



**Ministry of
Education**

**TECHNOLOGY IN EDUCATION FRAMEWORK:
TEACHING AND LEARNING, ADMINISTRATIVE
OPERATIONS, PROVINCIAL INFRASTRUCTURE**

Ministry of Education
June, 2013

TABLE OF CONTENTS

INTRODUCTION	1
PRINCIPLES	2
EXPECTATIONS.....	3
Teaching and Learning	3
Administrative Operations.....	3
Technological Infrastructure.....	3
OUTCOMES AND SUPPORTIVE STRATEGIES	3
Teaching and Learning (TL) – Fostering Digital Fluency (DF).....	4
Teaching and Learning (TL) – Technology-supported Learning (TSL)	5
Administrative Operations (AO)	6
Technological Infrastructure (TI)	7
ROLES AND RESPONSIBILITIES.....	8
Roles and Responsibilities for Technology in Education.....	9
BIBLIOGRAPHY	12

INTRODUCTION

Saskatchewan’s PreK-12 education system fosters and promotes digital fluency¹ and the infusion of technology in teaching and learning to improve outcomes for all students. Students are fluent for a digital age, handling complexity with adaptability and creativity through the use of real-world tools and processes. Educators and administrators are fluent in using and applying technology to enrich and enhance student learning and their own learning and professional growth. Educational leaders ensure the integration of technology to support productive systems for learning and administration.

The integration and effective use of technology is vital to Saskatchewan’s teaching and learning environment and to enhancing learner² success. Not only can technology facilitate creative, flexible and purposeful thinking and knowledge construction within the classroom, it also extends the “reach” of educational opportunities for students regardless of geographic location, population density, timetable conflicts or an individual school’s ability to offer particular courses. The acquisition of skills and dispositions related to technology is fundamental in an information age and knowledge-based society; technology use is no longer just an option for our students and teachers, but a fundamental literacy.

Our education system is focused upon attaining high levels of achievement for all students, equitable opportunities for all children and youth to learn and succeed, smooth transitions, and system accountability and governance. Effective technology use supports these priorities in a variety of ways. Student achievement can be augmented by improvements in learning outcomes. The provision of equitable opportunities is facilitated through a variety of strategies including access to online resources, the use of assistive technology, and the availability of increased credit options via distance education. Smooth transitions of learners throughout the system are made possible through strategies such as the sharing of data. Technology supports a high standard of accountability through the collection, transmission, and analysis of data related to finance and to improving learning outcomes.

Effective technology use by administrators and support staff is essential to sound business practice. The complexity of information, resource, and facilities management demands the infusion of technology throughout the business environment.

A secure, reliable, and progressive provincial educational technology infrastructure is critical to the successful integration of technology into teaching, learning, and administration.

This framework addresses technology in education in three main areas: teaching and learning, administrative uses, and provincial infrastructure. The purpose of this framework is to provide direction for the use of technology within the Saskatchewan education system. The framework is divided into four sections:

1. Principles which guided the development of the framework.
2. Expectations which describe stakeholder commitments.
3. Outcomes which are attainable through particular strategies.
4. Roles and related responsibilities for educational stakeholders.

¹ The ability to use digital technologies readily and strategically to learn, to work, and to play. (Refer also to page 3.)

² In this framework, “learner” refers to all individuals who have the capacity to learn (e.g., students, educators, administrators).

PRINCIPLES

Equity – Learners, regardless of location or ability, benefit from equitable access to educational opportunities, technology tools and resources, and a technology-infused learning environment.

Student-Centered – Information and communication technologies are planned and implemented on the basis of their pedagogical value and the capacity to support individual learning styles, needs, interests and aspirations.

Accessibility – Teachers and students are able to access technology in a manner that supports choices made on the basis of pedagogical considerations. On-site supervision and technical support are provided for students enrolled in distance learning.

Quality – High quality, research-based digital resources incorporate sound pedagogical practice, standards, and exemplary instructional and assessment strategies.

Professional Competence – Technologically fluent educators and administrators are guided by technology, pedagogy and content knowledge in making choices about the appropriate use of technology in support of student learning.

