Technology Plan

Three Year Plan: Annual Review Required

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Technology Infusion Vision

We desire to maximize the use and integration of technology for staff, students, and community in order to enact the educational beliefs of the school division, so that students use technology as a tool to become lifelong learners and be successful in a change society.

We envision using technology to further a learning community where students will:
- Experience technology integrated across the curriculum,
- Become ethical and informed consumers of media, and
- Have access to teachers with the skills to be able to integrate technology.

Executive Summary – Planning For Change

Our vision refers to the fact we are living in a change society, not a changing society. In a changing society there is movement from one known to another known. In a change society the norm is the movement or the change. Because of this uncertainty, our technology purchases and implementation plans must focus on <u>flexibility, accessibility, and capability</u>. There are four main principles of the technology plan:

Flexibility, accessibility, and capability

1. Facilitate learning with technology rather than learning about technology by providing access to and integrating technology in every K-12 classroom throughout the school division.
2. Prepare teachers for integrating technology through ongoing staff development programs.
3. Enhance teacher productivity through efficient administration.
4. Facilitate the use of student assessment data to inform instruction.

Teachers are the ones who improve student learning outcomes, not the technology. Given the proper environment, a positive change in teachers' technology infusion practice will occur. This change in practice is a vehicle to facilitate other positive changes in teacher practice, such as an increased focus on student centered learning and authentic assessment. The use of technology has been proven to increase both student and teacher productivity and to ensure learners are more able to cope in a change society.

Our goal is to ensure that by 2014:
- Every teacher in the Saskatchewan Rivers School Division will continue to have daily access to a laptop computer that is not more than four years old.
- Students have just-in-time access to technology in either a building minimum of 15 computers or at a 10:1 ratio. Access will be in the form of wireless laptops that can come to the classroom or a pod of laptops consistently in the classroom.
- Every classroom is equipped with a SMART board.
- Every classroom is equipped with a sound field system.
- Libraries have computers at a 50:1 ratio for students.
- Public access devices are enabled at our high schools.
- Practical and Applied Arts course offerings, at the high school level, are supported with desktop labs.

- Technology is infused into the curriculum and every student has the opportunity to use technology to learn and to demonstrate their learning on a daily basis.

Commitments, Expectations, and Measurement

Expected Outcomes:
Our expectation is that appropriate access for both students and teachers will improve the learning environment and therefore learning opportunities.

Learners
- Commitment::
    o Continue to provide flexible consistent access for students inside the classroom in order to:
- Expectation:
    o increase student learning
    o increase student Opportunity to Learn
    o increase student information literacy

Learning Environments
- Commitment:
    o Provide teachers with:
        ▪ upgraded hardware on a 3-4 year rotation basis
        ▪ SMART boards
        ▪ software
        ▪ ongoing training
- Expectations:
    o meet the Ministry of Education's outcome requirements to enable teachers to manage data-driven practices.
    o increase efficiencies in record keeping, scheduling, monitoring, and reporting student progress.

Professional Competency
- Commitments:
    o provide staff development to enable teachers to effectively infuse technology into the curriculum to
    o develop a division-wide, interactive, connectivity model for the delivery of staff development and classroom instruction opportunities.
- Expectations:
    o enhance classroom instruction
    o improve student learning

Measuring Progress:
We will use the hierarchy of technology integration rubric (see Appendix A) which describes a continuum of behaviours to assess our current level of proficiency in each implementation area and indicate the desired outcomes and behaviours. We will also establish goals and

timelines for improvement based on the behaviours described in the rubric. This holistic rubric, and any analytic tools based on it, will aid in the development of division-wide, school, and individual teacher goals.

The technology plan must be a living document, with ongoing renewal to reflect changes in technological education solutions and resulting changes to goals and outcomes. The focus of the evaluation of the success of the plan must be on the impact technology use has on student learning and efficacy (McNabb et al., 1999, in Tunison, 2003).

