSC's professional development courses into online courseware. **Online Ed Partnership**. Working closely with districts across ESD 112 to develop a regional strategy for online learning.

ESD 113
- Located in Olympia, Thurston County.
- Serves a five-county region in Western Washington—Grays Harbor, Lewis, Mason, Pacific and Thurston.
- 71,498 K-12 students across 173 schools and 26 private schools.
- 44 public school districts.

	Impact—400+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**PD/Cisco Networking Academy**. Over 10 years as the regional Cisco Academy delivering comprehensive web-based learning, assessment, performance tracking, hands-on-labs, preparation for industry standard certifications, and instructor training and support. Majority of students and teachers are trained as network administrators for their school district or have plans to bring the Cisco program to their home district. Over 10 years, more than 100 students and teachers have graduated from the ESD 113-based academy. http://www.cisco.com/en/US/learning/netacad/course_catalog/index.html. **PD/Student Learning Plan**. Hands-on training for curriculum directors, principals and teachers. Onsite training sessions at Winlock, Tumwater and Tenino school districts. The SLP clarifies roles and responsibilities for schools, families and the student on a path to academic achievement. Training sessions introduce the step-by-step structure of a learning plan and how to design the plan to meet individual needs. ETSC staff work with the School Improvement Planning Team, which opens access to content specialists and consultants who work closely with teachers and administrators. ETSC-led training introduces technology integration into the team's support program, which builds new, 21st century skills and expands program capacity. **PD/Millennium Digital Academy**. Grant funds from the USDA's Rural Utility Services cover videoconference equipment for 11 remote sites. Makes participation in K-20 Network VC-based events possible, such as Virtual Field Trips and distance learning programs. Developed in partnership with the Pacific Mountain Workforce Consortium. **One—to-One Tech Integration Pilot**. Uses off-lease return laptops (Computers 4 Kids program) for students who attend Montesano's Simpson Intermediate Elementary School. Four classes of 4th-graders—100 students − each have a laptop. An OpenClassroom server set up for their exclusive use consolidates instructional resources. The pilot cycles in off-lease laptops over two years, so that by the end of the third year, all 4th-graders will have laptops for learning.
Incubator	**Microsoft IT Academy**. Launches in 2009 to 44 districts. The academy connects learning to the demands of real jobs. Teachers and students gain key technology skills through targeted curricula, professional courseware, hands-on workshops, clinics and seminars. Participants learn how to build software solutions on the Microsoft platform.
Innovation	**Smart, Versatile Videoconferences**. Promotes the creative use of videoconferencing to reduce travel and conserve resources across the region. Grant-funded training will introduce VC concepts to district staff and demonstrate the ease and flexibility of the medium. Complimentary activity—the state-funded Next Generation K20 Desktop Video Conferencing project is complete—15 remaining districts now have a laptop, Web cam and Polycom PVX. With the final installs, all ESD 113 districts will have at least one VC unit for meetings, conferences, class activities, PD and distance learning.

Olympic ESD 114

- Located in Bremerton, Kitsap County.
- Serves a four-county region—Clallam, Jefferson, Kitsap and Mason.
- 50,459 K-12 students across 116 public schools.
- 15 public school districts.

Impact − 270+ educators participated in ETSC-led professional development programs in 2008	
Active Programs	**PD/PBS TeacherLine**. 130+ graduate level, facilitated online courses for teachers that cover the arts, mathematics, instructional technology, instructional strategies and science. Also available PBS TeacherLine Peer Connection − PD for instructional coaches that builds a community of coaches and teachers who communicate and collaborate online.
	Where in Washington? Students work in teams to research and present clues to a state location. During the videoconference, students present their clues, school-by-school, and when the camera focuses on other school teams, the students take notes on their competitors' presentations. Once all the presentations are over, students have 30 minutes to dive into reference materials and search the Web to figure out where their competitors' mystery locations could be. 900 students in the 2007-08 school year.
	PD & Instructional Support/Moodle Services. Eleven districts use the Moodle server to host special interest Web sites for teachers and students. Plenty of training, instructional support and learning projects on this user-friendly, hardworking software platform—everything from training on *Google Earth in the Classroom* and *Web 2.0 Blogs and Podcasts* to instructional strategies for tech integration and individual classroom Web sites.
Incubator	**More PD Online**. New strategies to bring professional development to the desktop of teachers across the region. Software applications that support online collaboration launch first—Moodle, GotoMeeting and Skype.
	PD Database. A searchable online database of instructional and curricula content that ETSC staff can integrate into a course management system, such as Moodle.
	More PBS TeacherLine. As Washington's local provider for PBS TeacherLine services, ETSC staff are looking at ways to strengthen the ESD 114's partnership with this high-impact program partner and expand the number and range of course offerings.
Innovation	**Close the Geographical Divide**. A series of projects in development that expand the use of Web 2.0 tools, online meeting software and videoconferencing to promote greater collaboration and interaction among district educators.

Puget Sound ESD (121)

- Located in Renton, King County.
- Serves a three-county region—King, Pierce and Kitsap (Bainbridge Island).
- 386,275 K-12 students across 745 public and 200 private schools.
- 35 public school districts.

	Impact − 710+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**Technology Program Reviews**. Intensive work with districts to provide a comprehensive review of the technology infrastructure and plans for future development. Reviews comprise strategic, goal-oriented recommendations for improvement. Final reports comprise an infrastructure assessment and comparison relative to state standards and similar districts. **PD/Adobe Digital Literacy Project**. Extensive schedule of cost-effective ($10-40 per class) workshops on Adobe products. Grant-funded for 3 years. 2008-09 schedule: 14 − 6-hour workshops, 2 − 20-hour workshops, 3 − 60-hour workshops. **PD/Digital Photography Summer Bootcamps**. 3-day residential program that teaches educators how to optimize the power of digital cameras in teaching and learning. This is a partnership initiative with the Northwest Council for Computers in Education. **PD Roster**. Workshops, institutes and contracted instruction, offered throughout the year, which focus on technology training and integration. Sessions range from half-day programs to five-day institutes.
Incubator	**One-day High Value Events**. Plan to build out the number and frequency of one-day events that cover high value topics for educators and ed tech leaders. Past successes − Leadership in Online Learning Summit, Private Schools Day and the eLearning Showcases. **Create new online PD opportunities**. Begin with the Thinkfinity project, which integrates key communications and collaborative software platforms − Moodle, GotoMeeting, and GotoWebinar.
Innovation	**Expand the Bootcamp program**. Include other ESDs and diversify the range of subject matter. **Expand the Peer Coaching program**. Build out with greater flexibility, partner with other ESDs. Build on the program's proven value as a sustainable, revenue source and highly effective way to bring tech integration into teaching and learning.

