Diversifying Opportunities for Learning Program Delivery in Saskatchewan

by
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This paper was commissioned by the Saskatchewan School Trustees Association with support from Saskatchewan Education to explore alternate strategies for program delivery. The paper was developed with the assistance of a reference group. This paper calls for support and action toward diversifying program delivery to extend learning opportunities in rural and northern areas and to enhance the capacity to respond to individual needs and circumstances.

Adapting learning opportunity for best fit with learners and their contexts is the primary purpose for diversifying program delivery. The guiding principle is to use all available resources most efficiently and effectively to optimize learning opportunity in each local circumstance. New technologies expand delivery possibilities, but other solutions may involve creative partnerships or reconfiguring schedules, student-teacher groupings, resources, and facilities.

The Saskatchewan education system has the curricular flexibility, commitment to continuous improvement, and student-centred philosophy to support responsive delivery. Diversification does, however, raise many issues to be addressed, which are identified in this paper. Timely, collaborative action is needed to create the future for education in this Province.

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1. Introduction

This is a time of accelerated innovation driven by the rapid pace of globalization, technological advancement, and social change. Individuals, families, communities, workplaces, and social institutions—all are challenged to adapt constructively. The education system is no exception.

"Education in Saskatchewan is responsive, innovative and accountable in meeting the challenges of constantly changing student, family and community needs and social and economic conditions" (Curriculum and Instruction Advisory Committee, 1997)

Change brings both challenges and opportunities. Current education delivery challenges are extending equitable access to education for rural and northern communities and continuing to adapt to learners' diverse needs in a changing context. Curricular challenges include furthering Core Curriculum implementation and promoting technological literacy. Opportunities to stretch capacity in all these areas are offered by available information and communication technologies (ICT) and the growing potential for education partnerships in Saskatchewan.

In the mid-20th century, basic literacy and job skills were sufficient preparation for productive, satisfying positions in society. A minority of students completed high school, and a rare few sought further education. Today, grade 12 is the standard prerequisite for rewarding employment and higher education. Education levels for employment positions are rising, and life long learning is required to stay current in any field.

Though the need and demand for education is increasing, access and options in many of Saskatchewan's rural and northern communities have reached limits within traditional delivery. Organizing students by subject and grade and relying on group-based, onsite instruction is optimally designed for large-scale enrolments. With low enrolments and proportionally less program support (e.g., budget, staff, facilities, resources), delivery needs to be modified for optimal efficiency and effectiveness.

"The fundamental aim of education is to develop the potential of each person to the fullest extent." (Saskatchewan Education, 1998, p. 26).

Meanwhile, despite the learning opportunities available in schools today, almost one-quarter of students leave school before completing grade12 (Saskatchewan Education, 1998). The number of students opting for home-based education, though small, has doubled over the last six years. For a variety of reasons, some students do not adapt and thrive within learning environments presently provided for them. Flexible delivery adaptation may improve the success and retention of at-risk students.

From outward appearances, education delivery in Saskatchewan has not changed much since the 1950s. The vast majority of students are in classrooms with about two dozen peers and a teacher from 9:00 a.m. to 3:30 p.m. on scheduled school days. Unconventional approaches are noticeable rarities in a landscape of primarily traditional

delivery. Traditional schooling, like any delivery model, has advantages and disadvantages. Its overwhelming familiarity, however, tends to eclipse other possibilities that are within the scope of Core Curriculum flexibility.

"...flexible learning delivery systems are promising to maintain the lead in education and provide individual workers/learners with the programs they need and when they need them..." (Laferrière, 1999)

Many schools in Saskatchewan and beyond have already achieved positive results by reconfiguring space, resources, students, teachers, or time in some unorthodox way. Others have extended capacity by incorporating external expertise, resources, and facilities. These trailblazers have discovered first hand that learning need not be confined to any particular place, time, communication medium, or grouping of teachers and learners. The next step is to share expertise, ideas, and supports to promote diversifying learning opportunities on a province-wide scale.

This document invites proactive, collaborative action to enhance and diversify education delivery in Saskatchewan. It is intended to promote acceptance of proposed change by reflecting on the evolving context for education, current challenges, and readiness for change. Hypothetical models and real life examples are provided to illustrate and suggest possibilities. Capacity-building strategies are offered to guide practical implementation, and issues are identified for further consideration. The first task, however, is to define "diversifying learning opportunity".

2. Defining *Diversifying Learning Opportunity*

Diversifying learning opportunity means creating a variety of delivery models to expand options, accommodate student diversity, and adapt to local conditions. It means demonstrating that quality learning opportunity can be constructed in many different ways. It means enhancing the capacity of the education system to respond to diverse individual needs and community contexts.

"...different schools find different ways to react to and address the needs of their students and their communities." (FutureEd, 1999)

Adapting delivery for the best fit with learners and their environments is the primary focus. The guiding principle is to use all available resources most efficiently and effectively to optimize learning opportunity in each local circumstance.

Delivery adaptation, in a small or large way, may be focused on one or more of the following strategies:

- Enabling individual pacing and continuous progress,
- Moving students or teachers among learning sites,
- Modifying school day, week, or year schedules,
- Creating virtual schools to offer full programs,
- Augmenting onsite programs with distance delivery,
- Offering full support for home-based learning, or
- Integrating community facilities and expertise.

2.1. What "Diversifying" Does and Does Not Mean

It Does NOT Mean	It Does Mean
• Compromising learning objectives, goals, or principles of practice;	• Implementing education goals in a variety of learning environments;
• Applying standard solutions to all learners or communities;	• Making best use of available resources to create diverse, responsive solutions;
• Relying on technology as a panacea, letting the tool shape the solutions;	• Using ICT as one tool of many to enhance learning opportunity;
• Anticipating funding increases or attempting to cut costs;	• Staying within budgets and using funds responsibly and imaginatively;
• Imposing top-down solutions to local problems; or	• Engaging in an inclusive process of consultation and decision-making; and
• Proposing a cure-all for concerns and challenges in education.	• Proposing one piece of a continuous improvement process.

2.2. Variable Dimensions of Learning Environments

"Modern communication and information technologies are having an increasing impact on learning—how we learn, where we learn, when we learn..." (SchoolNet, 1996)

The traditional approach to schooling fits the popular "mental model" of what education should look like. It is difficult to imagine equally viable but different learning environments when the word *education* habitually triggers images of traditional schooling. Senge's (1990) five strategies for stretching the imagination, summarized in Appendix A, are worth the effort of further reading.

Seriously considering a proposal to diversify learning opportunity on a wide scale requires being able to imagine the many shapes that learning opportunity might take. Thinking of learning environments in terms of potentially variable dimensions may stretch the imagination and establish common reference points.

Learning environments can be defined by six dimensions. The four variable dimensions—*who, where, when,* and *how*—are open for creative adaptation. The two constant dimensions—*why* and *what*—are shaped by Saskatchewan's education goals, principles, and Core Curriculum which form the foundation for all public education delivery in the Province. While *with whom, where, when,* and *how* students learn may vary widely—*what* and *why* should always be consistent with the goals and philosophy of public education in Saskatchewan.

"Information technology challenges the tradition that children should be educated in a specific place, for a certain number of hours, and a certain number of days during the week and year" (D. Ravitch, USA Commissioner of Education)

Who

Who participates in a learning activity could vary in terms of roles, number, and composition. Roles might consist of any mix of teachers, students, guest experts, mentors, tour guides, and so on. The number of participants engaged may vary from one person to a dyad, a small or large group, or a distributed network across virtually connected sites. A stable group of participants may work together over a long term through a series of learning activities, or group membership may fluctuate from one activity to another.

Where

Where learning activities are located could vary from a classroom to any school, home, workplace, community, or cyberspace setting—from one site to multiple sites in sequence or simultaneously. All participants could be present at one location or connect together from many different or distant locations.

When

When learning activities occur could vary in terms of scheduling, duration, and timing. Scheduling and duration can vary from fixed study periods and term deadlines to open schedules, flexible terms, and continuous progress. Timing of activities might be *synchronous*, meaning all participants engage at the same time, or *asynchronous*, meaning participants engage at different times. Participants in a half-hour, live video-conference, for instance, would have to tune in at the same time. Participants in a three-day electronic text conference could read and post comments at their convenience over the duration.

"...the capacity of the technologies enables a remote, single-room school to access many of the instructional resources available to schools in an urban setting." (Farrell, 1999)

How

How learning occurs refers to the medium or media chosen to connect participants in a learning activity, not the essential design, or *what*, of an activity. That is, students can do collaborative planning together in a classroom corner, over the phone, or by electronic conferencing. Conducting guided research can be done in a library, on the Internet, or in a field setting. Most learning activities lend themselves to a range of interaction media.

"...expected effects of ICT on learning are closely related to the quality of their use by teachers and learners." (Laferrière, 1999)

The interactivity level of learning environments relates more to the nature of the activity than to the medium of interaction. Lecturing is basically one-way transmission of information, whether delivered to a live audience or a video camera. Debating controversial topics, on the other hand, invites dynamic interaction whether by face-to-face communication or through electronic text conferencing.

