

A Matrix for E-Collaboration in Rural Canadian Schools

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INTRODUCTION

This is a case study of interinstitutional e-collaboration in a rural part of Canada, based on e-teaching and e-learning for senior high school students. In the process of developing e-collaboration between institutions, new structures and processes were created that complemented traditional schools. Through this initiative, e-collaboration provided extended educational and, indirectly, vocational opportunities for senior students in small schools in Atlantic Canada.

In a pilot study in 1999, selected advanced placement (AP) subjects were made available online for what was believed to be the first time. Furthermore, the AP subjects were made available online to students in senior classes in small rural Newfoundland and Labrador secondary schools ($N = 8$). There were no online AP courses to guide the initiative at the time and the curriculum at this level had not previously been provided to students in small rural schools. Through interinstitutional e-collaboration senior students in rural schools in a small part of Atlantic Canada were provided with extended learning opportunities. AP instruction was developed both on site and online, synchronously and asynchronously within new collaborative structures organized around e-teaching and e-learning.

BACKGROUND

It has always been difficult to provide senior students in rural schools with curriculum opportunities equal to their peers who are educated in larger, usually urban institutions. Governments find it difficult to justify the appointment of specialist teachers to rural schools when there are small numbers of students on site requiring instruction in their areas of specialization. Accordingly, many senior rural students leave home to be educated in urban schools. In some cases they are taken by bus to larger institutions on a daily basis while others are

educated in boarding schools. The issue of equality of educational and, indirectly, vocational, opportunities is at the heart of most initiatives to provide extended learning opportunities for rural students (Hawkes & Halverson, 2002; Information Highway Advisory Council, 1997).

Newfoundland and Labrador is one of the smallest Canadian provinces in terms of population. The province is characterized by its predominantly rural social structure, its distinctive history, and its unique culture. Approximately two thirds of schools in this province are in rural communities, almost all of which are located on the coast. A few of the smallest and most isolated communities have no road access. The reorganization of primary, elementary, and secondary education in Newfoundland and Labrador into 10 school districts provided an opportunity to develop the first digital intranet in the province. School District 8 contained 18 schools ranging in student enrolment from 40 to 650. School District 8 was approximately 2 hours by road from the capital city, St. Johns, which is the location of Memorial University of Newfoundland. Eight schools within the school district, together with the TeleLearning and Rural Education Centre of Memorial University of Newfoundland, formed a digital intranet within which senior science courses were taught in open classes. By including this research and development centre (located within the Faculty of Education of the only university in the province) in the new rural school structure, collaborative research between academics and teachers was encouraged. The synergy of professional development between schools and a professional faculty addressed a concern recently raised by Thompson, Bakken, and Clark (2001) that "seldom are classroom teachers required to become involved in research/scholarly inquiry." As schools in the school district and academics at the University were involved in the organization of teaching and learning in the new electronic structure, collaboration quickly followed. Collaboration between participating schools and the Centre for TeleLearn-

ing and Rural Education at Memorial University of Newfoundland led to the development of Web-based Advanced Placement courses.

A MATRIX FOR E-COLLABORATION BETWEEN SMALL RURAL SCHOOLS

The creation of the first digital intranet in Newfoundland and Labrador was with a group of eight small schools in the same rural education district and was a pilot study. Schools in a single district were academically and administratively integrated so that teacher expertise could be shared by designated senior students for whom on-site instruction was not otherwise available. This involved collaborative teaching and learning in an environment within which schools were competing for a declining number of students.

The development of the first school district digital intranet in Newfoundland and Labrador involved a matrix of technological, pedagogical, organizational, and conceptual change. In rural Newfoundland and Labrador, this matrix supported the creation of a rural school district digital intranet of four interconnected dimensions:

Technology	Pedagogy
Organization	Conceptual change

Technologically, the development of the school district digital intranet was difficult. In many parts of the province telecommunications infrastructure was barely adequate to link schools within such a structure. Minimum specifications were adopted for computer hardware and network connectivity. All schools involved in the project had DirecPC satellite dishes installed to provide a high-speed down-link. In most rural communities in this part of Canada, digital telecommunications infrastructures do not enable schools to have a high-speed up-link to the Internet. For real-time instruction, Meeting Point and Microsoft NetMeeting were selected. This combination of software enabled a teacher to present real-time interactive instruction

to multiple sites. An orientation session was provided for students prior to the implementation of this project. Students had to learn how to communicate with each other and with their instructor using these new technologies before classes could begin. Although there was some shared technical support in the district, principals expressed a desire to have a technician, if possible, on each site. In some schools, teachers with expertise in computer technology were undertaking technician roles in addition to their classroom activities to keep computers operating. This was accepted by teachers and principals as necessary in emergencies, but it was not considered to be an ideal situation. At the time of the pilot study there was a fragile technical infrastructure in some parts of the intranet, depending in some instances on the good-will of particular teachers to ensure that it was maintained. This situation was not conducive to the expansion of the intranet and was not likely to encourage new teachers to begin using IT in their classrooms. The need for students to be comfortable with the technologies to which they were introduced became apparent early in the school year. One teacher subsequently recommended training in the use of technology prior to a student undertaking an online course in future, including the use of WebCT (My Records, chat rooms, lessons, quizzes, Bulletin Board, private mail and using attachments to transfer assignments); Netmeeting and Meetingpoint (logging in, whiteboard, chat, efficient collaborative use of the microphone). Students were almost evenly divided between those who had computers at home with Internet access and those who did not. During the third research visit, 25 students were interviewed: 13 indicated that they had this technology in their homes while 12 did not.

Pedagogically, the integration of schools in a single district meant teaching in ways that were different from traditional classroom practices. Instead of providing instruction exclusively within their own classrooms, teachers had to consider teaching collaboratively from one site to another in what became shared teaching and learning space. The challenge of teaching between rather than exclusively in schools focused attention on what Van Manen (2002) terms “the pedagogical task of teaching.” For some teachers this was difficult to accept when a colleague on another site had the role of teaching AP students on line in his or her school, from another school in the district intranet. For those teachers who taught the initial AP subjects of chemistry, mathematics, physics and biology within the new col-

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