Key Findings

A comprehensive needs assessment compiled with current research identified the following areas of consideration for successful plan actualization:
- job embedded, curricular integration in-service for teachers
- basic computer skill in-service for teachers
- access to SMART board technologies
- student computers at the point of instruction, at a ratio of 10:1
- improved wireless reliability and log on time (#1 biggest roadblock to integrating technology from April 2010 survey)

All this needs to be done in a manner that provides flexibility and control at the school-based level in order to meet the needs of teachers and administrators and integrate with building culture.

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Implementation Plan Highlights

Implementation requires planning, purchasing, implementation, and evaluation. These four areas need to be considered from both the technical and the pedagogical areas. All areas of implementation must constantly keep the three tenets of our vision in mind and also think *flexible* for future use, *accessible* where the learning takes place, and *capable* of meeting our vision.

It is important to strive to provide flexibility with respect to the actual implementation at the school level so that administrators and teachers are able to work within the building culture to ensure maximum technology infusion. It is also critical that the Division continue to refine our infrastructure to support reliable teacher and student use of technology.

The hardware focus of the last three year technology plan was to provide teachers with laptops and to institute student laptops as opposed to desktop labs in elementary schools. Wireless implementation was a large part of the infrastructure change and the Laptops for Learning initiative was to be the major staff development initiative. Although technology staff development is now integrated into all curricular in-services and technology coaching is advancing teachers in technology and teaching skill levels, staff development is still one area that requires improvement.

Moving teachers away from having concerns about having too much information for students to process, their own lack of knowledge about technology, and having enough computers for whole class activities (top three curricular concerns from April 2010 survey) is where the staff development must kick in to change beliefs and values in order to shift teaching practices. (Preston, E. Retrieved Sept 14th, 2010) SRSD is providing laptops at a 10:1 ratio and is intentionally not funding 1:1 laptop initiatives at this point. Research has not indicated increased student achievement in math or literacy as a result of 1:1 student computing. (Dunleavy & Heinecke) In fact, some research indicates student communication and collaboration skills increase only when students share a computer with one or more peers. Our Saskatchewan curricula supports student-centered learning done through inquiry and assessed with performance tasks. Having a small pod of 4 - 6 computers in a classroom consistently facilitates this type of learning. It is our belief that having a classroom teacher take ownership of a pod of computers increases their knowledge of networking and log in issues and decreases some of the wireless and log in time issues that seem to exist.

Needs Assessment

SRSD employees representing K-12 urban and rural schools were asked to participate in a technology planning needs assessment in May 2010. They were asked for their input about our current and future situation regarding technology integration. In total, 527 people responded to the survey including 322 classroom teachers. Information from both multiple choice and short answer were compiled and summarized in order to determine what SRSD teachers felt was needed to move toward our identified vision.

How are computers currently used in our schools?
A summary statement from 2007 said that, *"most of our teachers are able to work with their computer, access files, and use a word processor, so we are headed in the right direction as teacher use of computers is growing. However appropriate student use appears less than desirable because existing student expectations exceed teacher skills."* This is still the case three years later. Data shows that teachers in general rate themselves at the blue and or green level, akin to our student achievement data collection levels, for various basic computer software skills, and that a larger percentage of teachers are more confident with their skills if they have a SMART board in their class. Teacher computer skill level then increases again with the length of time the teacher has had a SMART board.

Another summary statement from 2007 said that, *"most of our teachers are __not__ able to use the web appropriately for information sharing, gathering, and management. They overwhelmingly cannot use the Web to extend their computer knowledge and use."* This has changed significantly; 82% of our teachers who have had a SMART board for over two years state they would place themselves in the green zone, or excelling, at using the Internet effectively. The number drops to 57% in the green zone for teachers who do not have a SMART board, but this is still a gain from 2007. The color coded scale used to obtain a green zone or excelling statement is similar to other SRSD data collection charts (see Appendix B).

