A railway runs through it:

“Tracking Canada’s Past” in the schools

D. Kevin O’Neill
Faculty of Education
Simon Fraser University
Burnaby, BC
Canada
dko@acm.org

> Education being a social process, the school is simply that form of community life in which all those agencies are concentrated that will be most effective in bringing the child to share in the inherited resources of the race, and to use his own powers for social ends. (Dewey 1897)

Paper presented at “Canadian Historical Consciousness in an International Context”: inaugural conference of the Centre for the Study of Historical Consciousness, University of British Columbia, Aug. 26-29, 2001.

For many years now, the participants in this seminar and many of our colleagues have explored the question of what it means to know and understand History — meaning not only knowledge of specific, culturally-valued events and people from the past, but also knowledge of how the past comes to be understood by historians. The body of scholarship built over the past decade, in particular, has made considerably clearer what a difficult enterprise it is for students to build a mature understanding of History as a discipline, and has identified many of the stumbling blocks to students' success in this endeavour. To mention a few of the hurdles familiar in this circle:

- Textbook accounts of historical events are often oversimplified, and present a single, homogenized perspective on events (Beck and McKeown 1994; McKeown and Beck 1994), usually in a depersonalized voice (Wineburg 1991).
- Since students usually do not encounter multiple perspectives on the same events, they are not challenged to develop ways of reconciling or selecting among differing accounts (Barton 1997). Consequently, when confronted with such accounts, they either arbitrarily ignore some, or ignore evidence entirely and provide an account of how they believe things 'must have happened'.
- School environments typically provide students with a poverty of experience with which to understand the process of historical interpretation (Levstik and Barton 1997). For example, teachers are often forced to cover too much material in too little time, rendering "history" into a kind of trivia game.
- Students often encounter so little source evidence in their studies, they never learn to distinguish historical scholarship from mere storytelling (Zarnowski 1998).

These and other findings have shown how absurdly decontextualized the intellectual work of history can become in school. This may be the primary culprit behind such startling findings as Shemilt's (Shemilt 2000) regarding the ideas of high schoolers asked to consider what would have happened if Hippocates or Galen had not come along. Rather than thinking about the probable effects on the unfolding of thought about the human body and illness, some of his interviewees simply imagined a hole in the textbook: they claimed that "nothing" would have happened.

Such findings remind us that disciplinary literacies, like those of history, mathematics and science, are born of and live in scholarly communities of discourse and practice (Bazerman 1988; Myers 1990; Miller 1994), which are never perfectly reflected in K-12 curriculum (and arguably, cannot be). They confront us with the possibility that if we truly want students to understand the concerns and methods of historians, they may not only need the opportunity to work on authentic problems, with authentic sources, and in authentic ways. It may be just as important that they see their personal knowledge work as taking place in a community of critical minds whose mission is "doing history" (Levstik and Barton 1997; Seixas 1999).

Unfortunately, there are limits to the change one can effect in a learning environment by having the same cast of characters (teachers and students) perform to a different pedagogical script, using different props. After many years of didactic instruction, it can be difficult to change students' expectations about how they participate in learning at school. One way of helping students and teachers to see their work differently, and of supporting them in doing their work differently, is to offer them the support and guidance of new partners. This idea lies at the heart of a project being developed in my lab, which we call "Tracking Canada's Past"[1].

Touching the world outside

The central idea of Tracking Canada's Past is to build a geographically distributed learning community, in which teachers and students from cities and towns across Canada can work together to research a historical phenomenon that has influenced them all: The Canadian Pacific Railway. As some readers will know, this was the first transcontinental railway in Canada, and the first great national project for the handful of British colonies which entered confederation in 1867. For many years before free trade, rail transport was the basis for much of the economic development west of Ontario, and indeed, many cities and towns across western Canada owe their very existence to the railway. As a result, most have unique, unpublished sources of evidence about it, as well as unique vantage points on what the endeavour meant.

Using an Internet-enabled software application for collaborative learning called Knowledge Forum® (Scardamalia and Bereiter 1994), we plan to have teachers, students and adult volunteers from historical societies, museums, libraries, and other institutions build a shared database of research notes, artifacts, and competing narratives relating to the CPR in their communities. Students' first-hand research from disparate local sources, along with textbooks, films and other more traditional materials, will provide a context for teaching strategies that will emphasize reflection on the value of various kinds of historical evidence (ie. records and relics), and support work in which students will attempt to integrate or reconcile the various perspectives represented in the sources and narratives they have assembled. Rather than merely digesting others' accounts of the past, we will ask students to write history themselves.

Why the CPR?

It is worth explaining a little about our choice of subject-matter for the project. As scholars have noted before (Francis 1997), the building of the Canadian Pacific Railway is an vital part of Canada's national creation myth. Americans (with whom we seem doomed forever to compare ourselves) created their country through battles with the British and each other; while Canadians created theirs through a struggle with geography.