"...electronic instruction ...can be as effective as traditional classroom lectures...and discussion. On-line students have test scores equal to those in conventional classrooms." (Jones, 1997, as cited in Russell, 1999)

Many media support both synchronous (real time) and asynchronous (delayed time) interactions. For example, a teacher can guide a science lab activity as a synchronized, whole-class event or at delayed intervals as students circulate among lab stations. Electronic text exchange is usually delayed but becomes synchronous by using the real-time "chat" feature of electronic communication software. Telephone, primarily a medium for live conversations, can be used to exchange delayed messages.

The latest *how* possibilities for learning greatly expand the *who*, *when*, and *where* possibilities. Given ICT means now available, participants need not be in the same location or engaged at the same time to learn together. A student on a national concert tour could maintain continuous enrollment in one school. A specialized science teacher could facilitate learning with students in the next room, town, or province. A working student could log onto a delayed-time electronic conference after the evening shift. A home-based student could pursue studies from various sources near and far.

The classic configuration of the four variable dimensions is to situate one teacher and 20 to 30 students in a classroom for a scheduled 50-minutes of live interaction. Changing any one of these variable dimensions can create an equally viable but quite different learning environment.

Traditional Schooling	Options for Diversifying Program Delivery		
Who? 1 teacher and 20 to 30 age-peers	Teams of teachers work with groups of students. Older students help younger students.	Mentors, resource persons, parents, and community members participate in activities.	Independent students connect with teachers, mentors, and peers as needed.
Where? In a classroom	Learning facilities include individual workstations plus small and large group areas.	Learning environments are extended to other schools and community sites.	Learning opportunity is accessed online from the home, school, or elsewhere.
When? 50-minute periods over a year	In-depth study of thematic units occurs in longer time blocks over shorter terms.	Students can negotiate flexible attendance or choose day or evening classes.	Students can connect to online resources and courses 24 hours a day, 365 days a year.
How? Through face-to-face contact	Interactions with resources, teachers, peers, and mentors occur by various means.	Learning activities include online and onsite interactions with other participants.	Independent and collaborative learning activities are guided by online teacher support.

"...education systems were...designed earlier in this Century using the learning theory and technology available at the time." (Lafernière, 1999)

3. The Changing Context for Education

The potential to further stretch and vary delivery is vast, but schools are doing their best now—is greater delivery flexibility necessary? The answer may be clearer after reflecting on the changing context for education. Many of the circumstances and purposes for which traditional schooling was designed no longer apply to the same extent.

Traditional Social Context

- Families tend to stay together in stable communities.
- A basic education is enough for most jobs and for a lifetime.
- Students are often segregated by needs, abilities, and cultures.
- Compliance, conformity, and peer competition are encouraged.

Today's Social Context

- Families are changeable and mobile; communities are less connected.
- More credentials are required and lifelong learning is essential.
- Classrooms are composed of an increasing diversity of students.
- Collaboration, independence, and critical thinking are encouraged.

Traditional School Purposes

- Ensuring compliance with schedules and constant teacher direction;
- Transmitting textbook information and standard curriculum content; and
- Promoting and grading on the basis of competitive achievement.

Today's School Purposes

- Building life long learning capacity and independent learning skills;
- Engaging learners in integrated, authentic learning activities; and
- Developing the full learning potential of all individuals.

3.1. The Emerging Context for Education

"The constructivist approach to teaching is more in accordance with what is now expected of the knowledge worker (information retrieval, complex problem-solving, higher-thinking, communication, and collaboration skills)." (Lafernière, 1999)

While the primary purpose of education is not to serve economic interests, work is the accepted means to achieve personal fulfillment, rewards, and recognition in our society. The following personal resiliency characteristics are recommended for career success today and in the future:

- Fully developed talents, interests, and values;
- Positive self-concept, optimism, and adaptability;
- Strong communication, teamwork, and creative problem solving skills;
- Independent self-management skills; and
- Lifelong learning capacity, including the ability to adapt to new learning environments.

These days, developing the full potential and learning capacity of all students is more important than sorting them into categories of academic success or failure. While education still serves a socialization purpose, desired

qualities reflect the holistic scope of moral, cognitive, and social development in a pluralistic society.

"Learners are viewed as active constructors, predisposed to learn certain things more readily than others" (Lafamière, 1999)

The *transmission* learning model has yielded to what is commonly known as the *constructivist* model. This model, congruent with underlying principles of Core Curriculum, suggests that learners construct knowledge by interpreting experiences and understanding them in relation to prior knowledge frameworks. Given global connectivity, common knowledge is evolving rapidly. Learning to learn is now more important than absorbing current knowledge.

Families and communities have all been touched by social change. Students represent increasingly divergent needs, abilities, and circumstances. Effective delivery requires responsive adaptation of learning opportunity.

3.2. Emerging Approaches to Education

Dramatic shifts in the context and purpose for education call for equally dramatic reorganization of education. Movement from traditional toward emerging approaches for education in the future is illustrated by the contrasts below:

Traditional Approaches	Emerging Approaches
♦ In-person is the predominant or only interaction mode.	♦ Various modes are used to fit circumstances and purposes.
♦ One teacher with 20-30 students is the standard classroom grouping.	♦ Learners, teachers, and others are connected in various configurations.
♦ Students are physically transported to school sites.	♦ Students or teachers may be physically or electronically mobilized.
♦ Resources tend to be limited to those within the school	♦ Resources are extended to sources and expertise beyond the school.
♦ Learners and families adjust to the schooling structure.	♦ Learners and families negotiate to fit their needs and circumstances.
♦ Learning achievement varies widely within fixed time periods.	♦ Students achieve the same objectives in varying time periods.
♦ Learning activities are directed by teachers on a whole-class basis.	♦ Activities may be teacher or self-directed with individuals or groups.
♦ Student achievement is assessed at scheduled intervals.	♦ Each student is assessed when deemed ready to succeed.
♦ Students are promoted in yearly increments across all subjects.	♦ Students continuously progress at different rates in various subjects.
♦ Quality is measured by inputs such as teacher ratios and instructional time.	♦ Quality is gauged by student progress with inputs adjusted accordingly.

A distinction should be made "between technologies that extend or replicate the classroom model, and those that fundamentally change the instructional paradigm". (Bates, 1996, as cited in Bracewell et al., 1998)

Tapscott (1998, p. 143) suggests that a powerful new learning paradigm will emerge as online learning is increasingly integrated into education programs:

- from linear to hypermedia learning,
- from instruction to construction and discovery,
- from teacher-centered to learner-centered education,
- from absorbing material to learning how to learn,
- from school to lifelong learning,
- from one-size-fits-all to customized learning,
- from learning as tedious to learning as engaging, and
- from teacher as transmitter to teacher as facilitator.

4. Current Challenges

Diversifying program delivery is an appropriate response to a convergence of challenges facing education today:

1. Expanding learning opportunity for rural and northern students,
2. Meeting an increasing diversity of student needs,
3. Promoting technological literacy, and
4. Continuing integration of Core Curriculum.

4.1. Extending Rural and Northern Access

"Parents in the rural setting...made it very clear that their first priority was to keep their children at home and have them attend schools in their own communities." (Flemming & Pain, 1997)

At present, many students in sparsely populated areas of Saskatchewan do not have access to learning choices and opportunities comparable to those enjoyed by urban students, especially at the secondary level. Enrolments are steadily dwindling in rural schools; many are already below the level required to support efficient traditional delivery. Northern enrolments are rising, but so too are onsite delivery costs and staff recruitment difficulties. Meanwhile, demand and expectations for secondary education are steadily climbing in all areas of Saskatchewan.

School size is a critical factor for rural and northern delivery. Traditional delivery requires sufficient school enrolments to support efficient student-teacher ratios (STR) within specialized grade and subject classrooms. If meeting STR expectations means consolidating two or more grades into one classroom and stretching a teacher's expertise to cover multiple grades and subjects, traditional delivery becomes strained. Small school budgets have limited capacity to maintain the resources, facilities, and auxiliary services required to support full-scale, onsite programs. Since working under such conditions is demanding, recruiting and retaining qualified staff becomes difficult.

Consolidating enrolments to regain economies of scale is one strategy to sustain traditional delivery in rural areas.

"It is important that our learning systems are guided by a vision of learners and of the communities to which the learners belong and which they are helping to create" (SchoolNet, 1996)

Student travel, however, has already reached upper limits in many rural areas, and school closure accelerates erosion of rural communities. In the north, distances between communities are often too great to consider consolidation.

The challenge is to devise effective yet economical delivery models to extend learning opportunity for students in rural and northern communities. A locally responsive approach would involve maximizing all available resources, local and distant, to create optimal learning opportunity in each setting. Diverse solutions might feature one or more capacity-stretching strategies such as the following:

- Integrating community sites and expertise into learning environments to support authentic, community-based learning activities;
- Jointly supporting full programs by moving teachers and students, virtually or physically, among schools in a local area; and
- Virtually connecting teachers and learners to create a full-program virtual school or to augment onsite programs in local schools.