ESD 123

- Located in Pasco, Benton County.
- Serves a seven-county region in the southeastern area of the state—Asotin, Benton, Columbia, Franklin, Garfield, Klickitat and Walla Walla.
- 62,075 K-12 students.
- 23 public school districts

	Impact − 230+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**PD/Moodle**. Summer camp for teachers designed as Moodle immersion. Hands-on experience designing, using and teaching with this engaging Web 2.0 learning management system. Good sign for the future − teachers and techies really enjoyed the camp's inaugural year and valued the time and opportunity to concentrate on Moodle's potential to deliver curricula online.
	PD/Student Learning Plan. The SLP clarifies roles and responsibilities for schools, families and the student on a path to academic achievement. Training sessions introduce the step-by-step structure of a learning plan and how to design the plan to meet individual needs. ETSC staff lead a popular webinar delivered via GoToMeeting software. The feedback is terrific − teachers really appreciate the one-to-one assistance and not having to travel as they learn how to manage the SLP process.
	PD/Streaming Video & Online Databases. Extensive training on the streaming services available through ESD 123. Resources are substantial—5000+ educational video titles for classroom use plus online databases that include Proquest, eLibrary, World Book and more. Training is designed to encourage teachers and students to use these high quality, education-friendly research resources.
Incubator	**ESD.tv**. An online site that hosts ESD- and student-created video. Could also open access to educational videos now blocked on sites such as YouTube.
	21st Century Learning. Online course designed to introduce school leadership to the Gen Y learner. The program provides digital resources and tools that will help educators connect with, and orient school programming toward, the 21st century learner.
	Pre-K to Pay. One-day conference that gathers educators and employers. Agenda will spotlight skills and the development of learning environments that will prepare students for post-secondary life, work and education.
	STEM on the Moodle. Partner with regional STEM (Science, Technology, Engineering & Math) high schools to develop a model STEM program for use statewide. Build the program on a Moodle server to capture, evolve and publish new ideas about STEM programming.
	Thinkfinity Training. Delivered via the Moodle server, ETSC staff plan to connect teachers to Thinkfinity course content and PD focused on tech integration. New development: integrate a new search feature that makes it possible to search the Thinkfinity database by state academic standard and content area.
	Payment Plan for Educational Technology & Training. Build a new program that allows schools to buy equipment by making regular payments. Include tech integration training as part of the package. This way, schools can purchase four interactive whiteboards at a time, instead of one per year. The payment plan could be structured over a four-year period and include training. ETSC staff envisions 3 training sessions in the first year, 2 in the second and 1 each in years 3 and 4.

	Impact − 230+ educators participated in ETSC-led professional development programs in 2008
Innovation	**PD/Open Source Forums**. Frequent workshops that explore the many uses and value of open source software in K-12 education. ETSC staff brings together educators and techies who work with open source applications to develop cost-saving solutions for districts. These forums have real impact—several schools have made the move to OpenOffice and continue to support each other between forums. Several districts have made the leap to Moodle, too, and use this innovative digital learning platform to deliver online course content.

North Central ESD 171

- Located in Wenatchee, Chelan County.
- Serves a four-country region of north central Washington − Chelan, Douglas, Grant and Okanogan.
- 40,340 K-12 students across 121 public and 15 private schools.
- 29 school districts.

	Impact—550+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**Educational Technology Users Group**. Bi-monthly meetings to interact and learn about new developments in the field. The subject matter is wide ranging − E-rate, K-20 network, classroom-based technology, best tech support practices for teaching and learning, disaster recovery and emerging technologies. Group averages 20 participants each session. **PD/Instructional Technology**. Primarily on-site teacher training. ETSC staff takes a hands-on approach and also offer Thinkfinity training sessions at the districts. This is a high-demand program, which continues to expand. **Technology Co-op**. The ETSC stocks a variety of new classroom technology that teachers can check out and demo for a time. It's a great way to get new technology into a teacher's hands and support technology-rich instructional practices. If they want to take the next step, ETSC staff help with the acquisition process. **PD/Student Learning Plan Training**. Online and onsite training to help teachers and administrators manage the SLP application and process. The SLP clarifies roles and responsibilities for schools, families and the student on a path to academic achievement. Training sessions introduce the step-by-step structure of a learning plan and how to design the plan to meet individual needs. ETSC staff average 25 participants per year in these popular sessions. **PD/Summer Sessions**. One-day workshop that covers technology integration across multiple content areas. The 2008 session introduced social networking software and hands-on PD for applications teachers use every day.
Incubator	**IP Video**. In the works, a project that links health classes with local medical centers over IP video. **Instructional Tech User Group**. A community of teachers using technology every day in class activities. Concept came out of the 2007 NCCE Summit. ETSC staff would like to see this group become a conduit of information and support for tech integration back in their home districts. At each meeting, the teachers will share new and innovative ideas on how to use technology to improve instruction and learning. And, teachers will get to demo new and emerging technologies from select vendors. ETSC staff have high hopes this will be a terrific way to form a network of instructional technology leaders, outside the peer coaching community, which is not open to all districts.

	Impact—550+ educators participated in ETSC-led professional development programs in 2008
Innovation	**PD/Enhanced Peer Coaching (EETT)**. Changes for Cadre 2. ETSC staff have invited the participating teachers to our *Regional Tech Days* where they get hands-on experience with technology and discuss tech integration issues with their peer coaches. **School-To-Work**. ETSC staff participate in the local Greater Wenatchee Area Technology Association (GWATA) and have formed an Ed Tech committee to explore the relationships between education and employment within our community. **Partnership/Internet Safety**. A partnership with ETSC colleagues at ESD 101 supports the development of an internet safety program customized to the regional needs of ESD 171. ETSC staff attended the train-the-trainers workshop with Spokane SD to integrate proven expertise and best practices.

Northwest ESD 189
- Located in Anacortes, Skagit County.
- Serves a five-county regional of northwest Washington − Island, San Juan, Skagit, Snohomish and Whatcom.
- 160,426 K-12 students across 356 public schools.
- 35 school districts.

	Impact − 400+ educators participated in ETSC-led professional development programs in 2008
Active Programs	**PD/Teacher Leadership Project**. 3- to 5-day trainings held at the district's request, structured for a single school or district. On the instructional side, TLP training uses the Understanding By Design framework and builds it out with tech integration. Course leaders deliver face-to-face and online learning designed to move teachers from a focus on the operational to a focus on technology as support for teaching and learning. TLP training reaches an average of 25 teachers each year. ETSC staff also provides TLP-modeled training to support district-led technology integration projects. **PD/Workshops & Events**. 20 classes per year, slated mainly in the spring and summer. Several are hybrid classes taught with a face-to-face component supplemented with online support. An average of 12 educators sign up per course. **Policy & Leadership Support**. Ongoing consultation for districts, schools and educators related to internet safety, how to encourage age-appropriate behaviors with technology, and the legal and ethical issues that arise with technology integration. Two trainings each year with an average enrollment of 15 educators. **Technology Program Reviews**. Popular service for districts that delivers guidance on the development and business cycle of district technology portfolios, plus one-on-one consultation.
Incubator	**New Co-op for PD**. On the boards—a Technology Integration Professional Development Co-op based on the same business model as the highly successful e-Rate Co-op (see above, **PD/E-Rate Training**).
Innovation	**PD/Partners in Learning**. Microsoft-sourced grant program that promotes access to technology and its integration into teaching and learning. ETSC staff and educators from across NWESD are in contact with a global community that looks for, and experiments with, innovative instructional practices and approaches to professional development. The focus is tech integration, specifically hardware and software that take advantage of the communication and collaboration possible with digital technologies. **Partnership/Library of Congress**. ETSC staff is generating curricula content that integrates technology based on the outputs and outcomes of the recent Teacher Leadership Project.

Appendix X. Academic Standards for Educational Technology

With the December 2008 launch of the new standards for educational technology, OSPI took an important first step toward the realization of a longstanding vision—that every student in Washington State can take advantage of the resources and rewards of a 21st century learning environment.

- The new standards are designed to reach across the digital divide among K-12 schools. As Grade Level Expectations for digital technologies, the new standards work compatibly, and practically, within the current teaching and learning environment.
- Each standard is accompanied by realistic classroom activities that use very little technology—an internet connection and a computer − equipment we know is available in 99%+ of state classrooms[2], as well as activities well-suited to learning environments in which technology is abundant.
- The new standards integrate the excellent work already established at the national level and are congruent with the multiple iterations of technology standards already in place across Washington State school districts. The new standards set the bar for operational proficiency and challenge teachers and students to use technology across all core subjects.