Despite complaints of Canadians' ignorance about their own stories (Granatstein 1998), the CPR creation myth remains a salient touchstone for them. Salient enough, at least, that the latest in a long-running series of patriotic TV ads for "Molson Canadian" beer is largely built around grainy black-and white images of the CPR. Along with a catchy jingle repeating "I am Canadian", viewers watch the last spike being driven in the mountains of British Columbia; hardy-looking pioneers riding the rails on hand-pumped scooters; and troops massing at train stations to mobilize for the First World War. (These are bracketed by grainy colour images of the Maple Leaf flag replacing the Union Jack, and Canada winning an Olympic hockey match.) The remarkable staying power of the CPR myth is probably why, in a country that has no national history curriculum, one can still rely on the CPR taking pride of place in the history and social studies curricula of many provinces.

---

[1] This project is a collaboration between myself and Marlene Scardamalia at the Ontario Institute for Studies in Education, University of Toronto. Funding is provided by the Social Sciences and Humanities Research Council of Canada.

Of course, the CPR is much more than a myth. One of two mammoth companies to which Canada owes much of its present form (the other being the Hudson's Bay Company), it is the only one that remains of much relevance to its future. Moreover, its activities have intersected with so many important themes in history and social studies curricula (including early confederation politics, immigration, tourism, and the white settlement of the west), that Pierre Berton could quite fairly describe Canada as "a rare example of a nation created through the construction of a railway." (Berton 1970) When speaking of Canada's history, the railway *does* in fact run through it. This being the case, it is easier to justify the large investment of curriculum time necessary for a long-term, open-ended investigation in relation to this theme than it would be for many others. Finally, because the CPR is a phenomenon that touches most regions of Canada in direct or indirect ways, Tracking Canada's Past has ready potential to scale up if our proof-of-concept is successful.

What do we hope to achieve?

Taking Peter Seixas' (2001) definition of historical consciousness as *individual and collective understandings of the past, the cognitive and cultural factors which shape those understandings, and the relations of historical understandings to those of the present and the future*, Tracking Canada's Past can be viewed as an attempt to design a cognitive and social innovation which will help to advance high schoolers' historical consciousness.

Despite this lofty-sounding aim, and what we think is great potential, we will begin on a modest scale. Over the next three years, we will develop a small "proof of concept" network in which, together with a handful of experienced collaborating teachers, we will develop the new materials and teaching techniques required by our nascent community. This design work, which will be substantially guided by prior research, will proceed through a "design experiments" approach — of which more later.

McKeown & Beck (1994) argued that to understand historical reasoning deeply, young adults should be encouraged to pursue their emergent curiosities in greater depth as they study, and if necessary, should draw resources from outside the classroom to enable their inquiry. We hope and expect that the distant collaboration in which we engage students will provide both opportunity and social motivation for them to reflect on the value of disparate historical evidence and accounts. In this first phase of our work, we plan to focus our attention on three related teaching goals on which we believe our approach may provide unique purchase:

- *The complexity of historical causation*. While young adults begin with a naive linear conception of historical causation (ie. "one thing leads to another"), under the right circumstances they can come to understand that most historical events have multiple causes and that large-scale outcomes in society are not deterministic or inevitable.

- *The nature of historical evidence.* While students may begin with the simplistic conception that history is passed down from eyewitnesses who all agree what happened (Barton 1997), young adults can learn to consider both the possible motives of historical actors and witnesses in crafting their accounts of events, and the reasons why some relics or accounts survive, while others do not.

- *The nature of narrative accounts*. While young adults may first see no distinction between historical evidence and the "information" they glean from textbooks, they can

> learn to "construct an author behind the text" (McKeown and Beck 1994) and develop strategies for understanding the conflict and divergence of narrative accounts. Mature learners also understand that writing history is not merely a matter of recording what happened when, or even why it happened, but that good historical accounts capture the irony, contradiction, and unexpectedness of events.

Building our community

While we do not view computer networking as a magical solution to any problems in history teaching, we do believe that the Internet makes possible much deeper and more routine influences between the intellectual communities of school and the world outside. In place of the isolated encounters that students normally have with adults during field trips and career days, the Internet can allow students' academic work to overlap with the work of adults in ways that more meaningfully initiate them into communities of discourse and practice (Lave and Wenger 1991). In the past, physical distance and the conflicting schedules of school and work have often kept these opportunities from students.

Since 1995, I have been working with teachers, graduate students and other knowledgeable adults to orchestrate on-line mentoring relationships for classes of students pursuing long-term investigations. This work has shown strong benefits in the realm of high school science, where it has enabled students to carry out far more ambitious work than they otherwise could (O'Neill, Wagner et al. 1996; O'Neill and Gomez 1998, November). What is more, the adult mentors’ role as a responsive, critical audience for students' research appears to result in a deeper understanding of literate practices in this discipline: particularly those related to genres of research reporting (O'Neill 2001). I expect some of this prior work to be of benefit in Tracking Canada’s Past.

