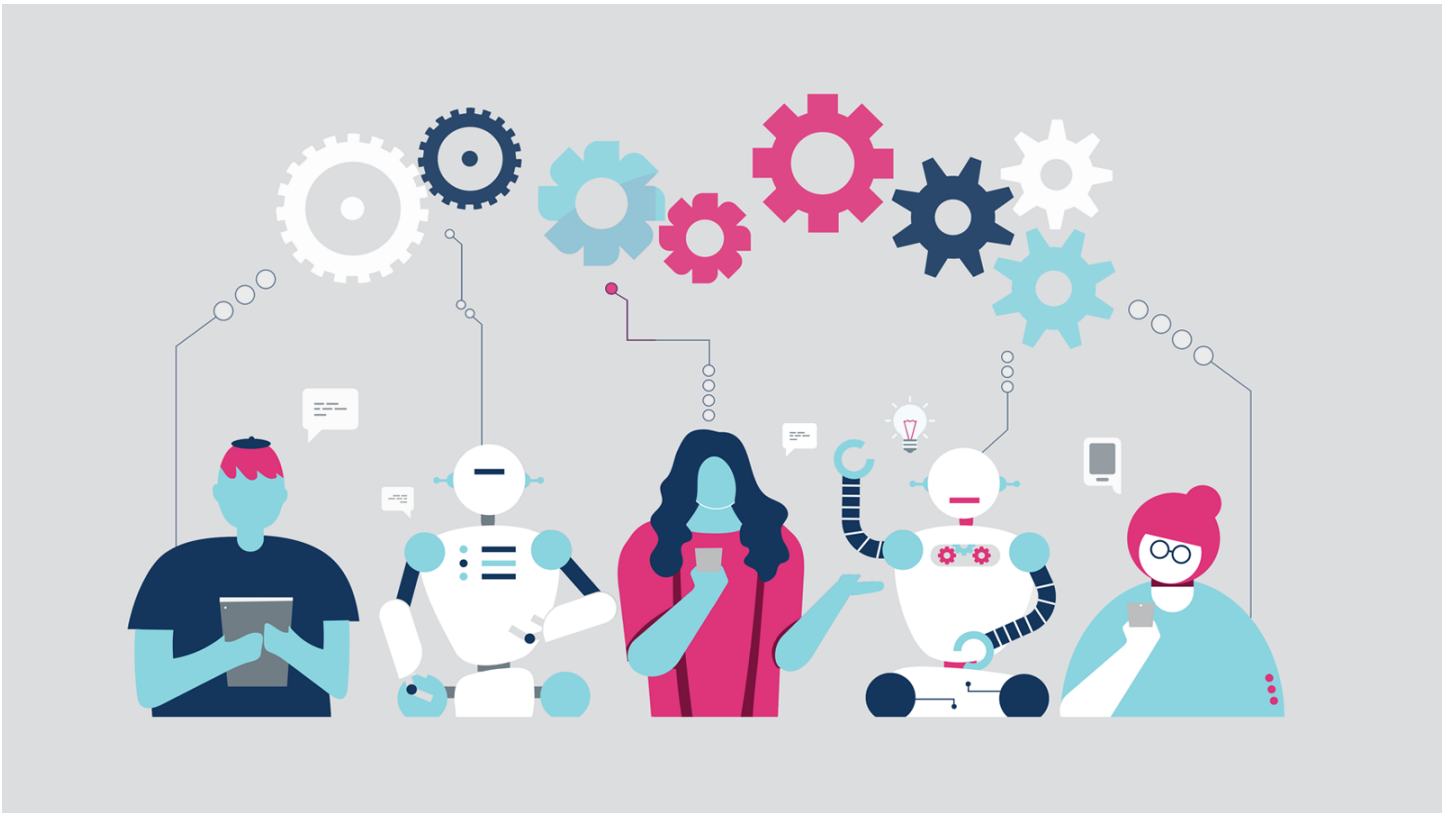# Instructional Technology and Innovation Plan

**Amplifying student learning and competencies :
create, innovate, contribute.**

2020-224

District Technology Advisory Committee

Catherine Ellis	Teacher
Louise Thompson	Teacher
Delyth Morgan	Principal
Fiona Summerville	Principal
Updesh Cheema	Principal
Chris Rolls	Lake Cowichan Teachers Association
Erica Roberts	Cowichan Valley Teachers Association
Lisa Read	District Information Technology Coordinator
Sheri Kinney	Disrict Library Learning Commons
Sheryl Koers	Associate Superintendent
Jason Sandquist	Secretary Treasurer
Glen Posey	District Principal of Instruction and Innovation

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Executive Summary

Context:

Social and economic change is rapidly accelerating due to exponential growth in technology and globalization. Kindergarten students today will leave school in 2030 and in order to thrive in an unknown future must be prepared for participation in a world where job skills quickly become obsolete and problem solving and resilience are essential. Students will require data literacy to interpret the world, capacities to flourish in an ever-expanding technological environment and the abilities to protect their personal privacy and security in a digitally connected planet. The rate of change and the interconnectedness of our planet is not predicted to slow, therefore we need to develop competencies in our students that provide a combination of creative, entrepreneurial and technical skills that will allow shifting into new occupations as they emerge (OECD, 2019***). Instructional technology therefore must be infused in daily learning to provide students the needed skills to transition to a future of their choosing and one where they have the competencies to create and innovate, contribute socially, collaborate with others, think critically and be literate across domains.