Partnerships – Saskatchewan is committed to collaborative approaches to achieve common goals. School divisions are encouraged to work with one another and with the Ministry to achieve the vision and outcomes outlined in this framework. Partnerships and information sharing among school divisions, PreK-12 education partners, post-secondary institutions, First Nations and Métis educational authorities, libraries, industry, and communities advance technology in teaching and learning.

Accountability – The Ministry, school divisions, and sector partners are publicly accountable for the effective use of financial and technological resources in education. Data are used to inform strategic decisions within the ministry, in the boardroom, and in the classroom.

Sustainability – A technology-supported learning environment is strengthened by sound business and administrative practices, is sustainable in the long-term within available resources, evolves based on research and analysis of trends, and is supported by the Ministry, school divisions, and educational partners.

EXPECTATIONS

Teaching and Learning

Saskatchewan's educational system will foster the comprehensive and systematic development of knowledge, skills, dispositions, and judgements essential for digital fluency in educators and students. The ministry and school divisions will work together to improve the digital fluency of all educators and students; that is, the development of strategic, innovative, and ethical producers, consumers, and managers of information, communications, media, and processes within evolving digital landscapes.

Educators will develop the expertise required to effectively use appropriate technologies to assist students in achieving curricular outcomes. Curricula require that students grasp fundamental disciplinary constructs, create knowledge and insight, gather and process information, generate ideas, make conceptual connections, think and work like subject area experts, and represent and share their understandings.

Administrative Operations

The ministry and school divisions will work together to ensure that data collection as required to inform planning and accountability is both efficient and effective. School divisions have developed and implemented appropriate practices and procedures for using and maintaining tools and managing information.

Technological Infrastructure

The Ministry of Education will ensure that a secure and reliable province-wide learning network, supported by provincial technology standards and solutions, is available to all schools. The ministry and school divisions will work together to ensure that facilities are built or renovated with consideration for current and future technology needs.

OUTCOMES AND SUPPORTIVE STRATEGIES

Outcomes describe the desired impacts or changes, including new knowledge and skills, changed attitudes and behaviour, or improved conditions. Indicators describe the results or extent to which stakeholders experience the benefits of each outcome. Strategies articulate the activities or work required to ensure that outcomes are achieved. These should be used in school division planning, and reported through the Continuous Improvement and Accountability Framework process.

Teaching and Learning (TL) – Fostering Digital Fluency (DF)

Outcomes and Indicators

Outcome TL(DF)1: Saskatchewan’s educational system promotes the development and deepening of student and educator digital fluency.

Indicators:

- a) Curriculum outcomes and indicators describe what students must know and be able to do to strengthen and extend digital fluency.
- b) Educators leverage technologies in their pedagogy for improved student understanding.
- c) Classroom practices and learning experiences are routinely shaped by and improved through the strategic and effective use of a variety of existing and emergent technologies.
- d) Educators and educational partners use technologies to collaborate, create, and share exemplary supports for learning, including pedagogical insights and approaches.

Outcome TL(DF)2: Students and educators competently and readily use technologies, including applications, devices, and networks, to communicate effectively, collaborate purposefully, consume strategically, produce creatively, manage reflectively, and lead ethically for improved student achievement.

Indicators: Students and educators:

- a) engage others to originate and share information, express and assess ideas, build understanding, and collaborate to produce meaningful works.
- b) generate, collect, interrogate, and interpret data; locate, navigate through, and critically assess information and its source(s) across a variety of media; strengthen literacies; construct and represent knowledge; and share, locally and globally, their work.
- c) devise and practise strategies to maintain, locate, and access, systematically and safely, digital information.
- d) strengthen personal learning strategies and refine solution-seeking processes to facilitate and promote responsible, ethical, and legal uses of technologies.

Outcome TL(DF)3: Students and educators participate discerningly in a global digital society.