The International Society for Technology Integration has National Educational Technology Standards both for Students and for Teachers. (ISTE NETS-T and NETS-S) These are the

technology use standards for teachers and students that we work towards (see Appendix C). Teachers were asked their perceived competence level with regard to these standards and the average placement for most teachers was in the yellow zone, or the beginning to achieve area. There were more teachers with SMART boards self-reporting at higher levels on the rubric, however their average was also in the yellow zone. Between 38 and 63% of our staff members stated that they were not sure whether the student laptops had a piece of standard, available software. Four pieces of standard inquiry-based software, Comic Life, Audacity, Windows Movie Maker, and Photostory, are deemed indispensible for student projects and yet most of our teachers didn't know we have them available. Further, 93.5% of teachers say the highest used piece of software by students is Internet Explorer. This indicates either a lack the computer skills to effectively integrate technology, or a lack of pedagogical knowledge of what to do with computers once they have them.

As we move from how computers are currently used in our schools to how we want students to experience learning we note that it is both harder to achieve and harder to collect data on. In 2007, the Ministry of Education commissioned a survey entitled "Beyond the Mouse and Modem". This survey identified some pedagogical and productivity goal areas for Saskatchewan Rivers. Those goals and our results are as follows:

What Technology Should Do for Us in Our Vision

	2007	2010 Goal	2010 Actual
Enhance student learning	26 - 41%	100%	55%
Enhance students' Opportunity to Learn	2 - 16%	70%	59%
Enable teachers to manage data-driven practices	17%	70%	100% enabled
Meet their staff development needs by providing an interactive, information system for professional growth and purposeful collaboration	9 - 16%	100% available, 70% use.	10% (Breeze system from 2007 offline, new Drupal system)
Ensure record keeping, scheduling, monitoring student progress, and reporting student progress as efficient as possible.	70%	100% at least occasionally	100% options exist for hardwired, wireless, home and work.

What is the current accessibility to technology?
In 2005, 132 teachers wrote comments on the topic of accessibility. Times have changed and five years later, there are not only more teachers commenting on the topic but now the topic is accessibility AND reliability (wireless computing has brought another dimension to accessibility).

Present Situation in Saskatchewan Rivers

	2007 Percentage	2010 Percentage
A single computer or several computers without Internet	10%	0%
A single computer in classroom with Internet access	59%	100%
Several computers in classroom with Internet access (Pod in classroom)	14%	5%
Cart of laptops I can bring to my classroom	20%	100% - All K-8 classrooms
One or more computer labs	76%	100% - All schools with grades 9-12
A laptop for teacher use both at work and at home	12%	100%
A pod of computers near my classroom	20%	N/A

The most prevalent comments from 2010, are summarized below:

When asked what one technology change or policy change would most benefit student learning, the most concrete comments included:
- ➢ Content Filtering (Web Gateway) sometimes gets in the way
- ➢ Allow students to bring personal devices and attach to our network
- ➢ SMART boards in all rooms
- ➢ Go back to hardwired computer labs
- ➢ Have pods in all classrooms

When asked what the single biggest roadblock to the integration of technology into core curricula was, recurring answers included:
- ➢ It takes too long to log on to the computers
- ➢ Lack of staff development time and or opportunities
- ➢ Not having access to a SMART board
- ➢ Blocking software (Web Gateway) gets in the way
- ➢ Low teacher comfort level, teacher unfamiliarity
- ➢ Not enough computers for students
- ➢ Lack of resources for the computers (software)

Gap Analysis - Teachers and Technology
What type of in-service are our teachers seeking?

Almost everyone is seeking some type of training with regard to teaching with technology. In 2005, 93% of our teachers felt that their post secondary education was ineffective in preparing them to use computers appropriately in instruction.

Teacher comments indicate that there is a global misunderstanding about what technology integration into curricula and classroom computer use is supposed to or could look like. Frustration with hardware and/or infrastructure, a personal lack of computer knowledge, and a lack of a pedagogical vision that clearly depicts what good technology integration looks like, have helped to create this climate.

Teachers say they need:
> basic computer in-service
> curricular integration in-service

In the support realm, they requested:
> reliable faster computer access
> access to web material that is currently blocked
> SMART boards

In summary, staff development needs to start at a belief and vision level and work to fill identified skill gaps after a common understanding has been adopted.

