Preparing Washington Public School Students for the 21st Century:
Four Case Studies of Successful Integration of Educational Technology

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This report explores the experiences of four divergent school districts that have achieved excellence in educational technology. Each district has had a clear vision and enough funding to largely attain the four pillars and the leadership and will to successfully integrate technology in the classroom. These districts, Kent, Bellingham, Onalaska, and Oakesdale, vary not just in size, but in a number of other important characteristics such as location (urban versus rural), tax base, and the nature of the local economy. It is hoped that the experiences of these districts can provide valuable lessons about the paths to excellence in education technology, its benefits, and the challenges it presents.

To foreshadow, there is one factor common to each district's march toward excellence in educational technology--leadership. In the smaller districts, it is the vision and drive of the superintendent and/or a key principal or administrator that pushes the district forward. In larger districts, not only must the superintendent and key administrators be ardent supporters of educational technology on a district-wide basis, but principals must also actively push integration in their own buildings. Leadership and vision are necessary to make the tough budget decision required to fund technology adequately over the long haul. Unwavering leadership is also essential to transform district and school cultures, so that teachers will learn how to use technology tools and then employ them the classrooms. Without determined leadership from the top, technology programs will simply come up short.

Kent School District

Diana Eggers, a teacher and Technology Integration Specialist, observes every day the telltale signs that technology has energized both students and teachers in the Kent School District. During a recent fire alarm drill, an exercise long loved by students seeking to leave the classroom, she overheard a student beg the principal to end the drill, demanding a quick return to class because only forty-five minutes remained to complete an online research project. One of Diana's colleagues, a teacher with over 25 years of experience who once described herself as set in her ways, hesitant, and resistant to change, was seemingly coasting toward retirement. With a bit of prodding and help from some tech-savvy teachers, however, she applied for and received a grant that allowed her to bring technology adequately into her classroom. After a bit of training, the reinvigorated teacher moved from the status quo to computer-centered teaching methods, projects, and assignments, a move, she says, that has made her a much more effective teacher.

Located in the city of Kent, population 71,000, and in surrounding unincorporated areas, the Kent School District (KSD) lies about twenty miles southeast of Seattle in a mixed urban, rural, and industrial area of King County. The local economy is similarly mixed with service, industrial, and agricultural components. It is the fourth largest district in Washington, serving 25,798 students. With an assessed property value of $330,249 per student, slightly below the state average, KSD maintains an operating budget of $160 million budget for its 1,483 teachers and thirty-eight schools.
Origin of the KSD Technology Plan

During the 1980's, KSD, like many other school districts in the Seattle metropolitan area, used levy money to purchase a great deal of stand-alone computer hardware. Still, the district lacked a systematic plan for staff development or integration—the levy contained no money for training or technology operations and maintenance—and the Apple hardware was underused. On a district wide basis, computer technology was controlled by two different departments, Information Management and Instructional Services, that did not cooperate. Consequently, the district's computer systems had a low capacity, did not interface, used outdated software, and were on the verge of failure. Most people within the district, both staff and teachers, sensed a need for change.

Superintendent Jim Hager believed in the power of technology and knew that KSD needed more direction, so he performed a management audit soon after assuming his position in 1991. To even better understand the scope of the district's technology problems, he then brought in outside technology consultants. Using the perceived need for change to his advantage, he soon urged the heads of the two warring departments to seek opportunities elsewhere. Next, based on the consultants' recommendations, he created a separate department of Information Technology to serve both business/information management needs and instructional needs. To make sure that technology would never again fall on the backburner, Superintendent Hager required the new head of Information Technology department to report directly to him, the only assistant in the district with a mandate to report directly. This relationship has proven crucial for transmitting Superintendent Hager's leadership.

As these organizational and institutional changes were implemented, Superintendent Hager also convened the User Friendly Group of heavy technology users, including teachers and principals as well as members of the finance and instructional departments, to craft the district's technology vision. Due to its diversity, group members were often at loggerheads, but the diversity soon became a strength. The group produced a compromise vision that stressed both education and information management concerns, functionality and ease of use issues, and simplified communication processes. This compromise vision created a widely shared sense of ownership that would see it to fruition. The two central principles of this vision are:

[The] expanded use of technology will provide students with career opportunities and options for success. [The] effective use of technology will allow increased timeliness and efficiency in the management of information services.

With this vision in place, the district hired Kent Keel, the former Technology Director for Seattle City Light and an outsider to the education field, to head the new Information Technology department. Mandated to create a technology plan based upon the User Friendly Group's initial vision, Mr. Keel soon produced KSD's 1993-2000 technology plan. The plan established five performance indicators for successful technology:

Integration of computer and other technologies as teaching and learning tools throughout the curriculum. Incorporation of improved communication and computer technologies into staff and student performance expectations. Implementation of staff training programs in the use of technology for management of information and instruction. Establishment of support and maintenance systems to facilitate the use of technology. Documentation of increased efficiency in management of district information.
Mr. Keel next moved Rick Feutz, once Washington’s Teacher of the Year, from the classroom to oversee the creation of curriculum as Director of Instructional Technology. Mr. Feutz was given wide latitude, due in part to Mr. Keel’s lack of experience in the education field and to Mr. Feutz’s own expertise as a teacher. To help Mr. Keel and Mr. Feutz make decisions, the technology plan put into place an organizational scheme that considers both the district good and site-based decision-making, striking a balance between short-term needs and long-term vision and planning. Strategic planning thus involves three committees: an Information Technology Steering Committee, an Applications Planning Committee, and a Technical Planning Committee. These committees involve users and administrators from all levels and relevant departments, continuing the diverse, yet cooperative planning model that began with Superintendent Hager’s original User Friendly Group.

The technology plan was an easy sell in the community, since many KSD parents work in nearby technology industries or at least use technology in their own jobs, but teachers and the school board were a different matter. The school board initially wondered if the commitment of budget dollars to computers rather than people was worth it, but the force of Superintendent Hager’s leadership and the strength of the district’s vision and technology plan prevailed. Teachers were also wary of shifting budget dollars from people to technology. The efforts and credibility of Mr. Feutz, a onetime official in the teachers’ union, were instrumental in overcoming this wariness; his very presence on the technology team reassured worried teachers.

### Funding the KSD Technology Plan

Mr. Keel recognized that the district could save a great deal of long-term infrastructure and administrative costs if the initial investment in system technologies is not short-changed. Most of the $7.9 million from the 1988 levy was spent on standalone equipment that was nearing obsolescence. So, Mr. Keel shaped a new six-year spending plan for connectivity infrastructure and phone, video, electrical, and desktop upgrades. In 1994, the district passed a $130 million capital projects bond, with $6.9 million set aside for the projects outlined in the spending plan.