Indicators: Students and educators safely engage, with others and with digital content, to:

- a) pursue opportunities for personal, social, and economic engagement and advocacy.
- b) explore creative self-expression and deepen their sense of self, community, and place.
- c) achieve personal and professional goals.
- d) engage in purposeful lifelong learning.

Strategies

1. Articulate and share a comprehensive vision of digital fluency for Saskatchewan students and educators.
2. Articulate K-12 digital fluency competencies that delineate the knowledge, skills, attitudes, and judgements required in teaching and learning.
3. Influence new and revise existing K-12 curricular outcomes and indicators to require the development of digitally fluent learners.
4. Collaborate to create or evaluate supports for teachers and students that facilitate purposeful and effective uses of technologies.
5. Use technologies to facilitate student access to learning.
6. Assess and evaluate student achievement of digital fluency competencies.
7. Support the growth of educators’ digital fluency through professional learning.

Teaching and Learning (TL) – Technology-supported Learning (TSL)

Outcomes and Indicators

Outcome TL(TSL)1: Students have equitable access to high quality instruction through flexible approaches using technology that meet the diverse needs of students and teachers within their school division.

Indicators:

- a) Distance and online learning opportunities are available to students, as required.
- b) Intra- and inter-school division learning opportunities are available to students with local support provided.
- c) Distance learners have success rates that are equivalent to students in traditional classroom environments.
- d) Assistive technology and technical support is available to students with intensive needs and/or school personnel.

Outcome TL(TSL)2: An array of high quality digital resources³ is available to teachers and students to support teaching and learning in a variety of instructional settings.

Indicators:

- (a) Resources are evaluated according to curriculum fit, effectiveness, and research-based best practices.
- (b) Sharing of resources among teachers occurs in day-to-day practice.
- (c) New high quality resources are developed annually, and previously developed resources are updated, as required.

Strategies

1. Develop and adopt standards and guidelines that will create high quality distance learning environments, digital resources, and experiences for learners.
2. Establish mechanisms for system-wide management and coordination of assistive technology and other technology-supported learning options for students.
3. Establish processes for needs assessment, continuous evaluation, and improvement of assistive technology and technology-supported learning opportunities to enhance options and access for students.
4. Explore partnerships with post-secondary partners to meet the distance learning needs of adult learners.
5. Evaluate previous web-based resource development criteria, processes, and projects.
6. Establish processes and criteria to guide planning, development, and funding of future technology projects.

³ Resources are materials that support teacher practice, that invite teachers to reflect on their practice, and that are available for teachers to use as components of courses. Digital resources are those materials that support and enhance learning which can be provided in electronic format and can be electronically transmitted and, therefore, widely accessible.

Administrative Operations (AO)

Outcomes and Indicators

Outcome AO1: School division and school administrators and support staff use technologies to maximize effectiveness and efficiency in administrative operations.

Indicators:

- a) Data collection, analysis, and reporting processes are standardized and results used to inform decision making.
- b) Common applications are used to manage information, communication, resources, and facilities.
- c) School divisions work collaboratively with one another and the Ministry to deliver effective and efficient information technology services.

Outcome AO2: Staff and students benefit from a business environment that supports effective and equitable use of technologies.

Indicators:

- a) Procedures are implemented to facilitate continuous improvement of technology systems, including replacement cycles.
- b) Appropriate, cost-effective technologies support the diverse needs of teachers, students, administrators, and support staff.
- c) Equitable access to technologies is provided.

Outcome AO3: Administrators and support staff leverage technologies to support teaching and learning.

Indicators:

- a) New technologies are evaluated for their potential to support student learning.
- b) Technologies are provided for effective communication and collaboration among stakeholders.
- c) Assistive technology is provided to support student learning.

Strategies

1. Facilitate shared intra- and inter-school division leadership and professional learning in best practices in business and administration.
2. Collaborate on volume acquisitions of technology tools and information technology products, services, and resources, and other goods and services.
3. Establish processes for intra- and inter-school division development of common technology tools, templates, and databases.
4. Identify required technology competencies, and develop and implement a Professional Learning Plan for administrators and support staff.
5. Adopt international technology standards (e.g., ISTE) for school administrators and support staff in the areas of visionary leadership, digital age learning culture, professional practice, systemic improvement, and digital citizenship.