What frameworks will enable us to best meet our vision?
Teacher access: Supporting staff practice with access to a laptop computer has significantly improved the daily work life of our teachers. It was a needed first step towards improving student learning; maintaining this practice is essential to moving forward.

Student access: *At the elementary school level,* access should occur in the classroom. Having computers in pods and an interactive white board supports learning in a student-centered, inquiry-based classroom. Teacher training and support will be essential for effective implementation as many elementary schools continue to have a lab setting. The lab can benefit students in grades 6 to8 working on Practical and Applied Arts; however, this compounds the computer shortage for K-5 students resulting in many not having access to computers at all until upper grades. *At the high school level,* labs are still needed and are appropriately used to meet curricular objectives in Practical and Applied Arts courses, such as; Computer Production Technology, Computer Science, and Information Processing.

Additional hardware: Hardware in the form of items beyond the traditional computer should be explored when they can. Such items support the ISTE NETS (see Appendix C), facilitate communication and collaboration with others, and support a student learning. In the past, iPods and digital cameras have been purchased to help differentiate and enhance instruction within these guidelines. As access to technology changes, items such as ipads, graphics tablets, document cameras, and student response systems should also be explored to provide our students up to date access to technology. SRSD pilot projects, Teachers' Resource Centre kits, and suggested school-based purchasing are all current options for authorized, peripheral hardware purchases.

Staff Development Summary:
Each teacher will develop a common understanding of what technology infusion looks like and how it is linked to the learning expectations of our 21st century learners. Each teacher will become proficient at using a variety of software to deliver classroom content. Teachers will receive practice and guidance in developing lessons and units, and collaborate with other teachers in order to facilitate continued professional learning.

Qualifying division staff development initiatives will include training in:
* developing inquiry-based unit plans,

- coaching or mentoring other teachers,
- using data to measure and monitor student growth,
- using technology, including web development, to meet curriculum outcomes,
- sharing current research regarding student learning, and
- media literacy.

Examples of such initiatives include, but may not be limited to; The Early Literacy Project, Literacy in Action, Math Tech or Implementation Teams, Putting IT ALL Together, Curriculum and Technology Online Community, Intel Teach to the Future Cohorts and, SMART board Online Learning Community.

The coaching model currently allows for approximately 20 teachers per year to truly develop the above described proficiencies. Teachers who have been through the coaching experience commented on how beneficial the experience was and 92% rated themselves at the blue or green level in creating digital age lessons and assessments (see Appendix B). This is compared to 40% of our general teaching population who rated themselves at the same level on the same question. This data supports our belief that the coaching model is working, however, a recurring comment was that even these coached teachers wanted the experience again; an option we cannot currently provide them. Therefore, a goal during this plan implementation timeline would be to add additional technology coaches. An alternate post-coaching staff development plan could possibly encompass an online community for these staff members.

At the high school level, in-service needs regarding technology revolve around our guest wireless implementation and the impact this can have in the classroom. Teachers require guidance in developing procedures and policies at the classroom level that support the proper collaborative use of guest technologies. They require pedagogical in-service so they are aware of the curricular benefits of using such technologies to inform instruction through data collection, to collaborate with peers in the classroom and around the world, and to use various applications to analyze larger and more relevant data sets, thus deepening understanding rather than focusing on arbitrary information.

Pedagogical Evaluation
Teachers who have had the opportunity to both serve on the Curriculum and Technology Team and to plan technology rich lessons with our technology coach have helped develop and describe what technology integration best practice looks like in Saskatchewan Rivers. These teachers have a shared vision of what technology integration should look like developed from sources such as; personal experience as Microsoft Innovative Teachers for Canada; ISTE annual conferences, and division initiatives built around Intel Teach to the Future resources. Their vision of successful technology integration is described as follows:

What will teachers be doing?
- Facilitating students using just-in-time learning technology skills
- Being a life long learner and co-learner
- Changing their attitudes towards technology and integrating it into the classroom
- Modeling technology use, ongoing learning, and ethical behavior.