Since very little money had been spent previously on funding ongoing technology costs, carving money out of the district’s maintenance and operations budget has been a struggle. Currently, KSD funds 79% of its technology expenditures, mostly the ongoing costs, from its operations budget, a sum that reaches $9.5 million every year. The other 21% comes from the $6.9 million set aside for technology from the 1994 bond. Other funds from the bond issue have been used for technology related expenditures such as electrical system upgrades at older schools and infrastructure at the new high school. Only 51-75% of technology funding is secure in any given year, owing to competing priorities in the operations budget. Still, Superintendent Hager has remained committed to technology, finding the funds where he can. Facing an anticipated drop in state money due to Initiative 601, KSD enacted program cuts commensurate with the expected drop, for a total of $4.2 million. When this drop did not materialize, Superintendent Hager earmarked the $4.2 million for priority projects rather than restore the program cuts. Every year since 1994, most of the money has been allotted for educational technology. Creative budgeting on his part, using state money to reduce K-3 class size and vocational education money to fund half-time technology teachers for example, has freed up other funds for technology.

Superintendent Hager has also encouraged teachers and the Information Technology Department to seek outside sources of money. For example, seventeen KSD teachers belong to the Learning Space; membership brings a laptop and technology training. Five KSD teachers have received the
Gates Foundation grants that provide $10,000 for technology in their classrooms. District level Technology Integration Specialists also help identify grants and send them out to teachers whom may be a good fit. By taking advantage of a Puget Sound Educational Service District and State Challenge Grant program, KSD has received 200 multi-media computers. Another program, funded by King County and TCI Cablevision, delivered free fiber optic lines to all KSD schools in unincorporated areas; Mr. Keel is now lobbying the City of Kent to finance fiber optic lines for schools within the city. KSD also engages in partnerships with companies like Apple, Oracle and MC2 to pilot and adopt state-of-the-art software. The district has even developed and sold the rights to its web calendar, bringing in a steady stream of royalties.

The 4 Pillars in KSD

Hardware: There are over 9000 computers available to the students in KSD, for a ratio of better than one computer for every three students; only one-third of these computers, however, are new. In fact, the ration of high-end, multi-media computers approaches just one per classroom. The technology plan provides for depreciation and replacement of hardware, but future budgetary constraints could hinder replacement.

Though the district has full time technical support and maintenance staff, a hardware or network problem is repaired in two days or less in only 11-25% of the cases. Support staff is simply stretched too thin. Each LAN specialist covers five schools, spending half a day each week at each school for regular maintenance and trouble-shooting. If there is a hardware problem, the equipment must go to the district office shop manned by two full-time technicians.

Connectivity: All thirty-eight schools have dedicated data lines and LAN, and each of the 1500 classrooms also has internet access thanks to Mr. Keel's six-year infrastructure plan. Secondary schools currently have two T-1 lines while elementary schools have one, and fiber optic connections are on the way. By 1999, each classroom will have ten Ethernet drops, one video drop, a phone line, and voice mail for the teacher.

Content & Curriculum: Expected Student Learning Outcomes are integrated with the EALRs in the technology plan, and these are tied to technology literacy skills introduced, developed, and utilized throughout the K-12 experience. Much of the content and curriculum can be found from the district's Teacher's Toolbox web page. This page is a gateway to technical information, lesson plans, student information, student portfolios, news sources, libraries, references, benchmarks, and assessment procedures. The lesson plans, which fall into four categories, K-3, 4-6, Junior High, and High School, are created and submitted largely by KSD teachers. There are also extensive curriculum resources available on the web such as Collab-O-Write, Literacy Lighthouse, and Writing Corner for developing reading and writing skills, the Everyday Math Web page for math skills, the Lightspan project for art, language, design, and critical thinking skills.

Professional Development: KSD is committed to training, with over one-third of its yearly technology spending devoted to professional development. The training program, developed by Mr. Keel, Mr. Feutz, and a group of teachers, helps teachers learn how to use computers and software, what to do with technology, and why it should be used for particular educational purposes. In its three training labs, KSD offers collaborative classes on over seventy-two subjects; last year, 288 classes of at least fifteen participants were scheduled. KSD teachers guide most of these classes.
Teachers are encouraged to learn how to use educational technology in a number of ways. First, the active and committed leadership of Superintendent Hager, Mr. Keel, and Mr. Feutz has led to a district wide expectation that teachers should be using educational technology. Many principals, says Mr. Feutz, literally had no understanding of educational technology’s potential, so the district created a PC’s for Principal's program that gave computers to sixty-three principals and their head secretaries in exchange for fifteen hours of technology training. As they became more familiar with technology, the principals could ratchet up expectations about technology training. Each teacher in the district has fifty-two paid hours per year to improve themselves as a teacher; thanks to leadership from the top, many teachers spend these hours in the computer labs, where—with programs worked out between KSD and local colleges—they can earn college credits and certificates. The district also funded a Windows on the World program that gave 487 teachers multi-media computers in exchange for forty hours or more of training.

The Big Payoff: Integration

The leadership of Superintendent Hager has underpinned a huge culture change in KSD. He has set the expectation that technology is just another tool, like a pen, a pencil, or a chalkboard, that must be used in the classroom, and this expectation has been supported by providing teachers with technology training, personal computers, and internet connections. Further, each elementary and junior high school has at least a half-time technology specialist who helps teachers with software, content, and integration; high schools have a full-time technology specialist. Mr. Feutz recognizes that Instructional Technology "need[s] to create tools that people believe will make their jobs easier" for integration to happen, because effective use goes a long way toward changing the culture. Technology Integration Specialists, early adopters who are taken out of the classroom for a year to help with curriculum development, have made teachers aware of these tools. They teach not just how to use technology but also what to do with it and why it should be used, crucial aspects of integration.

Everywhere in Kent one can find indicators of this culture change. For example, the three training labs operate all day, and schools allow teachers to attend, sometimes with their classes, during school hours. Ann McGlone, an Integration Specialist, notices that initial forays into educational technology follow a common model: a teacher will take a lesson and, with coaching, put it online and improve it a bit; then early success spurs the teacher to more development. Now, teachers throughout the district are sharing developments, collaborating, and communicating with other teachers like never before. In primary schools, half-time technology teachers run computer labs and assist teachers with integration. Each school also has a permanent technology committee that coordinates curriculum development.