With the above in mind, the Cowichan Valley School District Instructional Technology Services Department, in concert with the School District Learning Team, strives to co-create technology enriched learning environments by providing staff with appropriate technology tools and instructional development. Through strengthening the systemic capacity of our educational staff, students will be offered technology infused* learning that is personalized, may be accessed anytime anywhere, and that transforms the learning process. Whenever possible, we will offer a triple track agenda** of support to continue transforming the learning opportunities for our students. This philosophy means that simultaneous work will take place to offer common Applied Design Skills and Technology (ADST) experiences for all students, opportunities for classroom innovation and a continued focus on aligning and connecting district wide learning opportunities for staff and students through the development interconnected competencies.

*Technology infusion: A digitally rich, technology-infused learning environment is one in which the inclusion of digital technology is not an event or layer, but rather integrated throughout all stages of the learning process.

**Triple Track Agenda: One where the system is simultaneously working on improvement, transformation and wider collaboration.

***http://www.oecd.org/education/2030-project/teaching-and-learning/learning/skills/Skills_for_2030_concept_note.pdf

Background:

The Cowichan Valley School District Instructional Technology Services Department strives to provide strong performing infrastructure and equitable access to technology for teachers and students. An intentional movement away from desktop computers towards portable devices in non-specialty programs has allowed significantly greater flexibility in how and where students access resources that support learning. We have achieved a ratio of four students to every one portable device across the majority of our schools and continue to work towards improving this ratio. Moving to portable embedded at the classroom level supports the district's implementation of the BC Curriculum by creating opportunities to shift instructional practices and to begin embedding increasing levels of design thinking, computational thinking, creativity and entrepreneurship in daily learning. Moreover, the devices and software implemented provide students and teacher the best in class tools to support learning while building creativity, design, entrepreneurial, productivity and data literacy skills.

A technology rich environment is part of our learner's day-to-day life and we endeavor to provide students with current learning tools that amplify their education and prepare them for their future. This requires a technical focus on a strong foundational infrastructure that includes well managed network bandwidth, strong WiFi and a focus on privacy and security. Having a strong infrastructure allows learning with technology to move away from being a once in a while event to an integrated part of how learning in the classroom flows. Moreover, it

allows teachers the flexibility to personalize student learning through a wider variety of digital tools and to welcome students to bring their own device to school as a resource to amplify learning and engagement.

Empowering teachers with the required instructional technology and pedagogical skills to support student learning is a long standing goal of the District Technology Advisory Committee and provides the greatest opportunity for us to develop learners who embrace diversity, are able to work collaboratively, problem solve and thrive in an increasingly digital and data rich society.
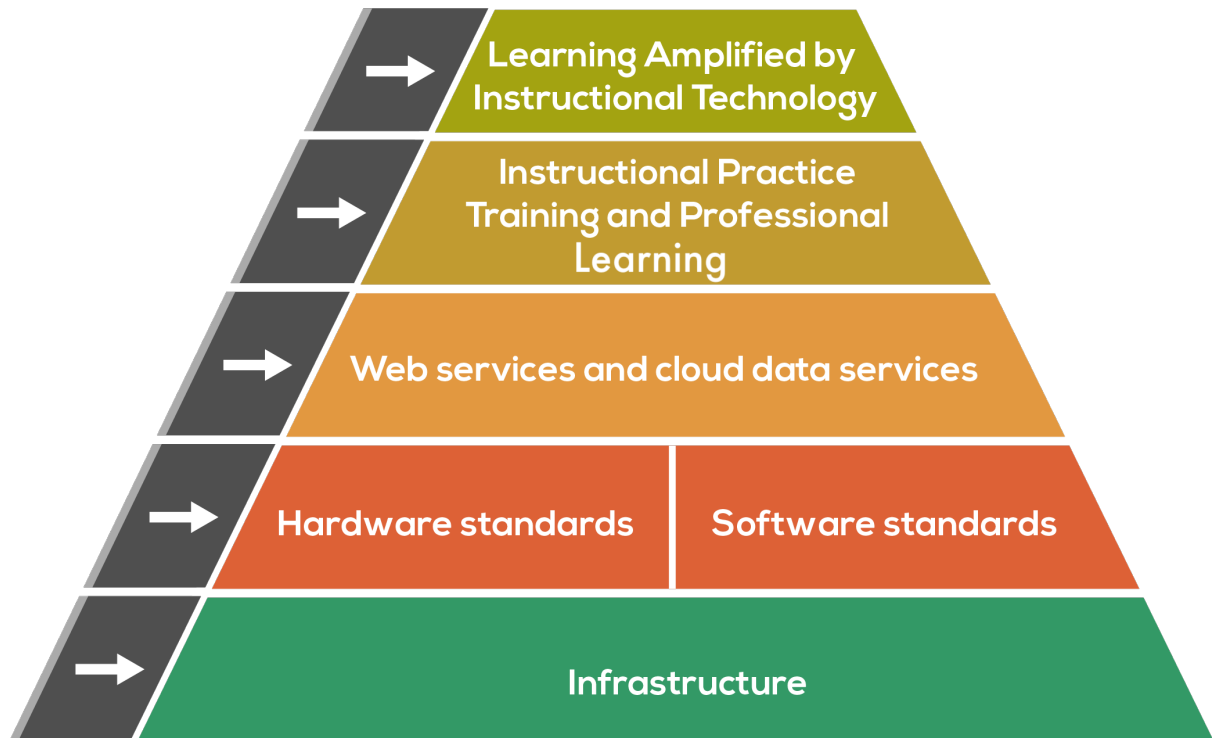
Financial Implications:

A strong infrastructure with clear hardware and software standards is the cornerstone that supports our district in meeting many of its student learning goals and business efficiency targets. Layered on top of this, must be well designed professional learning opportunities for staff if we are to amplify students' education through instructional technology infusion. To meet these requirements, the projected budget over the next four years is approximately $2.6 million. A key financial pillar of the plan is to move the majority of standard technology equipment to a three or four-year refresh cycle to ensure that staff, students and core technical systems are equipped with the most appropriate technology. The refresh model involves strategic leasing of equipment where approximately 25% of devices are refreshed each school year. This keeps our technology more current and reduces the risk of large single year cost pressures due to unexpectedly large amounts of equipment reaching end of life simultaneously. By planning using this replacement cycle, we can more accurately predict and operationalize year over year budgets to provide our staff, teachers and students with equitable access to technology. Furthermore, as the school district continues to grow, we will need to systematically grow budgets to keep pace with technology demands.

Strategic Priorities:

Providing a stable well managed infrastructure and equitable access to digital learning resources will not transform student learning opportunities unless implemented concurrently with relevant pedagogical support for teachers. With this in mind, our strategic priorities are:

1. Continued improvement of internet bandwidths at each school through traffic shaping and Next Generation Network v2 implementation.

2. Hardening wireless networks across all schools through a stronger security posture, VLAN installations for traffic shaping, switch upgrades and migration to 10G connections.

3. Provision of ongoing staff training and professional development to support instructional practice in digitally rich learning environments.

4. Staff training and professional learning opportunities that are integrated with the roll out of new resources and hardware eg iOS and Office 365.

5. Expansion of our strategic equipment leasing.

6. Continued focus on privacy and security education for our staff and students in conjunction with ongoing refinement of our processes as they relate to online resources and district data.

7. Connection to the broader District Strategic Plan – focusing on applied learning and authentic real-world learning experiences created through well-designed learning environments that are profoundly personalized, learner-centred, inclusive and Social.

Instructional Technology Services Pyramid
for Student Success

The above graphic illustrates that reliable infrastructure is the foundation upon which everything must be developed. Moreover, defined hardware and software standards provide the needed consistency and stability across schools to allow educators to infuse technology into their practice. The standardization of hardware and software creates district-wide compatibility, allowing the expansion of communication, collaboration and sharing of ideas. Training and professional learning programs that focus on the infusion of technology within instructional practice enable educators to optimize learning environments for students by expanding instructional skills. Technology training in the Cowichan Valley School District is designed to engage teachers in reflective practice and support them in expanding effective instructional strategies that incorporate appropriate technology tools.

Cowichan Valley Educators' Technology Skills and Attitudes for Success

Teachers in the Cowichan Valley School District are committed to improving student learning through collaboration, continual personal development and exploration of promising practices. The District Technology Advisory Committee supports our teachers in using the following ISTE standards as a framework through which to amplify student learning.

ISTE STANDARDS
FOR EDUCATORS

Empowered Professional

1. Learner

Educators continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Educators:

a. Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.
b. Pursue professional interests by creating and actively participating in local and global learning networks.
c. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.

2. Leader

Educators seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Educators:

a. Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.
b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.
c. Model for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning.

3. Citizen

Educators inspire students to positively contribute to and responsibly participate in the digital world. Educators:

a. Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.
b. Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.
c. Mentor students in the safe, legal and ethical practices with digital tools and the protection of intellectual rights and property.
d. Model and promote management of personal data and digital identity and protect student data privacy.

iste.org/standards

Learning Catalyst

4. Collaborator

Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Educators:

a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.
b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.
c. Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.
d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.

5. Designer

Educators design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Educators:

a. Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs.
b. Design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning.
c. Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.

6. Facilitator

Educators facilitate learning with technology to support student achievement of the 2016 ISTE Standards for Students. Educators:

a. Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings.
b. Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.
c. Create learning opportunities that challenge students to use a design process and computational thinking to innovate and solve problems.
d. Model and nurture creativity and creative expression to communicate ideas, knowledge or connections.

7. Analyst

Educators understand and use data to drive their instruction and support students in achieving their learning goals. Educators:

a. Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.
b. Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.
c. Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.

ISTE

Cowichan Valley Education Leaders Technology Skills and Attitudes for Success

Education leaders in the Cowichan Valley School District are committed to improving student learning through collaboration, continual personal development and exploration of promising practices. The District Technology Advisory Committee endorses our leaders in using the following ISTE standards as a framework through which to amplify student learning.

ISTE STANDARDS
FOR EDUCATION LEADERS

1. Equity and Citizenship Advocate

Leaders use technology to increase equity, inclusion, and digital citizenship practices. Education leaders:

a. Ensure all students have skilled teachers who actively use technology to meet student learning needs.
b. Ensure all students have access to the technology and connectivity necessary to participate in authentic and engaging learning opportunities.
c. Model digital citizenship by critically evaluating online resources, engaging in civil discourse online and using digital tools to contribute to positive social change.
d. Cultivate responsible online behavior, including the safe, ethical and legal use of technology.