"Saskatchewan's increasingly diverse population is challenging educators' and education systems' capacity to maintain the commitment to equity and excellence for all." (Curriculum and Instruction Advisory Committee, 1997)

4.2. Meeting Diverse Needs and Circumstances

Saskatchewan is committed to providing appropriate learning opportunity for all learners. One challenge is fulfilling this commitment for learners with needs related to mental or physical illnesses, behavioral disorders, cognitive or physical disabilities, or giftedness. A second challenge is to enhance retention and progress for at-risk students in vulnerable socioeconomic circumstances who do not meet conditions for success in traditional delivery.

Meeting Exceptional Learning Needs

Traditional classroom delivery was originally designed for homogeneous groups of students. Core Curriculum offers strategies for accommodating individual needs, but meeting all needs is still a challenge. A recent curriculum evaluation (Saskatchewan Education, 1999a) found the following:

> *Those teachers who appear to have fully implemented the curriculum describe the practices as "adaptable to all students' interests and abilities" while still agreeing that meeting the needs of all is a challenge. (p. 65).*

"The diversity of the student population requires that education be inclusive and responsive to a range of cultural, linguistic, social, economic, and religious differences." (Curriculum and Instruction Advisory Committee, 1997)

Restructuring delivery to allow more individual flexibility in activities and pacing may expand the capacity to meet diverse learning needs. Adaptations should be tailored in each case to fit specific needs, which means developing expertise in needs assessment and adaptive design. Potential restructuring options include the following:

- Grouping students by capacity for independent and cooperative learning, not grade, and proportioning teacher ratios and instructional time accordingly;
- Supporting learning in a home or health care environment, as a temporary or partial option, to provide an alternative to full-time school attendance;
- Providing opportunities for gifted students to pursue independent learning and virtually connect with students who have similar interests; and
- Enabling students with special needs to connect virtually with peers under the direction of onsite or distance teachers with relevant expertise.

Accommodating At-Risk Circumstances

Regarding students in StoreFront schools: "Generally they have dropped out of the mainstream school system, having experienced particular problems with attendance." (StoreFront Schools, 1999)

Regular attendance is crucial for effective traditional delivery. As instruction and assessment is group-paced over a fixed term, students who are often absent or inattentive tend to fall behind. Existing handicaps can then be compounded by hopelessness, anger, and peer rejection. Frustrated students tend to disrupt classes and alienate teachers, often culminating in expulsion or voluntary leaving. About one-quarter of students leave school without completing grade 12 (Saskatchewan Education, 1998).

Low socioeconomic status and lack of parent support are associated with early school leaving, which in turn predicts low earnings and dependence of social support systems (Statistics Canada, 1992). Early school leavers may feel marginalized in society and disinclined to support their own children's schooling, thus perpetuating a generational cycle.

Social service agencies are tackling family dysfunction and poverty, and schools are doing their utmost to encourage regular attendance. Meanwhile, many disadvantaged students continue to flounder and leave school prematurely. Alternative programs, where available, often serve as a last resort for students who have already experienced failure and left regular schooling.

"...the root of educational failure ...lies in the cultural disadvantage of specific social groups. ...[If] schools do not respond to the specific needs of these groups... schools themselves help to increase the initial disadvantage." (FutureEd, 1999)

If at-risk students cannot meet conditions for effective schooling, the alternative is to modify schooling conditions to fit students' circumstances. Irregular attendance may be less of a handicap with individual pacing, continuous progress, and alternatives to full-time in-school attendance. Progress would still depend on time-on-task, but may be less fraught with discouragement and failure.

At-risk students are by no means a homogeneous population, and responsive delivery must reflect assessed needs in each context. The following options, all based on some degree of individual pacing, may be applicable:

- Negotiating attendance contracts with individual students and their families;
- Enabling continuous promotion in each subject family (e.g., Language arts and social studies) rather than on a whole-grade, annual basis; and
- Dedicating more time on an individual basis to weaker subjects and less to stronger ones to maintain coherent progress.

4.3 Promoting Technological Literacy

"...technology represents a 'new basic' for schools, and deserves strong emphasis along with such traditional areas as reading, writing, and mathematical competencies." (Richmond, 1997)

Promoting technological literacy has become a priority in light of rapid technological change. Use of Internet technology, in particular, is virtually exploding across the globe. Internationally, users are expected to more than quadruple from 150 million to 700 million over the next two years (United Nations Development Program, 1999).

Information and communication technologies (ICT) are the enabling means behind globalization and related cultural and economic shifts. Education will determine whether new technologies empower or sideline Saskatchewan people. By harnessing the transformative medium, educators can influence change in a positive direction.

Where appropriate, using ICT to support learning gives students and teachers the motivation and opportunity to master new technologies. Unprecedented means are available to extend learning, for both teachers and students, beyond school boundaries. Possibilities that were once too expensive or complicated are now within reach of schools, workplaces, and homes across Saskatchewan.

Competition Implications of ICT

"...current technological advances are making it feasible to offer on-line learning programs that are equal to or even superior to regular classroom instruction." (Alberta Education, 1999)

For the public education system as a whole, technological literacy means adapting to the new reality of market competition. Virtual K-12 education programs are springing up all over North America and beyond. Home-schooling registrations across Canada are rising. In Saskatchewan, they have grown 216% over the past 6 years (Saskatchewan Education, 1999b). Public education consumers now have an increasing array of alternative choices.

The Saskatchewan education system could try to preserve its "market share" by limiting access to alternatives through legislation and policies. New learning technologies in use, however, are not bound by political and geographic boundaries (Farrell, 1999).

The alternative is to proactively protect the integrity of public education by extending the capacity to serve all learners, including those who choose home-based and distance learning. While other provinces and countries are

in the process of developing distance learning opportunities, Saskatchewan has an immediate window of opportunity to participate in partnership initiatives.

4.4 Actualizing Core Curriculum

In Saskatchewan, Core Curriculum is inherently dynamic, and best practices are believed to evolve over time. Curriculum maintenance is therefore a continuous process of *actualizing* a dynamic curriculum rather than a final state of having *implemented* a static curriculum. This distinction reflects the strong commitment to continuous education improvement in Saskatchewan.

"The challenge is to ensure that the Core Curriculum remains current, reflecting continuous change in the environment and responding to diverse and changing student and societal needs." (Curriculum and Instruction Advisory Committee, 1997)

Core Curriculum is designed to be flexibly adaptable to diverse needs and circumstances. Recognizing that children develop at different rates and learn in a variety of ways is a central theme (Saskatchewan Education, 1984). The following congruent teaching practices are encouraged:

- engaging individual learning styles and interests,
- facilitating independent learning,
- enabling continuous progress for each student, and
- designing authentic, integrated learning activities.

Diversifying delivery is congruent with Core Curriculum and with education goals (Appendix B) and principles of best practice (Appendix C) that define quality education in Saskatchewan. Every opportunity to stretch learning environments can be aimed toward close alignment with these goals and principles.

Emerging technologies make it increasingly feasible to support independent learning, track individual progress, and engage in professional development. The same tools can be used to incorporate external resources and expertise to enhance relevance and authenticity. New levels of Core Curriculum actualization are within reach.

"Collaborative learning, constructive learning, and apprenticeships are not new concepts in learning. Technology can help establish a supportive infrastructure that makes it possible to use those powerful models without burning out." (Dede, in O'Neil, 1995).

Therese Laferrière (1999) identified ways that ICT could empower learners in constructivist learning environments:

- access to extended sources of information
- mastery of basic information skills,
- opportunities for authentic learning activities,
- exposure to new problem solving methods,
- engage in active pursuit of learning,
- connect with others from and beyond the classroom,
- create products to demonstrate learning,
- develop project management and research skills, and
- collaboratively construct knowledge with others.

5. Is Saskatchewan Ready for Diverse Delivery?

Keeping pace with change and meeting current challenges may be reason enough to promote diversification of learning opportunity. Nonetheless, is Saskatchewan ready to support this initiative? The optimistic answer is "Yes". Given collective will and vision, a move toward responsive delivery is timely, apt, and doable according to the following readiness indicators in Saskatchewan today:

1. Valuing of individual and community diversity,
2. Existing local education governance structures,
3. Commitment to continuous improvement,
4. Growing capacity for partnership and collaboration,
5. The flexibility of Core Curriculum, and
6. Effective, economical means to extend delivery.

5.1. Appreciation for Community Diversity

"What needs to be done to increase effectiveness and how one does it are situationally specific." (Sergiovanni, 1991, as cited in FutureEd, 1999)

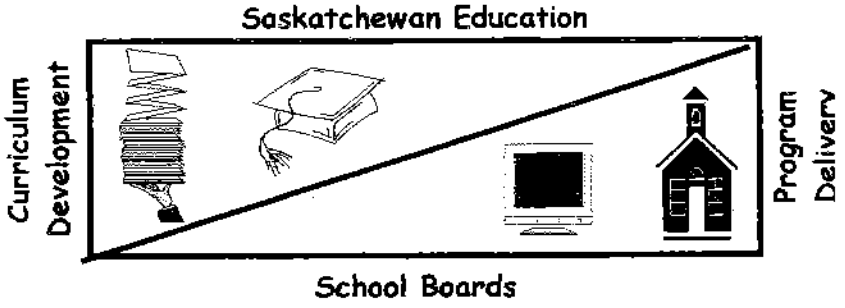
Saskatchewan is a mosaic of distinct communities that support a diverse economy and culture. Diversity is celebrated and valued in this Province. All communities need access to equitable education services, but delivery contexts vary widely. A locally responsive approach to optimizing learning opportunity is the appropriate way to address unique local problems and circumstances.