Educational Technology Success Stories: Students, Teachers & the District

Simply put, the exposure to technology and the student-based learning it enables motivates students to learn, and they are accomplishing some amazing things. Together with a few teachers, students at Mattson Junior High School developed the Collab-O-Write curriculum. Students also had a hand in developing the Literacy Lighthouse, and they design most school web sites. When teachers bring their entire class to professional development sessions, invariably a few kids will learn much faster than the teacher and then teach their classmates. Educational technology does more, however, than provide a means for whiz kids to excel. Teacher facilitated learning where students direct themselves with the requested assistance of teachers improves student learning and makes them more excited about attending class. A great deal of student work is now uploaded to personal portfolios or class web pages stored on the district's network; with their work thus
displayed, students feel that they are working for themselves and the quality of their work rises. Further, connectivity allows students and teachers at disparate locations to interact and learn from one another. KSD elementary students are now learning the basic technology literacy skills so well that the typical third grader has keyboarding skills commensurate with many sophomores. At Sawyer Woods Elementary, Principal Dennis McClellan found that accelerated reading software encourages students to read more, while at the same time monitoring their comprehension and diagnosing reading problems. Technology also helps students with special needs at Sawyer Woods, such as the physically disabled student who write with great difficulty but keyboards with ease and the autistic students who engages in quality learning with computers.

When students are about excited technology, their teachers are likewise invigorated. KSD teachers are also much less isolated, tapping into online communities and working together like never before. New online student learning profiles, containing grades, attendance figures, assessment items and student work, will allow teachers to more accurately measure academic achievement and target resources and appropriate teaching methods toward individual children. The technology is also bringing parents into greater contact with both teachers and their children, especially when parents can view their child's work online.

Technology has generated a number of administrative efficiencies for KSD, saving time and money. With the instructional services, finance and budgets, human resources, and facility management computer systems linked, staff no longer pushes as much paper, freeing them for other tasks. Thus, the district has not required new administrative staff as it has grown in size. Activities such as tracking the hours of student workers, sending lunch counts to the central kitchen, print shop requisitions, attendance, grade recording, and registration for professional development classes are now handled online. The sheer amount of paperwork required for each special education student was driving committed teachers out of the field until active online form generation simplified the process.

Other uses of technology have rendered KSD more open to the community. Annual Performance Reviews are now posted on each school's web page, increasing school accountability. New "push" technology allows specialized email delivery of district information to parents, ranging from lunch menus to sports schedules and game cancellations to job openings. Soon, parents will have access to a "My Kid" button on school web pages that will make it easy to monitor their child's absences, grades, etc. Eventually parents will be able to pay all school related fees over the web.

**Challenges to Educational Technology**

Fred High, Executive Director of Finance and Budgets, notes that funds from the state are not keeping up with enrollment increases owing to Initiative 601. And as KSD's enrollment rises, huge new demands are made on the operations budget. To improve academic achievement, fifty new K-3 teachers were hired this year, and the teaching year was lengthened five days for staff development. Such moves tug at the technology budget at a time when a great deal of hardware needs to be upgraded. With the second highest property assessment in King County, KSD is not in a position to use another capital levy; besides technology would only compete with buildings or maintenance and operations as levy issues. Current levels of technology funding will be difficult to maintain.

Principal understanding and support of technology and funding needs more development on a district-wide basis. Principals, who receive a great deal of grant information, should share this with teachers. Buildings can and do write and receive smaller grants, but the principal must push it.
Supportive principals give release time to teachers so that they may write grants. Some create and even sit on grant committees. Still, as Mr. Feutz, Ms. Eggers, and Ms. McGlone observe, such support is sometimes lacking. This can also hinder professional development and integration. Many principals encourage their teachers to take technology classes or use early adopters to motivate other teachers, but some do not. Principals have discretion to use building and instructional materials funds for technology related acquisitions. But again, such assistance for integration varies from principal to principal. Those principals more steeped in educational technology like Dennis McClellan, a member of the User Friendly Group, identify a need for a better fit between new instructional technology and software and training classes as well as for more instructional and maintenance support.

Mr. Keel, as the head of Information Technology, also sees the need for more instructional and maintenance support. His biggest challenge has been hiring and training technology staff and then losing them to the private sector. This problem has been partially solved by hiring people from the community who have deep ties to KSD. The district's web master, for example, is a former student of Mr. Feutz whose wife teaches in the district. Mr. Keel would also like to hire more full-time classified technology staff, especially for the high schools and junior high schools. This can be done with a combination of building money, vocational education money, and district money, but he is having a hard time convincing principals of the necessity.

**Bellingham School District**

Students in grades 4-5 at Silver Beach elementary are very taken with educational technology. Most have "key pals" in Singapore, children in grades 4-5 with whom they share information about their culture and life via email. Many also serve as technology tutors, spending time in the school's computer lab teaching younger students--and sometimes their teachers--how to use basic software. These tutors even teach senior citizens from nearby retirement homes how to use computers and email, navigate the web, and operate publishing software to create cards for relatives, friends, and grandchildren. Library Media Specialist Darlina New notices that the tutors are very empowered because they are given responsibility and trusted; every student responds in an exemplary fashion. Dylan had behavior problems before becoming a technology tutor, but has been a model of good behavior since. As Ms. New notes, the act of signing an agreement to behave both inside the lab and in class actually leads students to improve their behavior. In this way, Ms. New uses access to educational technology as a tool to positively engage many children who might otherwise be disruptive.

Bellingham, a community of over 57,000 located ninety miles north of Seattle in the I-5 corridor, has a diverse economy and is home to Western Washington University (WWU). Bellingham School District (BSD), the largest of seven in Whatcom County, consists of 10,162 students and 5550 teachers in 18 schools and operates on a budget of $61.1 million. Its assessed property value of $456,119 is well above the state average.

**Origin of the BSD Technology Plan**

In the early 1990's, a few buildings in BSD had computers, funded sometimes with grants or PTA money, but there was neither a district-wide strategy for technology nor equal access to technology among various schools. Superintendent Dale Kinsley stepped into this situation with a vision of the great instructional possibilities offered by educational technology, but no clear plan on how to make it a reality. Superintendent Kinsley took this vision to the district and the community
at large seeking advice on how to build a technology plan and how to fund it before even considering equipment purchases. Over the last fifteen years, according to school board member Dave Blair, BSD has made an ongoing effort to focus on long-range planning and community involvement with planning. So, when Superintendent Kinsley began to push forward with educational technology in 1992, he naturally convened a Strategic District/Community Planning group comprised of staff, administrators, early adopters, parents, and community members to make recommendations. A technology committee was formed to write a technology plan based on these recommendations; the committee had a similar composition but included more instructional media staff. The completed plan, finished in early 1993, provided a clear and comprehensive vision:

Technology is key to learners' achievement of world-class standards. First and foremost is the critical need for students to be able to access information, manipulate data, synthesize concepts and creatively express ideas to others using video, text and audio media. Technology can virtually bring the world to the child, providing a depth and richness of instructional approaches to reach children of all learning modalities. The child becomes a “knowledge architect” using the rich resources at his/her fingertips.... Secondly, technology is an administrative tool which can bring efficiency to the management and assessment realms of education to continuously improve the students' learning. The power of technology allows easy tracking of student work enabling teachers to develop and maintain individual learning profiles for all learners.

