

## Linking Communities through Internet Technologies

By Dr. Rodelyn Stoeber

**N**ew Internet technologies are available that can provide teachers—especially those in isolated rural areas—with support in dealing with the many challenges they face in the classroom.

My research seeks to understand how the use of Internet technologies in a virtual community affects, positively or negatively, the teaching of science in a potentially high-risk environment—in this case, the minority language setting.

There is often considerable distance between schools within a school division, and it can be very difficult and expensive getting all the teachers together in one place for professional development sessions or other projects. To investigate whether recent innovations in Internet technologies could alleviate these challenges, Project CRÉAS (*Centre de recherche sur l'enseignement et l'apprentissage des sciences*) was initiated. This project is meant to support teachers in their instructional role, not to replace them through the implementation of distance education courses.

Project CRÉAS is a collaborative effort among the Division scolaire franco-manitobaine (DSFM), the Bureau de l'éducation française (BEF) of Manitoba Education, science and science education professors of the Collège universitaire de Saint-Boniface (CUSB), as well as francophone Grade 9 Science teachers. Dr. Léonard Rivard has been instrumental in the implementation of the research and has provided guidance for the direction of this work. With Dr. Brian Lewthwaite from the University of Manitoba, we have developed and validated an instrument to assess the effectiveness of the professional development provided to teachers.

An offshoot of Project CRÉAS is Project PEER (*Petites écoles en réseau* or the Creation of a Small School Network). In this project, small francophone rural schools were linked together by Internet technologies to explore scientific principles and concepts within a social constructivist framework. This project's model could be applied not only to those teaching in a minority language context, but also to those teaching in isolated rural areas, whatever the language of instruction. Within the framework of Project PEER, information and communication technologies were developed and used to reduce teachers' isolation, to provide them with additional support, and to promote the study of science among francophone students.

In another research project, a microcomposter was used to study the dynamics of a "mini-ecosystem." Internet

technologies were used to support student understanding of the importance of composting and the science associated with this activity. Using a prototype microcomposter developed by Fernand Saurette, a scientist from CUSB, students observed and tested the factors impinging on the decomposition of organic matter and the recycling of these elements into the ecosystem. They also studied the biodiversity within this mini-ecosystem. The microcomposter was used as a tool for teaching the scientific principles involved and for emphasizing the importance of sustainable development and the protection of the environment. Technological tools were used to facilitate and motivate students in a collaborative learning environment. These included Moodle, which is an interactive website, Elluminate, which is synchronous webcasting software, and the electronic portfolio ePEARL.

The final research project was "Developing scientific literacy through Education for Sustainable Development in a small school network." It provided professional development and resources for teachers in order to explore how scientific literacy can be developed through the creation of problem-based scenarios and practical experiments dealing with sustainable development issues. Problem-based scenarios suitable to the blended learning environment (synchronous and asynchronous instruction) were created in collaboration with teachers, scientists from CUSB, and the science and sustainable development consultant from BEF. These were accessed by teachers through a wiki, and participants used Elluminate to meet and communicate virtually.

The scenarios, which involved the study of values, issues, and action plans, were directly linked to Manitoba curricula. Teachers involved in the pilot project received professional development with regards to the concepts of sustainable development, the issues, the use of scenarios to enhance student involvement and motivation, and the use of Internet technologies to foster meaningful conversations centred on the learning contexts. Two learning contexts were created—one involving the study of community bodies of water, and the other involving the study of biodiversity using a microcomposter. While the pilot project has been completed, more resources for this project are being developed based on results from the study.

For further information, contact

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### Profile Dr. Rodelyn Padua Stoeber

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