It makes practical sense that program delivery designed to fit the rural community of Milestone may be unsuitable for northern Île à la Crosse or the suburban University Park area of Regina. Each community has different circumstances that must be taken into account to design optimal learning opportunity in each context.

5.2. Existing Local Governance Structures

"As educators, our primary responsibility in education is to create and enhance student environments, experiences and learning." (Mills, 1995)

A locally adaptive approach is supported by the existing structure of education governance. While Saskatchewan Education leads curriculum development and standard setting, school boards have primary responsibility for program delivery. Policy makers and administrators are already in place to manage the process of finding, implementing, and evaluating locally responsive solutions.



5.3. Commitment to Continuous Improvement

"Information and communication technologies (ICT) present us with an opportunity, and a challenge, to reach for a more human approach to teaching and learning." (Lafernière, 1999)

Evolving a more responsive approach to program delivery is congruent with Saskatchewan's strong commitment to continuous improvement in education. Recent reviews of special education, secondary programs, integrated services, and education indicators demonstrate openness to critical reflection and new ideas. In Saskatchewan, continuous improvement is expected and encouraged.

Diversifying learning opportunity, however, will not solve all the challenges and issues facing education today. Efforts must continue to strengthen education by stabilizing funding, supporting teachers, developing leadership, and building partnerships. In the broader context, all sectors must continue working together to address the holistic needs of children and youth in a changing world.

5.4. Growing Capacity for Partnership

"Our learning structures and institutions...are enhanced and extended by forming links and partnerships within the formal education community...and with institutions, enterprises and associations outside the formal system." (SchoolNet, 1996)

New possibilities for extending delivery are emerging with increasing interest in collaborative partnership across all sectors in Saskatchewan. People and organizations are finding new ways to work together toward common goals.

Learning opportunities in or out of the school could be enriched by strengthening partnerships between educators (i.e., teachers, administrators, trustees) and...

- Students, as the central agents of learning;
- Parents, as joint custodians and co-providers of developmental support for children;
- Community organizations, to share resources, expertise, and efforts for collective benefit;
- Businesses and employers, to contribute to the education of future producers and consumers;
- Human service agencies, to build coherent support for the holistic development of children and youth;
- Other education providers, to jointly provide more effective, efficient education services; and
- The media and entertainment industry, to channel a powerful influence in a constructive direction.

5.5. Flexibility of Core Curriculum

"The flexibility and openness of the curriculum...is its greatest strength." (anonymous, cited in Saskatchewan Education, 1999)

Thanks to the last major change wave in Saskatchewan's education system, which launched Core Curriculum, program delivery has room to stretch within a student-centred philosophy, holistic education goals, and a flexible, "evergreen" curriculum. Together, these form a sound foundation for education through the foreseeable future. Saskatchewan is well poised to continue the reform

momentum, diversifying learning opportunity to fulfill the responsive intent of Core Curriculum.

5.6. Available Means to Extend Delivery

Using information and communication technologies (ICT) to bridge time and distance barriers opens new possibilities for configuring learning opportunity. The capacity to adapt learning environments (where, when, how, and with whom learning occurs) to best fit learners and circumstances has exponentially increased. ICT also offers tools for managing individual programs, expanding resources, supporting professional development, and sharing ideas.

Options are expanded by "increasing capacity, flexibility, and suitability of [ICT]... together with the continuing decrease in the cost of hardware." (Farrell, 1999)

Popular applications of ICT are already reshaping patterns of working, learning, and everyday living. The experience of learning with new media, when appropriate, will broaden future life long learning and career development opportunities for both teachers and students.

Diversifying delivery does not imply an arbitrary shift to distance delivery or computerized instruction. Different learning environments have pedagogical and practical advantages for particular purposes, but none is optimal in all contexts. Learning technologies include everything from writing on a blackboard to exchanging live, two-way video. ICT offers welcome tools for crafting solutions; it is not a solution in itself.

6. Models and Examples of Responsive Delivery

The diversity of responsive delivery options is far too broad to provide a comprehensive inventory of existing and possible models. It may be useful, however, to sketch a few hypothetical models to illustrate potential applications to local circumstances. A brief sampling of real life models may further indicate the enormous range of practical possibilities.

6.1. Hypothetical Models

"[While] schools are better at doing what they were designed to do than ever in the past, unfortunately, what the schools were designed to do is no longer serving the needs..." (Schlechty, 1997, as cited in FutureEd, 1999)

The following fictional scenarios are designed to illustrate how delivery might be modified to address current challenges in diverse contexts. They are provided only as hypothetical examples, not prescriptive solutions.

Model A: A Small, Rural Community

The context is a small rural community located 90 kilometers from a major urban centre. Approximately 200 students are enrolled in a K-12 school. Elementary and middle level students, separately, are grouped by subject families, not grades. With teacher guidance, older students

"...attendance involves different forms of contact but not necessarily full-time physical presence, and learners may 'attend' many institutions simultaneously". (SchoolNet, 1996)

take the lead role in planning and completing thematic projects with younger students. Computer programmed instruction supplements classroom instruction.

Teachers rely on information and communication technology (ICT) to manage individualized programs, participate in professional development, locate resources, and communicate with parents. Students use ICT to complete products, conduct research, communicate with off-site mentors, and activate computer programmed instruction.

One day each week, secondary students attend classes for two core courses in the local school. On another day they travel to the city high school to access three other courses. They complete independent work for all courses at home for two days per week, guided by telephone and online contact with instructors. The fifth day is dedicated to online elective courses, work experience, or community service. A handful of students have opted to take courses offered by the city high school from an online source with tutorial assistance from a local teacher.

Model B: An Inner City High School

"...increasingly more students face overwhelming, complex personal and family problems that make it difficult for them to remain in school. ...we must rise to the challenge and learn to think beyond the comfortable and familiar." (LeClaire, 1999)

The context is an inner city high school with approximately 750 students from ages 14 to 21 enrolled in grades 9-12. These students have various circumstantial handicaps: living in poverty, parenting young children, working part-time, getting entangled with the criminal justice system, or living at large with no fixed address. Most have had failed at least one grade or been expelled from another school.

School hours are adjusted to accommodate students' life styles. Classes are offered from 9:30 a.m. to 8:00 p.m. Students can choose a part-time or full-time program of morning, afternoon, or evening classes to fit their personal schedule. Block scheduling of weekly classes allows part-time students to attend on selected days of the week.

Continuous progress is individually paced and assessed. Students are organized into study groups wherein stronger students assist others. Teachers' efforts are supplemented by computer programmed instruction. Students progress into the next grade level in each subject whenever they fulfill course objectives, which provides a strong incentive for staying on task.

Model C: A Cluster of Small, Rural Communities

The context is three rural communities spaced roughly 40 kilometers apart, each with 80-90 students in a K-8 school. The area high school is in the centrally-situated community. The school division considered closing two schools and consolidating attendance in the central K-8

"Traditional solutions for Saskatchewan rural school depopulation have included consolidation of schools and busing students longer distances to these larger schools.... At some point, however, the distances become too long or the school too small for these alternatives to remain viable." (Coutts, 1998)

school, which has a new gym, science lab, and computer lab. This would have meant transportation time of more than three hours each day for some students, so a multi-campus distribution structure was created to enhance learning opportunity without closing schools.

Each school is organized into four student groups: kindergarten, grades 1-2, grades 3-5, and grades 6-8. The school schedule spans six days. In each cycle, kindergarten students spend two days with a full-time, itinerant teacher and one day with the grade 1-2 class. One day each cycle, Grade 3-5 and 6-8 students in the two outlying schools are transported to the central school for gym, science lab, and computer lab. An itinerant French, fine arts, and social studies teacher and an itinerant special education teacher spend two full days in each school.

Gym, Science Lab, and Computer Lab Days

	1	2	3	4	5	6
School A	3-5	6-8				
School B			3-5	6-8		
School C					3-5	6-8

In all classrooms, students work primarily in single-grade study groups, and teachers use a group tutorial approach rather than whole-class instruction. Multimedia courseware is used to strengthen specific skills and knowledge sets.

Model D: An Isolated Northern Community

"Technology dramatically expands access to learning, enriching the resources and expertise available to all learners, and expanding services to those...who are not well served by present structures" (SchoolNet, 1996)

The context is a small, isolated northern community with approximately 65 students in a K-12 school. Kindergarten to grade 8 students are organized into two classrooms, K-4 and 5-8, with one teacher and an assistant assigned to each. Progress is continuous and individually assessed. Students graduate to the next grade level when ready.

A rotating buddy system is used so students alternate between working with younger and older students. Thematic projects are adapted to progressive levels of complexity. Community elders, artisans, and other knowledgeable guests are frequent visitors. The teacher relies on small group tutorials, and the assistant concentrates on those needing additional assistance.