With this comprehensive plan in hand, Superintendent Kinsley's next step was to convince the school board to fund educational technology by including money for technology in an upcoming capital levy. Inclusion was crucial, for the district lacked the infrastructure and hardware required by the plan. Since the district had engaged the community and school board in planning issues, providing information on what was happening in schools, what students were doing, what students needed, the plan was an easy sell. Not only did the school board recognize the need for computers in schools, but parents and the community did as well. So, the board approved the plan and the levy went forward. At this point, the district went further in engaging the community, marshalling business support, sending speaking teams to community events and local organizations, encouraging building level parent groups--often the PTA---to convince other community members. The district even used polls conducted by a WWU professor to gauge the salability of the bond issue to the community. The bond passed in May 1993 with over 70% of the vote, but the turnout did not reach required the required level of 40% of the last election. After a renewed push, the bond finally passed overwhelmingly in February 1994 with the requisite turnout.

As the six-year technology plan has unfolded, ongoing assessments of students, program, staff, and methods have provided for both instruction and program modification at district and building level. Jim Stevens, Director of Business and Finance, says that the key to the modification process is to let instructional people make the decisions and then have technical and finance people support them. Changes are informed by contributions from building level technology committees that detail a vision for educational technology within the school, a description of how staff will use hardware, a procedure for selecting curriculum support software, and a staff development program. This participatory process has proven to a huge strength in implementing the plan: since so many people had a hand in shaping it, nearly everyone has a stake in its success.

Funding the BSD Technology Plan
Compared with many school districts, BSD’s high property tax base and growing student population leave it financially well positioned. The collaborative and participatory planning process is replicated in the budgetary realm, so the fact that 50% of the $1.3 million spent yearly on technology comes from the district’s operating budget reflects broad support for this spending priority. Indeed, 91-100% of this funding is secure. Bonds and levies provide another 45% of the technology budget. The 1994 capital levy of $35.9 million set aside $6.3 million for district-wide infrastructure, 1500 computers, and assorted peripherals. A 1996 levy for remodeling Bellingham High School also included money for technology within that building. Given the historically high level of support for education within Bellingham, the district is considering a new levy to fund hardware replacement in the later years of the technology plan. Finally, state technology competitive grants provide 5% of technology funds. For many new grants, WWU has emerged as a partner, especially on proposals involving the K-20 network. Director of Library Media & Technology, Nancy Messmer even encourages buildings to apply for grants.

The Four Pillars in BSD

Hardware: BSD has 2106 computers, of which 1876 are new. Each classroom has at least one networked computer, and each school has the equivalent of one computer lab with thirty computers. Depreciation and replacement costs are included in the technology plan. For example, in 1997-98 hardware upgrades brought all systems up to a Pentium level, with Windows 95 and Office 97.

If teachers are not certain that the computers will work, maintains Computer Services Manager John Getchell, they will not use them. To this end, he and his staff of four technicians handle hardware and network problems throughout the district, visiting each school on a weekly basis. Another staff member deals exclusively with applications problems. Usually this staff is sufficient, though Mr. Getchell notes that it can get thin when large-scale upgrades occur. Consequently, 26-50% of network or hardware problems are fixed in two days or less. Each school's library media specialist has also received training from Mr. Getchell’s, and they serve as the frontline, handling minor technical problems.

Connectivity: All eighteen schools have LAN and dedicated data lines using a T-1 network. Each of BSD’s 497 classrooms has Internet access, with two drops that can support up to four internet connections.

Content & Curriculum: BSD has resolutely avoided "edutainment" software and produced a great deal of its own curriculum tied to the grade level technology goals detailed in the technology plan. Progress towards these communication, information processing, and productivity goals is assessed through yearly assessments of technology literacy skills. Web-based assignments, called modules, where students make answers rather than just find them, merges content and EALR standards. Further, each school must have a detailed plan for electronic curriculum, and schools develop much of their own. The plan for Sehome High School, for example, includes curriculum and activities in science, math, English, consumer education, library/information literacy, fine arts, business/computer applications, health, applied technology, and foreign languages.

Professional Development: During the first few years of the technology plan, all teachers were given release time and required to complete fifteen hours of training in networked systems and basic software at the district's technology lab. For the first year of the program, the district provided one technology tutor for the elementary, junior, and high school levels to coach teachers on an
individual and group basis, sometimes along with students. Since then, the district had provided additional training for new curriculum with technology applications and for information literacy and the net. Most classes are developed and taught by district teachers. Each school's technology team also furnishes training for building specific hardware and software, and library media specialists work with teachers on the creation of curriculum. Every teacher also has access to staff development lesson plans from the district's web page. These plans include creating online student investigation units, information literacy and the net, using databases as a tool to support questioning and investigation, and integrating problem-based and learner-centered lessons as well as instructions for building curriculum pages and lesson plans.

In each school, the technology committee, early adopters, and the library media specialists serve as internal advocates, urging teachers to continue their training in educational technology. Since each school performs a yearly assessment of staff technology literacy, there is a clear expectation that teachers must improve technology skills. Principals also encourage their staff to further their training. Principal Steven Morse at Silver Beach Elementary notes that yearly assessment allowed him to wear down recalcitrant and reluctant staff. To reward schools that use educational technology well, the district gives them first access to new hardware and software; so principals have a vested interest in sharpening staff technology skills.

The Big Payoff: Integration

A culture change is underway in BSD, with teachers using computers more and more to collaborate with one another or to research and design lessons, creating a synergy between same grade level teachers at different schools. Early adopters generally share curriculum developments with less able colleagues to speed along integration. Carolyn Hinshaw, an early adopter, member of the Learning Space, and teacher at Birchwood Elementary, estimates that 20% of BSD's teachers have highly developed technology literacy skills, 60% do fairly well, and only 20% possess a low level of skills. For 65-70%, educational technology is central to the classroom experience. With more collaboration, communication, and information sharing among teachers, educational technology has boosted morale. Members of the technology committee at Sehome High School were so eager to bring educational technology to the school, that they spent weekends installing the network wiring. A recent district progress report notes that teachers are demanding more release time to collaborate on integrating educational technology with engaged student learning, a clear indication of a culture shift.