Integration & Digital Citizenship. The standards are structured around two − EALRs (Essential Academic Learning Requirements) and their related GLEs (Grade Level Expectations).

Technology Integration. Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems.

Digital Citizenship. Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior online.

Federal Law, State-Level Action & Support. The impetus for technology standards emerged first with the No Child Left Behind Act (NCLB), Title II, Part D provisions. Specific provisions of the NCLB that mandate the reporting of technology literacy at the 8th grade level fell to each district. However, the federal government stopped short of defining technology literacy and left that up to state-level decision makers.

The other NCLB directive—*encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by state educational agencies and local educational agencies*—relates to the technological proficiencies of teachers.

In translation, the state must define the instructional proficiencies related to technology integration and encourage teachers to develop them.

In 2005, OSPI's Educational Technology unit worked closely with two working groups—Technology Literacy for Students and Technology Integration into the Curriculum—to develop tiered frameworks—

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[2] Data from the Washington State 2007 Technology Inventory. All classrooms have high-speed internet and the majority have at least one computer with web access. Over 70% have access to LCD projection devices either in the classroom or building and approximately 60% have access to a document camera, most of which are in the classroom.

one by which 8th-grade educators could evaluate technology literacy among their students and another by which educators could assess their own ability to integrate technology into classroom activities.

The Tiers of Technology Literacy present three levels of proficiency for 8th grade students:
Tier 1
- Personal use and communication: students use technology to complete school work and for personal use.

Tier 2
- Access, collect, manage, integrate and evaluate information: students use technology for research and public presentations.

Tier 3
- Solve problems and create solutions: students use technology to solve real-world problems and create knowledge products.

The Tiers of Technology Integration define the journey every teacher makes as he or she becomes an experienced technology integrator.
Tier 1
- Teacher focus on productivity: teacher uses technology to get their job done.

Tier 2
- Instructional presentation and student productivity: teacher facilitates large group learning activities and student productivity through the use of technology.

Tier 3
- Powerful student-centered 21st century learning environment: students are actively engaged in individual and collaborative learning activities that use technology.

State Law, OSPI-Led Action & Support. The need to report 8th-grade technology literacy among students and technology integration among teachers were two of several factors that raised the profile of educational technology and prompted many districts to begin the groundwork for technology integration.

Around this time, too, many teachers were experimenting with technology-rich learning activities and making the discovery that information and communication technologies (ICT) used effectively have clear and positive potentials for the teacher and the learner:
- Technology motivates students to delve into a subject area.
- Technology has an inexhaustible flexibility—mechanically and creatively. Students create, manipulate and individuate their learning artifacts.
- Technology reduces the amount of time teachers need to create differentiated content.

Aware of the pressing need for technology skills among high school graduates headed for higher education, career training or the job market, the 2007 Washington State Legislature directed the Office of Superintendent of Public Instruction to develop a new set of academic standards. Lawmakers called for Essential Academic Learning Requirements and Grade Level Expectations that describe what K-12 students must know and be able to do with technology. They framed these new proficiencies within a definition of basic literacy and its next level of skill development—technological fluency.

2SHB 1906, Section 16. *With funds specifically appropriated, by December 1, 2008, the SPI shall develop essential academic learning requirements (EALR) and grade level expectations (GLE) for educational technology literacy and technology fluency that identify the knowledge and skills that all public school students need to know and be able to do in the areas of technology, and technology literacy and fluency.*

A development team of 14 K-12 educators from districts across Washington worked with OSPI staff to draft the new technology standards following the directives of the legislation.

2SHB 1906, Section 16. *The development process shall include a review of current standards that have been developed or are used by other states and national and international technology associations. To the maximum extent possible, the superintendent shall integrate goal four and the knowledge and skill areas in the other goals in the technology essential academic learning requirements.*

They envisioned an exciting future for the young learners that begins with a 21st century − standards-based − educational environment. As a group of educators, they were committed to the idea that teachers and students can engage in dynamic and creative learning communities that promote life-long learning within the public school setting.

The team reviewed many of the existing educational technology standards developed by other states and standards actively promoted by national and international associations. They also examined Washington's core subject academic standards for form and content. As the development team was writing state standards, more than 160 districts were generating classroom activities and instructional strategies aligned with homegrown learning goals for educational technology, many of which were based on the 1997 National Educational Technology Standards developed by the International Society for Technology in Education (ISTE).

State Standards Grounded in Nationally Recognized Standards. To anchor their work, the team chose national standards developed by ISTE. The organization's 2007 revision of its National Education Technology Standards for Students (NETS-S) are now foundational to the technology standards developed by many other states and by districts across Washington.

> *As foundational ICT skills penetrate our society, students will be expected to apply the basics in authentic, integrated ways to solve problems, complete projects, and creatively extend their abilities.*
> —ISTE Web site, http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/NETS_for_Students.htm, December 17, 2008

The NETS-S are designed to help students prepare to work, live and contribute to the social and civic life of their communities. The new standards reflect the higher-order thinking skills and awareness of digital citizenship critical to life and work in the 21st century. ISTE is in the second year of a three-year project (2007-2009) to update the NETS-S for students, and certified teachers and administrators.

The team consolidated the ISTE NET-S from six to four to two—Integration and Digital Citizenship—through the draft and review process.

Core Subject Integration & Review. Once drafted, standards development moved to nine *integration* teams—one per Educational Service District. Each team assimilated the draft standards into a specific academic content area. They selected examples of classroom activities that integrate technology and build key proficiencies, accompanied by online resources that support teaching and learning.

When the work of the integration teams was complete, OSPI contracted with an expert, Bette Manchester, recognized nationally for her success and expertise in the development and implementation of K-12 technology standards. Manchester reviewed the draft standards and made specific recommendations on content and concept.

Development, Approval & Implementation
Development — led standards development team meetings November 2007 through October 2008

Review, feedback & approval — January 2008 through November 2008

K-12 Leadership
- State Superintendent of Public Instruction and OSPI Chief of Staff
- Teaching & Learning program staff
- OSPI Career and Technical Education staff
- Educational Technology Support Center directors
- Bette Manchester (national expert)

K-12 Leadership Committees & Associations
- Curriculum Advisory & Review Committee
- Bias & Fairness Committee
- Educational Technology Advisory Committee
- Washington Association of Career & Technical Educators

Conferences for Educators
- OSPI January Conference 2008 and Summer Institute 2007
- Northwest Council for Computers in Education 2008
- Washington Library Media Association 2008

Activities — December 2008 through June 2009
- Submitted to the Washington State Legislature December 1, 2008.
- Organize, review and publish curricula support materials and lesson plans in the Grade Level Resources section of the OSPI Web site — spring 2009.
- Link the example activities of the educational technology GLEs to the core subjects.

- Develop PD content and materials that support the rollout of the technology standards statewide.
- Teacher training. Work with the ETSCs to develop and promote a variety of professional development opportunities.
- Develop a *Teachers Tool Kit* of learning materials.

Appendix XI. Planning for Technology Acquisition & Integration

Strategic planning in the public sector has the same high value as it does in private industry. Forward-thinking strategic plans embody a process that determines an organization's direction as it responds to changes in the operating environment. In the education sector, strategic plans support the decisions made by administrators and, in this way, identify the educational direction, goals and results that define each region and district. Process is the operative idea here—in the act of engaging staff from all areas and levels to create a sound business strategy, employees come to a deeper understanding of workplace dynamics and are empowered to act in the organization's best interests.

The No Child Left Behind Act establishes a framework for the requirement that school districts develop a technology plan. At the state level, the administration and oversight of technology planning is structured through the NCLB's programmatic arm—Title II, Part D, specifically Enhancing Education Through Technology (EETT).