3. Empowering Leader

Leaders create a culture where teachers and learners are empowered to use technology in innovative ways to enrich teaching and learning. Education leaders:

a. Empower educators to exercise professional agency, build teacher leadership skills and pursue personalized professional learning.
b. Build the confidence and competency of educators to put the ISTE Standards for Students and Educators into practice.
c. Inspire a culture of innovation and collaboration that allows the time and space to explore and experiment with digital tools.
d. Support educators in using technology to advance learning that meets the diverse learning, cultural, and social-emotional needs of individual students.
e. Develop learning assessments that provide a personalized, actionable view of student progress in real time.

2. Visionary Planner

Leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology. Education leaders:

a. Engage education stakeholders in developing and adopting a shared vision for using technology to improve student success, informed by the learning sciences.
b. Build on the shared vision by collaboratively creating a strategic plan that articulates how technology will be used to enhance learning.
c. Evaluate progress on the strategic plan, make course corrections, measure impact and scale effective approaches for using technology to transform learning.
d. Communicate effectively with stakeholders to gather input on the plan, celebrate successes and engage in a continuous improvement cycle.
e. Share lessons learned, best practices, challenges and the impact of learning with technology with other education leaders who want to learn from this work.

iste.org/standards

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4. Systems Designer

Leaders build teams and systems to implement, sustain and continually improve the use of technology to support learning. Education leaders:

a. Lead teams to collaboratively establish robust infrastructure and systems needed to implement the strategic plan.
b. Ensure that resources for supporting the effective use of technology for learning are sufficient and scalable to meet future demand.
c. Protect privacy and security by ensuring that students and staff observe effective privacy and data management policies.
d. Establish partnerships that support the strategic vision, achieve learning priorities and improve operations.

5. Connected Learner

Leaders model and promote continuous professional learning for themselves and others. Education leaders:

a. Set goals to remain current on emerging technologies for learning, innovations in pedagogy and advancements in the learning sciences.
b. Participate regularly in online professional learning networks to collaboratively learn with and mentor other professionals.
c. Use technology to regularly engage in reflective practices that support personal and professional growth.
d. Develop the skills needed to lead and navigate change, advance systems and promote a mindset of continuous improvement for how technology can improve learning.

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Training and Innovation

Teacher Training and Professional Learning Opportunities

Goal(s):
1. To provide staff with training and professional development opportunities which provide them the skills needed to amplify student learning through technology infusion.
2. To develop a staff training and professional development schedule aligned with School District 79 Learning Framework goals.
3. To redesign the District Instructional Technology Mentor model to include Teacher Librarians where possible.

Current Status

Learning opportunities are presently offered throughout the year and coordinated by the District Information Technology Coordinator and supported by our District Curriculum Coordinator, Library Learning Commons Teacher and District Helping Teacher. These opportunities are organized around themes such as assessment, Office 365 productivity tools, collaboration tools and amplifying learning through digital design etc. The themes emerge from feedback collected from our school-based educators and/or from district goals. The formats may include side-by-side support, evening dine and learn sessions, after school sessions and lunch time. We also offer a Mentorship Program involving co-teaching a tech infused lesson along with follow-up from District Learning Team members as needed.

Actions:
1. Develop a staff training and professional development schedule aligned with the School District 79 Learning Framework.
2. Continue to provide staff training opportunities that model how technology infusion can amplify student learning with the BC Curriculum.
3. Set a staff training and professional development schedule anchored to technology purchases and built into the technology deployment process.
4. Set a staff training and professional development schedule that is aligned with the capacity of the Technology Department to deploy new equipment.

Lead:

District Principal of Instruction and Innovation
District Instructional Technology Coordinator

Cost Estimate: $40,000 per year

Challenge Based Inquiry Classrooms

Goals:
1. To reorganize students into multi-grade communities of learners.
2. To organize learning around the big ideas in the BC Curriculum and connect them to real world inquiry problems with no pre-determined solution.
3. To amplify learning in these classrooms by embedding an appropriate amount of technology.

Current Status (June 2019):
Presently we have four Challenge Based Inquiry Classrooms across three schools. The classrooms are organized either as a 3-4, 5-6 or 6-7 split with a goal of moving to grades 5-7 at some point in the future. Three of the classrooms were equipped with a 1:1 ratio of iPads to students and one with a two students to one device ratio. Teachers in these classrooms have been supported through Challenge Based Inquiry training and with a small amount of release time to collaborate and share successes and challenges. For the 2019-2020 school year it is expected for this model to grow to nine classrooms across four schools.

Actions:
1. Develop a training schedule where existing teachers help support new teachers to the model.
2. Purchase required teacher resources.
3. Set release budget to allow for planning and sharing meetings throughout the year.
4. Budget to purchase required student and teacher iPads to embed in the classroom.

Lead:
District Principal of Instruction and Innovation
District Information Technology Coordinator

Cost Estimate: $20,000 per year

Instructional Technology

Teacher Technology

Goals:
1. To provide teachers with portable technology tools which allow them to amplify student learning, collect and share evidence of learning and keep their business processes efficient.
2. To have projection technology available in each teacher's classroom to allow presentation and sharing of information.
3. Over the next four years to have every teacher with an assigned device and where possible an iPad 9.7" and lease return Mac or Windows laptop.