Nevertheless, the district's culture change is heavily dependent upon the support of principals for educational technology within their buildings. Some principals use their budgets to advance integration. Principals Steven Morse at Silver Beach and Larry Brown at Sehome both use SLIG funds for staff development that emphasizes integration. Principal Brown, together with Ms. Messmer, even helped science teacher Mike Gallagher, an early adopter and eager user of educational technology, secure funds from the district for science lab computers. Penny Jewett, the library media specialist at Fairhaven Middle School, is encouraged by her principal to spearhead the culture change within their building. Principal Morse pushes his teachers to keep the school's computer lab occupied all day long. Supportive principals also use their technology committees to foster integration through planning, training staff, and even writing grants to gain software, hardware, and release time.
Computers are becoming just another part of the learning environment for BSD students, who now begin keyboarding in third grade. They routinely access electronic resources, use computers as part of the writing and research cycle, and utilize a variety of technology tools and publication or multimedia software to present the results of their investigations and projects. Most students use the district network to access work or lessons, or information, and over 90% of students in grades 3-12 use email to communicate regularly with teachers and other students. Students are increasingly energized by educational technology. Because they can post their work online for view by family members and friends, students work more diligently and produce higher quality results. The learning activities with educational technology are also more exciting and challenging. Work is more collaborative, designed to develop new insights and ideas while dealing with real-world problems. Many tasks are multidisciplinary, and instruction is interactive with the teacher serving simply as facilitator. Some students have advanced so much that they train other students and their teachers or create lessons and curriculum for use within the district. A few even serve as technicians. At Sehome, six students help service the school’s 350 computers.

Educational technology has given BSD teachers more tools and strategies to support diverse learning styles and has freed them from traditional teaching roles as they become guides, facilitators, and co-learners. Teachers now assign more ambitious and complex tasks that involve in-depth investigation over long time periods. Teachers routinely use the district network to access information, work, and lessons on network drives. Student assessment and portfolio data with grades and academic progress records are at teachers’ fingertips, allowing them to better serve individual student needs. Teachers are also developing and designing a great deal of innovative content, such as the Ellis Island Virtual Heritage Museum or the Math Support Web.

For the district, the move to a Windows NT network environment has been a good one, creating administrative efficiencies by decentralizing network responsibilities. For example, network user passwords no longer must be handled by Computer Services; this is the province of library media specialists. Desktop attendance and online grade recording have cut administrative times for teachers as well.

Technology has also enhanced communication between teachers and administrators, who now share information much more frequently via email. Technology has even opened BSD to parents and the community. Teachers can easily exchange information with parents online, and many parents staff computer labs before and after school, extending the hours that students may use them. Some labs are even open for parent use. This openness and communication builds community advocacy of education and school levies. Indeed, the very fact that grandparents can view the work of the grandchildren online, says Ms. New, makes the bond between the community and BSD much stronger, reinforcing support for educational technology.

Challenges to Educational Technology

According to Superintendent Kinsley, a lack of state support is the biggest challenge to educational technology in BSD, especially given the spending limits of Initiative 601. Fund 291 monies from the state are of little help, he says, because they are competitive and project oriented, doing nothing to address statewide equity in educational technology. With a less than ideal technology budget, maintenance suffers, and support is spread too thinly. In addition, teachers feel that not enough computers are available to students and ask for more early release or substitute
time for in-service development after school. Many also wish for guidance of the technology tutors who were available only during the first year of the technology plan.

Onalaska School District

Many years ago, an Onalaska student became seriously ill and had a prolonged stay at Children's Hospital in Seattle. Using email, recently brought to the district by Superintendent Robert Kraig, this student was able to keep up his studies. Eventually, this student, Ryan Faussett, became so adept at using educational technology that he is now the district's Network Director. Yet it is not just the technology overachievers who benefit from Onalaska's technology program. According to Director of Computer Technology Robert Armstrong, Logan, a recent valedictorian who earned a full scholarship at Yale, was at best a mediocre user of technology in comparison to other students. Still, his skills were so superior to those of other job seekers that he was hired by the Yale Law School to handle its computer support and technical assistance. Technology has also transformed teachers. A newly hired veteran teacher veteran teacher had little experience with educational technology and was wary. After learning to use email and online grading and attendance software, the teacher became an eager adopter, now regularly using the web for his classes.

The community of Onalaska, with 6000 residents, lies in central Lewis County, approximately 100 miles south of Seattle in the I-5 corridor. Its economy is highly dependent upon the timber industry; as a result there is chronic unemployment. The assessed property value of $254,194 per student is well below the state average. Onalaska School District (ONSD) spends $5.6 million on 954 students, fifty-one teachers, and three schools.

Origin of the ONSD Technology Plan

When he became Superintendent in 1986, Robert Kraig faced a school district that owned exactly two computers. He began immediately to shape a new learning environment using educational technology, moving forward not so much with a plan but a vision (now explicated in the technology plan) "that technology is an integral tool in the learning process and that all students need to have and apply the technology skills that will be necessary in their futures." Still, educational technology was initially a bit of a hard sell to the school board. To convince the board, Superintendent Kraig pointed to the decline of the local timber industry that drives students to Portland, Olympia, Tacoma, or even Seattle for jobs, where they compete with others who have technology literacy skills. Board member Pete DeYoung, who uses technology every day on his dairy farm, supported Superintendent Kraig; and initial spending on technology went forward. When Onalaska students went out and succeeded in the workplace, Superintendent Kraig had ample evidence to convince the board that a long-term technology plan is essential to any education.

ONSD's mission statement reflects its twelve-year commitment to creating successful educational technology: Onalaska's mission is to allow students to become successful citizens, life long learners, and contributing members of society through attainment and application of the basic and advanced skills necessary in their futures. The role of technology in achieving the mission is to provide tools for student learning enhancement to meet the challenges of an increasingly advancing technological society. ONSD is committed to making available, providing access to, supporting, and integrating technologies which enhance and support the curriculum content, results, and outcomes in a restructured learning environment. Our first priority is to provide our staff and students with the support for technical, instructional, developmental, and financial needs
essential to a technology environment. Our second priority is to assure equitable access for everyone (teachers, students, administrators) to the necessary technologies for lifelong learning.

To fulfill this mission, a more systematic technology plan developed with important contributions from staff and teachers, and the plan has been updated every year to meet growing and changing needs. A Technology Planning Team, including school board members, teachers, vocational teachers, a principal, a parent, Superintendent Kraig, and the technology staff of Mr. Armstrong and Mr. Faussett, now meets regularly to alter the plan. Needs are gauged from yearly staff and student surveys, and a yearly report from an outside technology consultant also helps the district make good decisions.

