RESEARCH REPORT

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New Strategies for Program Delivery in Saskatchewan

by

F. Barry Brown

The Saskatchewan School Trustees Association commissioned Dr. Barry Brown, Professor, College of Education, University of Saskatchewan to develop this report. This report describes options for using technology in program delivery - 'What are the distance education possibilities for K-12 program delivery in Saskatchewan?'

In January 2000, the Saskatchewan School Trustees Association sponsored a seminar and released a report to explore new directions for program delivery in Saskatchewan. SSTA Research Centre Report #00-01 entitled **Diversifying Opportunities for Learning: Program Delivery in Saskatchewan** 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 student needs and circumstances.

This document is intended to stimulate further discussion about options for program delivery as well as provide practical information for boards of education. References in this report are included as web links – see our website at http://www.ssta.sk.ca

SSTA Research Centre Report #00-02
March 2000

Introduction

Educators in Saskatchewan face exciting times. Same-time, same-place learning environments are being displaced by an anytime, anywhere learning model that is not constricted to a provincial perspective. Learning is being driven by demand rather than by supply. Learning has become a function of what we do, not where we study or what curriculum we have assimilated. Information technology is demanded by the learner both as an area of study and for delivery of content. Distance learning and virtual institutions are emerging as mainstream components of educational programming. Convergent technologies and networking have combined to forge strong links among urban and rural systems. Rural residents, long disadvantaged socially and technologically in comparison to their urban counterparts, are now able to participate in life long learning activities. Recent advances in technology and dropping costs of information networks combine to ensure delivery of high quality training and education to the rural learner.

A Digital Province

Digitalization is driving technological convergence on a global scale that places the learner in the "digital driver's seat" whether that learner is in an urban, rural or developing region. Digital techniques have taken the development of learning resources out of the hands of a few and placed production capability in the hands of anyone with a multimedia computer. Digital convergence of technology and networking permits dissemination of text, graphics, voice, still and moving media in the same format. Digital techniques have dramatically cut costs by reducing format specificity and bandwith necessary to deliver content. Interaction with the distance learner has become easier and more cost effective.

In Saskatchewan the evidence of digital readiness is pervasive. The most dramatic evidence is the recent conversion of the Saskatchewan Communication Network (SCN) satellite distribution infrastructure from analog to digital. Where the SCN satellite transponder was formerly capable of one quality analog signal it is now capable of six quality digital signals in the same bandwidth. Rental cost of the transponder has remained constant resulting in reduced cost while distribution potential has increased six fold. Saskatchewan's telephone infrastructure has made the conversion to digital, possibly the only fully digital network in the world. Clean, 64 kb, digital dial tone telephone lines at a provincial penetration rate that also exceeds connection rates anywhere else in the world provide reliable communications and modem support throughout the province at reasonable cost. The digital telephone network provides high speed Internet lines and Integrated

Services Digital Network (ISDN) lines on a dial-up basis to anyone with a telephone connection. ISDN and the fibre optic network permit two-way compressed video conferencing throughout most of the province. Satellite Internet, satellite telephone and cable television extend Saskatchewan's ability to carry out a variety of distance learning initiatives.

Global Perspective

Simonson, in 1995, stated that "no one really wants to learn at a distance," but "...everyone demands the opportunity to learn at a distance..." His recent statement exemplifies the situation in a world context:

> ... in 1999, it seems that demands for distance education are everywhere. Distance education is beginning to affect almost everyone. Everyone wants to learn at a distance, or have a distance education program. Students are signing up for distance education courses in staggering numbers. Teachers, even chemistry teachers, are offering courses using technology of all categories and offering these courses to distance learners. And, every self-respecting school administrator, college dean, or university president is spouting off about his or her institution's distance education program. (TechTrends, 43:5, p.4)

Synthesis of literature from around the world indicates that technology is more pervasive than it has ever been. A recent government study points to a boom in distance education in both the numbers of courses and enrolment in courses. *(New York Times, January 1, 2000, 12education)* <http://nytimes.com> Tools inherent in information technology provide an unprecedented array of techniques and processes to enhance and alter human activity. Educators at all levels generally accept that information technologies allow for new dissemination mechanisms and new ways for students to engage in inquiry-based learning. Educational agencies are struggling with the basic problem of how to use these technologies to further their educational mission. Most agencies now accept that content delivery does not define learning but that learning occurs as a consequence of processing and acting on the information gained. Former definitions of traditional and distance education are no longer valid as information technology in combination with developing flexible teaching and learning strategies give way to a hybrid model that combines the best qualities of each.

