Canadian Stories of Distant Cases: Audiographics Teaching and Learning of High School Physics in the RACOL Project

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Abstract

The Rural Advanced Community of Learners (RACOL) project is intended to provide learning opportunities to high school students in remote communities in northern Alberta. This paper uses a narrative case study research methodology, and reports the author's experiences as a teacher of a class of 16 physics students. The teacher was located in a room 800 km from the students, who were scattered among 4 schools located across several hundred kilometers in northern Alberta. The paper is focused specifically on some of the unique challenges presented by this mode of teaching and learning, as well as on the project’s success in providing enhanced opportunities for these students.

Introduction

Students in remote areas in many countries suffer from reduced access to some school courses, due to the small size of the schools in their communities. This is especially true in some areas of northern Canada, where the population density is quite low, and communities tend to be scattered and schools small. The Rural Advanced Community of Learners (RACOL) project is an alliance between the Universities of Calgary and Alberta, Netera Alliance, the Banff Centre, SDI Inc, the Northern Alberta Institute of Technology and the Fort Vermilion School Division (FVSD) to provide enhanced educational opportunities to students in the Fort Vermilion School Division in northern Alberta. The project’s goal is to use the additional bandwidth offered by the Alberta Supernet (a high speed network initiative of the Alberta government) to provide high quality ‘virtual presence’ (streaming MPEG2 video, audio and audiographics) learning environments in FVSD schools. This will allow the skills of teachers to be shared across a number of schools, and will allow classes that are too small to be viable in a single school to be brought together across schools. In turn, this will allow students who would not have had the opportunity to study, for example, Grade 11 physics, to study the subject with a teacher, rather than by correspondence. The original plan was that the Supernet and the Virtual Presence Learning Environments (VPLEs – suites of computers, SMARTBoards (interactive whiteboards shared over the Internet, video cameras and video monitors, combined with control systems and interfaces) would be in place by the beginning of the 2002-2003 school year in September 2002. A number of factors delayed the project, so that by the time classes began students had SMARTBoards and a single older computer in each room in which they were studying, and were connected to the Internet by unstable 56k modem connections, often shared across the whole school including computer labs. This meant that an audiographics teaching mode, which complemented the resources above with audio teleconferencing using the telephone system, was substituted for the video-based, high-bandwidth environment with up-to-date computers that had been envisaged. Fort Vermilion School Division and its teachers have significant experience with audiographics teaching, and four classes – a French class, two Mathematics classes and a Physics class – were begun using the audiographics mode. The author was invited to join the project and teach the physics class about 10 days before the beginning of semester, when the original physics teacher withdrew from the project.

Some Challenges and (Tentative) Solutions

Audiographics teaching and learning has significant advantages over correspondence or web-based modes of delivery for teaching physics to high school students. Its mostly synchronous nature (the course is a semester long, and the class meets for 80 minutes each weekday morning – some asynchronous bulletin board and e-mail elements are also present) and particularly the presence of a shared whiteboard for drawing diagrams and solving problems mean that it allows the teacher to work much more interactively with students, and to address their questions and concerns as they arise. This mode is also characterized by some unique challenges that do not arise in face to face teaching, however. This (heavily edited) reflective journal excerpt describes one such challenge:

I’m really proud of myself: I haven’t sworn at the machines in the students’ hearing… yet! (description of the setup procedure was here – e-mail me for the longer paper!) So far this is all just the procedure if everything works perfectly. I guess I could simplify it slightly by not using the laptop, but it’s sometimes a lifesaver if the SmartBoard computer doesn’t connect, and because it’s connected via the Fort Vermilion VPN it also gives me a good barometer for how slow the connection is – I draw something on the SmartBoard, then watch with the students as it takes one, two or five minutes to appear on their screens. But everything doesn’t always go...
perfectly: I’ve started keeping a log of tech problems encountered, just in the bottom of my diary for each day. The entries for the past week, verbatim, are:

Tuesday 22: No connectivity in cyberport except SmartBoard
Wednesday 23: Login probs with Putty/new gateway @ U of A end + VPN probs @ FVSD end
Thursday 24: Still gateway probs, therefore no SmartBoard – lappie fine
Friday 25: No probs at all: see BB.
Monday 28: Rocky Lane had server (DNS/LDAP) probs. Lappie prob: do not hibernate (or else reboot)
Tuesday 29: NetMeeting dropped out and had to have the mtg rebuilt.