Students in grades 9-12 pursue individualized distance learning programs with tutorial assistance provided by one onsite teacher. Courses originate from various sources and through various media. The extra-large classroom is equipped with a dozen Internet-linked computers, a fax, telephones, video equipment, and a satellite lead-in. Students taking the same course at the same time tend to

work together. The school day is continuous with no fixed periods other than lunch hour and recess breaks.

The school also serves as a learning centre for adult learners engaged in distance or self-directed learning programs. A floating tutor is available during the afternoon and some evenings to provide assistance. The tutor also provides assistance by telephone and email to high school and adult students who are pursuing home-based distance learning. The community is welcome to use the gym, when not otherwise in use, and the resource centre during school hours. Community recreation and social events are held in the school on a weekly basis.

6.2. Living Examples

"I could not find any research to support my theory but decided to pursue the idea anyway.... We have never looked back." (Tetreault, 1999)

Many living examples of modified delivery demonstrate how different arrangements of time, participants, location, and communication media can work. The examples range as far as the imagination. Some represent major departures from conventional schooling. Others demonstrate how small changes can make a difference. The following examples include a detailed profile of one particularly innovative school and various examples of school-based delivery modifications, distance delivery, and virtual schools.

School-based Delivery Modifications

Sacred Heart Community School is located in an inner-city neighbourhood of Regina. In 1995, the school began a long-term improvement process. Two challenges addressed, among many, included reducing schoolyard violence and taming a grade 6 cohort group that had gelled into a "class from hell" (Tetreault, 1999). In each case, modifying dimensions of the learning environment, *when* and *with whom* primarily, created effective solutions.

"Over a four-year period, Sacred Heart Community School moved from a violent, out-of-control school to one that is peaceful and child centred." (Tetreault, 1999)

To minimize opportunity for schoolyard violence, the school day was shortened by eliminating recesses and reducing the lunch break to a half-hour. Instead of recesses, students have two 20-minute physical education classes each day, staggered so that only a small number are in the schoolyard or gymnasium at one time. Free time activities during the lunch break are supervised and structured with student groups in various locations. The results are impressive: violence has been virtually eliminated and the number of full-day suspensions in each school year has dwindled from 127 to 21 over the past five years (Tetreault, 1999).

To break entrenched negative behavior patterns in the grade 6 class, students were regrouped into two grade 2/6 split classes to dilute peer pressure and motivate responsible behaviour. Classroom dynamics became much more constructive and functional, and the same grade 6

"...we needed to adjust a number of other procedures that, even today in many schools, continue to be part of school routine with little or no thought given as to why we do them other than we have always done it that way." (Tetreault, 1999)

students became leaders in the school. Changing the *with whom* dimension produced dramatic results.

There are many more examples of creative delivery modification in schools all across Saskatchewan. A small sampling includes the following:

Scenic Valley School Division is in the final stage of a three-year experiment with a four-day school week. *Winston Knoll Collegiate* in Regina features unorthodox architecture to create several self-contained "colleges" in a large school.

At *Nutana Collegiate* in Saskatoon, 80% of students are classified as at-risk. Students are surveyed every two years, and a number of innovative programs have been implemented to respond to identified needs. For example, classes begin at 9:30 a.m. to accommodate adolescent sleep patterns and an on-site daycare offers convenient childcare for students who are parents. Partnerships with social and health service agencies, as part of a major *integrated school-linked services* initiative, have enhanced services for students.

Other programs offered at Nutana Collegiate include the *ReEntry Program*, which allows students to register at any time. The *Main Street Program* offers a "storefront" attendance alternative for students between 14 and 16 years of age who have severe behavior and/or attendance problems. Block scheduling within four quarters enables students to complete courses over a short term. This fits well for students who need only a few classes or who cannot commit to attending for a full school year.

Carlton Comprehensive High School in Prince Albert offers supported independent study as an alternative to regular attendance. Participants study course materials at home and meet with a teacher to review assignments on at least a weekly basis. Those who need structure have scheduled one-hour sessions; others come in at any time. Students progress at their own rate. If attendance is interrupted, they continue where they left off upon returning. Two is the maximum course load at any one time. Courses available include those that do not entail lab or shop work: language arts, maths, social sciences, and some sciences.

Participants in the program include students in regular programs who need to catch up on courses and students who, for whatever reason, are unable to manage regular attendance. About 90 students are enrolled at any one time, 45 to 50 tend to be steadily active, and turnover is continuous with a waitlist of about 80 students. The program is offered free to students of any age, and anyone who asks is considered for entry. Approximately 200 credits

per year are completed through this program with one-and a-half to two full-time teachers.

Supplementing Programs with Distance Delivery

"Communications and information technologies are transformational technologies with powerful...implications for learning and learning systems" (SchoolNet, 1996)

Distance education is functioning in a myriad of forms across Canada. Teachers of the Saskatchewan Government Correspondence School communicate with learners by mail, fax, email, telephone, live video, and in-person contact. In many cases, distance delivery is used to supplement onsite school programs. The following are examples of using distance delivery to extend in-school programs:

- The Saskatchewan Communication Network facilitates delivery of secondary courses. One-way audio-video transmission of a teaching segment is supplemented by two-way telephone and fax contact with instructors.
- Saskatchewan Rivers School Division is experimenting with fully interactive audio and video delivery transmitted by means of wireless microwave.
- The Eston-Elrose School Divison has a division-wide distance delivery network using PictureTel technology to transmit two-way audio-video communication over two telephone lines.

Full-Program Virtual Schools

Virtual schools and virtual schooling both involve distance learning facilitated primarily by asynchronous or synchronous electronic communication (FutureEd, 1999) *Virtual schools* are self-contained schools with their own administrators, staff, and full-time enrolments. They offer full programs to students, often in their home setting. *Virtual schooling* refers to using virtually delivered courses to extend in-school programs, not as a stand-alone option.

"The development of virtual institutions is still experimental, rather unfocused, and not necessarily matched to clientele learning needs." (Farrell, 1999).

Virtual schools are growing in number around the globe (Farrell, 1999). Virtual enrolments may vary from a few dozen to several thousand students. In many cases, virtual schools supply students with the computers, software, and Internet access required for participation.

According to Alberta Education (1999), virtual schools are an increasingly popular choice with parents and students for many reasons besides geographic barriers:

- Students can learn independently at their own pace,
- It is a viable option for parents who prefer not to send their children to regular schooling,
- Students who work or have other commitments can "attend school" outside of regular school hours,
- Some students have health problems or disabilities that prevent school attendance, and

- Virtual schools may offer more program options than a small, local school can manage.

"A single instructional design is being replaced by a variety of resource-based and learner-centred approaches. Centralized development has given way to local autonomy in course development and local provision of courses." (Alberta Education, 1999)

Academy On-Line (http://www.academyonline.org) is an example of a small virtual school. As described in a review of Alberta virtual schools (Alberta Education, 1999), its staff of five teachers serve an total enrolment of 115 students. Students study at home where a key parent is designated to work cooperatively with teachers to support learning. Teachers, who also work at home, develop their own materials and activities, adapting them to meet individual needs. Multi-graded, interdisciplinary projects are a major component of learning activities. Students meet together in person during four "institutes" held each year.

Several large-scale virtual schools are now operating in Canada. *The Eden Project* (http://eden.scbe.on.ca) in Ontario, has 2000 students. In British Columbia, *The Greater Vancouver Distance Education School* (http://www.gvdes.com) has 9000 students. The *School of Hope* (https://www.schoolofhope.org) in Alberta is a Catholic virtual school with over 1800 students.

7. Developing Capacity for Diversification

"A new learning system for the future would involve changes in all the interconnected elements of the system.... Many of these changes are now occurring.... What they need is guiding vision to shape them and to integrate them." (SchoolNet, 1996)

Many innovative delivery models are already in place in Saskatchewan. Extending and raising the level of responsive delivery on a province-wide scale, however, is an ambitious undertaking. The first task is building the capacity to support and sustain coherent diversification efforts across Saskatchewan. Capacity-building involves creating and strengthening some key supports:

1. Establish forums and processes for the collaborative identification and resolution of challenges at the local and provincial level;
2. Review and revise policies and regulations that hamper the flexibility of program delivery;
3. Establish processes and standards for creating and accrediting distance learning opportunities while ensuring congruence with Core Curriculum;
4. Develop an equitable, province-wide information and communications technology infrastructure;
5. Define Core Curriculum expectations in explicit, verifiable terms, and devise methods to consistently assess learning acquired in a variety of ways;
6. Build understanding and support for a shared vision of responsive, diversified program delivery among all education partners; and
7. Prepare educators in training to work within diverse program delivery models and provide appropriate

learning opportunities for teachers and administrators.

7.1. Creating Forums for Collaborative Action

"Collaboration of all educational partners is key for channeling the forces at play in directions that will be effective and pedagogically sound." (Lafarrière as cited in Olson, 1999)

Efficient and effective delivery diversification requires collaboration and communication at all levels of the education system. At the local level, structures and processes are needed to engage all concerned in consultation, needs assessment, and problem solving. At the provincial level, an inclusive forum is needed for coordinating efforts, building a common vision, and sharing ideas and resources across the Province.

Provincial Forums

Modifying delivery is not a new venture in Saskatchewan. To date, however, local efforts have been too disconnected to create a coherent, sustained momentum across the Province. Each time a new initiative is launched, time and energy is invested in reinventing from scratch.