- Teaching critical thinking skills
- Teaching students will be their primary goal; technology will enhance this teaching
- Receiving in-service aimed at incorporating technology into their lessons to enhance student outcomes.
- Monitoring their teaching practices and the resulting student outcomes.
- Collaborating with other teachers

What will students be doing?
- Being a risk taker when learning with new software
- Becoming comfortable with technology
- Thinking critically and evaluating what they see
- Solving problems using different tools
- Collaborating more
- Accessing, using and choosing appropriate technology
- Increasing their learning
- Staying motivated
- Following teacher modeling using the skills that they have been taught

What will schools be doing?
- Providing time, resources, and financial support
    - Supporting teachers with in-services
    - Providing time for teachers and students to learn
    - Providing resources for teachers via in-service or having a school coach as a mentor
    - Providing access to computers, in-service, and funding
- Aligning technology goals with the curriculum.
- Showcasing their accomplishments
- Developing a technology culture – for example: Staff development in technology, school wide acceptable use policies, and invest in technology for schools

Implementation Plan

Implementation requires planning, purchasing, rolling out, and evaluation. These four areas need to be considered from both the technical and the pedagogical areas. All areas of implementation must constantly keep the three tenets of our vision in mind and also think *flexible* for future use, *accessible* where the learning takes place, and *capable* of meeting our vision.

What is the specific framework proposed?
SRSD aims to continue to provide and upgrade laptops for all teachers; to provide laptops for students in a 10:1 ratio, and purchase SMART boards for all full time teaching classrooms.

SMART boards have been purchased for all but 77 classrooms at the present time and with the current year's orders, we anticipate reaching our goal within the next school year.

The student laptops are to be implemented inside classrooms in a K-8 setting; in consultation with the school administrator, the technical services department will facilitate a dedicated, computer area with hardwired network and power for these computers to receive updates. The laptops will be able to function wirelessly in the classrooms when needed.

The classroom dedicated computer location is the solution to teacher feedback indicating a need to shorten the startup time of our computers. This configuration allows for more consistent and faster updates, software installs and management of the computers, and easy pre-class boot up. In order for the dedicated computer location, or pod of computers to be in the classroom where technology can be integrated across the curriculum, the following would be required:

- A permanent, dedicated table, desk, or workspace to accommodate the computer and users,
- A dedicated network cable going back to a central wiring closet, and
- Adequate AC power for computers.

Additionally, in some school locations the pod in the classroom would necessitate the running of network cables and power. This would require skilled personnel for running the network cables and power. Additional required hardware might include; pack poll, network jacks, power bars, rack and patch panel, conduit, desk(s), tables, or counters.

Educationally, a pod in the classroom is the most desirable situation, however in some school situations the dedicated hardwired computer location will have to be a lab setting. Teachers will be encouraged to use the laptops wirelessly in classrooms and to use that dedicated, hardwired computer room for the maintenance and care of the computers rather than to teach in.

Wireless Guest Access
We have been working to put infrastructure in place to allow students to use their own personal wireless devices in the classroom in a safe secure manner. We are currently using MERU access points in high schools. The long term goal is to provide complete coverage like we have with our internal wireless system. Currently, we have full coverage at Carlton Comprehensive High School, and one MERU access point at all other high schools. This guest access requires a SRSD username and password. Content filtering applies and users are restricted from accessing internal Saskatchewan Rivers' network resources.

Data Initiatives
The Saskatchewan Rivers School Division is part of a provincial pilot project organized to test data warehouse and school improvement software. The software improves this school division's capability to access and analyze student assessment data. The result is a more robust school improvement planning process that should result in improved learning outcomes for students.

The data warehouse product is Skopus; it contains student demographic information along with the results of common school division and provincial student assessments. SkoVision

is the school improvement software that allows schools to easily follow the progress of their SMART goals and prepare their annual Learning Improvement Plan.

Web Development
We have enabled a Drupal content management system so that all staff members have access to contributing to the school website by creating personal web spaces in a secure environment.

