Open Classes and Access to Learning Opportunities for Young People in Rural Communities

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In most countries some people live beyond major centres of population and, with the advance of e-learning, expect to receive the same educational opportunities as those who live in cities. For governments this raises the policy problem of justifying the provision of specialized teaching and learning resources in sparsely-populated areas that will be used by relatively few people. In rural Canada a solution has been found in the internet-based academic and administrative integration of small schools in rural communities so that they are able to share teachers, particularly those in specialized areas of the curriculum. The development of collaborative teaching and learning has been facilitated by these structures known as school district intranets.

The purpose of creating open classes that link teachers and learners in small schools in rural communities is to extend educational and, ultimately, vocational opportunities, for young people. Internet-linked open classrooms that connect increasing numbers of rural students within school district intranets use traditional face to face and virtual teaching and learning. These open educational structures challenge the dominance of school size and location, enabling young people to meet in educational cyberspace to share experiences and collaborate in learning projects.

THE DEVELOPMENT OF OPEN CLASSES IN NEWFOUNDLAND AND LABRADOR

The re-organization of primary, elementary and secondary education in Newfoundland and Labrador over the last decade into ten and, subsequently, five school districts, provided opportunities to develop intranets in the province within which virtual teaching and learning environments could be created. Three stages in the development of open classes can be identified in the school system of Newfoundland and Labrador.

(i) The Development of Web-based Science Courses in Selected Schools

Initially internet-based courses were introduced in selected schools in Newfoundland and Labrador in the belief that these would become "lead schools" and assist other institutions in adopting and using new technologies in teaching and learning. This initiative was not popular with schools that were not selected for a leading role, many of whom countered by drawing attention to the collaborative use of information technologies in models already developed in New Zealand (Stevens, 1999) and Iceland (Stefansdottir,1993) in which schools were academically and administratively linked using telephone services before the advent of the internet. After one year of developing information technologies in selected lead schools in rural Newfoundland and Labrador, it was decided to develop internet-based courses in a more collaborative model across a small network of schools following the examples of Iceland and New Zealand (Stevens, 2003a; 2003b). Two initiatives accompanied this decision. First, it was decided that within the initial network in Newfoundland and Labrador four Advanced Placement (AP) subjects would be provided on line. Second, these subjects would be provided on line to rural students in participating networked schools, some of which had very small student enrolments. Previously all AP teaching across North America had taken place in traditional schools located in urban centres through face to face instruction. For the first time, AP was delivered online and to small schools in rural communities.

The development of Advanced Placement internet-based courses in Biology, Chemistry, Mathematics and Physics took place within a development team in each subject area. In developing AP courses on-line, a lead science teacher in each discipline was paired with a recent graduate in 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 appropriate, scientists from the Faculty of Science. The extent to which each web-based course was developed by a team of four people varied. Most course development took place through interaction between lead teachers and the recent graduates. Although at times faculty members had different opinions as to the most appropriate approach to the design of the courses, this model enabled the four courses to be developed over a sixteen-week summer recess period in time for the next school year. The first intranet was created in a single school district of Newfoundland and Labrador – a district that has recently been absorbed into another school district though provincial re-organization of education.

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 did not enable schools to have a high speed up-link to the internet. Appropriate software had to be identified and evaluated for both the development of the resources and the delivery of instruction within the Intranet. Front Page 98 was selected as the software package. Additional software was used for the development of images, animated gifs and other dimensions of course development. These included Snagit32, Gif Construction Set, Real Video, and similar packages. Many software packages were evaluated and finally WebCT was selected. This package enabled the instructor to track student progress, it contained online testing and evaluation, private E-mail, a calendar feature, public bulletin board for use by both instructor and student, a link to lessons and chat rooms for communication between teacher and student. 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.

(ii) Teaching Senior Science in a School District Intranet

The creation of the first school district intranet was an attempt to use information and communication technologies to provide geographically-isolated students with extended educational opportunities. In eight schools within the first rural school district of Newfoundland and Labrador, 55 students were enrolled in AP Biology, Chemistry, Mathematics and Physics courses. (AP courses enable senior students to begin undergraduate degrees with a small part of their program completed from high school if passes are achieved at grade levels specified by the university to which they direct enrolment applications). The school district initiative challenged the notion that senior students in small schools have 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. From time to time they met for social occasions and to spend some time with their science teachers in person. Research into the organization of senior students who were independent learners in a networked environment in New Zealand (Stevens, 1994) preceded the formation of the initial school district intranet in Canada. Independent learners in New Zealand were found to learn effectively and were able to obtain satisfactory results in national examinations within an electronic network of small rural schools. In the New Zealand situation though, students usually had at least one teacher on site to assist with questions of an academic nature. In the Canadian intranet, this was not always possible. A question facing teachers and researchers in the initial stage of the first Canadian school district intranet was whether students who were not used to being unsupervised

could cope with new freedom and accept increased responsibility for their learning. Students were unanimous at the conclusion of the Canadian school year, that to be successful in an AP on-line course, it was necessary to be able to learn independently, cope with a high volume of work and be willing to ask teachers and other learners questions as they arose (Stevens, 1999).