Current Status

The district has been working to ensure each full-time teacher is assigned a mobile device that supports their current instructional practice and has the ability to allow movement toward digital portfolios and communicating student learning differently. We presently have 75% of all teachers with a mobile device be it a 9.7" iPad or a lease return Mac laptop or lease return Windows laptop. Those not having a mobile device will have an older desktop computer in their classrooms. In the 2019-2020 school year we expect to update approximately 120 teacher devices and have all full-time teachers with a device. Teachers over the last four years have been given the option of a 9.7" iPad with Keyboard, a refurbished Mac laptop or refurbished Windows laptop. Selection and recommendation is made based on how the teacher is instructing in their classroom and what activities are of most importance.

Actions:
1. Purchase / lease a selection of iPads 9.7" and lease return Mac and Windows laptops.
2. Continue to provide training opportunities that support teachers in amplifying students learning, collecting and sharing evidence of learning differently and keeping their business processes efficient.

Lead:
District Principal of Instruction and Innovation
District Information Technology Coordinator

Cost Estimate: $100,000 per year

Elementary Classroom Technology

Goals:

1. To provide all elementary classrooms in the school district with a ratio of one mobile device to every 4 students.
2. To provide each elementary school enough mobile technology to allow them to organize equipment half-class and whole-class groupings as needed.
3. To continue to support our iOS standard as a core technology, while adding a selection of supporting laptop devices in each school.

Current Status

Presently, the district has approximately 2700 iPads, 1000 windows devices and 400 Apple Laptops deployed K-12. In Elementary Schools, we have approximately a ratio of 4 students to every 1 iPad, plus a mixture of iMac Desktops for specialty work and windows laptops. At identified schools, with greater need, the ratio may be slightly lower.

Actions:

1. Audit existing student to device ratios across schools and maintain levels as much as possible.
2. Audit the entire district and collect feedback on present device deployments and requested device standards.
3. Connect device deployments with Technology Mentor Program

Lead:

District Principal of Instruction and Innovation
District Information Technology Coordinator
System Support Specialists

Cost Estimate: $25,000 per year

Secondary Classroom Technology

Goal:

1. To provide all Secondary Classrooms in the school district with a ratio of one mobile device to every 4 students.
2. To provide each Secondary School enough mobile technology to allow them to organize equipment into half-class and whole-class groupings as needed.
3. To continue to support a "messy classroom" model of providing a variety of devices including iPads, Windows Laptops, Mac Laptops, Windows Desktops and Mac Desktops to meet specific needs.

Current Status

Presently, the district has approximately 2700 iPads, 1000 windows devices and 400 Apple Laptops deployed K-12. In Secondary Schools we have approximately a ratio of 4 students to every portable and desktop device. Secondary Schools have an assortment of equipment from iPads to laptops and specialty computer labs. Portable devices are embedded in classrooms / departments at each school and in some schools a selection of portable devices has been made available for short term check out through their libraries.

Actions:

1. Audit existing student to device ratios across schools and maintain levels as much as possible.
2. Audit the entire district and collect feedback on present device deployments and requested device standards.
3. Connect device deployments with the Technology Mentor Program.

Lead:

District Principal of Instruction and Innovation
District Information Technology Coordinator
System Support Specialists

Cost Estimate: $25,000 per year

Specialty Programs - Secondary Schools

Goal:

1. To provide specialty programs with desktop or portable computers that meet program delivery needs.

Current Status

Each school has one or more specialty computer labs depending on the school population and the programming offered to students. Labs are generally updated on a 5-6 year cycle. We have focused on offering iMac Technology as much as possible which provides dual boot capabilities so that work can be completed in both a Windows 10 or Mac X environment. Specialty programs that require equipment to support activities such as CNC machines, Wind Tunnels and gaming environments cannot always be fully funded out of the Technology Budget. In these circumstances schools are responsible for funding of the equipment.

Actions:

1. Meet at least once per year with Secondary Principals and their school's Specialty Teachers to discuss specific site needs and how they fit into the District Instructional Technology Technology Plan.
2. Continue to refresh labs at a 5-6 year cycle with a target to reduce this cycle by 1-2 years.

Lead:

District Principal of Instruction and Innovation
District Instructional Technology Coordinator

Cost Estimate: $80,000 per year

Classroom Projection Technology

Goal:

1. To equip every classroom with either a projector or a minimum 65" flat screen television and AppleTV.

Current Status as of February 2012:

Approximately 80% of Secondary and Elementary classrooms have projectors or flat panel televisions with AppleTV installed. We are working to get all classrooms with updated projection technology in place and will continue to purchase and install as quickly as possible.

Actions:

1. Complete an audit in May-June of 2019 to determine how many classrooms do not have projection technology package in place.
2. Purchase the required number of flat panel televisions and supporting devices as soon as possible and coordinate a priority installation schedule with Maintenance.

Lead:

District Principal of Instruction and Innovation
District Instructional Technology Coordinator
System Support Specialists

Cost Estimate: $15,000 per year

Library Management Software

Goal:
1. To continue to operate the L4U library management system for 1 more year.
2. To complete a RFI / RFP process to select an updated library management system.

Current Status

The district operates and centralized, web-based L4U library management system. This system provides circulation and inventory cataloguing for each school. Our contract will end in June 2019 and which point we will renew for one year and go through an updated product review to determine next steps for providing library services.

Actions:
1. Go to RFI / RFP to procure a library circulation system.
2. Implement the selected library management system.