Provincial level coordination is needed to go beyond the sporadic stage of delivery diversification. It may be timely to consider creating a provincial coordinating council to focus communication, collaboration, and collective wisdom on diversification efforts. Participants in such a forum might undertake some or all of the following tasks:

"Relevant processes need to be sorted out, and will require time to be developed and disseminated." (Laferrière, 1999)

- Collaborate to create a coherent, province-wide approach to diversifying program delivery and to achieve economies of scale;
- Recommend revisions to provincial policies and standards for structuring learning opportunity (e.g., when, where, and with whom) to allow greater flexibility with appropriate quality control;
- Recommend policies and procedures for accrediting learning acquired from outside the Provincial education system;
- Analyze provincial indicators to identify changing contexts and implications for delivery effectiveness;
- Identify the professional expertise required and collaborate with teacher education programs, boards of education, and professional associations to support appropriate professional development;
- Promote support for delivery diversification among all education partners, including educators, trustees, students, parents, and the general public; and
- Engage all education partners in communication and collaboration to support new delivery initiatives.

"There are some remarkable examples of the transformation that can take place when a vision for an educational system is developed and its implementation championed by decision-makers" (Farrell, 1999)

Saskatchewan Education is presently facilitating coordination and collaboration at the provincial level to harness new learning technologies. These efforts will provide needed expansion of delivery options.

Overarching coordination is needed to provide support for all possible means to extend and enhance program delivery, including those which do not involve learning technologies. If the broad focus is on enabling flexible response to individuals and communities, learning technology can be viewed as one of many means to achieve that purpose.

Local Forums

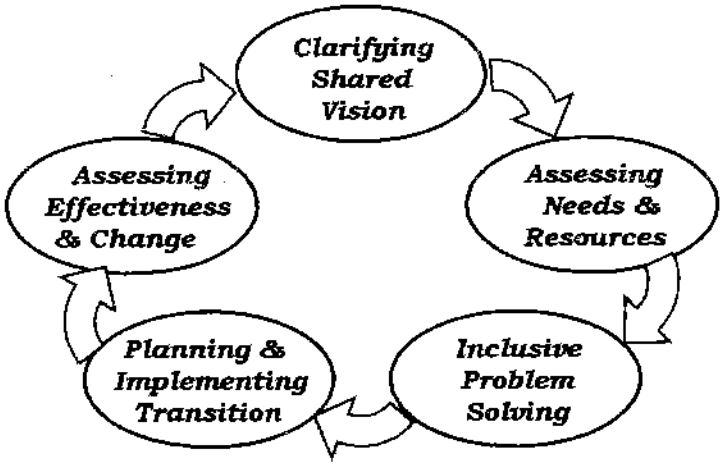
Division-level administrators and trustees would play a key role in local diversification efforts. It is important that these leaders understand the need for responsive flexibility and can imagine possibilities beyond traditional schooling.

"In a society undergoing significant and rapid changes, learning systems need to be accessible, flexible, responsive, diverse, and balanced...." (SchoolNet, 1996).

A collaborative leadership style bodes well for the success of local initiatives to restructure program delivery. Local administrators and trustees could involve students, parents, teachers, and the community in a cyclical delivery adaptation process as follows:

- Clarifying a common vision to unify understanding, goals, and efforts toward locally responsive delivery;
- Conducting a holistic assessment of context, needs, resources, and options;
- Engaging in an inclusive process of problem definition and solution finding;
- Planning and implementing a collaborative transition process on a minor or major scale; and
- Assessing effectiveness of new initiatives in relation to a continuously changing context.

A Collaborative Local Adaptation Model



"The change process is made up of a number of essential steps: readiness, needs assessment, solution seeking and selecting, implementation, and evaluation." (Curriculum and Instruction Advisory Committee, 1984)

7.2. Revising Policies and Regulations

"...if the old discrete institutional prescriptions are left in place, no significant change is likely to occur." (Lafernière, 1999)

More flexibility in provincial legislation and policies would expand the scope of versatility at the local level. For example, greater latitude in scheduling, funding allocation, and course accreditation would be useful. Provincial structures need to balance enabling local autonomy with maintaining essential standards.

Responding to individual and community needs in each context would likely require revision of policies at the division and school level as well. Identifying needed changes to administrative structures could be part of the problem solving or planning stage of a local improvement process.

7.3. Extending Distance Learning Opportunities

Availability of versatile distance learning opportunities would significantly enhance responsive capacity at the local level. To develop new delivery options appropriate for this Province, Saskatchewan Education is currently supporting a number of pilot initiatives around the Province (e.g., The Southeast Distance Education Project).

Virtual learning is "expanding options for learning, options that will continue to include...face-to-face instruction along with the electronic classroom." (Farrell, 1999)

Distance learning opportunities could originate from a local school, another division, the provincial level, or another province or country. Developing distance courses is a costly venture, so there are economical advantages to designing them for broad distribution.

Out-of-province sources offer ready-made courses that are not necessarily congruent with the Saskatchewan emphasis on the quality of the learning experience. Core Curriculum promotes constructive interaction among learners and teachers in the context of warm, caring environments (Curriculum and Instruction Advisory Committee, 1984). Information and communication technologies should be used to facilitate collaborative relationships, not learner isolation. There may well be a market beyond the Province for Saskatchewan-style distance learning programs that connect people together in learning communities.

There are at least two possible directions for extending distance learning opportunities in Saskatchewan. The centralized approach would involve expanding distance learning opportunities originating from a provincial delivery system. The decentralized approach would involve coordinating a network of distance learning opportunities from various local and provincial sources. That is, a course originating from one school or division could potentially be accessed from other sites in the Province to achieve optimal delivery capacity.

The decentralized approach would build on the current inventory of courses from various local, provincial, and external sources. It would also enhance the immediacy and diversity of available options. However, this approach would require extensive coordination and monitoring at the provincial level to ensure that the provincial curriculum is fully covered, that there is sufficient capacity to meet demand, and that all options can be easily identified.

Consistent standards and policies are necessary to ensure that distance learning opportunities are congruent with Core Curriculum, reasonably sustainable over time, and necessary to meet demand. Saskatchewan Education has recently launched a process to develop policies related to learning technologies and distance education. The aim to produce a policy handbook to guide decision making.

"For technology to be taken seriously by teachers and for it to make a sustained impact on learning, technical support must be there when needed, it must function as intended, and people must know how to use it productively." (Richmond, 1997)

7.4. Developing the Technology Infrastructure

Information and communication technologies (ICT) offer tremendous potential to enhance and extend learning opportunity in Saskatchewan. Negotiations with service providers are continuing at the provincial level to expand connectivity levels in Saskatchewan.

Meanwhile, current levels of ICT technology in most Saskatchewan schools and in many homes can support a variety of online learning experiences. Adding the capacity for two-way, live video interaction may soon become an affordable option in many locations.

Ideally, technologies used for learning should be relatively familiar and easy to use for both teachers and learners. Relying on technologies that are already within the realm of popular usage may limit possibilities but enhance practicality. Using "cutting edge" technologies can inflate costs and restrict access to only those sites that have specialized expertise and equipment. To achieve optimal economies of scale, some degree of infrastructure standardization is necessary.

"To the extent that computers demand attention for themselves and their quirks, rather than simply providing an effective means to ends that we have set, they're actually a hindrance to education" (anonymous, cited in Faris, 1995).

Saskatchewan Education has announced the intention to develop a Learning Network infrastructure in the Province. The following essential components will create a comprehensive support base for teaching and learning with technologies:

- Structures and processes for conducting research, dialogue, and needs assessment;
- Support for professional development, including training, technical support, and online forums for sharing knowledge and innovations;
- Broadly-based connectivity among educational institutions and libraries across the Province; and

- Provision of a comprehensive array of resources and support, including funding, to sustain all components of the Learning Network.

7.5. Defining Expectations and Assessing Learning

Many teachers would appreciate greater clarity of Core Curriculum expectations to support consistent assessment and reporting of achievement (Saskatchewan Education, 1999a). Continuing development of descriptive scales, or rubrics, designed for this purpose would be useful and timely. Ideally, such tools would enable consistent assessment of learning that occurs in a diversity of environments within and beyond the education system. The overall aim would be to protect the integrity of Core Curriculum but allow sufficient flexibility to recognize learning achieved in a variety of ways.

"...many teachers see a need 'for more specific skills to guide planning, evaluation, and reporting." (Saskatchewan Education, 1999a)

Post-secondary institutions have grappled with assessing learning acquired from external sources for some time now. Prior learning assessment (PLA) techniques and tools have recently been developed to allow accreditation of informal learning or on-the-job training. PLA strategies developed in the post-secondary realm may have parallel applications to the K-12 education system.

Saskatchewan Education is moving toward creation of a Learning Assessment and Recognition Agency in the Province. This central agency would coordinate a coherent approach to assessing and accrediting learning from all education sources and levels in the Province. Potential benefits include a more seamless education system, with credit recognition across all sectors, and fewer resources expended teaching students what they already know.