Prior work notwithstanding, there is an enormous amount of design work to do before we begin work in our first few classrooms in spring 2002. Much of this work is being undertaken by an evolving team of history teachers and graduate students in both Education and History; and though its outcomes are uncertain, at this point I can describe our orientation toward the work, and some of the research that informs it.

What kind of community do we want?

In recent years, driven in part by a vigorous debate over the social situatedness of knowledge and skill (Brown, Collins et al. 1989; Greeno 1998), a range of classroom design experiments have aimed to re-shape the relationships among teachers, students and subject matter, to mirror more closely work of adult learning communities. While the approaches taken and their degrees of success have varied substantially, most have aimed to foster deeper conceptual understandings and greater awareness of how the canonical knowledge of the curriculum is arrived at (Brown and Campione 1994; Bielaczyc and Collins in press).

An important problem in current work is understanding how to routinely build learning “communities” that are not merely networks going by another name. Previous examinations of age- and expertise-diverse learning communities, both on-line (Bruckman 1998; Woodruff in press) and off (Jacobs 1961; Harper 1987) have yielded laundry lists of necessary and desirable features and qualities for learning communities, including:

- a diversity of knowledge and interests among members
- shared goals of understanding
- norms of reciprocity and trust
- ongoing awareness of what others are doing
- shared customs and rituals
- interdependence
- an array of well-understood roles

Many of these qualities can be summed up in the phrase that sociologist Robert Putnam (2000) uses to frame his historical analysis of community and civic participation in America: "social capital". His analysis suggests that many of the factors and functions discussed previously in the literature on community can be productively viewed as by-products of this broader phenomenon:

> Whereas physical capital refers to physical objects and human capital refers to properties of individuals, social capital refers to connections among individuals — social networks and the norms of reciprocity and trust that arise from them. (Putnam 2000, p. 19)

So, another lens through which to view what we are trying to do with Tracking Canada's Past is to build a greater density of long-term relationships within and between schools, and between schools and external communities of expertise. To understand what this might be like, it is helpful to take a close look how relationships work in face-to-face communities where mentoring, apprenticeship, and other much-lauded learning relationships occur spontaneously. One rich illustration is the learning community surrounding the master mechanic Willy, depicted in anthropologist Douglas Harper's (1987) *Working Knowledge: Skill and community in a small shop*. This community relies on an array of interdependent relationships. Some are relatively cool: clients visit the shop, drop off their inoperative cars or farm machinery, and pay Willy in cash once he has finished repairing them. But deeper, more reciprocal learning relationships coexist with, and to some degree rely on these remote ones.

Regulars at Willie's shop, like the author Harper himself, make use of Willy's tools and expertise for their own projects, working virtually as Willy's apprentices. In Harper's account, it becomes clear that the friend-apprenticeship and fee-for-service relationships are actually reliant on each other: paying customers depend on barterers to supply the spare parts, odds and ends that Willy uses to do his work for them, while the friend-apprentices rely to some extent on the paying customers to supply the cash required to buy any tools and supplies that cannot be made from scratch. Finally, on a broader scale the business of the shop itself is sustained by the word-of-mouth advertising that both paying clients and apprentices carry out. All in all, social capital is a vital part of what makes the community tick.

Shared rituals for history learning

Unfortunately, social capital is not grown overnight. It grows organically, and like ivy creeping slowly up a wall, it sometimes needs a lattice to cling to. Graduate schools have a variety of framework rituals to scaffold the entry of students into scholarly discourse communities. These vary from place to place, but usually include coursework, comprehensive exams, proposal defenses, and so on. Similarly, to scaffold the participation of high school students in a community with such diverse (read: daunting) opportunities as ours is likely to present, we will need some straightforward, but flexible rituals. Ann Brown referred to these as “participant structures” (Brown and Campione 1994).

Taking cues from related work on project-based pedagogy (Polman 2000), I expect an important set of our rituals to be built around what are called “milestone” assignments. These are relatively small and manageable research and writing tasks that represent authentic pieces of the planned finished product — here, an original historical narrative relating somehow to the CPR. The milestone assignments for Tracking Canada’s Past may include the following:

- Choice of research partners
- Choice of a theme for exploration (e.g. early confederation politics, business, tourism, exploration, technology, native peoples’ affairs, or the arts)
- Collection of some primary source evidence relating to the theme (e.g. archival photographs, records from city archives, documentation of a visit to a historic site)
- Collection of secondary sources relating to the theme and evidence
- References to related research by peers within the networked community
- Analysis of primary and secondary sources, including peers’ work
- An original, analytical narrative

When designed well, milestone assignments like these can have several virtues. From a logistical standpoint, they structure students’ use of time, which can too easily be frittered away in a lengthy unit. (Tracking Canada’s Past is likely to run for a number of months, “threaded” alongside other units.) Milestones can also provide an important means for scaffolding students’ thinking in a new discipline. By asking students to report their work in authentic forms, and to an audience broader than their teachers, we can make an effort to ensure that they are not merely “bluffing” their way into History, to borrow Bartholomae’s (1985) phrase . Finally, in a shared workspace like Knowledge Forum®, milestones can provide opportunities for feedback from peers, teachers and mentors (D'Amico 1999), enabling the kinds of “social comparision” (Butler 1992) that helps students learn to judge the quality of their own work independently.