**Funding the ONSD Technology Plan**

ONSD struggles to fund its yearly educational technology budget of at least $110,000; only 11-25% of the budget is secure. Funds come from the following sources: 50% from levies; 20% from Federal Title 1 grants; 20% from other grants; and 10% from the district's operating budget. Despite the local economic downturn, the community is highly supportive of education. A 1994 $1,000,000 capital levy provided a one-shot infusion of $100,000 for hardware and infrastructure. Two-year maintenance and operations levies provide approximately $50,000 for consumables (infrastructure, parts, etc.) and $80,000 to pay technology staff salaries.

Superintendent Kraig must employ a great deal of flexibility and inventiveness to keep the technology plan afloat. Vocational monies are often allotted to the business computer lab at the high school. Title 1 funds go for learning software. If written properly, he can also use a grant to bring in a computer or some software along with monies for staff development and student training. A recent Grant for Science/Math was used to fund student technology training, for example. Superintendent Kraig also encourages teachers to write grants. One teacher just received a grant from Washington PTA and KIRO Television for hardware, software, and training for students. The district also tries to save costs by using free software taken from the internet, bringing in vendors for walkthroughs and soliciting their advice, and upgrading all old hardware until it can be upgraded no more. In this way, ONSD has largely funded achievement of the four pillars.

**The Four Pillars in ONSD**

Hardware: ONSD has 360 computers, of which fifty are considered new. The technology plan maps out depreciation and replacement, but this is financially difficult. Each classroom in the district has at least one computer, and each school has a computer lab. Future levies have money earmarked for seventy new computers for classrooms and teachers as well as additional modern computers for labs.

Roughly 25% of the technology budget is spent on maintenance. Mr. Armstrong was hired after the district acquired its one-hundredth computer, and Mr. Faussett came on board when the district's network became more complex. Largely self taught, the technology staff finds the web to be an excellent resource for solving technical problems. The district also uses six student technology technicians, trained by Mr. Armstrong and Mr. Faussett, to assist with hardware and network maintenance and repair. Due to this combined effort, 76%-90% of network and hardware problems are solved in two days or less.
Connectivity: Each ONSD’s three schools have a LAN and dedicated data lines, and all classrooms have Internet access. Every computer in the district is networked, connected by a fiber optic system. Since the network was cobbled together over the years using disparate hardware and network software, those who created it, initially Mr. Kraig and Mr. Armstrong and now largely Mr. Faussett, are the only people who can administer it.

Content & Curriculum: The technology plan states “technology is a tool, not an end in itself.” Therefore, ONSD has a great deal of grade level appropriate communications, information processing, and productivity learning goals involving educational technology. Curriculum frameworks then integrate the skills these goals entail with specific activities meant to help students achieve EALR benchmarks. Student achievement, especially at the K-8 level and for all special programs, is assessed using software that measures basic reading, writing, math, and keyboarding skills. Students in each grade level also have access to a network folder that contains evaluation and assessment tools, content tied to the EALRs, and sample state-tests developed by Superintendent Kraig for EALR practice.

Professional Development: In-service training represents almost 25% of the technology budget. Superintendent Kraig, who provides much of the training along with Mr. Armstrong and Mr. Faussett, employs what he terms an "On-Time & On-Demand" training model. Using manuals he developed with simple tools like PowerPoint and Screen Capture, staff can learn at their convenience the basics of networked systems, most software, electronic assessment, multimedia projects, and integrating electronic curriculum with EALRs. Training also occurs during vendor visits and lab workshops on early release days and Saturdays. Student technology technicians periodically provide individualized in-class training for teachers and their students.

All teachers are required to learn and use email as well as online grading and attendance. From this point, teachers set their own pace for training, although the technology plan sets out communications, information processing, and productivity learning goals for all teachers. To motivate the teachers, Superintendent Kraig “feeds the hungry and gives them what they need, and lets the stragglers catch up." In other words, he gives the best technology the district has to offer to those teachers who actively use technology in their classrooms, which motivates those teachers who do not receive new hardware. Early adopters, like Debbie Cottonware--also a member of the Learning Space--mentor other teachers.

The Big Payoff: Integration

For integration to happen, says Superintendent Kraig, the district culture must change, and this takes time--ten to twelve years in ONSD. To precipitate integration, the technology staff makes sure that all the hardware and software function properly before it hits teachers’ desks and classrooms. And this has worked. For most ONSD teachers, who have received technology training over ten years, computers and the network have become the center of classroom instruction. Even the principals and counselors are heavy users. In the lower grades, full-time aides in the elementary and middle school computer labs help teachers use software for instructional activities, electronic lesson plans, and state testing assistance. In the higher grades, more teacher-facilitated, student directed analytic activities utilize educational technology.

Educational Technology Success Stories: Students, Teachers & the District

"Our students think it is just part of school and believe every school has what we have." This, says Mr. Armstrong, is how students view educational technology. Thanks to their ongoing exposure to
educational technology, ONSD students have become information navigators, critical thinkers, knowledge creators, communicators, selectors of appropriate technology for specific purposes and even technicians. Many student technicians are so good that they go on to work as network administrators for Internet service providers. Adam, class valedictorian and former technology assistant, just entered college as a junior Network Technology major; he was allowed to skip the first two years of course work which he had already learned in high school.

Each student benefits from technology every day. All students from fourth grade on keep an electronic portfolio, which can only be access via a private password, and each has an email account. From any computer at school, and even from home, students can log on and use their portfolio where they store art, writing, web pages, and other work and assignments. Grade level folders added to the portfolios are especially helpful for juniors and seniors, for they contain career planning and college application exercises as well as templates for resumes and job applications.

Teachers are able to teach classes that they could never teach before thanks to educational technology. High school science teacher John Garcia teaches astronomy and ecology classes that the district could not previously offer with class instructional materials taken from the web. Students in these classes turn in term papers as full-blown multimedia projects, and many work online from their homes. Mr. Garcia’s students are now creating the Onalaska News Web Page with community interviews, sports information, local problems and issues, and community events. Ms. Cottonware's fourth graders are using PowerPoint to make presentations, networked computers to perform online research and analysis, and electronic chat-lines to communicate with other fourth grade classes in Nine Mile Falls and Aberdeen on collaborative learning projects. She values technology not only for the new learning activities it enables; it can also enable certain students. One child, who had a great deal of trouble writing and thus hated writing reports, learned to use PowerPoint to craft reports. After presenting the report to his class, the student has never been more motivated.

The district now uses software to manage student data, develop class schedules, monitor student attendance, produce report cards and transcripts, and generate reports, saving a great deal of staff time that is now directed elsewhere. Transportation scheduling is also done online, and kitchen services will come online next year.

Educational technology makes possible greater communication and interaction between the district and the community. One computer lab is open to the community four nights a week from 3-8PM. Superintendent Kraig believes this openness fosters community support for the district levies. A great deal of district information is available to parents online, including district, test, and sports calendars, lunch menus, and student handbooks. By operating list-serves for Washington superintendents and district business managers, ONSD has access to ideas, information, and resources from throughout the state. It also runs list a list-serve for a science club that brings together students and members of the community.