7.6. Building Vision and Support

Successful implementation of responsive delivery would depend on building shared vision and support among all education partners. Teachers, administrators, trustees, students, parents, and the general public are more apt to support what they understand, as found with Core Curriculum:

> *...the more knowledge that people have about the philosophy and framework of Core Curriculum, the more likely they are to be positive about it (SIDRU, 1999).*

"Our collective capacity to reconceptualize learning and teaching is here called forth." (Lafernière, 1999)

Providing opportunities to see or experience adapted forms of program delivery may help to consolidate a shared vision. Seeing possibilities translated into reality can be reinforced by promoting understanding of the changing context and challenges for education in Saskatchewan. Strategies for

building shared vision and support among all education partners may include the following:

- Supporting innovative pilot projects across the Province to enhance visibility and develop workable models (e.g., successful Grassroots projects);
- Using public media and events to showcase and demonstrate exemplary models of adapted delivery;
- Using ICT media to convey the message and facilitate dialogue among education partners so that people gain a hands-on appreciation for its potential; and
- Promoting understanding of Core Curriculum and the congruence of responsive delivery initiatives with its philosophical foundation.

7.7. Extending Professional Development

"As knowledge workers themselves, teachers need the flexibility, quality, collaborative practices and distributed cognition and leadership, now being associated with knowledge workers". (Lafernière, 1999)

Both new and established educators would need time and opportunity to learn new ways of managing learning in new environments. Professional development opportunities could also be extended to trustees, parents, students, and others who play decision making and support roles in diversified delivery.

The traditional "workshop" approach to professional development may be more useful for transmitting information than for transforming practice (Showers & Joyce, 1996; Dantonio, 1995). "Just-in-time", participant-directed learning activities such as peer coaching, mentorship, and collaborative inquiry may be more effective for supporting a transition to new practices.

The principle of using all available means to respond to learners and contexts can be applied to professional development. Possibilities for exchanging ideas, resources, and strategies with professional peers can be expanded far beyond the school. Opportunities may take many forms:

- Partnership for professional development with the private sector and other education systems;
- Networking teachers and other professionals with electronic forums for communication, collaboration, and resource distribution; and
- Providing opportunities for peer coaching and collaborative innovation within and across schools.

"...teachers and education systems are known more for their capacity to resist change than for their roles as agents of reform. Yet teachers are de facto in the midst of change all the time." (Fullan, 1995)

Delivery adaptations could have major or minor implications for the teacher's role, and these might vary widely from one site to another. Professional development opportunities should ideally be directed toward the specific expertise required on a "just-in-time" basis in each location.

Pre-service development is important so that new teachers are prepared to support diversified delivery and share practice innovations with established teachers. Teacher and administrator education programs in the Province have a critical role to play in developing the professional expertise required. It may become necessary to support teacher specialization in particular delivery modes.

A variety of teaching styles would be required to serve a variety of learning environments. Both new and established teachers would ideally have the opportunity to develop and work within a preferred mode of practice.

8. Implications and Questions to Consider

Changing complex systems is not a simple task. Implications and questions related to diversifying delivery on a large scale need to be thoughtfully considered. Some of the issues likely to emerge may include the following:

1. Implications for teachers;
2. Equitable access to learning technologies;
3. Students' independent learning capacity;
4. Social interaction needs of students;
5. Funding to support transition; and
6. Acceptance by parents and the public.

8.1. Implications for Teachers

"Regulations cannot transform schools; only teachers, in collaboration with parents and administrators, can do that." (Darling-Hammond, 1996)

Modifying delivery may have major or minor implications for teachers. Some schools may tackle radical change while others may make incremental adjustments. Are teachers ready and willing to adapt to new teaching and learning environments?

In principle, many educators would likely endorse realigning delivery with a student-centred philosophy. Those who are comfortable with Core Curriculum might appreciate how altering some dimensions of the learning environment could enhance learning. Those at the initial stages of adapting to Core Curriculum may not be looking for additional challenges. Many Saskatchewan teachers are nearing retirement, a time when consolidating, not innovating, feels timely.

"The current trend toward resource-based, learner-centred and personalized learning models is challenging educators" (Alberta Education, 1999)

Teacher readiness is an important factor to consider when contemplating potential changes to program delivery. Within a local consultation process, teachers would ideally have the opportunity to foresee the implications for their practice, to influence the change agenda, and to make their support needs known. Teachers are in a position to contribute valuable wisdom to designing innovations.

To adapt to significant change teachers will need support and time...

- to become conversant with new means and methods,
- to absorb changes and try out new ideas, and
- to help students adjust along with teachers.

Time allotted for professional learning and preparation may need to be adjusted to support new delivery models. Traditional proportions were appropriate for preparing to teach from a textbook to the whole class. More preparation and research time is needed to support facilitation of integrated, resource-based learning activities. As students become more independent in their learning, teachers may be able to devote more time to facilitating learning and less time to direct instruction.

"We need to remind ourselves that education is fundamentally a human, not a technical or economic activity." (Kerr, 1996 as cited in Alberta Education, 1999)

A common concern when technology is integrated into learning environments is that computers might replace teachers. Laferrière (1999) uses a play on words to explain that courseware can re-*place* the teacher out of the direct instruction role and into the learning facilitation role.

It takes human caring and judgement to raise and educate children. Rather than replace teachers, information and communication technologies are perhaps best used to facilitate teacher-student contact and extend it beyond the school. Even when multimedia resources are used to facilitate learning, their value lies in the quality of professional design and their use should always be guided by a teacher's professional judgement.

8.2. Equitable Access to Learning Technologies

How can access to learning technologies become more equitable? At present, schools and divisions are at various stages of acquiring equipment and expertise to take advantage of new learning technologies. For practical support purposes, it is advisable to use technology that is currently in popular usage. Schools that are equipped below that level have significantly reduced options for extending delivery. For the sake of equity, an important principle in this Province, a basic standard of technology should be supported for all schools.

"Students with access use the Internet to collaborate with classmates in project-based learning and find current, relevant information from a variety of sources. Students without home access are disadvantaged." (Olson, 1999)

Access to technology in the home is also an equity issue, especially when learning opportunity is expanded to include home-based study. Even in traditional delivery, home access to electronic resources can make a significant difference. Many distance education providers lease equipment to students at little or no cost. Higher technology costs may be balanced by lower facility and transportation costs.

8.3. Students' Independent Learning Capacity

Are students ready to take greater responsibility for learning if given the opportunity? Gifted and mature students may thrive with more independent learning, especially if they participate in planning. Many students would need a transition phase to develop self-confidence and task approach skills. Some students would have difficulty adapting, and others might function best with a high degree of teacher direction and structure.

"...research on learning styles provides clear directions for either how to teach individuals through their learning style patterns or how to teach them to teach themselves by capitalizing on their personal strengths." (Dunn & Dunn, 1992)

The optimal learning environment depends on individual learning style as well as purpose. Learning style is often defined only in terms of sensory perception. Dunn and Dunn (1992) offer a more holistic definition that includes physiological, social, emotional, and environmental domains of learning preference. It is not necessary or even possible to assess all these elements of learning style, but they serve to remind educators that one environment will not be effective for all learners.

- *Physiological* factors include perceptual strengths, time-of-day energy cycles, need for nourishment, and preferred mobility levels.
- *Environmental* preferences are related to lighting, temperature, sound, furnishings, and setting.
- *Emotional* aspects include motivation, persistence, responsibility, conformity, and preferred degree of structure.
- *Social interaction* preferences pertain to working alone or with others; the characteristics of chosen peers; relationships with adults; and variety versus routine.
- *Psychological* processing styles include left or right brain hemisphericity, global or analytic perspective, and impulsive or reflective processing.

When learning environments more closely reflect individual preferences, students demonstrate better achievement, discipline, and attitudes (Dunn & Dunn, 1992). A diversity of environments could accommodate a wide range of learning strengths, needs, and styles.

"...the isolation factor, that has long been a criticism of distance education, has changed. ...students...applaud the greater opportunity for discussion and collaboration that they have through a virtual model." (Farrell, 1999)

8.4. Meeting Social Interaction Needs

Bringing students together in schools offers opportunities for incidental and planned social interaction. If some models of program delivery involve students learning in their homes, how might their social contact needs be met?

It may be useful at this point to test common assumptions related to this issue by asking the following questions:

- Are structured, institutional environments the preferred setting for social interaction?

- Are same-age cohort groups the optimal milieu for developing appropriate social skills?
- Can meaningful interaction occur by electronic communication?
- What forms of social interaction are students likely to encounter in their adult life?

Despite the limitations of text exchange, on-line communication has become a popular forum for social interaction. Removing the influence of gender, race, appearance, and age on communication offers advantages. When digital audio and video transmission becomes a common reality, the capacity for sustaining meaningful relationships through online contact may increase dramatically.

Live contact, the sensory experience of being *with* other human beings, however, remains an essential part of being human. A holistic learning program might address that need by various means besides full-time school attendance:

- Alternate between on-site and virtual attendance days, with the proportion depending on distance;
- Establish local learning centres where students can meet and interact with each other and with teachers;
- Provide learning and social activities in local community sites on a regular basis; and
- Share responsibility for meeting social interaction needs with families and communities.