Inviting the outsiders in: Telementoring

As in Willie’s shop, the fruitfulness of what happens around students’ individual projects will depend on the social capital, the network of human relationships, in our community. This is where we believe our adult volunteers will play an especially important role. In recent years, my colleagues and I have had considerable success in efforts to engage K-12 students and knowledgeable adult volunteers from around North America in curriculum-based on-line relationships (Ferneding-Lenert and Harris 1994; O'Neill, Wagner et al. 1996; Bennett, Hupert et al. 1997; Dimock 1997; O'Neill and Gomez 1998, November; Harris and Jones 1999; O'Neill and Scardamalia 2000; O'Neill 2001). These “telementoring” relationships differ from more traditional forms of voluntarism in education, in part because the adults’ commitment of time is spaced in small increments, rather than being massed together. In a traditional expert visit to a school, for example, the adult might stop in several classrooms to talk with students about his or her career, and take questions from the students and their teacher. These kinds of visits have important limitations, as one of the teachers involved in my work (O'Neill 2001) explained in an interview:

> It's a very limited amount of time in your students' [lives]. For instance [a program I'm familiar with] sent lawyers into the classroom. And this is a very nice program, they'd be there every week for a period, over three weeks or four weeks. But what if the kid, in the interim, thought of something, or had a dimension that they wanted to talk about? If the classroom teacher wasn't in a position to discuss it with them, or didn't have the knowledge to discuss it with them, then it was on hold for a week. [It's important to take advantage of the student's curiosity] before it diminishes in their view of things that are crucial and important.

In the typical telementoring scenario, several volunteer mentors each commit as little as 15 minutes per week to checking in on the progress of their mentees and providing advice or guidance. But this stretches over several weeks, and is focused on the work of very few students. By having a relatively large number of people (often one volunteer for every three students) each contribute relatively small amounts of their time, without the need for travel, students can engage directly with practitioners of a discipline in a way that is not too onerous for them. Such relationships can also be much more rewarding for adult volunteers, because the long-term dialogue enables them to develop complex ideas with students over time, rather than simply passing on existing knowledge (O'Neill, Abeygunawardena et al. 2000). At its best, telementoring dialogue focuses on the problems of understanding that emerge as students progress in their research.[2]

Today, telementoring programs connect thousands of students and volunteers each year, demonstrating that despite initial scepticism (as much on my part as anyone else's), well-educated adults are quite capable of complementing the efforts of skilled teachers to support ambitious classroom inquiry (see esp. O'Neill, 2001). My hope is that with the benefit of further research, and using software tools currently under development in my lab, telementoring relationships will be routinely orchestrated in many schools with about the same level of teacher effort as is needed to organize a field trip. While there are a host of questions as to how it might be realized, there appears to be immense potential for growth. Census data on volunteering, educational attainment, and Internet access suggest that as many as 2.7 million people might be prepared to serve as telementors in the U.S. and Canada alone (O'Neill and Harris 2000).

Catalyzing the growth of social capital

Telementoring is not only useful as a form of support for individual students or teams of students. Some of my recent work with the Knowledge Forum® team at OISE/UT has clarified its potential as a catalyst for the growth of social capital in a learning community (O'Neill 2001). In recent design experiments carried out in Toronto-area high schools, grade 9 and 11 students used Knowledge Forum® to discuss their ongoing research with one another, and a number of volunteer mentors. After declaring their research interests to their teachers, students were organized into thematic "working groups" of varying sizes: from a single student to 10 or more. "Matches" were made between each of these working groups and a volunteer mentor with related expertise, who oversaw their work. A compartment called a "view" was set up within the shared workspace for each working group, to help them organize their efforts.

---

[2] Curious readers can find detailed descriptions of telementoring, including case studies of individual relationships, elsewhere (O'Neill & Gomez 1998; O'Neill, Abeygunawardena, et al., 2000).

An important contrast between this model of telementoring and those used in the past was that students did not work with their mentors in the privacy of e-mail. While each student and mentor had a "home" view in Knowledge Forum®, in which to place their research notes and communicate with others, these views were open for everyone to read and write in. This new arrangement was dubbed “mentoring in the open” (O'Neill and Scardamalia 2000) and gave rise to learning behaviours among both students and their mentors that increased social capital in the community.

While one might have expected students and mentors to keep to their groups in this arrangement, a surprising number “peeked” into the mentoring dialogues of their peers. This “free model-seeking”, as we called it, allowed students to emulate the best practices they observed among their peers and peers’ mentors. As one student explained in an interview:

> Yeah that's what I found [Knowledge Forum®] really useful for...not just in my [part of the database], but when I looked around...it was nice to see where people were, so I knew if I was ahead or if I was, like, behind a little bit. So...it was nice to see...what other people were doing.

