Technology Mediated Learning to Sustain Rural Schools: Personal Reflections on an e-Learning Project

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Introduction

In many countries, there is a policy issue related to the provision of educational opportunities in small rural communities to ensure the opportunities are comparable to those available in urban areas (Hawkes & Halverson 2002; Multani, 2007). The issue is one of economy of scale as it is expensive to provide specialized areas of the curriculum, on-site, to small numbers of students. The enrolment of senior rural students in boarding schools, providing instruction by correspondence based on print and audio and bussing them to larger, sometimes urban institutions, have traditionally provided solutions to this problem.

In recent decades, technology-mediated learning has provided new solutions for those who are educated beyond major centres of population. An example of how this solution has been implemented is provided by the case of high-school education in the province of Newfoundland and Labrador, Canada. In particular, a project in the former Vista school district of Newfoundland and Labrador changed the nature and scope of rural education and, in doing so, provided a possible template for other places where people are educated in small and isolated communities (Stevens, 2007).

The Vista Project was designed to explore ways of academically and administratively linking rural schools in dispersed communities, thereby creating collaborative, Internet-based teaching and learning structures for senior high school students. Following the creation of an initial intranet based on eight small rural schools, other communities joined the Project before the provincial government called for a ministerial inquiry into the emerging practice of what was referred to as distance learning in schools (Government of Newfoundland and Labrador, 2000). After extensive analysis of student, teacher, parent and school submissions, the Project was extended to include almost all schools in the province through the provincial government's creation of the Centre for Distance Learning and Innovation (CDLI).

The purpose of this reflection is provide an overview of the Vista Project and to illustrate how it led to the development of forms of K-12 distance education that exist in the province today. The reflection highlights the advantages of the project for the province, in general, and for students, in particular.

Background to the Vista Project

With continuing out-migration, most small schools in Newfoundland and Labrador are decreasing in size and, during the last decade, many have closed.

Furthermore, there has been consolidation of provincial school boards from ten to four and, in 2013, from four to two (an English and French district), reflecting the reduction in size, location and number of schools in the province. The changes that have taken place in the organization and administration of education in rural Newfoundland and Labrador have influenced classroom structures and processes.

In 1998, when the Vista intranet was established to academically and administratively integrate eight small rural schools through the local school board, teaching and learning in selected senior classes could, for the first time, be shared between the dispersed sites. The eight participating schools had to coordinate senior classes in those areas of the curriculum that were taught across multiple sites if they were to be able to work together. Some schools received instruction for senior classes from teachers located on other sites (schools) within the network.

Classrooms that had previously been closed to one another began to open to classes located in other parts of the district network for both teaching and learning. The autonomy of teachers within their own classrooms as well as their isolation from other members of the profession were challenged by this initiative. Students were required to discuss their work with peers they did not know and who participated in shared lessons taught from other locations. The traditional closed, or autonomous, model of the school was challenged by an increasingly open teaching and learning environment in which the sharing of teaching resources and collaboration between both teachers and students was facilitated and encouraged.

Four Advanced Placement (AP) web-based courses in Biology, Chemistry, Mathematics and Physics were developed. Each of the four subject areas was organized by a development team. A lead science teacher in each discipline was paired with recent graduates in each of the disciplines of Biology, Chemistry, Mathematics and Physics who possessed advanced computer skills including web page design, Java and HTML. The lead teacher and the graduate assistant were advised from time-to-time by Faculty of Education specialists at Memorial University of Newfoundland in each curriculum area and, where possible, scientists from the Faculty of Science.

Most course development took place through interaction between lead teachers and the recent graduates. This model enabled the four courses to be developed over a sixteen-week summer recess period in time for the1998-1999 school year. 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 (Stevens, 2003).

The initial intranet in the Vista school district challenged the notion that senior students in small schools had to leave home to complete their education at larger schools in urban areas. By participating in open classes in real (synchronous) time, combined with a measure of independent (asynchronous) learning, senior students were able to interact with one another through audio, video and electronic whiteboards. On occasion, they met for social interactions and to spend some time with their science teachers in person.

The initial electronic linking of eight sites within a school district to collaborate in the teaching of AP Biology, Chemistry, Mathematics and Physics initiated a series of open classes in rural Newfoundland. The creation of the first intranet was an attempt to use information and communication technologies to provide geographically isolated students with extended educational and, indirectly, vocational opportunities. This initiative was part of a broader pan-Canadian initiative (Information Highway Advisory Council, 1997) to prepare people in Canada for the Information Age (Ertl & Plante, 2004). The development of the first intranet within a single school district involved the introduction of an open teaching and learning structure to a closed one. Accordingly, adjustments had to be made in each participating site so that administratively and academically, AP classes could be taught.