Technological Infrastructure (TI)

Outcome and Indicators

Outcome TII: A secure, stable, and evolving provincial educational technology infrastructure that is accessible, sustainable, and responsive to the needs of the education sector exists.

Indicators:

- a) Students and teachers have safe, reasonable, and equitable access to one another and to the world.
- b) Teachers and students have access to appropriate networks, technologies, applications, and digital resources.
- c) Policies and guidelines ensure compatibility of technologies.
- d) A robust infrastructure for technology is implemented and maintained, including integrated interoperable technology systems to support management, administrative operations, and teaching and learning.

Strategies

1. Identify infrastructure and service requirements based on teaching, learning, and administrative operations within the sector.
2. Design and implement infrastructure and technology services to meet sector needs.
3. Work with sector stakeholders, service providers, and government partners to negotiate common infrastructures and services.
4. Collaborate with sector partners to establish and maintain provincial network management policies, protocols, and practices.
5. Facilitate opportunities for professional development of technical support staff and users as part of a comprehensive provincial strategy.
6. Facilitate the development of technological solutions to enable partnerships across the sector including the Ministry, school and public libraries, schools, post-secondary institutions, and First Nations educational partners.
7. Adopt international technology standards (e.g., ISTE) for school administrators in the areas of support, management, and operations to foster productive systems for learning and administration.

ROLES AND RESPONSIBILITIES

A clear understanding of the Ministry's and school divisions' roles and responsibilities is fundamental to policy direction and effective governance. The Ministry's roles and responsibilities in legislation, policy, and strategic direction setting for the province are distinct from those of school divisions which encompass direct program delivery, resource development, and business operations. In addition, various advisory groups support information management, the flow of information between school divisions and the Ministry, and the identification of infrastructure requirements, while providing opportunities for co-ordination and collaboration among school divisions and other system partners related to technology. The chart on the following pages outlines a comparison of Ministry and school divisions' roles and responsibilities in ten key areas: policy and direction, infrastructure, funding, technology infusion, professional learning, accountability, distance education, data collection and analysis, data and information management, and future thinking.

Roles and Responsibilities for Technology in Education

Note: It is anticipated that roles will shift as the education sector continues to work towards higher student achievement.

ROLE	MINISTRY	SCHOOL DIVISIONS	ADVISORY GROUPS
Policy and Direction	<ul style="list-style-type: none"> ▪ Establishes legislation and policy direction ▪ Sets vision, principles, and outcomes ▪ Sets standards, regulations, guidelines, and best practices ▪ Establishes curriculum and conducts research ▪ Requires monitoring and reporting of progress related to the Technology in Education Framework outcomes ▪ Addresses equity, where appropriate. 	<ul style="list-style-type: none"> ▪ Implement and deliver education supports and services in keeping with provincial vision and plan ▪ Accommodate and support different models of learning ▪ Accommodate different learning styles ▪ Provide options and choices for learners ▪ Ensure equitable opportunities, access, and outcomes. 	<ul style="list-style-type: none"> ▪ Explore opportunities for shared projects related to: <ul style="list-style-type: none"> ➢ provincial vision and plan ➢ models of learning ➢ access to learning opportunities.
Infrastructure	<ul style="list-style-type: none"> ▪ Plans, funds, and implements provincial infrastructure in support of equitable access ▪ Sets policies for appropriate use of provincial infrastructure ▪ Provides provincial coordination and facilitates linkages with partners. 	<ul style="list-style-type: none"> ▪ Ensure appropriate use of the provincially provided infrastructure ▪ Plan internal school division use of infrastructure ▪ Establish local partnerships ▪ Work with other school divisions, First Nations schools, libraries, and regional colleges to achieve efficiencies. 	<ul style="list-style-type: none"> ▪ Provide input and advice on ministry and sector-wide policies, standards and guidelines ▪ Identify issues and potential solutions with respect to information flow between the ministry and the sector ▪ Provide input and advice on planning and priority setting and sharing of resources and capacity.
Funding	<ul style="list-style-type: none"> ▪ Aligns financial accountability and realigns funding according to roles and responsibilities of the Ministry and school divisions ▪ Establishes funding parameters for provincial infrastructure ▪ Sets expectations regarding the use of funding in concert with reporting mechanisms that ensure submission of appropriate information. 	<ul style="list-style-type: none"> ▪ Provide and manage funding to support appropriate and effective use of technology. 	<ul style="list-style-type: none"> ▪ Coordinate efforts and equitable cost sharing on acquiring software, hardware, and technical resources in support of teaching and learning, business and administration, and infrastructure (e.g., instructional resource development, automated use of information, provincial licensing opportunities).
Technology Infusion	<ul style="list-style-type: none"> ▪ Ensures that technology use is incorporated into all curricula ▪ Supports a provincial approach to development and sharing of supports related to curricula. 	<ul style="list-style-type: none"> ▪ Acquire and implement technology tools and resources to: <ul style="list-style-type: none"> ➢ support learning ➢ support classroom delivery and school library applications ➢ deliver and support distance learning ➢ support learning outcomes and business operations ➢ support business applications, records management, monitoring, and reporting. 	<ul style="list-style-type: none"> ▪ Support a provincial approach to development and sharing of supports related to curricula ▪ Support a collaborative approach to achieve efficiencies with respect to particular sector roles.
ROLE	MINISTRY	SCHOOL DIVISIONS	ADVISORY GROUPS