Our volunteer mentors also engaged in this opportunistic model-seeking, despite the fact that the possibility was not even mentioned to them by the researchers or the teachers. One mentor, a exhibit designer from a local museum, explained how she began to examine other mentors’ advice-giving strategies in order to improve upon, or validate her own:

> ...I started, I guess, peeking in on some of the other discussions to see what level of assistance was going on, and how harsh you should be about certain things. Because you want to be encouraging, but you also want to say, you know, you’re really out of line there, way off in left field. And maybe you should think about this (laughs). Where are you going?

A statistical analysis of student surveys and computer log files from the project suggested that “peeking” into the dialogues their peers were carrying out with other adults enabled students to more clearly see the potential for just the kinds of reciprocal relationships that Putnam argues build community. Moreover, the presence and activity of adult mentors in the shared inquiry space validated the efforts of public-spirited students to aid their peers, when they might easily have been viewed as grandstanding. On occasion, supportive peers were even viewed as taking up slack for mentors who logged onto the shared workspace less frequently. An example comes from a group of Grade 9 students, who went out of their way to praise the efforts of their “grade 11 mentors” in our interviews:

> One thing I'd like to add is that the grade 11's, they were kind of like mentors 'cause...they're only two years older, [but] they're a lot smarter. And they'd also respond to some of my [notes]. One [grade 11] responded to 2 or 3 of my [notes]. He...asked a lot of questions, and he helped me out a lot because he [asked me] “what about this?” and he said, “you should really take this into consideration”. [So, the grade 11s] helped out a lot. They were like mentors in a way.

A richer example is provided by a second group of grade 9s. For their study, they had chosen to explore the possibility and social consequences of an anti-aging drug that might extend a healthy person’s life by 50 years. In the following interview segment, the grade 9s praise an 11th-grader, Sandy, for her collegial support. She had chosen the same research agenda, and gently kept the grade 9s from jumping to conclusions in their work:

> Keith: Sandy was a real help. She kept contradicting [me]. Like I'd say, “here, it's here! I found an anti-aging drug!” [And] she said, “no you didn't, it's just a lotion” and stuff like that. And she, she'd always be...
>
> Holly: She was almost like another mentor.
>
> Keith: Yeah, she helped us a lot.

Knowing when we’ve brought them in: Methodology

Despite the foundation provided by prior work on history learning and telementoring, drawing students into an on-line community like ours will to offer many unique challenges. Our first attempts are bound to be imperfect, and systematically refining an innovation as complex as this one will be a difficult task. How are we to know, for instance, if we are achieving our pedagogical goals, and with whom? If we are not achieving our goals with all students, we must know whether our innovation systematically “misses” students with particular characteristics, or in particular school settings, so that we can refine it over time.

As some of my readers will know, the past decade has seen Education researchers grow increasingly disenchanted with the ability of experimental methods to answer the sorts of design-oriented questions we are asking (Brown 1992; Collins 1992). It is terrifically difficult to conduct a properly controlled experiment in an authentic school setting, and where they can be done they often fail to explain why an innovation does or does not work. If researchers run an "innovation versus no innovation" experiment and find that the innovation didn't bring about any apparent improvement, there may be a multitude of reasons for the failure.

Design experiments are an emerging style of research whose purpose is to develop richer knowledge about the strengths and weaknesses of educational innovations under varying conditions. Collins describes their function by analogy to the wind-tunnel testing that is used to evaluate aircraft and automobiles (Collins 1992). Like other designed artifacts, curricula are based on theory; but this theory is far too incomplete to predict how they will be enacted under a range of circumstances as wide as that encountered in schools. Thus, the intent of a design experiment is to carefully scrutinize a design in action, so as to develop the knowledge that designers and educational practitioners need to understand its potential.

In a typical design experiment, researchers have a hand in designing the curriculum that is enacted, and provide both labour and expertise to help evaluate its effectiveness in detail. Theory helps to surmise which variables are likely to shape success. As far as is practical, measures are taken of these variables; then, the natural variation in outcomes used to tease out the empirical relations associated with success. Such analysis may make contributions to theory, but is chiefly driven by the need to figure out how the innovation can be made more effective, and how it can be reproduced. Reaching fully generalizable knowledge through design experiments is a slow process, but its virtue is that each iteration produces some knowledge that practitioners clearly need.

As designers, the Tracking Canada's Past team is interested in several broad questions:

The enactment of our design:

- How is our innovation enacted in each classroom?
- What does students' historical reasoning look like in each classroom?

Students' engagement in our community:

- How does student engagement vary?
    - How does this variation relate to student characteristics that one would expect to shape participation? (e.g. prior knowledge of themes under study, prior grades in History, attitudes toward writing, orientation toward learning or performance goals)
- How does the form and intensity of students' engagement influence…
    - Ideas about historical causation?
    - Ideas about historical accounts?
    - Ideas about historical sources and evidence?
    - The quality of work on milestones and finished work?