Three primary goals drive the activities of state agencies charged with executing the provisions of EETT:

- Improve academic achievement through technology integration.
- Cross the digital divide of access and participation. Ensure that every student is technologically literate by the eighth grade, regardless of race, ethnicity, gender, family income, geographic location or disability.
- Encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be implemented as best practices by state and local educational agencies.

This federal funding divides into two streams:

- Money to spend on local initiatives that increase access to technology and technology-based activities that support student achievement—50 percent with 25 percent spent on teacher training.
- Money available to fund competitive grants—50 percent. In Washington State, these competitive dollars make possible the successful Enhanced Peer Coaching Program.

A key provision of the federal program stipulates that districts produce a technology plan with two primary strategies − improve student technology literacy and increase the ability of teachers to integrate technology into teaching and learning.

In Washington, the State Board of Education (SBE) also weighs in on technology planning. The Board requires that building-level school improvement initiatives address how technology can improve student learning. Federal and state-level requirements dovetail as staff design the technology plan around the goals and activities developed for the SIP—the School Improvement Plan.

Planning for technology acquisition is mandatory for every district that chooses to apply for the E-rate discount. Specific criteria frame the approval of every technology plan and are summarized in these guidelines:

- The plan establishes clear goals and a realistic strategy—designed to meet the district's educational goals − that integrate telecommunications and information technology into teaching and learning activities.
- The plan has a professional development strategy in which technology integration training for teachers is a central component.
- The plan includes a professional assessment of the telecommunication services, hardware, software, network and related services needed to support teaching and learning.
- The plan presents sufficient budget to deliver on its goals and strategies.
- The plan details an evaluation process that enables staff to monitor progress toward plan goals and make adjustments as new developments and opportunities arise.

In a technology plan, the degree of technology integration into classroom-level activities − aligned to the learning goals of the school improvement plan − determine its quality and value. OSPI staff advises each district to observe the well established Essential Conditions (Appendix IV) as foundational to the strategic direction of the technology plan.

Clear Goals & Realistic Strategies. Formal approval of each district's technology plan happens at the state level. OSPI is the Washington State agency certified by the Schools and Libraries Division of USAC to approve technology plans. OSPI staff direct the approval process. Staff selects a group of evaluators from across the state and provides the training necessary to review and approve all technology plans. The plans are structured around a three-year implementation cycle. As of December 31, 2008, 293 of the 295 school districts in Washington have an approved technology plan in effect until June 2010. Two districts elect not to participate.

Appendix XII. Qwest Foundation Teachers & Technology Grant Program

The Qwest Foundation[3] is a robust philanthropic expression of the parent company's commitment to community service. Its funding priorities land squarely in the education sector—preK through grade 12—and in volunteer programs that support local action to meet community needs.

In the education sector, new and innovative learning approaches, early childhood education programs and the development of leadership skills among teachers and parents are areas of significant interest and funded generously.

Direct Funding for 21st Century Educators. The Teachers & Technology grant program also occupies an important position in the Qwest Foundation's portfolio of education initiatives. This unique 14-state grant program funds up-and-coming technology integrators who use digital technologies to strengthen student engagement and advance academic achievement. The Foundation committed $1 million to the initiative, which had its inaugural year in 2003.

Teachers & Technology is constituted with a distinctive program structure and hidden strength; at the state level, operation and administration is assigned locally to a government agency or non-profit organization. Once assigned, Foundation staff work closely with the people who run each local project on program design, management, monitoring and evaluation. Their goal − create the straightest possible line between the money and the teachers selected to put a learning project into action. The project must evidence clear learning goals and integrate technology in an imaginative way.

The Qwest Foundation has provided $100,000 each year since 2007 for the Washington State program. The funding aligns to a strategic initiative shared by the Foundation and the Educational Technology Unit at OSPI − promote technology integration and the development of 21st century skills across K-12 schools.

As partners, Educational Technology Unit and Qwest Foundation staff hold a common belief that digital technologies are essential tools for teaching and learning and that skilled technology integration will enrich the learning environment. Also understood is the fact that most teachers must adjust their instructional practice to accommodate technology as a teaching partner. Less about the lecture, successful tech integrators demonstrate awareness that digital technologies are a powerful way to expand and stimulate the learning experiences for all students.

Document, Support & Promote. The strategic objectives that frame the Washington State program revolve around documenting and interpreting the classroom experiences of the educators and students who participate in each Foundation-funded learning project. As the program matures, it will also be critical to identify and promote the instructional practices that take advantage of today's digital technologies.

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[3] Qwest Foundation: http://www.qwest.com/about/company/community/foundation.html

Teacher profiles are in development that explore the dynamics of the experience as described by several of the teachers. The profiles are web-based and the content modular for easy digital distribution, re-packaging and promotion.

Competitive, Region-based Grant Awards. The grant program is competitive; teachers submit proposals for a learning project that integrates specific digital technologies. State-certified public school teachers and library/media specialists who have regular access to a classroom are eligible and projects must be grounded in the academic standards that form the core of each content area. Although learning projects range greatly in approach and grade level, the program attracts a specific kind of educator − teachers who are either experienced tech integrators or who have some experience with technology integration and want to take their instructional practices to the next level.

Grants of $10,000 are awarded regionally—one per ESD—following two rounds of evaluation. Committees that reflect a cross-section of educational stakeholders are convened at all nine ESDs. Each committee selects two potential awardees as finalists. At the state-level, a group comprised of representatives from OSPI, the Governor's Office and Qwest Foundation review the applications of the 18 finalists, following which, nine learning projects are chosen for funding.

At the tactical level, program staff in the Educational Technology unit design activities and communication products that recognize grant awardees and promote the new knowledge and expertise that emerges with each grant cycle.

Program activities are varied and align with the strategic objectives of the state program:
- Recognize teachers who understand how to integrate technology in a way that improves instruction and guides the 21st century learner.
- Recognize teachers who are adjusting their instructional practice to meet the needs of all students.
- Promote instructional models that integrate digital technologies.
- Promote innovative learning models that use digital technologies as a powerful way to expand and stimulate the learning experiences for all students.
- Promote the integration of technology by sharing these proven innovations across the K-12 educational system.
- Support the goals and activities of the Washington State Strategic Plan for Educational Technology in K-12 Public Schools.

Veronique Paquette was the recipient of a Qwest Foundation grant in 2007. Here is an extract from her teacher profile, which examines the 2nd-grade learning project Veronique designed.

> *Relevancy is the key to learning. I believe that when academic standards are integrated into activities that relate directly to real life, children are most eager to learn. What we teach must make sense to the bigger life kids see and experience outside the classroom.*

Science is my passion so it works best for me. I teach it as a discrete subject, of course, but I love to connect it with the other subject areas my students study because that's the way the real world works. Scientists have to understand and apply all the disciplines of our core curricula to the work they do and the professional life they lead. I think a teacher can use any subject as a central lens through which we teach everything else. And, my experience has taught me that it's easy to bring in all the other subject areas if you get up-and-over your own niche.

Love the kids for whom they are. In my experience, this is the key to powerful teaching and learning. Students unpack their amazing backgrounds and experience every day in class. These young story-tellers bring us the world. Pay attention and you will find an unbelievably rich source of inspiration and knowledge you can use to make learning real.

Here are three project summaries from the 2009 grant recipients that exemplify the type and range of learning projects Washington State teachers develop for Qwest Foundation program.

Jessica Schenck
Chief Kamiakin Elementary, Sunnyside SD, ESD 105, Grade 5
Jessica has developed a dynamic learning project that will build on her students' facility with the school's Math World blog. Her learning goals are specific, designed to expand knowledge of math and communication, and build a new literacy with technology integration. Students will journal about their math activities, discuss problems and solutions, ask questions and respond online as classmates jump into the conversation. They will solve new problems through Internet research and report their findings on the blog. All class activities are designed to align with state standards for educational technology, math and communication.