National Perspective

The importance of information to the Canadian people was highlighted in the 1999 Speech from the Throne:

> The Government will become a model user of information technology and the Internet. By 2004, our goal is to be known around the world as the government most connected to its citizens, with Canadians able to access all government information and services on-line at the time and place of their choosing.
> *<http://www.pco-bcp.gc.ca/sft-ddt/doc/fulltext_e.htm>*

Knowledge infrastructure in Canada was further supported with this promise:

> ...provide increased access to high-speed Internet service for classrooms and libraries and stimulate the production of Canadian multimedia learning content and applications. This will build on the success of SchoolNet.
> *<http://www.pco-bcp.gc.ca/sft-ddt/doc/fulltext_e.htm>*

From a national perspective SchoolNet is one of the most significant developments in virtual educational environments. Describing itself as "classrooms without walls, information without limits, communication without borders", Canada's SchoolNet is forging on-line network "connectivity" in conjunction with its provincial and territorial partners.

> On March 30, 1999, Canada's SchoolNet, together with its partners, successfully made Canada the first nation in the world to connect its schools and public libraries to the Information Highway. In its second phase, Canada's SchoolNet continues to work with its partners to extend connectivity to 250,000 access points, the equivalent of one Internet connection per classroom. Steps will also be taken to connect all First Nations communities to the Internet by the end of fiscal year 2000-2001.
> *<http://www.schoolnet.ca/general/special/survey/survey_e.html>*

> "GrassRoots will contribute significantly to fulfilling our vision of making Canada the most connected nation in the world by the year 2000, and helping Canadians become the most sophisticated users of this new technology," Minister Manley stated. 20,000 new projects with an estimated 5 million students participating are anticipated as a result of this program.
> *<http://www.schoolnet.ca/today/press/448.html>*

In 1997/1998 the College of Education at the University of Saskatchewan launched the first fully on-line course in Saskatchewan directed at pre-service and in-service teachers. *<http://www.usask.ca/dlc/CofE2.htm>*. In the 1998/1999 academic year Alberta Education saw the successful launch of a campus-wide on-line learning environment with 14,000 student registrations in 375 on-line courses. Alberta, a leader in development of virtual schools, has 3,600 full-time and 1,800 part-time

students in 24 on-line schools. *<http://ednet.edu.gov.ab.ca/>*. School divisions across Canada are rushing to introduce on-line courses and virtual schools to address a variety of issues facing education in today's society. One such initiative is TeleEducation NB, a province-wide distance learning network in New Brunswick. Their site includes a worthwhile tutorial titled *Learning on the Web*, a free Web-based course written by educators for educators. *<http://teleeducation.nb.ca/lotw/>*

Private and public virtual school and college entities are springing up like flowers after a warm spring rain. Educators have greatly underestimated the demand for learning opportunities that are not constrained by time and place. Early adopters of distance education practices were usually tied to traditional educational organizations because of the cost and complexity of delivery. The advent of reliable, low cost Internet delivery of on-line learning resources and learner/provider interaction has made dramatic changes in who can be a provider. On-line providers are not constrained by costly plant and personnel infrastructures that mandate high tuition costs and public subsidy. The last decade has been a major shake down cruise for diversified delivery of learning in Canada. The make-a-buck-quick "cherry pickers", the dedicated educators, and the traditional educational institutions made use of the Nineties to experiment with new information technology and delivery strategies.