Looking back a couple more weeks in the diary, this might be a bit heavier than usual, but I found no week with less than two incidents of some kind related to the technology. And that doesn’t include the students who forget their WebCT logins, or whose WebCT passwords suddenly fail to work and I have to contact someone at the U of A to get them reset, or the students who just have trouble operating WebCT, and who it’s extremely difficult to give good tech support to over the phone with another 15 students waiting around.

Some of the challenges are less technical than personal. This second reflective journal entry describes an issue that might have arisen in a face to face classroom as well, but took on a particular complexion in the distance learning context:

“They throw me out of the school at lunch time, and I haven’t been able to touch a computer for about a week”, James (a pseudonym) says, and my heart sinks a bit as I promise to “talk to some people and sort it out”. I tried to tighten things up, to make the students accountable for their own learning, this time, but it looks as though I’ll have to open up the online quiz again, which means that the five students who chose not to do it by the appointed closing time will get another chance. At this stage, in the middle of the semester, after the first assignment had fallen due (and about half the students had submitted it late, some not at all), I was beginning to realize that we had a serious problem. In my desire to be as fair as possible to the students, and to allow them to succeed despite the technical and practical challenges of web site access, I had the feeling that I’d been training them into learned helplessness and irresponsibility. By keeping the quizzes open for longer and longer beyond the planned closing date, I had taught them not to worry about deadlines in this class, not to make that extra effort to prepare and complete the tasks on time: “don’t worry, Dr Geelan will just extend the deadline again”.

One of the principles I try to live my life by is ‘Never ascribe to malice that which is adequately explained by incompetence’. (Apparantly ascribed to Napoleon.) I don’t want to assume that the students are actively manipulating my goodwill and desire to be as fair as possible to give themselves an easier time and break the deadlines. I’d prefer to believe that, like me, they’re sometimes disorganized and very busy, and if one deadline looks more rubbery than another, that’s the one they’re likely to try to stretch. So, while I have some doubts about the exact extent of their lack of access to computers to do the quiz, and about whether they made a real effort, I have to assume that they’re telling the truth, at least until I can check it out, and to make allowances. I’ll talk to the people in the school and try to find ways to ensure that the students have good enough access, and that I make the demands of the tasks clear, and the deadlines firm. But my efforts to be fair aren’t fair. They’re not fair to the good, conscientious students who work hard and put themselves out to study and prepare and complete all the tasks on time, only to see other students who weren’t as conscientious receive chance after chance and more time to prepare. They’re also not fair to the students who are learning that ‘by Friday’ means ‘a week next Tuesday’ – this isn’t helping them in school, won’t help them at university, and will be disastrous in their working lives. I’m doing them no service at all if I teach them that ‘the computer ate my homework’ is the excuse for all seasons.

Conclusion

The pedagogical challenges of teaching in audiographics mode in an unstable technological environment arise largely out of the interaction of human nature with technological failings. They remain, nonetheless, pedagogical problems, with pedagogical solutions, although often practical solutions and improved humans systems are important parts of the solutions. Amazingly, sometimes there’s even a technological fix! The challenges of teaching in new modes should not be under-estimated. Teachers develop rich repertoires of knowledge, skills and reactions in their classroom teaching, and supplement those repertoires in their distance education experience, but new media require new methods and new messages, and that skill base simply requires the same ingredients as any skill base – time, experience and reflection.