> *At my school, 93.5 percent of students receive free/reduced price lunch; 39.8 percent have English as a second language; and 29.3 percent are the children of migrant workers. About half my students met reading and writing standards, as measured by the 2008 4th grade WASL and less than 18 percent met math standards. Their different learning styles and needs demand flexibility. Some need more time for typing and composing, which is something this project will specifically allow for. Others need extra background and scaffolding or languages resources. This project will put a tool for those needs directly into the hands of students.*

David Steele, Nancy Noble
Kilo Middle School, Federal Way Public Schools, Puget Sound ESD, Grades 6, 7 & 8
Math, science and educational technology line up beautifully in a series of standards-based activities designed to teach pre-engineering skills. Students will get comfortable with terminology, construction techniques, and the basics of physics and structural engineering as they build a model bridge from cardboard. Testing comes next to figure out if the bridge is strong enough to withstand the weight and stress it must sustain. Then, learning takes on double-duty as students gain a hands-on understanding of engineering mechanics and how to design and conduct experiments.

> *In the workplace, employees are using productivity tools, such as word processing, spreadsheets, databases… Our intent is to create a learning environment where students use those same productivity tools to organize their thinking, express their ideas and publish or*

present the results of problem solving activities….digital resources will allow our students to chat with real life experts around the world, investigate and solve problems in the community and work with other students in the State of Washington, as well as in other countries.

Lisa Conlon
Larrabee Elementary, Bellingham SD, Northwest ESD 189, Grade 5
Energy efficiency was not built into the portable classrooms that house Lisa Conlon's 5th-graders. Expensive to heat and cool, she and her students will embark on an important project to conserve energy and capture the impact of conservation activities on air quality and ambient sound. Lisa's students will design experiments to affect change in energy use and, working closely with the district's maintenance supervisor, they will monitor, measure and evaluate the results of the project. What works will publish to a wiki they can share with kids around the world who spend their school days in portables. Lisa has designed a variety of learning activities that integrate state standards for science, math, technology, reading and writing.

> *Responsive educators sense the optimism and can-do spirit that children exude when given the opportunity to solve a real life problem. The teacher's role is to provide the tools and instruction that will support collaborative student teams to plan, implement and share innovative projects…In my ideal classroom…students would learn and teach one another about the technology, and discuss ways to generate information and products that compel others to think and join in their efforts.*

In development are a series of teacher profiles that spotlight our Qwest Foundation and Enhanced Peer Coaching grant recipients. Designed for the online environment, the content will be indexed for easy searches, the text written for optimal readability and the site architecture built to house the digital learning artifacts produced by the K-12 students who are involved with the learning project. The first profile is set to launch in the spring of 2009.

Appendix XIII. Enhanced Peer Coaching Grant Program

Washington's Enhanced Peer Coaching initiative is made possible by the Dept. of Education's Enhancing Education Through Technology program (EETT). Authorized by Title II, Part D, of the Elementary and Secondary Education Act (ESEA) and amended by the No Child Left Behind Act of 2001 (NCLB), EETT is the only federal formula and competitive grant program of its kind centered around technology integration.

In Washington State, staff with the Educational Technology unit have developed and continue to support a highly successful Enhanced Peer Coaching Program. Over the past two years, these competitive grant awards have increased the capacity of high-poverty schools to engage students with digital technologies and improve student performance.

School-based, each grant represents $9,000 in federal EETT dollars. Recipient teachers receive the funds in year one of the two-year program. In year two, peer coaches receive an additional $4,500 that makes it possible to bring in more participating teachers and support the peer coach with additional training.

Here are the program fundamentals:
- 10 days in year one and four to five days in year two of regional training led by Educational Technology Support Center staff.
- Registration fees for the Northwest Council for Computer Education Conference.
- Travel expenses.
- Substitute teacher or release time costs.
- Equipment for the coach and participating teacher(s).

Value & Strategic Importance. Many teachers have taken an interest in digital technologies and learned how to run specific software applications and operate computing hardware. But the concept of technology integration reaches far deeper than operational proficiency and gets to the core of an educator's pedagogy. The research is very clear on the issue: technology integration can't happen without a corresponding shift in the way teachers teach. Peer coaching is a way to make this essential change in instructional practice.

Peer coaches join a supportive, evolving community of learners and practitioners. Within this lively and inspiring context, they become social learners who experience a dynamic way to develop, practice and refine their pedagogy. These teachers are keen to explore a rich new dimension of their craft: the educator who is at ease as a co-learner, guide or expert at the center of a technology-rich learning experience.

Empathy & Just-In-Time Support. The program puts several learning modalities into play. Learn, connect, reflect and practice are central activities as teachers learn to coach their colleagues. Peer coach trainers impart theory coupled with demonstration and practice all within the confidence-building, supportive environment of *one colleague to another*. In an environment

of empathy and just-in-time support, peer coaching becomes a very practical way to deliver the ongoing, consistent support essential to sustainable professional development tuned to a teacher's skill level.

Washington's program—peer coaching enriched with technology integration training—originated with the EdLab Group, formerly the Puget Sound Center for Teaching, Learning and Technology, http://www.psctlt.org/splash.html. There, in 2001-02, the Puget Sound Center team developed a program called T2CI (Teaching + Technology Coaching Initiative) that made it possible for schools to realize the systematic integration of technology into teaching and learning. Staff in the Educational Technology department at OSPI built the Enhanced Peer Coaching Grant Program on this solid scaffolding now an important way in which they extend the value and positive impacts of peer coaching and technology integration statewide.

Role of the ETSC. Peer coach training is available at each Educational Service District (ESD) led by the Education Technology Support Center (http://www.edtech.wednet.edu/) directors and staff.

Program Basics. The program is a 10-session course that trains teachers to create a collaborative, student-centered learning environment across all subject areas.

PD activities are designed to:
- Support systematic technology integration and new teaching techniques.
- Play to an educator's natural inclination to share ideas and collaborate.
- Learn how to share new skills with a colleague.
- Create a source of empathy and just-in-time instructional guidance for their colleagues.
- Develop new proficiencies with technology.
- Integrate real-world digital technologies into teaching and learning: email, computers, probeware, graphing calculators, interactive whiteboards, multimedia equipment and more.

Once trained and back in the classroom, peer coaches deliver one-to-one, embedded support for their collaborating teachers. They focus on the development of strong, standards-based curricula and assessments as they introduce a novice technology integrator to learner-centered instruction.

The Educational Technology unit launched the program at the outset of the 2007-08 school year. Now working with its second cadre, 281 educators are trained as peer coaches across Washington.

Evaluation Methodology. Evaluation & Research Associates (ERA) of the PSCTLT conducted an in-depth evaluation of the Enhanced Peer Coaching Program.

ERA evaluated the implementation and impact of the Enhanced Peer Coaching Program. Formative and summative, their evaluation produced bi-monthly reports and a valuable final report that summarizes the key dynamics and impact of the program. Here is a description of the evaluation methodology.

> *Evaluation questions focused on the implementation and usefulness of the training sessions, the extent grant resources were utilized, how peer coaching was implemented at the school-level including benefits, challenges, and support, the impact on the teaching practice of coaches and collaborating teachers, and the impact on student learning.*
>
> *To answer these questions, evaluation data was collected from facilitators, coaches, collaborating teachers, and school administrators. Data was gathered using mixed-methods, including quantitative data gathered via surveys with ratings of program components and pre-post measures of technology integration skills, and qualitative data, including areas for open-ended responses, document review, and site visit interviews and observations. Additionally, a review of current literature on peer coaching professional development was conducted and published by ERA as a separate document to provide research on peer coaching as a form of professional development for school districts, coaches, and facilitators.*

Impact = Greater Engagement + Motivation. Enhanced Peer Coaching received high marks throughout the evaluation process. In the final report PSCTLT describes the impact the program has had on student performance.