(iii) From Closed to Open Teaching and Learning

The province of Newfoundland and Labrador has a high rate of use of satellite dishes per capita and there are many schools in the province with Local Area Networks (LANs). As a province, Newfoundland and Labrador provided excellent opportunities for the development of these technologies. Students in the initial school district intranet were frequently subject to scrutiny by their peers as they responded through chat-rooms, audio, video and with their AP on-line teacher. The intranet provided students with access to multiple sites simultaneously, as well as the opportunity to work independently of a teacher for part of the day. The need to prepare for classes before going on-line became increasingly apparent to both teachers and students if the open, synchronous, science classes were to succeed. The advent of the intranet had implications for students who had to interact with teachers and their peers in a variety of new ways. The teaching of each of the four AP science disciplines in the intranet took place within classes that were open between participating sites.

The major change for the students in the first intranet in Newfoundland and Labrador was the opportunity to study advanced science subjects, as members of open classes, from their small, remote communities. The need for increased technical support for this new, open structure became increasingly urgent for teachers and students who were using information and communication technologies to teach and learn across dispersed sites. Both had to be provided with expert advice and instruction in the use of new applications. A problem has been the ongoing difficulty of securing and maintaining instructional design expertise in the preparation and upgrading of courses delivered through the intranet. Following a ministerial inquiry into what became known as "distance education in classrooms" in rural Newfoundland and Labrador schools, a decision was made by the provincial Department of Education (Government of Newfoundland and Labrador, 2000) to accelerate and extend the development of school district intranets. Within the Department of Education of Newfoundland and Labrador, a Centre for Distance Learning and Innovation (CDLI) was established to promote on-line learning within and between new electronic educational structures throughout the province.

ACCESS TO LEARNING OPPORTUNITIES FOR YOUNG PEOPLE IN RURAL COMMUNITIES

The structural changes that have taken place in Newfoundland and Labrador since the inception of the first school district 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. The provincial government, by advancing the creation of open classes between schools through the Centre for Distance Learning and Innovation, has expanded learning opportunities for young people in rural communities. Today 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, in future, teach in open, collaborative, internet-based learning spaces.

Changes have begun in the professional education of teachers in the province's only university. To be professionally prepared for the reality of new, virtual educational structures and processes in Newfoundland and Labrador it is necessary to introduce pre-service teachers to institutional as well as professional collaboration. The contradiction of teaching in closed learning spaces (or traditional classrooms) located in collaborative networks of schools challenges students to re-examine the changed nature of education in the province. Pre-service teachers are asked to consider research on the use of computers in education (Lowther et.al., 2003; Mathiasen, 2004)

and their potential for collaborative teaching as well as shared learning between dispersed sites (Cavanaugh, 2001; Ertl and Plante, 2004; Hawkes, and Halverson, 2002). A first step is to organize students into learning circles within which they can share recent classroom experiences from their internships and from which they often discover common problems. Discourse about shared experience between students and between teachers facilitates the creation of new realities as participants discover common perceptions, experiences and problems. The development of shared realities through cybercells - the integration of actual and virtual groups in which face to face members extend their discussions to collaborate with virtual visitors (Stevens & Stewart, 2005) - challenges teacher and student isolation in a way that is similar to how intranets challenged the physical isolation of rural schools in Newfoundland and Labrador over the last decade. In a cybercell teachers who collaborate on an actual site (or school) can share their discussions with virtual colleagues from other sites located within their internet-based network and beyond. Cybercells enable shared realities to be created both on site, for example, in a particular school, as well as virtually, by enabling participants at a distance to engage in discourse with those in a given, physical location.

IMPLICATIONS OF THE CREATION OF OPEN CLASSES IN RURAL COMMUNITIES

The development of open classes linking traditional small schools in rural Canadian communities has implications for teaching and learning, the organization of classes and for the management of schools. Space between small rural schools has become educational space and teachers have, in increasing numbers, learnt to teach within it as well as in their traditional on-site classrooms. E-teachers now complement traditional classroom pedagogy and provide an enhanced educational environment for the province's high school students. Students in rural Newfoundland and Labrador attend school in their local communities and engage with a growing number of e-learning programs administered by CDLI so that in the course of a school day high school students in the province interact in both actual and virtual learning spaces. An implication of these changes is that many schools have, through the creation of open learning structures and processes, become sites within teaching and learning networks. The institutional autonomy of traditional schools, particularly those located in rural communities, has been challenged as they increasingly engage with other schools (sites) to share teachers and resources. In doing so, collaborate teaching and collaborative learning has been fostered. In contemporary Newfoundland and Labrador the notion of traditional schools has been challenged and the concept of "rural" education is becoming redundant. The size and location of schools (sites) that participate in open learning structures (intranets) is no longer significant for education policy.

CONCLUSION

Early adoption of the internet by selected Newfoundland and Labrador rural schools and the creation of new structures and processes based upon it has transformed education in the province. The sustainability of the open learning project has been underpinned by mutual pursuit of the goal of providing quality high school education in rural communities, between teachers, university researchers, policy-makers, administrators and technology providers, supported by the willingness of senior rural high school students and their families to consider new ways of accessing educational opportunities. The project has been further sustained for cultural reasons in that it provides support, through enhanced educational opportunities, for the many rural communities that are part of the cultural identity of people in Newfoundland and Labrador. The next step in the development of the open classes that have extended learning opportunities for young people in rural Newfoundland and Labrador, is to consider how the advanced technological beacons that many small schools have become, can support adult and further education within the communities in which they are located. When this has been achieved, the province will have created communities of learners based on the increased teaching capacities of its rural schools, that meet the Information Highway Advisory Council's 1997 vision of preparing Canada for the digital world.

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