Adults' engagement in our community:

- How typical is our mentor pool of the populace?
- How typical is our mentor pool to other, more traditional volunteers?
    - …with respect to age, education, involvement in other community activities, concern for future generations, and other factors we know are important determinants of volunteering (Hall, Knighton et al. 1998).
- Do any of the above factors, or combinations of them, appear to make volunteers better suited as History mentors for children?
- Is there reason to believe that people will serve as telementors who have not been involved in other forms of volunteering?

A diagrammatic overview of the data we plan to address these questions with is offered in Appendix A. Our instruments including a selection of psychological and social psychological measures developed elsewhere (Diener, Emmons et al. 1985; McAdams and de St. Aubin 1992; Dweck 2000), as well as new measures being developed by the team. The historical reasoning instruments, in particular, will be new; though they draw substantial inspiration from Project Chata (Lee, Ashby et al. 1993). While these are still under development, some of our early work on them is provided in Appendices B and C.

Appendix B is a sample of a causal reasoning task, analogous to that designed by Lee, Ashby and Dickinson (Lee, Ashby et al. 1993), though at a level of complexity more appropriate for high school students, and using events which are likely to be encountered by students in the project. Appendix C contains a selection of competing narratives about the Canadian Pacific Railway, around which we are developing a high school analogue to the Chata "when did Rome fall?" task. Each of these narratives has been edited down or directly quoted from published sources spanning 95 years. These include a 1905 school text, a popular history, a "promotional" history written by a CPR executive, an economist's treatise on the role of the CPR in developing Canada, a "western" (rather than nationalist) history, and a modern (1997) commentary on the CPR myth.

As the opposing narratives of Appendix C illustrate, the history of the Canadian Pacific is contested territory, which will furnish ample diversity of perspective to challenge naïve conceptions of historical knowledge and methods!

Conclusion: The adventure begins

If "Tracking Canada's Past" were a train, it would barely be leaving the station. Like the Canadian Pacific itself, our project is one that will take several years to realize. In the near term, we will build a "proof of concept" community for history learning that will draw high school students, their teachers, and a variety of adult volunteers in a new, and hopefully richer kind of relationship to one another and to historical scholarship. Through their work together, the members of this community will engage with source evidence that is rarely used in Canadian schools; with peers in distant communities that have different relationships to the Canadian Pacific Railway; and with diverse accounts of Canada's beginnings which will challenge how they think about their country, and the enterprise of understanding the past.

Acknowledgements

Kit Lort and Stan Garrod, both members of the TCP team, helped shape many of the ideas expressed here.

References

Bartholomae, D. (1985). Inventing the University. When a writer can't write: Studies in writer's block and other composing-process problems. M. Rose. New York, Guilford.

Barton, K. C. (1997). "'I just kinda know': Elementary students' ideas about historical evidence." Theory and research in social education **25**(4): 407-430.

Bazerman, C. (1988). Shaping written knowledge: The genre and activity of the experimental article in science. Madison, WI, University of Wisconsin Press.

Beck, I. and M. McKeown (1994). Outcomes of history instruction: Paste-up accounts. Cognitive and instructional processes in history and the social sciences. M. Carretero and J. Voss. Hillsdale, NJ, Erlbaum**:** 237-256.

Bennett, D. T., N. Hupert, et al. (1997). Telementoring: Designing on-line mentoring environments for high school women in science and technical courses. Joint National Conference of the Women in Engineering Program Advocates and the National Association of Minority Engineering Program Administrators, Washington, DC.

Berton, P. (1970). The National Dream: The great railway, 1871-1881. Toronto, McClelland & Stewart.

Bielaczyc, K. and A. Collins (in press). Learning communities in classrooms: A reconceptualization of educational practice. Instructional design theories and models, Volume II. C. M. Reigeluth. Mahwah, NJ, Lawrence Erlbaum Associates.

Brown, A. L. (1992). "Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings." Journal of the Learning Sciences **2**(2): 141-178.

Brown, A. L. and J. C. Campione (1994). Guided discovery in a community of learners. Classroom lessons: Integrating cognitive theory and classroom practice. K. McGilly. Cambridge, MA, MIT Press/Bradford Books.

Brown, J. S., A. Collins, et al. (1989). "Situated cognition and the culture of learning." Educational researcher **18**(1): 32-42.

Bruckman, A. (1998). "Community support for constructionist learning." Computer supported cooperative work **7**: 47-86.

Butler, R. (1992). "What young people want to know when: Effects of mastery and ability goals on interest in different kinds of social comparisons." Journal of Personality and Social Psychology **62**(6): 934-943.

Collins, A. (1992). Toward a design science of education. New directions in educational technology. T. O'Shea. Berlin, Springer-Verlag.