Planning
We work in learning communities in our schools and we need to utilize this staff development practice when planning for new types of instruction. Consultation with technical directions committee members, including many administrators, indicates a need for the hardware to be deployed in a manner that fits the current culture of the building.

Purchasing
Research tells us that the most appropriate student to computer ratio is 3:1 but associated costs are prohibitive. A more attainable ratio with other Saskatchewan school divisions seems to be closer to 5:1 students to computers. SRSD is currently operating with a ratio that ranges from 10:1 to 3:1 depending on the school. We would like to aim for a three year end goal of 8:1 students to computers ratio at point of instruction with an associated cost of approximately one million dollars. Future technology plans should continue to aim for a 5:1 student to computer ratio.

Rolling Out
We desire to maximize the impact of our roll out by providing hardware to the schools that are ready to receive the training and to change teaching practices. The use of a technology coach to continually assist and support teachers in technology instruction supports the model of staff development in other successful division projects.

Technical Planning and Purchasing
The demands placed on the network infrastructure and systems (servers and computers) are great and diverse. The design and capacity are difficult to define when the change of tomorrow is looming but is not yet clear enough to define and quantify. Additionally, the division, schools, and individual staff make needed decisions that tax the hardware, network infrastructure, and support staff.

Greater and diverse use of technology by staff, students, parents, and outside organizations drives us in a direction that requires open access from inside and outside our network. At the same time, seemingly opposite demands are placed on the system to protect the operations of the organization, identity confidential data of staff and students, and protect the infrastructure itself from harm - from threats that may originate outside of the country or within the classroom. (Examples: criminals seeking financial gain via personal/financial information, viruses, Trojans, spyware and individuals misuse/ignorance of computers)

To help achieve these goals when change is the norm and demands expand, we need to continually reinvest in these key areas:
- Network infrastructure (switches, routers, firewalls, wireless access points)

- Servers
- IT support staff capacity and training.

Network Infrastructure
Currently, slightly more than half of the network switches that make up our LAN infrastructures have been replaced with modern Layer 2 and Layer 3 Gigabit switches. The remaining switches are inadequate to achieve the goals defined in this document and should be replaced on a three to five year cycle to maintain the capacity to handle new and changing demands.

Switches to be replaced and/or upgraded every 3 to 5 years

	Cost per unit*	Total cost
150	$3000	$600,000

* cost may vary depending on the number of ports required, Layer 2 and Layer 3 requirements, Power over Ethernet requirements and time of purchase.

Wireless Infrastructure
Each school currently has some older wireless 802.11g (wireless G) access points. This technology is dated and the equipment purchased at the time provides minimal coverage. Transitioning from slower wireless G to newer, faster 802.11n (wireless N) is a primary goal in replacing access points. We have purchased 2 enterprise class wireless controllers and several new wireless dual 802.11g/n (wireless G and N) access points. This change allows us to centrally manage the new wireless access points, configure numerous wireless security protocols, and segment different wireless users to appropriate secured networks (wireless guest verses wireless SRSD computers). This also provides a transition path from slower wireless G to faster wireless N.

To take advantage of this better wireless infrastructure, the following still needs to happen;
Purchase more new 802.11n access points
Continue to replace older unmanaged switches
Purchase of laptops and devices capable of utilizing 802.11n in the 5Ghz band.

Currently we have about 160 wireless G access points and 56 wireless N access points

Access points to be replaced

	Cost per unit*	Total cost
160	$1000	$160,000

Servers
Each school should have a server connected to the LAN, with the capacity to meet current and future storage needs, and the performance to run newer applications. Additionally, the ability to expand the storage capacity easily and as needed is vital. Each server should continue to be replaced every three to five years.

Additional servers are required for application specific tasks (examples: Destination Reading, accounting, database server, email. and web server) also need to be replaced on a three to

five year cycle and their software updated to newer versions, if we wish to maintain the capacity to change and grow.

Database servers	Cost per unit*	Total Replacement cost
Database server	$20,000	
Data warehouse server	$20,000	$20,000

Servers – Currently 60 in total
34 servers for schools or sites
26 servers for current applications and infrastructure

Server	Cost per unit*	Total Replacement cost
60	$7000	$420,000

* Cost will vary depending on need and time of purchase.