Professional Learning	<ul style="list-style-type: none"> ▪ Supports delivery of professional learning opportunities related to provincial infrastructure initiatives ▪ Facilitates and supports professional learning opportunities delivered using the provincial infrastructure ▪ Facilitates the coordination of professional learning options into a provincial strategy. 	<ul style="list-style-type: none"> ▪ Provide teachers with opportunities to develop the capacity to utilize contemporary technologies to communicate effectively, collaborate purposefully, consume strategically, produce creatively, manage reflectively, and lead ethically in a variety of teaching and learning environments. 	<ul style="list-style-type: none"> ▪ May recommend professional learning opportunities in support of teaching and learning, and data management initiatives ▪ Support sharing of professional learning opportunities across schools, school divisions, libraries, and regional colleges.
Accountability	<ul style="list-style-type: none"> ▪ Works with school divisions to address initiatives related to technology in education ▪ Monitors and accounts for all aspects of its role. 	<ul style="list-style-type: none"> ▪ Account for expenditures in financial records ▪ Report on use of technology and extent of skills acquired ▪ Monitor and account for all aspects of their role. 	<ul style="list-style-type: none"> ▪ Engage in a collaborative approach to acquiring software and/or hardware ▪ Monitor and account for all aspects of respective role.
Distance Education	<ul style="list-style-type: none"> ▪ Provides provincial infrastructure for use by school divisions, post-secondary, libraries, and First Nations schools and educational organizations, as desired ▪ Provides a course management system for use by school divisions, as desired ▪ Authorizes any non-school division providers, as required. 	<ul style="list-style-type: none"> ▪ Provide needed courses via distance delivery, as scheduling permits ▪ Arrange for students to receive courses via distance delivery from other providers, when delivery within division is not possible. 	<ul style="list-style-type: none"> ▪ Support provision of the central administrative hub/database for distance education opportunities for students ▪ Verify with Ministry that providers listed on the hub are eligible to deliver Secondary Level credits in Saskatchewan.
Data Collection and Analysis	<ul style="list-style-type: none"> ▪ Develops and coordinates data reporting tools and templates to facilitate data collection and analysis ▪ Provides electronic versions of templates for school divisions to use ▪ Collects data at the provincial level. 	<ul style="list-style-type: none"> ▪ Collect data at the school division level. 	<ul style="list-style-type: none"> ▪ Advise on standards for data format, use, and access ▪ Support efficiencies in accessing data collection tools.