New Strategies

Many agencies have acknowledges the pressing need for action in diversification of the manner in which teaching and learning are articulated in the Province of Saskatchewan. A significant step is a recent report of the reference group study commissioned by the Saskatchewan School Trustees Association with support from Saskatchewan Education titled *Diversifying Opportunities for Learning: Program Delivery in Saskatchewan.* (SSTA Research Report #00-01 *<http://www.ssta.sasknet.com/research/newiss.htm>*) Kate O'Brodovich, reflecting input from the broad-based reference group of Saskatchewan educators, defined the problem and made some recommendations to address challenges faced by Saskatchewan Educators in "extending opportunities for rural and Northern students", as well as "adapting to the increasing diverse needs of students across Saskatchewan".

The reference group agreed that:
> Diversifying learning opportunity means increasing the capacity to expand options, accommodate diverse needs, and adapt to local contexts. It means accepting that quality learning opportunities can be constructed in a variety of different ways.

> Many Saskatchewan schools have already achieved positive results from delivery innovations, proving that learning need not be confined to a particular schedule, place, or grouping of students. Diverse solutions use available means to enhance learning opportunity in each local setting. The next step is to diversify delivery on a province-wide scale so responsive models become the norm, not the exception.

Saskatchewan Possibilities

A smorgasbörd of delivery strategies is available in Saskatchewan. Several flexible teaching and learning initiatives have been undertaken, but these have been limited generally to pilot projects. A promising new project that exploits new delivery possibilities is the creation of a virtual cyber school at Holy Cross High School in Saskatoon. Using the cyber model this school will trial several delivery platforms that offer students educational programming at a time and place of their choosing. (*Saskatoon Star-Phoenix, January 6,2000, p.A3*) This section is an overview by medium that identifies many of the delivery platforms available in Saskatchewan. Links listed provide an opportunity to explore some current delivery initiatives.

Satellite Television
The television signal is uplinked to the satellite and then broadcast directly to the receiving site. Interaction is by telephone, facsimile and computer conferencing.

One-way Video Two-way Audio (full-motion colour)
Saskatchewan Communications Network (SCN)
Created by an act of the Legislature to provide increased access to information for the people of the province. SCN consists of two interrelated networks: the Training Network, delivering post-secondary and high school classes to over 180 classrooms more than 150 communities, and available to businesses and organizations for satellite conferencing; and the Broadcast Network, delivering curriculum support programming, post-secondary credit classes, and general educational and cultural programming through cable, wireless cable, and satellite systems across the province, with a potential reach of approximately 700,000 people.
http://www.scn.sk.ca/

One-way Video

Bell ExpressVu

Direct to home using a set-top box and an 18" (46cm) satellite dish. Telephone connection for interaction is possible. High-Speed Internet via Satellite is coming, using direct broadcast designed for use with home computers Internet via satellite uses the same satellite dish as your TV and accesses the Internet with downloads around three times faster than ISDN. *<http://www.expressvu.com/>*

Star Choice

Direct to home using a set-top box and a 24" (60cm) satellite dish. Telephone connection for interaction is possible. *<http://www.skyecom.com/star.html>*

Compressed Video

Video and audio signals are transformed from analog to digital so they can be compressed and transmitted using telephone lines. One or more ISDN (Integrated Digital Services Network) telephone lines are used to transmit two-way audio and video. Low cost and user controlled dial-up capability are advantages.

Two-way Video Two-way Audio (compressed video ISDN)

Saskatchewan Teacher Education Network (STEN)

Promotes improvement of teacher education in Saskatchewan through application of effective instructional technology to assure equitable access to pre-service and in-service teacher education and professional development programming. *<http://www.usask.ca/dlc/STEN.html>*

Eston-Elrose School Division

The Eston-Elrose School Division uses Picture-Tel technology to provide interactive classes between schools in the division.
<http://www.sasked.gov.sk.ca/schools/estonelrose/pictel.html>

Wireless Television

Digital wireless transmits television signals from a network of towers direct to the home. A set-top box provides the interface with a customer's television set. Systems are conditional access and channel line-ups are tailored to customer need. High speed Internet and interactive data services are possible.