The peer coaching program affects the students who are exposed to changes in the coaches' or collaborating teachers' classrooms. Collaborating teachers wrote about the program affecting their students by increasing their engagement and motivation, as well as their learning of class content and general technology skills. They also believed students benefited from the ability to share more easily their work and communicate with one another through the use of technology.

*Collaborating teachers and coaches described their students as more engaged and motivated to be involved in their lessons, a result of the changes in the teaching practice. **One peer coach stated, "I know that the students I work with on a regular basis have become more engaged because of what I have learned in terms of how to integrate technology into authentic 21st century learning activities."***

*The opportunity to use technology is a motivator to encourage students to participate. Technology engages students, leading to more learning of the content and allowing them to gain technical skills. **Technology used in the classroom presented information in a way that leads to a better understanding of the content being taught**. Using technology, students can easily share their work with others, increasing student accountability, encouraging them to do quality work, and allowing them to learn more from one another.*

Students with teachers involved in the peer coaching program learned technology skills and gained confidence in their abilities. Many of the lessons being used by collaborating teachers required students to utilize technology, boosting students' technology skills and confidence. Gaining access to an information base and increasing their research skills opens up a new world to students.

Many principals also mentioned the effect of the program on the students, such as being able to showcase their work. Parents appreciated that their students had the opportunity to learn technology skills. Coaches believed that adding technology supports students' academic and career future. A few collaborating teachers and coaches believed the impact of the program on their students would be better seen next year, after technology was further integrated into their teaching.

Comprehensive evaluation reports are available:
- Online at http://www.k12.wa.us/EdTech/Grants/Competitive/PeerCoaching/ResearchEvaluationPub.aspx
- Contact Molly Becker-Miller in the Educational Technology Unit, at (360) 725-4465 or by email, molly.becker-miller@k12.wa.us.

Appendix XIV.   21st Century Concepts for Teaching & Learning

- Relevance, Equity & the Connected Classroom
- A Quiet Transformation of Instructional Practice
- Engage & Instruct the Millenial Learner
- Access, Participation & the New Digital Divide
- Citizenship in the Digital Dimension

Relevance, Equity & the Connected Classroom

It is not a stretch to look at technology as an instructional partner in the classroom, an endlessly diverse and engaging collaborator that eases the enormous burden all teachers face as they stand before the class − to be the primary source of expert knowledge, insight and inspiration for learning...

In these early years of the 21st century, the connection between K-12 education and life beyond graduation has become critical as one generation prepares to hand over a globally integrated economy to the next. The voices of higher education and business have joined a national conversation in which there is agreement on this fundamental − K-12 curricula and instruction must integrate a 21st century skill set if our children are to compete and thrive once they graduate —college or work ready.

Technology integration delivers strong support for standards-based curricula and specific learning goals. A basic high-speed internet connection makes it possible to navigate the globe and bring back audio, video, library content and scientific data that students can integrate into learning projects. A simple document camera can open a new way to show how young learners construct knowledge and demonstrate what they can do with it. Digital communication software builds empathy as children hear, firsthand, the voice of human experience and engage industry experts. Advanced digital technologies create complex simulations through which students can experiment with the consequences of societal, historical and scientific events.

Relevant Is Real
As well, the immediacy of Web presence possible through video conference, email dialogue and interactive webinar introduces different perspectives on life and culture. Conversation among learners and experts anywhere enriches study with rapport, subtext and insight into the creative tangents that lead to expert knowledge. These learning experiences achieve relevancy—the struggles, limits and potentials of problem solving in the real world move theory into practice for young learners.

Educators report that digital technologies used effectively have three positive potentials for the teacher and the learner:
- Technology motivates students to delve into a subject area.

- Technology has an inexhaustible flexibility − mechanically and creatively. Students create, manipulate and individuate their learning artifacts.
- Technology reduces the amount of time teachers need to create differentiated content.

Equity Is the Windfall

The presence of cyberspace as a collective of cultures and human experience creates a natural venue for, and acceptance of, diversity. Compelling personal narrative trumps difference on the Web. Online we are global nomads in search of ideas to which we can relate and from which we can learn.

> *To succeed in today's workplace, young people need more than basic reading and math skills. They need substantial content knowledge and information technology skills; advanced thinking skills, flexibility to adapt to change; and interpersonal skills to succeed in multi-cultural, cross-functional teams."*
>
> −J. Willard Marriott, Jr., Chairman and CEO, Marriott International, Inc.

No less in the classroom. Technology used effectively can smooth progress from a standards-based lesson plan to an equitable learning environment that honors cultural background and life experience.

Integrated into the classroom, technology becomes a multi-modal way to extend the teacher. Standards-based curriculum couples easily to a medium that unpacks the world and opens new channels through which students show what they know and can do; a medium in which personal learning style is not a barrier to learning.

It is not a stretch to look at technology as an instructional partner in the classroom, an endlessly diverse and engaging collaborator that eases the enormous burden all teachers face as they stand before the class − to be the primary source of expert knowledge, insight and inspiration for learning. Smart software applications in tandem with the right hardware support problem-solving activities. WebQuests, Web 2.0 tools, such as blogs, podcasts and wikis, educational software, the internet, and desktop applications accommodate all skill levels and energize the progression of aptitude with powerful new tools for personal expression.

A Quiet Transformation of Instructional Practice

Given the interest in professional development programs that build integration skills among educators, it is not surprising to observe that the stand-and-deliver pedagogy that sustained 19th and 20th century classrooms is losing ground to a new kind of instructional practice...

Educators all over the world are grappling with the tectonic impacts of technology on the K-12 classroom and the bottomless, chattering, unsorted content engine that is the Web.

A new risk complicates these actualities. The implications for any student who takes their identity and citizenship online are so unpredictable that we cannot just connect the classroom to the internet, give every learner a laptop and hope for the best.

There are two new classroom dynamics in play:

- Young people do not arrive at school fully equipped with the new literacies of an interconnected world and the technology that powers its enterprise.

- Digital technologies do not just plug-and-play into teaching, learning and education management. These are complex, real-world tools designed to communicate, gather data, build knowledge and solve problems; technologies students must use beyond graduation whether they are college-bound or looking for a job.

Technology integration faces a parallel challenge to the dilemma that impedes traditional pedagogy: the class, as a whole, presents such a wide breach between those students who come to school academically and *technologically* ready to learn and those who struggle to understand each lesson and *only brush up against technology* in daily life.

The Right Technology for the Right Task

In a report, entitled, *21st Century Skills Professional Development*, the Partnership for 21st Century Skills is quick to make the point that the use of technology integration is not an end it itself. To think so, is to mask the essential point that teaching in any century is all about engaging the learner.

Educational technologies, of course, are an essential part of a 21st century curriculum, too. It's important, though, to realize that this does not mean teaching technology for its own sake—but rather applying appropriate technologies to instructional tasks in order to enrich the learning of both traditional and 21st century content, as well as promote the development of 21st century skills. And "appropriate technology," in some cases, may mean a pencil, or a book, or a conversation[4].

At its most effective, technology integration is seamless. The use of digital technologies is routine and transparent because the teacher and the class are focused on the activities of learning, not the technology.