D'Amico, L. (1999). The implications of project-based pedagogy for the classroom assessment infrastructres of science teachers. Annunal meeting of the American Educational Research Association, Montreal, Quebec, Canada.

Dewey, J. (1897). My pedagogic creed. *The philosopy of John Dewey, Vol. II: The lived experience*. J. J. McDermott. New York, G. P. Putnam's Sons**:** 442-454.

Diener, E., R. A. Emmons, et al. (1985). "The satisfaction with life scale." Journal of Personality Assessment **49**(1): 71-75.

Dimock, K. V. (1997). Building relationships, engaging students: A naturalistic study of classrooms participating in the Electronic Emissary Project. [On-line]. Available: ftp://ftp.tapr.org/pub/emissary/studies/Dimock.pdf.

Dweck, C. S. (2000). Self-theories: Their role in motivation, personality and development. Philadelphia, Psychology Press.

Ferneding-Lenert and Harris (1994). "Redefining expertise and reallocating roles in text-based asynchronous teaching/learning environments." Machine-mediated Learning **4**(2-3): 129-148.

Francis, D. (1997). National dreams: Myth, memory and Canadian history. Vancouver, Arsenal Pulp Press.

Granatstein, J. L. (1998). Who killed Canadian History? Toronto, HarperCollins.

Greeno, J. (1998). “The situativity of knowing, learning, and research.” American Psychologist **53**(1): 5-26.

Hall, M., T. Knighton, et al. (1998). Caring Canadians, involved Canadians: Highlights from the 1997 national survey of giving, volunteering and participating. Ottawa , Canada, Statistics Canada.

Harper, D. (1987). Working knowledge: Skill and community in a small shop. Chicago, University of Chicago Press.

Harris, J. B. and G. Jones (1999). “A descriptive study of telementoring among students, subject matter experts, and teachers: Message flow and function patterns.” Journal of research on computing in education **32**(36-53).

Jacobs, J. (1961). The death and life of great American cities. New York, Vintage Books.

Lave, J. and E. Wenger (1991). Situated learning: Legitimate peripheral participation. Cambridge, Cambridge University Press.

Lee, P., R. Ashby, et al. (1993). Progression in children's ideas about History. Annual meeting of the British Educational Research Association, Liverpool, England.

Levstik, L. S. and K. C. Barton (1997). Doing history: Investigating with children in elementary and middle schools. Hillsdale, NJ, Lawrence Erlbaum Associates.

McAdams, D. P. and E. de St. Aubin (1992). “A theory of generativity and its assessment through self-report, behavioral acts, and narrative themes in autobiography.” Journal of Personality and Social Psychology **62**(6): 1003-1015.

McKeown, M. G. and I. L. Beck (1994). Making sense of accounts of history: Why young students don't and how they might. Teaching and learning in history. G. Leinhardt, I. L. Beck and C. Stainton. Hillsdale, NJ, Erlbaum.

Miller, C. R. (1994). Genre as social action. Genre and the new rhetoric. A. Freedman and P. Medway. London, Taylor and Francis, Ltd.

Myers, G. (1990). Writing biology: Texts in the social construction of scientific knowledge. Madison, WI, University of Wisconsin Press.

O'Neill, D. K. (2001). Building social capital in a knowledge-building community: Telementoring as a catalyst. annual meeting of the American Educational Research Association, Seattle, WA.

O'Neill, D. K. (2001). Enabling constructivist teaching through telementoring. Computers in the delivery of special education and related services: Developing collaborative and individualized learning environments. L. J. Krueger. Binghamton, NY, The Haworth Press**:** 33-58.

O'Neill, D. K. (2001). “Knowing when you've brought them in: Scientific genre knowledge and communities of practice.” The Journal of the Learning Sciences **20**(3): 223-264.

O'Neill, D. K., H. Abeygunawardena, et al. (2000). The Telementor's Guidebook: A field guide to supporting student inquiry on-line. Ottawa, Office of Learning Technologies, Human Resources Development Canada.

O'Neill, D. K. and L. M. Gomez (1998, November). Sustaining mentoring relationships on-line. ACM Conference on Computer-Supported Cooperative Work, Seattle, WA, Association for Computing Machinery.

O'Neill, D. K. and J. B. Harris (2000). Is everybody happy? Bridging the perspectives and developmental needs of participants in telementoring initiatives. annual meeting of the American Educational Research Association, New Orleans, LA.

O'Neill, D. K. and M. Scardamalia (2000). Mentoring in the open: A strategy for supporting human development in the knowledge society. ICLS 2000: International Conference on the Learning Sciences, Ann Arbor, MI, Lawrence Earlbaum Associates.

O'Neill, D. K., R. Wagner, et al. (1996). Online mentors: Experimenting in science class. Educational Leadership. **54:** 39-42.

Polman, J. L. (2000). Designing project-based science: Connecting learners through guided inquiry. New York, Teachers College Press.

Scardamalia, M. and C. Bereiter (1994). “Computer support for knowledge-building communities.” Journal of the Learning Sciences **3**(3): 265-283.

