

NETWORKING QUEBEC SCHOOLS THROUGH ICTs

OECD-PEB SEMINAR

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Outline of presentation

1. Declining enrolments
2. Measures put forward to preserve village schools
3. Implementation of a fibre-optic web
4. *Remote School Network* project
5. Videoconferencing equipment
6. Conclusions

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Declining enrolments

- ❖ Quebec has 72 school boards administering its network of elementary and secondary schools
- ❖ This Quebec school network comprises 3 000 schools (2 300 elementary, 500 secondary and 200 combined elementary and secondary)
- ❖ Elementary and secondary school enrolments are expected to have declined 10% between 1993 and 2006 (from 1.01 to 0.92 million students)
- ❖ Quebec's birth rate is 1.43 – one of the lowest in the world

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Declining enrolments

- ❖ Quebec has seen migration to urban centres (continued stability in the

- city of Montreal; 25% decline in remote regions)
- ❖ 440 schools have fewer than 100 students, and 61 of them have fewer than 40 students
 - ❖ In view of this situation, it has become obvious that to preserve village schools is important
 - ❖ It is important because schools are a powerful symbol of the development and vitality of rural communities. They attract young families

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2. Measures put forward to preserve village schools

- ❖ The government has said it intends to ensure that village schools are preserved:
 - Because communities want them
 - Because parents want them
 - Because the welfare of students depends on them
 - So that high-quality educational services can be delivered

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2. Measures put forward to preserve village schools

- ❖ To meet this objective, the Ministry of Education has implemented:
 - A number of financial support measures to boost the operating budgets of village schools
 - Special capital investment subsidies so that school boards can undertake major renovation work

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2. Measures put forward to preserve village schools

- ❖ In particular, to meet this objective, the Ministry of Education has decided to harness information and communications technologies (ICTs) by:
 - Setting up a fibre-optic web linking Quebec's 3 000 schools:

Connectivity for Quebec's Communities

- Undertaking a project to develop new pedagogical approaches exploiting ICTs: the *Remote School Network*

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Main support measures
to preserve
village schools

Additional \$ aid

- For operations
- For capital investment

Providing access to ICTs

Part I:

Fibre-optic web

Part II:

Remote School Network
project

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Implementation of a fibre-optic web

- ❖ A fibre-optic web is being deployed to:
 - Provide access to ICTs and unleash potential for innovation in small schools
 - Foster school / community ties for new synergies in local development
 - Promote online government services

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Implementation of a fibre-optic web

- ❖ Quebec spans a vast amount of territory
- ❖ Linking 3 000 schools and buildings in 1 200 municipalities via a fibre-optic web is therefore a colossal challenge, especially for small schools in remote areas

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Implementation of a fibre-optic web

- ❖ Launch in 2001 of a government aid programme *Connectivity for Quebec's Communities* aimed at municipalities and school boards
 - Total capital investment of C\$225m (€140m)
 - Government aid = 66.7%

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Implementation of a fibre-optic web

- ❖ Difficulties encountered
 - Need for numerous partnerships
 - School boards / Municipalities
 - With owners of surface telephone and electric power distribution networks
 - With government-regulated telecommunications firms

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Implementation of a fibre-optic web

- ❖ Difficulties encountered (continued)
 - Limited availability of expertise has made it necessary to develop know-how
 - Existing regulatory provisions have had to be amended
 - Partnerships are complex
 - All these difficulties have delayed deployment, which is now 15% complete. Deployment is expected to be completed around 2006-2007

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Implementation of a fibre-optic web

- ❖ The web's architecture has three levels:
 - *Access* level

- This is the network's end point
- Schools can access the network at a minimum of 100 Mbps
- *Distribution* level
 - This involves groups of schools
 - Designated schools serve as distribution centres
- *Central* level (backbone of the network)
 - Traffic between the *central* and *distribution* levels is at 1 Gbps

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Implementation of a fibre-optic web

Diagram of web architecture

CENTRAL

Administrative Building -----> Administrative Building -----> Web

↑
Ethernet
1 Gbps

DISTRIBUTION

School School School School School School School School

Ethernet
100 Mbps
↓
Schools

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Implementation of a fibre-optic web

- ❖ Required equipment
 - Optical fibres
 - Level-3 switches at *Central* level

- Level-2 or -3 switches at *Distribution* points
- Level-2 switches at *Access* level
- Optical converters (*short- and long-distance*)

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4. *Remote School Network project*

❖ Project objectives

- To ensure the accessibility and quality of educational services in small schools (equal opportunity) through the use of ICTs
- To experiment with alternative learning models with school staff and students
- To analyse how the *Remote School Network* model can be expanded, and to explore ties between schools and communities

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4. *Remote School Network project*

❖ The approach:

- Research / action approach
- Involvement of numerous participants from government, school boards and the Centre Francophone d'Informatisation des Organisations (CEFRIO), which was mandated to co-ordinate the project. Anyone interested may visit the CEFRIO web site at the following address:
http://www.cefrio.qc.ca/english/projets/proj_34.cfm

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4. *Remote School Network project*

❖ The project:

- 3 school boards outside major centres, including 1 in Quebec's Far North
- 3 pilot schools (2 elementary and 1 secondary) and 7 partner

schools

- 30% of learning activities in network mode with other schools
- Connectivity delivered by fibre optics, i.e. “broadband”
- Video on Internet, knowledge-building software, platform

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4. *Remote School Network project*

❖ Project accomplishments:

- Networked learning activities, designed by teachers
- Review of transformations for school administrators, teachers and students
- Review with school boards of how to expand the *Remote School Network* model
- Analysis of technical issues
- Analysis of school / community partnership models

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4. *Remote School Network project*

❖ Results of observation:

- Change in participants’ attitudes
- Improvement in schools’ educational environment
 - Number and quality of interactions for students
 - Socialisation opportunities for students with students from other schools
 - Organisation of teachers’ work, reduction of professional isolation
 - Students’ curriculum learning maintained or increased at the end of the pilot project

- Positive effects on the community's perception of schools
- Innovation conducive to keeping teachers

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4. *Remote School Network project*

- ❖ Conditions for expansion:
 - Teachers' pedagogical practices, along with administrative practices, must change
 - Communications between organisations equipped with Intranets pose computer security problems. Possible solutions are being explored
 - The *Remote School Network* project entails purchasing hardware for teachers and students

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4. *Remote School Network project*

- ❖ Conditions for expansion (continued):
 - The Network's implementation requires an administrative style suited to a context of innovation
 - Accomplishments are fragile and will have to be consolidated before the routine stage is reached (temporary programme)
 - Practices must be integrated into teacher training

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Videoconferencing equipment

- ❖ To encourage wide-scale use, equipment should be:
 - Economical, so it can be available everywhere
 - Similar to equipment used on Internet by the general public
 - Simple to use for instructors and students

Videoconferencing equipment

- ❖ Comprising, in addition to a PC with videoconferencing software (“ivisit” or other) and broadband access:
 - For individual work:
 - Headphone with mic
 - Web cam
 - For classes or group work:
 - Digital projector / large television
 - Sound system
 - Wireless mic

[Insert photographs]

Conclusions

- ❖ Quebec, like most western societies, has a very low birth rate
- ❖ Innovative solutions must be envisioned
- ❖ By harnessing NICTs, new approaches are being explored, and the *Remote School Network* project shows very great potential

Conclusions (continued)

- ❖ We think Quebec’s experience could be of interest to other OECD-PEB Member countries
- ❖ To get in touch with the specialists running the project, I invite you to leave me your contact details