**Challenges to Educational Technology**

Replacing obsolete equipment is a huge problem for OSND, since nearly 70% of its computers have reached their useful life span of six years and have been upgraded as far as possible. Many computers are not even compatible with current software on K-20 standards. To replace these computers and maintain a ratio of less than three students per computer, the district needs an additional $63,000 per year that may not materialize given the local economy and the fall-off of state funds caused by Initiative 601. Another worry rooted in funding issues is the eventual loss of
Network Manager Ryan Faussett to the private sector. His talent is too great, and the pay offered by ONSD will soon be too low in comparison to the private sector believes Superintendent Kraig. Mr. Armstrong notes that the network is now so complex that he and Superintendent Kraig will likely be unable to maintain without Mr. Faussett.

Oakesdale School District

Russ Wagner, a parent of six current or former students of Oakesdale's schools, is amazed at the computer abilities and skills that his children have acquired. As a wheat farmer, he uses computer technology every day, but he finds that his kids are much more literate and able to use the computer as a tool than he is. He is thankful because he recognizes that technology provides his children with more opportunities and better prepares them for college and the working world. Indeed, many students agree with Russ. Seniors Patrick, Chris, Tina, and Trevor, for example, all find that self-directed learning using technology is much more satisfying; they value the life skills that such learning inculcates.

The city of Oakesdale, population 410, is located forty miles south of Spokane in the heart of the golden wheat fields of Whitman County; its economy is dominated by agriculture. The Oakesdale School District (OSD), with 177 students, employs fifteen teachers in two schools on a budget of approximately $2.3 million. Its assessed property value of $240,000 per student is well below the state average.

Origin of the OSD Technology Plan

Superintendent Melvin Louk was an early supporter of technology, realizing that it would become a powerful educational tool. During the 1980's, OSD purchased and employed educational technology in a scattershot manner. It was used by a few early adopters who more often than not kept their developments to themselves. A lot of money was spent, but there was no real plan to the expenditures. Sensing the wastefulness of these expenditures, Superintendent Louk together with K-12 Principal/Technology Director/Technology Trainer/Technology Teacher/Grant Administrator Lisa Holmes took leadership and convened a technology planning team. Teachers, parents, a school board member, the media librarian, and a member of the local business community joined them on this team.

The first problem faced by this diverse and participatory committee was their decided lack of expertise; they understood the need for a plan but were unsure of how to proceed. At this point, they hired an outside technical consultant, Ian Jukes from the Thornburg Center for Professional Development, who performed an in-depth educational technology needs assessment. Completed in 1993, this assessment led to a budget and five-year plan for technological integration. Like any comprehensive technology plan, this one addresses all four pillars, funding and integration. Special attention is given to yearly third-party evaluations of technology, teachers, and students to help realign both the current and next five-year plan to meet state and federal achievement guidelines. The technology planning team, which now also includes the outside consultant, a student, and a technical support person, meets regularly to monitor and adjust the plan.

The strong leadership of Superintendent Louk and Principal Holmes has led to a plan with a clear vision of integration:
In the OSD, we believe that the use of computers and related technologies: is an integral element of the educational process that has far-reaching impact for both students and staff; must not be viewed as a separate curriculum, but rather as an element of all curriculum strands and embedded into all appropriate learning activities; facilitates active participation of the learner; accommodates varying rates and styles of learning; facilitates development of thinking and communication skills; and is a powerful tool and an essential component in preparing students for the world of work.

This plan was an easy sell to both the school board and the community. The five-member school board, long stable with only twelve members over the last twenty years, has always listened to and trusted the vision of Superintendent Louk. In this agricultural community, where technology is used in production methods, for buying and selling crops, for monitoring prices, to gather information, or to file reports, the recognition that students need to have technology skills was widespread. And so, the plan moved forward.

**Funding the OSD Technology Plan**

To begin with, OSD has a very limited tax base given its low assessed property value per student. For this reason, the old fragmented technology expenditures guided largely by teacher requests were reigned in. Superintendent Louk and the school board worked out a plan where the teachers would pool and set aside their technology money for a year and then the school board would match that total. By the time the five-year technology plan was implemented in 1993, this pot of money totaled $150,000 and was used to install network infrastructure. Currently, OSD spends approximately $140,000 per year on technology—a budget that is 50-75% secure—with half that amount coming from the operating budget and the other half from grants. This expenditure averages $790 per student, a level well above the state average, and requires a great deal of creativity and commitment to sustain.

The inventiveness of Superintendent Louk and the leadership of Principal Holmes are instrumental to funding technology in OSD. For example, OSD has led a consortium of seven small Whitman County school districts that began in the early 1980's under the stewardship of Superintendent Louk. By banding together, this consortium has made itself much more attractive to state and federal granting agencies, broadening the number of students that any one grant can reach. The grant writing efforts have been aided by the expertise of Principal Holmes who reads and evaluates state grants in Olympia; while she is forbidden from writing the grants, she can give counsel. Through such cooperative endeavors, OSD has won a variety of grants: Goals 2000 Year II, Goals 2000 Year III, Eisenhower Math and Science, Technology/Curriculum, Connecting Students to a Changing World, and Weather Teacher. Innovative grant administration has then freed up a great deal of money for technology spending.

Still, funding half of a technology plan with grants is a risky proposition; this is why only 50-75% of the OSD technology budget is secure. For this reason, Superintendent Louk is making another bold move—the creation of a non-profit foundation to open the door for grants that require 501C3 status. Realizing that there is a great deal of money available from large granting organizations that can only be given to non-profits, Superintendent Louk sees the nonprofit as a necessity if current technology funding levels are to be maintained. Unfortunately, he has to balance the desires of community foundation partners, who want money for sports, music, and activities, with his narrow focus on technology.
The 4 Pillars in OSD

Hardware: OSD has over 100 computers available to its students; nearly all are or can be networked. Each school also has a computer lab where most of OSD’s thirty multimedia computers are located. Hardware and software is replaced as needed, based upon recommendations from the technical consultant and staff. Just this year, each teacher was given a state-of-the-art desktop computer after one such recommendation.

After relying exclusively on outside technicians and consultants, OSD designated two in-district personnel, the transportation director and a teacher, to handle wiring, network, and hardware maintenance as needed. This staff received training at the Apple technology school, learning Apple’s troubleshooting and repair methodology. Further, Principal Holmes and the media librarian have received training in network support and maintenance. Although the support situation is not ideal, indeed the staff must often invent or create solutions, hardware and network problems are almost always solved within two days. The technical support staff has been further aided by the creation in 1997 of a Student Technology Assistant Program, where one student per year is trained to help the support staff.