Lead:

District Principal of Instruction and Innovation
Library Learning Commons Coordinator
District Instructional Technology Coordinator
District Library Technician

Cost Estimate: $25,000 per year

Administration and Excluded Staff Technology

Principals and Vice-Principal Portable Technology

Goal:

1. To provide all Principals and Vice-Principals and Excluded Staff with portable technology tools which allow them to lead learning and maintain efficient business processes.

Current Status

All Principal and Vice-Principals and Excluded Staff have laptops ranging from one to five years of age. Laptops generally are assigned for a four to five-year cycle. Some principals have requested to have an iPad as well as a laptop to allow them to support Communicating Student Learning and other classroom initiatives. These requests are supported on a limited basis.

Actions:

1. Continue to upgrade Principal, Vice-Principal and Excluded Staff laptops on a four to five-year life cycle.
2. Evaluate changing needs for Principal, Vice-Principal and Excluded Staff technologies as it relates to leading learning and the changing business process needs of the district.

Lead:

District Principal of Instruction and Innovation
District Instructional Technology Coordinator

Cost Estimate: $10,000 per year

Support Staff Technology

Clerical Desktop Computers

Goal:

1. To provide clerical staff with standardized technology that meets their daily business process needs and that is fully compatible with the tools Principals and Teachers are using to lead learning.

Current

All Elementary schools and the majority of Secondary schools are standardized on Apple Mac Minis desktops. We have five workstations across 2 schools that have yet to be standardized.

Actions:

1. Complete standardization of clerical desktop computers.
2. Provide clerical staff with the opportunity to attend training sessions that align with deployment of new technology.

Lead:

District Principal of Instruction and Innovation

Cost Estimate: $8,000 per year

Operations Staff Technology (Electricians, Carpenters, Mechanics etc)

Goal:

1. To provide Operations Staff with standardized technology that meets their daily business process needs.

Current Status

Maintenance staff have portable or desktop technology tools that are purchased and refreshed based on their specific job function and changing needs. Technology Services updates operation's machines as budget allows and/or does cost sharing when possible.

Actions:

1. Work with the Operations Department to complete a technology review and determine specific needs.
2. Develop a refresh schedule.

Lead:

District Principal Technology Services
Operations Department Managers

Cost Estimate: $5,000 per year

Technology Department Technicians

Goal:

To provide Technology Department Technicians with standardized technology that meets their daily business process needs and allows them to best support staff and students.

Current Status:

Technology Department Technicians have three year old laptop computers, have access to department iPads and have a selection of Windows laptops and desktops for testing and specific task completion.

Actions:

1. Continue to assess Technician equipment needs as they relate to supporting district business processes and staff and student needs.
2. Continue a four year refresh cycle or as needed by district requirements.

Lead:

District Principal Technology Services

Cost Estimate: $10,000 – 15,000 once per 4 – 5 years

Technology Hardware and Software Selection
Hardware and Software Standards

Hardware standards are set through an evaluation process that looks at the specific needs of the end user, the security and privacy provided on the device / platform and total cost of ownership over the life of the device. This allows for selection of equipment that provides the best possible user experience for job specific needs. Similarly, software is evaluated through a use case analysis in combination with a security and privacy review to ensure the resource meets BC Public Sector Privacy requirements. Once these processes are completed, the District Technology Advisory Committee endorses standards.

The standards are continuously reassessed to ensure that equipment and software continue to best meet the learning needs of our students and business process requirements of the District.

Infrastructure
Bandwidth

Goal:
1. To provide all school sites with adequate bandwidth to meet the needs of educational programs and district business processes.

Current Status (June 2019):
Secondary Schools presently have the largest bandwidth demands due to larger student populations, greater numbers of portable devices and increasing use of digital web based resources. Presently, our three of our four Secondary Schools have the minimally required bandwidth, with one school requiring the purchase of a second connection to meet minimal requirements. Phase two the the provincial NGN network is expected to bring the district improved bandwidths over the next 3 years.

School Site	Existing Bandwidth (PLN)	Desired Bandwidth	Existing Bandwidth (PLN)	Desired Bandwidth
Cowichan Secondary	400mb	400mb	Crofton Elementary School	30mb
Frances Kelsey Secondary	400mb	400mb	Discovery Elementary School	30mb
Chemainus Secondary	200mb	200mb	Drinkwater Elementary School	50mb
Lake Cowichan Secondary	200mb	200mb	Ecole Mt Prevost	30mb
Quamichan School	400mb	300mb	George Bonner Elementary	50mb
CVOLC	50mb	100mb	Khowhemun Elementary School	30mb
			Maple Bay Elementary School	30mb
			Mill Bay Nature School	30mb
Elementary Schools			Palsson Elementary School	30mb
Alex Aitken School	30mb		Tansor Elementary School	30mb
Alexander Elementary School	30mb		Thetis Island	10mb
Bench Elementary School	30mb			
Chemainus Community School	30mb		Board Office Complex	2GB
Ecole Cobble Hill Elementary	30mb			

Actions:
1. Improve network traffic flow and monitoring through acquisition of resources to allow more precise traffic shaping across VLANs.
2. Expand VLAN configurations to support traffic shaping and monitoring.