ROLE	MINISTRY	SCHOOL DIVISIONS	ADVISORY GROUPS
Data and Information Management	<p>Ensures:</p> <ul style="list-style-type: none"> ▪ Information is easily accessible (accessibility) ▪ Information is timely, relevant, and accurate (quality) ▪ Management of information is clearly defined at all levels (accountability) ▪ Information assets are managed to protect their value (stewardship) ▪ Data are used to inform program planning and other business processes (decision making) ▪ Legislation, Memorandums of Understanding (MOUs), policies, and guidelines govern various aspects of managing information (e.g., MOU for sharing and exchange of data, policies and guidelines regarding information systems and data exchange standards). 	<ul style="list-style-type: none"> ▪ Ensure school division data management fits within Ministry policy framework in terms of accessibility, quality, accountability, stewardship, and decision making ▪ Acquire and implement data management systems, and business applications ▪ Provide data and information to the Ministry as required by legislation, MOUs, and policies (e.g., student data, teacher data, education finance data, facilities data, etc.) 	<ul style="list-style-type: none"> ▪ Provide input and advice on Ministry and sector-wide Information Management (IM) policies, standards, and guidelines ▪ Provide advice on IM strategic plan, priorities, and action plan ▪ Identify issues and potential solutions for managing the bi-directional flow of information between the Ministry and the sector ▪ Facilitate the development and adoption of pertinent data standards for data format, use, and access ▪ Identify areas for increased collaboration between the Ministry and sector, and amongst the sector ▪ Engage in a collaborative approach to acquiring software, hardware, and technical resources in support of data management initiatives.
Future Thinking	<ul style="list-style-type: none"> ▪ Define system outcomes related to educational technology ▪ Identify specific indicators of progress relating to the outcomes for educational technology in Saskatchewan, and collect data relating to these indicators ▪ Stay informed about current technological innovations and practices related to educational technology in other jurisdictions, and share with the sector ▪ Initiate original research about educational technology in K-12 education, when appropriate. 	<ul style="list-style-type: none"> ▪ Identify specific indicators of progress relating to the outcomes for educational technology in the school division, and collect data relating to these indicators. 	<ul style="list-style-type: none"> ▪ Recommend approaches and best practices for utilizing infrastructure to assess and share indicators of progress ▪ Provide a pragmatic view of the best practices for electronic information such as data warehousing, service-oriented architecture, etc. ▪ Support members in staying informed about current technological innovations and practices related to educational technology in other jurisdictions ▪ Initiate original research about educational technology in K-12 education, when appropriate.

BIBLIOGRAPHY

International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS*S) and Performance Indicators for Students (2007) – available at

http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_2007_Standards.pdf (accessed April 20, 2009).

International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS*T) and Performance Indicators for Teachers (2008)– available at

http://www.iste.org/Content/NavigationMenu/NETS/ForTeachers/2008Standards/NETS_T_Standards_Final.pdf (accessed April 20, 2009).

International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS*A) for Administrators (2009) – available at

http://www.iste.org/Content/NavigationMenu/NETS/ForAdministrators/2009Standards/NETS-A_2009.pdf (accessed September 28, 2009).

Mishra, P. & Koehler, M. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017-1054 – available at

http://punya.educ.msu.edu/publications/journal_articles/mishra-koehler-tcr2006.pdf (accessed October 30, 2009).

National Research Council. (1999). Being Fluent with Information Technology. Committee on Information Technological Literacy – available at http://www.nap.edu/catalog.php?record_id=6482.

National Research Council of the National Academies. (2006). ICT Fluency and High Schools: A Workshop Summary – available at http://www.nap.edu/catalog.php?record_id=11709.

Thompson, A., & Schmidt, D.A. (2007). Breaking News: TPCK Becomes TPACK! *Journal of Computing in Teacher Education* 24 (2), 38, 64 – available at

<http://www.iste.org/Content/NavigationMenu/Membership/SIGs/SIGTETeacherEducators/JCTE/PastIssues/Volume24/Number2Winter20072008/jcte-24-2-038-tho.pdf> (accessed November 3, 2009).