Additional upgraded storage and backup capacity costs per year.

	Cost per upgrade*	Total
Server storage upgrade	$1000	$34,000
Backup capacity upgrade	$1000	$34,000
Total		$68,000

* Costs will vary depending on usage at the school (increased computer usage translates into more storage capacity required.), the type of drives required for the server, and time of purchase. Also, some equipment can be redeployed extending the life of the hardware and reducing the need to purchase additional storage.

Support staff
We currently have six computer technicians, one database technician, one network analyst, and one software support clerical performing help desk duties to support our +2500 computers and servers; a ratio of more than 400 computers per technician.

The first line of contact with our technical services department for all teachers is our help desk. This is where staff receive software support, learn web-based reporting systems, have minor hardware issues fixed, or are placed in queue to have a technician visit them. Often our help desk person is able to remotely control a person's computer and demonstrates a solution online so that a work order for a live technician is not required. Our help desk person is also responsible for creating graphics for the Saskatchewan Rivers web site and maintaining the web site.

Network administration configures, maintains, and monitors the equipment that makes up this infrastructure. This includes firewalls, switches, WAN links, and wireless controllers. With the increasing use of internet and network based resources, as well as additions such as security camera systems and heating and AC systems to the network, it becomes important to ensure that the system has the capacity to support the demands.

Network security becomes even more important with additional non-division owned devices (student devices), third party systems, and software. It becomes increasingly important that different parts of our networks be separate and not able to access other parts of our network, while still maintaining functionality for the intended use.

Summary of technical department needs:
Ongoing technical training
Replace switches (routers and firewalls, five year cycle)
Replace servers (on three to five year cycle)
Maintain budget for increasing storage and backup capacity
Plan for increased support/help desk (.5)

Technological Evaluation
After attending a conference designed to promote insight into our current technology set up and use, one of our technicians formulated the following key questions to promote alignment of work in the school division:

- Is technology being used effectively?
- Is technology getting in the way of pedagogy?
- Are the students engaged in the lesson?
- Does the teacher display or have confidence in the use of the technology?
- Are the SMART boards and software installed and configured correctly?
- Are there things that the technical services department can do to facilitate learning?

Conclusion

The three components that require budget consideration are hardware (including infrastructure), software, and staff development. Research states that a budget which places equal financial support in all three areas will in fact support student learning.

Hardware needs to be robust enough to support the type of activities people are trying to accomplish with their computers and support the software we wish to purchase.

Software decisions should always come back to the support of student learning and ensure that students are able to meet curricular outcomes.

Staff development must support teachers so that technology is not getting in the way of pedagogy. Embedding philosophical technology training into core curricular in-service on a regular basis is essential. Training then expands to focus on skill attainment to fill identified needs for general skills and specific software implementations.

Reviewing and communicating the intent of the technology plan to administrators, teachers, and technology department personnel is important to the success of the overall plan. Addressing key questions in focus groups and actively seeking solutions to existing problems is essential.

Appendix A – Hierarchy of Technology Integration Rubric

Through teacher created SMART goals and self assessments, we aim to move teachers up one level per school year from Entry up to Innovation.

Entry

The Entry level is the first level of integrating technology into your classroom.

- ➢ **Fear that something will go wrong**
- ➢ **No explicit links to the curriculum**
- ➢ **Direct Instruction**

Key Indicators:
- o **Students all have the same role**
- o **There is a defined task for all**
- o **Free computer time is allowed when finished**
- o **The task could be done without technology**

Adoption

The Adoption level is the second level of integrating technology into your classroom.

- ➢ **Uses computer to prepare to teach**
- ➢ **Students use a word processor to make a final product**
- ➢ **Search the Internet**
- ➢ **Fear that something will go wrong**
- ➢ **Direct Instruction**

Key Indicators:
- o **Students all have the same role**
- o **There is a defined task**
- o **The task could be done without technology**

Adaptation

The Adaptation level is the third level of integrating technology into your classroom. This is where most teachers in the province lie.