Lead:

Network System Analyst
District Principal of Instruction and Innovation

Cost Estimate:

At school sites where bandwidth demand exceeds what will be provided by NGN 2, bandwidth will need to be purchased from vendors. Monthly fees and in some cases one-time equipment costs will be involved. All other bandwidth costs are provided from the provincial education block funding and assigned before release to the school district

Presently, we forecast two schools requiring bandwidth supplementation at an estimated cost of $3600 /year

Local Area Networks

Goals:

1. To continue to harden our Layer 3 switch infrastructure across all buildings through switch upgrades and the addition of fibre connections and 10 gigabyte switch uplinks.
2. To expand the use of VLANs across all buildings for greater network security and bandwidth management.
3. To install category 6 wiring in identified buildings to move our backbone speeds towards 10 gigabyte.

Current Status:

The switches currently in use across all buildings are standardized with a mix of layer 3, layer 2 switches and in rare situations layer 1. The switches currently meet the data requirements of our buildings and provide a one gigabyte backbone speed. We forecast however, that our two larger Secondary Schools will require ten gigabyte uplinks between switches in the next 3 years to support the expanding data traffic demands and to take full advantage of fibre and new wiring installs.

Actions:

1. Install layer 2 and layer 3 switches capable of supporting 10 gigabyte uplinks in our larger schools.
2. Review networks for deficient wiring segments and upgrade to fibre and category 6.
3. Expand VLANs on school networks in a priority sequence based on network monitoring data.

Lead:

System Support Specialist
Technicians as assigned
District Principal of Instruction and Innovation

Cost Estimate: $36,000 per year

Firewalls and Threat Management Devices

Goal:

1. To expand our technical skills in using the full feature sets of the Provincially assigned Paloalto firewall routers and threat management utilities on all networks.
2. To provide technical staff with efficient utilities and resources for tracking and managing all network devices.

Current Status:

All schools have ministry assigned Paloalto Firewalls in place. These devices provide a regularly updated content filter control as well as Unified Threat Management (UTM) features. On top of these physical devices, we license a DNS and content management filter called Cisco Umbrella which provides us a second layer of threat management capabilities.

Although our threat management is solid, it is not a complete solution as technical staff are required to track a device causing a threat or problem through server and firewall log reviews. This slows the speed at which threats can be resolved. A further layer of traffic monitoring with a sophisticated dashboard to display log data through a search tool is desired.

Actions:

1. Expand technical team's training on the threat management utilities we have deployed to maximize the impact of their implementation.
2. Spec and install a network flow and monitoring tool to further refine the technical staff's ability to monitor and eliminate threats on our networks.

Lead:

Network Systems Analyst
System Support Specialist Technicians as assigned
District Principal of Instruction and Innovation

Cost Estimate: $8,000 per year

Wireless Networks

Goal:

1. To provide district buildings with complete wireless coverage that is robust, stable and secure.
2. To organize our wireless service around our VLAN deployments so that we have optimized traffic shaping to support our business, education and BYOD needs in buildings.

Current Status:

Secondary Schools have wireless networks with the ability to support and manage up to 2000 simultaneous devices and Elementary Schools can support approximately 1000 devices. All classrooms in all buildings have WIFI coverage. However, as our schools continue to grow and the density of device usage is increasing more capacity across our wireless access points is required to avoid service slow-downs.

Actions:

1. Set and implement a wireless access point expansion / upgrade timeline for all schools based on specific building needs.
2. Provide technical staff training on wireless best practices from our vendor.
3. Budget for and purchase access points on a yearly basis to replace end of life equipment

Lead:

District Principal of Instruction and Innovation
Network Systems Analyst
Operations Department

Cost Estimate: $32,000 per year

Building Network Wiring

Goal:

1. To provide all school buildings with stable network wiring that meets category 6 standards.

Current Status:

All school buildings have category 5e networks with some networks identified as having cabling challenges due to too many hops, distance or suspected damage. The majority of classrooms across the school district have a network drop available to them, however we still have a selection of rooms where wireless is the only option to get networking into the space.

Actions:

1. Complete cabling evaluations in schools with network inconsistencies and develop site specific remediation plans.
2. Ensure all classroom locations which require physical network access have network cables pulled to the recommended location.

Lead:

Site Technicians
Maintenance Department Electricians

Cost Estimate: TBD

Data Centre

Goals:

1. To continue to expand our single directory service model to all services offered to end users in the school district. This means moving to a single username and password for the majority if not all services.
2. To provide on-site cloud storage and backup capacity for personnel at the Board Office Complex.
3. To develop a stronger off-site backup model for district mission critical data.
4. To expand our use of the Microsoft Toronto Data Centre.
5. To Implement an Enterprise Cloud Service back to protect cloud stored data.

Current Status

We have multiple servers located in our data centre which provide virtualized services using HyperV and VMware. These servers are nearing the end of life for the services they are required to support. Two new servers will be deployed in July 2019 to expand the data centre capacity.

Actions:

1. Purchase updated server hardware as required for the data centre.
2. Deploy an offsite backup solution that moves the backup away from the same flood zone.
3. Continue working to get all services to a single-sign-on model.

Lead:

District Principal of Instruction and Innovation
Network Systems Analyst
System Support Specialist Technicians as assigned

Cost Estimate: $5,000 per year

School Based Servers

Goals:

1. To provide each school with fast reliable file storage capabilities.
2. To continue to provide school-based cloud service file storage for a broad spectrum of devices that can be reached through the web from both on and off-site.
3. To provide caching services to support fast reliable iOS and Mac X updates.
4. To continue to provide on-site directory services for fast reliable single sign-on.
5. To explore reducing the number of school-based servers and move to a zonal clustering model.