Image Wireless Communications

Image Cable Systems is a Multiple System Operator (MSO) offering cable TV services to 50 Saskatchewan centres. 50 head ends are spread over an area of about 48,000 square miles, offering over 1500 channels, to about 20,000 subscribers.

Schools receive cable & special educational programming and resource support free through participation in the Cable In The Classroom national initiative. *<http://www.imagecable.com/cable/>*

Wireless Internet
Saskatchewan Valley School Division
First school system in Saskatchewan to establish a stand-alone wireless Internet network to 18 schools and the Board Offices. Using spread spectrum wireless technology the schools have access to high speed Internet broadcast from terrestrial towers directly to the schools. *http://svsd.sk.ca*

Satellite Internet
Telephone modems are slow; and in many remote areas, ISDN, ADSL, and cable modem are not available. In these areas fast Internet access is available via satellite dish and a modem connection to the computer. Costs are somewhat higher for two-way downloading and uploading information but equivalent if receive only and the telephone is used for interaction. Several sites are now in use in Northern Saskatchewan.

Internet
Canada's SchoolNet
Connects Canadian schools and public libraries to the Information Highway by providing access to high-speed Internet service for classrooms and libraries to distribute Canadian multimedia learning resources and stimulate development of content and applications. SchoolNet will extend connectivity to 250,000 access points, one Internet connection per classroom, and plans to connect all First Nations communities to the Internet by the end of fiscal year 2000-2001.
<http://www.schoolnet.ca/home/>

Internet Access Providers Meta-List
<http://www.herbison.com/herbison/iap_meta_list.html>

Global Internet ACCESS Providers
<http://www.thedirectory.org/>

Canadian Internet Service Providers
<http://abc.gc.ca/abi/6E.HTM>

Telephone High Speed

SaskTel Internet - High Speed Service

High Speed Internet service gives full Internet access, including e-mail and the World Wide Web. Up to 50 times faster than 28.8 kbps modem service and allows you to talk on the phone and access Internet at the same time, on a single telephone line.

<http://www.sasktel.com/highspeed/>

File Hills Internet

A Canadian company owned by five Canadian First Nations Bands is the largest non-government Internet Service Provider in Saskatchewan.

<http://www.filehills.com/>

Telephone Modem

There are many Internet Service Providers in Saskatchewan. Dial-up access uses plain old telephone lines (POTS) connected to the computer via a telephone modem. Generally this is considered slow access varying from 28.8 to 64 KBPS.

SaskTel Internet - Residential Dial-up Access

All-in-one Internet access, service, software, email access and Sympatico™ service. No matter where you live in Saskatchewan there are no long distance charges for dial-up access Internet service from SaskTel.

<http://www.sasktel.com/sympatico/index.html>

America On Line

Full function Internet access service. *<http://www.aol.com/>*

UNIBASE TELECOM LTD

<http://www.unibase.com/unibase/>

Year 2000 Service Providers

<http://www.oecd.org/ehs/y2k/canada/it03442e.htm>

DataLink CanadaWest

<http://www.dclwest.com>

Quadrant Newmedia

<http://www.quadrant.net>

WBM Office Systems
<http://www.wbm.ca>

Cable Internet

Using existing cable architecture cable companies are bringing high speed Internet into the home using a cable modem connection to the computer. This system is around 100 times faster than a regular telephone modem. The computer is connected to the network at all times, thus avoiding the necessity to dial each time as with a telephone modem.

Shaw Cable Systems
<http://shaw.home.com/>

Conclusion

" Timely collaborative action is needed to create the future for education in this province". *<http://www.ssta.sasknet.com/research/newiss.htm>* The opportunity is there for Saskatchewan to maintain its long established leadership role in the use of information technology for information sharing. The "barbed wire" telephone systems of a Century ago in rural Saskatchewan have given way to world class fibre optic and satellite information pathways of the future. A "made in Saskatchewan" flexible teaching/learning environment linking rural and urban learners in a seamless fabric is an eye-blink away if Saskatchewan educators collaboratively respond to the need using existing provincial infrastructure and resources. The key is collaboration!