- ➢ **Students use a word processor to edit**
- ➢ **Fear that something will go wrong**
- ➢ **Direct Instruction**
- ➢ **Teachers talk about "adding in" technology**
- ➢ **Worried about classroom management, time, and impact on student learning**

Key Indicators:
- o **Students all have the same role**
- o **More experimenting is allowed**
- o **The task could be done without technology**

Appropriation
The Appropriation level is the fourth level of integrating technology into your classroom.

- ➤ **Starts with outcomes**
- ➤ **Know something will go wrong, and try to solve it**
- ➤ **Lessons characterized by higher level thinking and collaboration**

Key Indicators:
- o **Students work together but have a variety of roles**
- o **Student role in the classroom is changed**
- o **Teacher as facilitator**
- o **Constructivist**
- o **Do things with technology that could not be done without**
- o **Variety of assessment tools**

Innovation
The Innovation level is the fifth level of integrating technology into your classroom.

- ➤ **Diverges from conventional teaching**
- ➤ **Transparent part of the curriculum, fulfills a variety of outcomes**
- ➤ **Students construct their own learning**

Key Indicators:
- o **Students work together but have a variety of roles**
- o **Student role in the classroom is changed**
- o **Teacher as facilitator**
- o **Constructivist**
- o **Do things with technology that could not be done without**
- o **Variety of assessment tools**

Appendix B – SRSD Benchmarks

When teachers were surveyed to obtain data for this report, they were asked to place themselves in the following areas:

1.) Green zone –   Excelling
2.) Blue zone –   Achieving
3.) Yellow zone –   Beginning to Achieve
4.) Red zone –   Not Yet Achieving

These color coded areas are very familiar to our teachers as they are the same colors used in our student data collection reports. The descriptor words also match our current report card system.

Appendix C – ISTE NETS-S and NETS-T and NETS-A

Saskatchewan Learning's 2003 document entitled 'Technology Skill Checkpoints' has broad outcomes for student technology use. They have been rumored to be under revision for the past three years and a new version of these checkpoints was due out spring 2010. The new Ministry of Education's version is based on the International Society for Technology Education's standards and most school divisions are aligning their technology goals to these worldwide standards. Saskatchewan Rivers' consultants have been integrating ISTE standards for students into core curricular areas where Ministry indicators have suggested integrating technology. There are also National Educational Technology Standards or NETS for Teachers and Administrators as well. (NETS – T and NETS – A) The ISTE website (see supporting documents) has various resources and suggestions for how to facilitate student learning through increased teacher and administrator knowledge.

NETS – S
1. Creativity and Innovation
2. Communication and Collaboration
3. Research and Information Fluency
4. Critical Thinking, Problem Solving, and Decision Making
5. Digital Citizenship
6. Technology Operations and Concepts

NETS – T

1. Facilitate and Inspire Student Learning and Creativity
2. Design and Develop Digital-Age Learning Experiences and Assessments
3. Model Digital-Age Work and Learning
4. Promote and Model Digital Citizenship and Responsibility
5. Engage in Staff Growth and Leadership

NETS - A

1. Visionary Leadership
2. Digital Age Learning Culture
3. Excellence in Professional Practice
4. Systemic Improvement
5. Digital Citizenship

Supporting Documents:
Powerful Learning Practice Cohort Website http://plpnetwork.com and PLP Video
http://plpnetwork.com/2010/05/17/the-culminating-tour
SRSD Division Owned Laptop Agreement (online)
SMART Goals, created by each teacher who receives a laptop (emails)
ISTE NETS for Teachers
International Society for Technology Education NETS for Teacher. Retrieved from:
http://www.iste.org/AM/Template.cfm?Section=NETS September 20, 2010

Dunleav, M, & Heinecke, W. F. The Impact of 1:1 Laptop Use on Middle School Math and Science Standardized Test Scores Retrieved from: http://www.informaworld.com/smpp/content~db=all~content=a902225753 September 14th, 2010