8.5. Funding for Transition

"Children are our future. They are our next prime ministers and premiers, our next doctors and nurses, our next parents and grandparents. If we can afford to do only one thing properly in this province, surely it must be educating our children." (Debbie Ward, President, SSTA)

Is transition funding required to support delivery diversification? If so, where will it come from when division budgets are strained to support present operations?

Education funding is often a contentious issue, especially in times of fiscal conservatism. In Saskatchewan, municipal and provincial governments share responsibility for funding education, and this can create additional tensions. In such a climate, funding for any new initiative is a concern.

Optimistically, some delivery modifications may prove to be budget neutral over the long term. Others, such as a four-day school week, may potentially reduce costs. Strategies that call for significant initial investment, such as distance delivery, could eventually reduce costs in other budget categories, such as transportation.

For the most part, however, launching any new initiative requires adequate and timely funding. The federal Grassroots Program, negotiated by Saskatchewan Education to support school-based pilot projects involving

learning technology, is an example of funding that could be applied to supporting delivery diversification.

Diversifying program delivery is about enhancing choice and versatility in education, not spending more or less money. New initiatives should be sustainable within balanced budgets, and cost-savings, though welcome, should not be the primary motivation. Ventures into distance delivery must be planned with particular caution as reliable data on distance delivery costs remains elusive (Farrell, 1999).

Diversifying delivery in a climate of fiscal constraint could be advantageous in the long run. It may heighten incentive to be economically creative, to build partnerships, to consult carefully, and to move in small, manageable steps.

8.6. Acceptance by Parents and the Public

"...for change to occur, the people affected must accept the proposed solutions. People will not readily accept solutions unless they are involved in decision-making at all stages in the implementation of change." (Curriculum and Instruction Advisory Committee, 1984)

Non-educators unfamiliar with recent trends in education may be more prone than educators to retaining traditional "mental models" of schooling. In the latest parent and public opinion poll conducted by the Saskatchewan School Trustees Association, however, 86.2% of respondents agreed that schools should have greater flexibility in delivering education (Canwest, 1995).

Parents are a diverse population and would likely react to proposed change with varying degrees of resistance or support. Some might appreciate the promise of greater responsiveness and flexibility. Others may fear erosion of education quality. Generally speaking, parents want the best possible education for their children: effective teaching, program options, and relevant preparation for the future Engaging parents in visioning, needs assessment, and problem solving processes may enhance receptivity to change.

Public support is essential for change because publicly elected officials manage the education system. Public perception can be strongly influenced by news media. Promoting informative and positive media coverage may enhance public support. Taxpayers may seek assurances that diversifying delivery will not inflate education costs. Rural residents may be hoping to hear that diversifying delivery may stem the tide of rural school closures.

9. Conclusion: Creating the Future

"As schools move into the postmodern age, something is going to have to give. It might be the quality of classroom learning.... It might be the health, lives and stamina of teachers themselves as they crumple under the pressures.... Or it can be the basic structures and cultures of schooling, reinvented for and realigned with the postmodern purposes and pressures they must now address." (Hargreaves, 1995)

The world is changing all around us and pressures on the education system are mounting. Education systems across the globe are moving toward new approaches to education delivery. Saskatchewan's education system can proactively adapt to these changes by supporting responsive diversification of program delivery.

The Saskatchewan education system is committed to continuous improvement. Extending equitable access to rural and northern students is a pressing challenge. Enhancing capacity to respond to students' needs and circumstances is congruent with fulfilling the student-centred philosophy and goals of education in this Province. Emerging technologies and growing partnership potential offer powerful new means to stretch and enhance learning opportunity. Harnessing ICT for program delivery is an effective way to promote authentic technological literacy.

For all these reasons, supporting responsive delivery adaptation is a timely and progressive initiative for education in this Province. The possibilities for creative action at the local level are vast, and collaborative effort could be applied to build the support and coordination needed at the provincial level. Saskatchewan is ready and able. Are we willing?

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Appendix A
Five Disciplines of the Learning Organization

Mental models are "deeply ingrained assumptions, generalizations, or even pictures and images that influence how we understand the world and how we take action" (Senge, 1990, p. 8). We need mental models to make sense of the world, but they need adjusting to reflect change or they become habits of mind that no longer fit reality. Many initiatives fail because they conflict with persistent mental models. To free ourselves from embedded mental models, we can uncover and critically examine our assumptions of how education should be conducted. When we share our thinking, we open our minds to the influence of other perspectives.

Building shared vision means more than composing lofty statements. An authentic shared vision forges people together around a common identity and purpose. It motivates sincere commitment, not just lip service. Sharing a vision requires formulating a set of principles and enabling practices so the vision can be translated into action.

Team learning extends collective capacity for creativity and wisdom beyond the sum capacity of team members. Team learning requires participants to suspend individual assumptions and think together through open dialogue. The quality of insights and ideas generated by team learning are unattainable by individual thinking.

Systems thinking means looking for the pattern connecting all parts of a system. Each part has a reciprocal influence, not always obvious, on all other aspects. We can understand any system only by looking at the whole picture, not just its distinct parts. When we see school, division, and provincial levels of the education system as one intertwined pattern, and learning in the school, home, and community as education of the whole child, we can see clearly how to reconfigure the pieces to effect desired change.

Personal mastery is the individual discipline of "continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively" (Senge, p. 7). Without this, individual excitement and commitment inevitably fades. To accomplish collective goals, each of us needs to genuinely believe in the effort.

Summarized from *The Fifth Discipline: The Art and Practice of the Learning Organization* by Peter M. Senge. 1990. Toronto: Doubleday

Appendix B
Goals of Education for Saskatchewan

Basic Skills
- Read, write and compute
- Acquire information and meaning through observing, listening, reading, and experiencing
- Process information through intellectual and technological means
- Solve problems by applying basic principles and processes of the sciences, arts, and humanities
- Communicate ideas through written and spoken language, mathematical symbols, and aesthetic expression

Lifelong Learning
- Seek and value learning experiences
- Act as self-reliant learners
- Base actions on the knowledge that it is necessary to learn throughout life

Understanding and Relating to Others
- Act on the belief that each individual is worthwhile
- Base actions on the recognition that people differ in their values, behaviors, and life styles
- Interact and feel comfortable with others who are different in race, religion, status, or personal attributes
- Develop a sense of responsibility toward others

Career and Consumer Decisions
- Develop an awareness of career opportunities
- Develop interests and abilities in relation to vocational expectations
- Adapt to shifts in employment patterns and technology
- Make informed consumer decisions

Membership In Society
- Assume responsibility for their own actions
- Work with others to achieve individual and group goals
- Participate in the democratic processes of government and perform the duties of citizenship
- Respect the rights and property others
- Act with honesty, integrity, compassion, and fairness
- Develop a sense of national pride and acknowledge the need for international understanding
- Work toward greater social justice
- Assume responsibility for dependent persons in a manner consistent with their needs
- Respect law and authority
- Exercise the right of dissent responsibly

Self Concept Development
- Perceive themselves in a positive way
- Appreciate their own abilities and limitations
- Set and work toward personal goals
- Assess praise and criticism realistically
- Present themselves with confidence

Positive Life Style
- Practice appropriate personal hygiene, engage in sufficient physical activity, and maintain a nutritionally balanced diet
- Avoid harmful use of alcohol and other drugs
- Cultivate interests that may be the basis for personal development and leisure pursuits
- Recognize the importance of productive activity
- Display initiative and pursue tasks diligently
- Maintain a safe and healthful community
- Respect and seek to enhance the environment
- Appreciate beauty in its many natural and constructed forms
- Express themselves creatively

Spiritual Development
- Seek an understanding of the purpose and worth of human existence
- Develop a knowledge of God
- Respect family, religion, and culture in a pluralistic society

Growing With Change
- Work toward immediate and long-term goals
- Base actions on an understanding that change is a natural process in society
- Select workable alternatives in response to changing conditions
- Develop confidence in making decisions that involve risk.

Appendix C
Education Principles and Enabling Practices

The following compendium of principles and enabling practices was compiled by the author and is based on explicit and implicit principles gleaned from various documents published by Saskatchewan Education.

- Because we believe in continuous improvement, we create conditions for positive change.
- Because we believe in shared responsibility, we support sharing vision, decision-making, and action with all education partners.
- Because we believe that learners are the centre of learning, we support learning activities that engage their interest and motivation.
- Because we believe that authenticity and relevance engage learners, we support authentic activities to fulfill relevant learning objectives.
- Because we believe relationships are our most valuable learning resource, we support learning environments that sustain positive relationships.
- Because we believe in preparing learners for fulfilling, productive lives, we promote skills, knowledge, and attitudes needed for future success.
- Because we believe that learning continues throughout life, we prepare learners for independent, self-directed learning.
- Because we believe in developing the full potential of every learner, we seek ways to extend appropriate learning opportunity beyond existing boundaries.
- Because we believe in recognizing and meeting individual needs, we support increasing flexibility to accommodate individual learning needs.
- Because we believe in equity, we accommodate diversity so that cultural and individual differences do not compromise learning opportunity.
- Because we believe in the Goals of Education for Saskatchewan, we support all appropriate means for learners to achieve these goals.