Connectivity: Each school has a LAN, dedicated data lines, and dial-up internet access. Further, all seventeen classrooms have internet access. To save money during the initial infrastructure installation, classrooms were wired for phones and computers simultaneously. OSD is planning an upgrade from the slower T-1 network to a speedier fiber optic network.

Content & Curriculum: From the beginning, OSD has focused on creating lesson plans with technology, standardized test, and assessment components. Currently OSD has tested and adopted a comprehensive technological scope and sequence curriculum that provides students with technology literacy skills that are then applied to curriculum geared to the EALRs.

Professional Development: During the 1997-98 school year, primary teachers were required to undergo four days of educational technology training while secondary teachers had to complete three days of training. Much of this training centered on connecting the scope and sequence curriculum with the EALRs. Most of the training is provided by Principal Holmes or the technology consultant who comes in once a month for a few days to work directly with teachers on curricular integration; substitutes are hired during these times, freeing up teachers to focus exclusively on training. Fifteen twelve-hour training modules developed by Principal Holmes and the technology consultant are also integral to ongoing staff development in OSD. These modules deal with a wide range of technology and curricular topics such as using laptops in the classroom, the integration of writing and technology, online resources, employing classroom management, electronic presentation, and desktop publishing tools, and using databases and spreadsheets. Teachers studying a module are usually placed in small groups for the sake of synergy. Generally, a teacher will complete three or four modules each year.

To incent teachers to take the training modules, OSD uses an Individual Technology Training Plan: if a teacher agrees to complete 120 hours of training--ten modules--above and beyond their contractual commitments, they receive a new laptop and software. For those few teachers who need a bit more prodding, the district pays for coursework, including educational technology classes, taken towards advanced degrees. Those who take advantage of the training and implement technology in their classrooms often have their special budgetary requests met.
The Big Payoff: Integration

OSD's teachers are mandated by the technology plan to integrate the use of technology into daily instructional practices, but it takes many years of continued exposure and training backed by benchmarks and supervision. Fortunately, due to the leadership of Superintendent Louk and Principal Holmes and the mechanisms put in place with the technology plan, just such an environment exists in OSD and a culture change is in progress. According to Principal Holmes, 70% of her teachers have integrated technology, and another 20% understand its importance but need further training. One indicator of the success of integration is the community pressure applied to teachers who lag. Parents in this small district know exactly what happens in each classroom, and they demand integration so that their own children are not left behind.

Educational Technology Success Stories: Students, Teachers & the District

All students in K-12 have the opportunity to utilize educational technology and must take Course #1 in a four-course computer science sequence. In Course #1, students learn the fundamentals of using hardware and software to solve real-world problems, web navigation, HTML programming, and multimedia applications in a networked environment, skills that most adults lack. Each course in this sequence utilizes self-directed learning based upon individual skill level. Students can develop the skills they lack with individualized assignments and leave class with an electronic portfolio of all their work that serves as a technology skills resume.

In the more advanced courses, students have become so adept at activities such as HTML programming— they create and maintain most of OSD’s web pages, that they have moved on to higher-order activities, including making educational programs for the lower grade levels, creating databases, making music videos, and even building their own LAN. This challenge energizes and excites the students so much, says Ron Sharp, the instructor for the four-course sequence, that many students surpass his own skills and can soon teach both him and the other students.

Technology also works for those students who are not quite so interested in its capabilities. Mr. Sharp tells me of his first meeting with a senior student who was forced to take the basic technology class. "I do not want to be here at all," the student informed Mr. Sharp. After learning that the student wished to be a physical therapist, Mr. Sharp designed a technology-driven research program to help the student study anatomy, physiology, and neurology. Technology literacy skills as well as career-oriented knowledge are forged as the student works toward the final product, an electronic physical therapy portfolio. Needless to say, the student is now excited about technology and about learning.

Educational technology, observes Principal Holmes, has provided a new, more creative and visual teaching tool that teachers formerly lacked, allowing them to reach some students who were previously unreachable. Moreover, satellite and internet connections now allow students to take tele-classes in Spanish, Japanese, or AP English, subjects formerly unavailable in such a small district. Teachers also appreciate the ability to exchange ideas, experiences, and curriculum with other teachers and the access to remote databases that technology provides.

Just this year, administrative tasks for the district, such as attendance, are coming online, a move expected to save teachers and staff a great deal of time. The automation of lunch counting procedures has already created substantial administrative efficiencies. OSD has become such a successful user of educational technology that it now serves as a model for the other districts in
the Whitman County consortium, a position that helps Superintendent Louk fulfill his private vision of equal access to educational technology for all Whitman County students.

Challenges to Educational Technology

OSD’s ability to fund technology at current levels is in serious jeopardy, and a depressed local economy makes special levies or bonds untenable. Compared to the last school year, OSD lost thirty students overall and twenty K-6 students. The resulting loss of state money meant a $140,000 hit to the operating budget. Consequently, personnel will face cuts this year and technology next year if enrollment does not bounce back. The fact that personnel will suffer cuts first reflects the depth of Superintendent Louk’s commitment to technology. But with cuts in technology coming next year, OSD cannot apply for any new grants that require matching funds. Small districts like OSD are thus in a bind, says Superintendent Louk, because the state will not fund technology at a level that will make a significant difference across the board, especially given the spending limits imposed by I-601.

Another challenge involves in-service training. Some teachers want new modules and more training for the software that they have, complaining that they have more than they can, or know how to, use. Other teachers complain that with so many state-mandated curriculum changes, they are being pushed to the breaking point when forced to integrate educational technology at the same time.

Common Factors in Successful Integration

As the experiences of these four districts show, strong and determined leadership is a must for successful integration of educational technology. A vision and technology plan come to nothing without the will to carry it through and initiate a culture change within the district. Funding for a technology plan, whether collected piecemeal as in ONSD and OSD or in large chunks as in BSD and KSD, will be misspent without a determined effort to push staff development and integration. This leadership begins with the superintendent in all districts. In smaller districts, a determined superintendent may be sufficient to change the district’s culture, but principals must be forceful advocates in the larger districts. The culture change takes time, at least six and as many as ten years in these cases, and pressure and incentives must be continually applied.

Each of these districts has also shown a certain flexibility in planning and funding. During the planning stage, an open process that takes into account the views of diverse users, administrators, teachers, community members, and parents seems necessary to both craft a plan that all parties will have a stake in bringing to fruition and to secure funding. And for funding itself, superintendents must be creative with their budgets, finding money for technology where they can. In the larger districts, this applies to principals as well, for they can creatively use their building budgets to help fund educational technology.