Current Status

Each of our schools presently has one or two servers that provides file storage, cloud storage, directory services and print services. The directory service and print services federate back to our central data centre, allowing centralize updates and changes. As NGN 2 is implemented and more bandwidth is provided to the school district, it will be desirable to reduce the number of servers located in buildings. One option to maintain redundancy while reducing the number of servers at each school site is to move to zonal server farms / clusters that will provide these same services.

Actions:

1. Update and replace school servers as required.
2. Explore and, if appropriate, design and zonal server farm plan to reduce overall hardware deployments while maintaining service levels.

Lead:
District Principal of Instruction and Innovation
Network Systems Analyst
System Support Specialists

Cost Estimate: $5,000 per year

Office 365, Mail and Calendar Services

Goal:
1. To transition from our existing mail, calendar, contact and collaboration server as soon as possible.
2. To determine an implementation plan and timeline to move to Microsoft Exchange Cloud Server for mail, calendar, contact and collaboration services.
3. To make a final privacy decision on implementing Microsoft Exchange Services on premise or cloud based in the Microsoft Canadian Data Centre.
4. To expand our of the Office 365 suite of tools for both education and business processes.

Current Status

Presently, the district operates an enterprise IceWarp Mail Server that provides unified webmail, POP, IMAP, calendar, global address book and collaboration services. The current desire is to move away from this product to allow all users to take full advantage of the Microsoft Office 365 unified tools that become available when running Microsoft Exchange. Our challenge point on moving to Exchange is recent concerns raised by the Office of the Information and Privacy Commissioner should we choose to run a cloud-based Exchange server in the Microsoft Canadian Data Centre. Further investigation is required to make a final recommendation as running an on premise of cloud-based implementation.

Actions:
1. Continue full implementation of the IceWarp Mail system for the next 1-2 years.
2. Upgrade mail server hardware to maintain services levels.
3. Plan and begin migration to Microsoft Exchange Server.

Lead:
Network Systems Analyst
District Principal of Instruction and Innovation
System Support Specialists as assigned

Cost Estimate: $35,000 per year

Help Desk System

Goal:

1. To continue to encourage our end-users to submit support tickets directly to the system or to coordinate through a building site contact.
2. To research and select an updated ticketing system to replace our now end of life system.

Current Status

The Help Desk Ticket System has been in production for over ten years and is used for day-to-day tracking of trouble tickets and to assign individual technician work. The system remains stable and functional, but it is officially at the end of development and support from the vendor. As no new development will take place on the system, it is time to begin looking for a replacement tool.

Actions:

1. Continue use of the existing Help Desk Ticket System.
2. Research and select a replacement system and develop an implementation timeline.
3. Continue to build a culture across the school district of submitting support tickets rather than phoning technology services directly for non-emergency requests.

Lead:

District Principal of Instruction and Innovation
District Information Technology Coordinator
System Support Specialists

Cost Estimate: $2,000 per year

Data
Evidence of Success

Desired Data	Instrument	Frequency
Hardware standard installed in all schools.	Tech Department Audits	Once per year
Software Standard installed in all schools	Tech Department Audits	Once per year
Teacher learning opportunities are consistently offered with attending teacher grade levels and school zones tracked to provide a picture of engagement.	1. Inservice calendar 2. Attendance records from inservice sessions	Continual review Per session basis
Improvement in student achievement in literacy and numeracy.	1. District Wide Write 2. District Wide Read 3. Numeracy Assessment	As per District Schedule
Student attitudes toward and use of technology tools.	Student survey on integration of technology in their learning	Once per year
Teacher satisfaction with technology support and technology tools available	Teacher survey	Once per year

*Where possible, data will be collected using one collection instrument (eg online survey tool).

Recommended Technology Competencies
Students Grades 4-9

Proficiency Scale	Emerging	Developing	Proficient	Extending
	The student demonstrates an initial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a partial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a solid understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a sophisticated understanding of the concepts and competencies relevant to the expected learning.

Technology Skill Competency	Suggested Resource / Tool	Emerging	Developing	Proficient	Extending
Digital publishing with ePub documents	Book creator, Pages, Keynote	4,5	4,5,6,7	6,7,8,9	7,8,9
Computational Thinking and Coding Concepts	Unplugged activities, Cubetto, Sphero, Root, Hour of Code, SWIFT Playgrounds, Lightbot Hour, Scratch, Micro:bits, Xcode, AR / VR	4	4,5,6,7	6,7,8,9	7,8,9
Desktop publishing	Pages, MS Word	4	4,5,6,7	6,7,8,9	7,8,9
Voice to text, keyboard interface and shortcuts	Siri, TypeRacer, All The Right Type	4	4,5,6,7	6,7,8,9	7,8,9
					7,8,9
Digital Video creation	iMovie, Clips, Stop Motion Animation	4,5	4,5,6,7	6,7,8,9	7,8,9
Showing Know, Do, Understand with the use of multiple digital tools and resources. Text, Audio and Video	Explain Everything Office 365, Pages, Keynote, Power Point	4,5	4,5,6,7	6,7,8,9	7,8,9
Robotics, Making and Coding	Lego MindStorms, VEX IQ, Micro:bits	4,5	4,5,6,7	6,7,8,9	7,8,9