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[4] Partnership for 21st Century Skills http://www.21stcenturyskills.org/index.php, 21st Century Skills and Instruction, http://www.21stcenturyskills.org/documents/21st_century_skills_curriculum_and_instruction.pdf, page 4, Web site extract 12/20, 2008]

Teacher, Guide, Mentor & Co-learner

The bedrock of K-12 education will always be academic standards that align to curricula and instructional practice. But in the 21st century learning environment, there is a renewed need for relevancy and it demands that we turn the classroom outward to a communicating, collaborating, relentlessly generating society that has moved much of its interaction online.

Technological and intellectual interconnectedness is a given in contemporary life and it falls on K-12 educators to become technology and subject-area integrators—educators who know how to create learning environments relevant to the life students recognize beyond the school yard.

Current research points out that technology integration without a corresponding shift in pedagogy weakens its value to the learner. Given the interest in professional development programs that build integration skills among educators, it is not surprising to observe that the stand-and-deliver pedagogy that sustained 19th and 20th century classrooms is losing ground to a new kind of instructional practice. Surprisingly, this quiet transformation of teaching style does not belong solely to the new wave of educators in pre-service. Rather, we are seeing teachers with 10 months, 10 years and more, repositioning their instructional stance from expert and lecturer to guide, coach and co-learner.

School-based, Collegial, Just-In-Time Support

In Washington, federal EETT (Enhancing Education Through Technology) funding supports a professional development program that guides educators through this important transition. Trainers with the Enhanced Peer Coaching program introduce powerful new instructional practices that support standards-based curricula and integrate digital technologies into classroom activities. There is much research to support peer coaching as an effective approach to professional development. Peer coaching is teacher-driven integrating easily into the daily routine. The approach is based on strategies that work for adult learners with training content that energizes collaboration and works through problem-solution frameworks.

> *Integrated into teaching and learning, technology can bring an educational project to life with the intellectual complexity and relevancy of real-world application.*
> −Dennis Small, Educational Technology Director, OSPI, 2008

Experts who specialize in teacher education look favorably on peer coaching because of its school-based, just-in time support and the way it plays to a teacher's natural inclination to share experience. Coaches and novices are often just a few classrooms apart; many elect to team teach as a way of taking the first steps toward technology integration.

Peer coaches make the journey from the relative solitude of traditional pedagogy into a learning community: mentors and novices who connect as equals. There is rich interaction among coaches and colleagues. They reflect, share experience and learn communally how to engage students with the issues and wonders—technological and societal—of life and work in the 21st century. When the training ends, novice peer coaches join a community of practice that sustains and grows this new expertise.

Through the program, peer coaches join a supportive, evolving community of learners and practitioners. They connect as equals in a dialogue that covers shared experience, reflection, new understanding, and the adoption of tools for a new kind of learning environment: a powerful way to try, refine and implement as social learners.

The Partnership for 21st Century Skills notes the unique value of peer coaching for in-service teachers. In a report titled, *21st Century Skills Professional Development*, the partnership recommends creating structured programs that enable new teachers to learn and re-learn the skills that define 21st century instructional practice.

> *For in-service teachers, "just-in-time" preparation that includes coaching and identification of new pedagogical tools and approaches to weave 21st century skills into content areas should be made available. Ideally, teaching academies, or other special initiatives, should exist so that teachers can develop and renew 21st century skills and pedagogy in structured programs[5].*

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[5] Partnership for 21st Century Skills http://www.21stcenturyskills.org/index.php/ http://www.21stcenturyskills.org/documents/21st_century_skills_professional_development.pdf, 21st Century Professional Development, page 2, Web site extract December 19, 2008

Engage & Instruct the Millennial Learner

The majority of our graduates will enter the world of knowledge workers who expect to share information and experience online with their peers unbound by time zones, geography or borders. They will draw on the dynamics of team play to evolve new ideas and solutions. And, they will be paid well for high productivity to think in original ways and create products tuned to the torrent of cultural and economic change that marks this century…

In 2005, Washington State legislators and the leadership at OSPI saw clearly that online learning was emerging as the new frontier in K-12 education. The data continue to support the position that standards-based online curricula must be an accessible option for all Washington State students. There was a collective call for policy development, balanced oversight, rule-making and data collection.

A predictable risk. With the passage of RCW 28A.150.262[6], there was an attendant forecast, which is playing out now: without vision, leadership, and a clear understanding of the opportunities and pitfalls within the virtual learning environment, online education runs the predictable risk of drifting toward the formation of a contract-based, nominally regulated version of public education in Washington State. There are strong indicators that current operating conditions at the district level are leading the state down this path.

Since 2005, OSPI staff, dedicated to a variety of programs that touch online learning, have been covering the gaps, primarily guiding and advising districts to the extent possible under current statute. But this small group with its many and diverse programmatic responsibilities cannot hope to meet the growing need for a strong, online education *system* with goals, performance standards, accountabilities and responsible financial administration. A clear case can be made for an efficient regulatory and operational framework with critical safeguards for learners, teachers and administrators.

It is critical that the proven building blocks of an effective education program—expert staff, certification, curricula, oversight, policy and professional development—take up their place to create a comprehensible and stable online education system nimble enough to adapt to a rapidly changing environment.

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[6] RCW 28A.150.262 defined the rules and requirements that govern an FTE (full-time equivalent student) receiving instruction through a digital program. On the Washington State Legislature Web site, http://apps.leg.wa.gov/RCW/default.aspx?cite=28A.150.262

These six data points provide a glimpse of what's on the horizon for online education. NACOL, the North American Council for Online Learning, published this research in 2008[7].

1. **K-12 online learning** is a new field—an estimated $50 million market—growing at an estimated annual pace of 30 percent.

2. **44 states have significant** supplemental online learning programs, or significant full-time programs (in which students take most or all of their courses online), or both. Only eight states do not have either of these options, and several of these states have begun planning for online learning development.

3. **There are 34 statewide** or state-led online learning initiatives.

4. **There were 173 virtual charter** schools serving 92,235 students in 18 states as of January 2007.

5. **57 percent of public** secondary schools in the U.S. provide access to online learning.

6. **72 percent of school districts** with distance education programs plan to expand online offerings in the coming year.

Why Has There Been Such a Rush to Online Education?
K-12 educators are feeling pressure from two primary sources:

- The need to engage and instruct the Millenial learner.
- The potential for online learning to create positive outcomes among students who struggle in regular classes.

The Technology Factor
Although K-12 educators cannot ignore the societal impact of technology on this generation, we must recognize that there is more to 21st century teaching and learning than technology. If students are to graduate with the 21st century skill set, education must make the connection between what you learn at school and what you do in the real world.

For the Millenials, online learning is digital technology with an interface and protocol that mirrors how they network, create, communicate and collaborate away from class. They come easily to the medium and expect the experience to look, feel and act like school unfettered by bricks-and-mortar.

Within these two ideas, lies a potential, untapped strength in online education: the majority of our graduates will enter the world of knowledge workers who expect to share information and experience online with their peers unbound by time zones, geography or borders. They will draw on the dynamics of team play to evolve new ideas and solutions. And, they will be paid well for high productivity—to think in original ways and create products tuned to the torrent of cultural

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[7] iNACOL (International Association for K-12 Online Learning), Fast Facts About Online Learning, June 2008, https://www.nacol.org/media/nacol_fast_facts.pdf, Web site extract December 19, 2008.

and economic change that marks this century. Learning online with its individual disciplines and group dynamics, is a constructive medium for the budding knowledge worker.

Are There Positive Outcomes for Online Education?
There is much research activity dedicated to online learning but scant conclusive evidence of positive outcomes. Over time we'll see the patterns and trends that point to, and affirm, good practice not available today. Recent research[8], however, leans toward these central ideas:

- Performance and achievement levels between distance and classroom programs appear to be equivalent.