The structural changes that have taken place in Newfoundland and Labrador since the inception of the first intranet, within which initial AP courses were developed and taught, has advanced to become a system that provides online instruction to almost all schools in the province. Following the provincial government's ministerial inquiry, links between schools were considerably expanded through the creation of CDLI as a division within the Newfoundland and Labrador Department of Education. CDLI develops and administers online learning that complements traditional classes in schools throughout the province.

Awareness of what was taking place in the delivery of education in the province had to be introduced to pre-service as well as practicing teachers who had traditionally been prepared to teach in autonomous, or closed, teaching and learning environments called classrooms. While many members of the profession will continue to provide instruction in traditional closed environments, an increasing number will teach in open, collaborative, internet-based learning spaces (Craig & Stevens, 2011).

Reflections on the Vista Project

It is timely to reflect on what was achieved by the technology-mediated learning that the Vista project provided for selected rural Newfoundland students. By networking small rural schools within intranets, schools that were physically small in terms of the number of teachers and learners on-site, became, in effect, much larger structures that were able to offer extended teaching and learning opportunities.

Teachers in the Vista intranet had been appointed to traditional schools but, through this project, some taught in the space between participating sites. Principals in participating Vista schools had teachers who were not members of their staff entering and leaving their schools at pre-arranged times of the school day which presented a lack of control over this new organization. Nevertheless, by fostering collaborative learning and teaching within extended networked structures, culminating in the creation of CDLI, educational opportunities were enhanced for many of the participating senior students.

A double first was achieved. Advanced Placement science and mathematics were, for the first time, made available online to rural students within the Vista intranet and, for the first time, AP courses were taught online rather than in traditional face-to-face mode. This was particularly significant for senior high school students in rural schools in the province, who, like their rural counterparts in other developed societies (e.g., Australia, New Zealand, Iceland) traditionally have not had the range of subjects available to them, on-site, that their urban counterparts take for granted.

Viable rural schools are essential for the resourced-based Canadian economy and are an integral part of it. In Canada, Australia, New Zealand, South Africa, Iceland, Norway and other parts of the world, a considerable part of national wealth lies beyond urban areas in fishing, agriculture, horticulture, forestry and mining. It is difficult to attract professional middle class parents to small rural communities in resource-based economies like these if they believe their sons and daughters will be disadvantaged through lack of learning opportunities. By adding AP subjects to local school curricula through the Vista Project, a considerable advance was made in extending learning opportunities for rural students.

In the Vista Project, traditional rural educational concerns about school size and location were addressed through technology-integrated learning. Eight schools were academically and administratively linked with one another, facilitating collaborative teaching and learning made possible by the Internet. Geographical isolation receded as an educational consideration as schools shared resources and learning opportunities expanded. Schools within the initial intranet became, in effect, sites within a teaching and learning network.

A model of technology–mediated learning for rural schools

As access increases to the Internet, the provision of education in rural Newfoundland and Labrador that is increasingly based on technology provides a useful model for other parts of the world. The structures and processes that have been implemented in this province have provided enhanced educational opportunities for students and have extended teacher expertise to larger numbers of learners than traditional classrooms permit. The Vista Project provided the catalyst for the provincial government’s ministerial inquiry

(Government of Newfoundland and Labrador, 2000) and a platform for the creation of the CDLI.

The provincial government has sustained this early Project through changes in the teaching profession that include the appointment of e-teachers, on-going technological adaptation to changes and the expansion of CDLI to manage and further develop e-learning in schools. A feature of the sustainability of this Project has been the close relationship that has developed, in pursuit of the shared goal of providing quality high school education in rural communities, between teachers, university researchers, policy-makers and administrators and technology providers. Ultimately, the Project has been sustained for cultural reasons: it provides support, through enhanced educational opportunities, for the many rural communities that are part of the cultural identity of people in this province. Where else would one find such close integration of a school system, the Department of Education, a university Faculty of Education and diverse rural communities?

Rural schools in Newfoundland and Labrador have been changed by technology-integrated teaching and learning initiated by the Vista intranet. Today's classes in the province's schools that are located beyond major centres of population are increasingly open places based on structural integration through CDLI, within which e-teaching and e-learning have flourished. The new structures and processes of technology-based education have enabled the province of Newfoundland and Labrador to meet the challenges of distance and isolation and extend learning opportunities regardless of the location of teachers and learners. In doing so, the province has implemented a solution to the perennial rural educational problem of economy of scale. Small student enrolments in dispersed, isolated communities are no longer barriers to extended curriculum opportunities.

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