- Online learning can have a positive influence on retention.

- Rates of successful completion have improved over time as online course design, instructional practice, support services and student screening are refined.

- Teachers with strong technology and communication skills in the virtual environment have a significant impact on student performance.

Learning Policy and Practice Survey: A Survey of the States is a report issued by the Center for Digital Education in 2008. The report followed a thorough review of state policy and programs. Its purpose: to determine the status of online learning policy and practice across the United States. The report is underwritten by Blackboard and Pearson Education and produced with the advice and consultation of the Council of Chief State School Officers (CCSSO) and the North American Council for Online Learning (NACOL). The report is an excellent snapshot-in-time of the state of online education in the U.S. (http://www.centerdigitaled.com/story.php?id=108006)

Clearly, educators and legislators need to know more about this fast-expanding component of public education. And, of equal importance, Washington State must take a leadership position from which to guide the future of online education in Washington.

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[8] Meta-Analyses of Research in K—12 Online Learning: Effectiveness of K-12 Online Learning, research briefing produced for NACOL by its Research Committee, http://www.nacol.org/docs/VSresearch-summary.pdf

Access, Participation & the New Digital Divide

We are witnessing the remarkable, chaotic and limitless democratization of opinion and knowledge. In the new order, everyone can construct, evaluate and speak out removed from the confining absolutes of print-documented fact and judgment; what is known changes with the online conversation. The medium redefines populism and rewards the individual who knows how to create, communicate and collaborate…

Citizenship and its public forums—news media, publishing, social activism—have added a digital dimension. New ideas materialize rapidly in the online environment ready for examination by innovators and pattern-seekers, professionals and amateurs. Conversation springs up in the *virtual* fueled by the expressive power of no-cost read-write tools that make it easy to put an endless iteration of ideas into play.

And, within this new space, we are witnessing the remarkable, chaotic and limitless democratization of opinion and knowledge. In the new order, everyone can construct, evaluate and speak out removed from the confining absolutes of print-documented fact and judgment; what is known changes with the online conversation. The medium redefines populism and rewards the individual who knows how to create, communicate and collaborate.

The only proviso? You must know how to *participate*. Omnipresent but not omni-advantaged, the online platform belongs to those who have the skills to enact their digital citizenship.

Opportunity Knocks for the Technologically Fluent

Henry Jenkins, Co-Director of the MIT Comparative Media Studies Program and Peter de Flores, Professor of Humanities, are expert analysts of media and its multi-dimensional relationship to society. Here they describe the new digital divide.

> *The Digital Divide (which has historically been understood primarily in terms of technical access) masks a deeper cultural challenge which we are calling the Participation Gap as many young people lack access to core social skills and cultural competencies that might enable them to fully participate in the new media landscape[9].*

And, from Andy Carvin who is the founding editor for the Digital Divide Network[10],

> *One of the biggest challenges to bridging the digital divide has been overcoming the rhetorical baggage regarding the meaning of the digital divide… As Henry so rightly articulates, it's about participation. It's about civic and socioeconomic involvement. It's about becoming 21st century citizens, where access to technology leads to opportunities for improving quality of life for our families and communities. If we're just trying to give everyone access so they can become day traders and buy stuff from online retailers, what's the point?*

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[9] MacArthur Foundation, Digital Media and Learning Project, Spotlight, Blogging the Field of Digital Media and Learning, Web site entry dated October 23, 2008, (December 11, 2008 extract) http://spotlight.macfound.org/main/entry/henry_jenkins_technological_access_solve_the_digital_divide_misconception/.

[10] The Digital Divide Network, http://www.digitaldivide.net, strives to be the online destination for individuals interested about and actively overcoming the Digital Divide. It is a storehouse of information for practitioners of all levels, and provides a community environment for the open discussion of the problem and the sharing of best practices.

21st Century Standards for Washington State Public Schools

Confronting new risks and mitigating the participation divide are Washington State's Standards for Educational Technology. They are structured carefully to develop the fundamentals of participation in young learners: operational proficiency and safe, ethical use coupled to technological fluency: the ability to integrate technology across the content areas.

> **Integration**
> Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems.
>
> **Digital Citizenship**
> Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior.

The standards capture this important new skill set and support the teaching and learning that must occur as we deepen and extend core academics with 21st century competencies—critical thinking, the ability to research and investigate, communication, collaboration, creativity, innovation and the capacity to act responsibly and ethically as a digital citizen.

The new standards strengthen our voice as we engage this important dialogue among educators, community members, lawmakers and industry leaders. With integration across core curricula, we will be able to enjoy the success of our young graduates as they leave high school and take up the opportunities of life and work in the 21st century.

Citizenship in the Digital Dimension

Tech-savvy Millennials, much like their grown-up industry counterparts, expect to team up, personalize, mix and refine technology to create new artifacts of knowledge, collaboration and personal expression…

In a December 2007 online report entitled Teens and Social Media, the Pew Internet & American Life Project, captured a rapidly evolving and vibrant snapshot of how young Americans integrate technology and its troublesome ingenuity—social media—into daily life. More than half of our teenagers have produced media content and about a third have distributed their media creations beyond friends and family.
(http://www.pewinternet.org/Reports/2007/Teens-and-Social-Media.aspx)

In 2007:
- 93 percent of 15-17 year olds used a PC.
- Three out of four teenagers spent time online.
- Majority of children age eight+, who are online, are gamers who also use email and instant messaging.

New Generation, New Learning Style
The technological fluency described in Washington State's technology standards sets the bar to the demands of the real world and, not surprisingly, to the social ground of the Millennial learners who populate our schools today.

Born between 1980 and 2000, American public schools are educating 77 million young people for whom technology is not a tool but a medium for the vocabulary and actions of life itself: a natural extension of the eye, the hand and the mind.

On the surface, we note their canny ability to connect, network, process high volumes of information, and adapt rapidly to new perspectives and shifting cultural norms. If we look closer, we note a critical singularity, described here by education researcher and cultural theorist, Kirsten Snyder.
> *The growing social development of youth in cyberspace communities potentially reinforces a divide between schooling and society as youth are creating alternative sources of connection and stimulation for learning and social networking that appear to mirror the very characteristics of living and working in the 21st century[11].*

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[11]Kirsten Snyder, Seminar.net - International journal of media, technology and lifelong learning Vol. 3—Issue 1—2007, http://www.seminar.net/index.php?option=search&searchphrase=exact&searchword=Department%20of%20Education. Snyder is senior faculty at the department of educational sciences at Mid Sweden University. Her research focuses on school and leadership development in a global age, with specific emphasis on social networks for learning and professional development and the digital culture. She is the author of numerous publications, including the co-authored book: *Living on the edge of chaos: Leading schools into the 21st century*.

Tech-savvy Millennials, much like their grown-up industry counterparts, expect to team up, personalize, mix and refine technology to create new artifacts of knowledge, collaboration and personal expression. Today, the corporately-employed developer of proprietary IT products is just one source of technological innovation.

For this generation, the push technology of the expert, or learner, working in isolation, creating print outputs for limited distribution has lost ground to the pull technology of the user surveying a limitless field of online information and downloading what they choose.

Social media is the companion to this new liquidity of knowledge. Technological literacy might be a good start but not a great advantage in a world where narrowcasting is weakening the influence of network news media and corporate public relations.

Journalism and the voice of private industry—once our two-pronged source of authoritative statement—are now questioned and beleaguered by bloggers and micro-bloggers, by Web site editorials and blanket text messages, all of which influence public opinion. The ability to review and analyze media products has never been so important to young readers.

21st century fluencies create the passport to this participatory culture, in which citizenship, achievement and self-expression have an expanding digital dimension.