Seixas, P. (1999). “Beyond 'content' and 'pedagogy': in search of a way to talk about history education.” Journal of Curriculum Studies **31**(3): 317-337.

Shemilt, D. (2000). The caliph's coin: The currency of narrative frameworks in History teaching. Knowing, teaching and learning History: National and international perspectives. P. N. Stearns, P. Seixas and S. Wineburg. New York, New York University Press**:** 83-101.

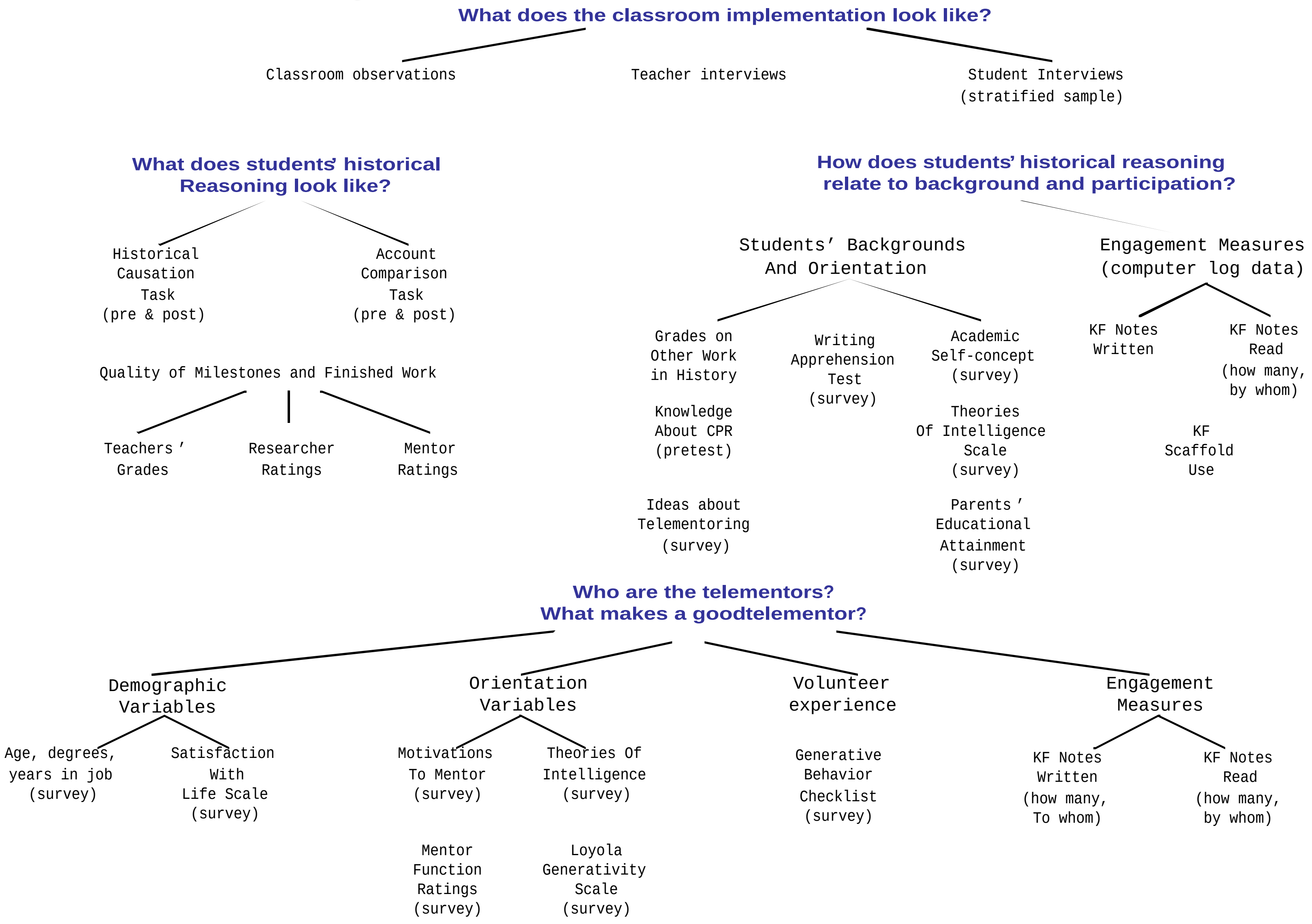
Wineburg, S. S. (1991). “On the reading of historical texts: Notes on the breach between school and the academy.” American Educational Research Journal **28**(3): 495-519.

Woodruff, E. (in press). CSCL Communities in Post-Secondary Education and Cross-Cultural Settings. CSCL II: Carrying forward the conversation. T. Koschmann, R. Hall and N. Miyake. Mahwah, NJ, Erlbaum.

Zarnowski, M. (1998). “Coming out from under the spell of stories: Critiquing historical narratives.” The New Advocate **11**(4): 345-355.

Appendix A

Tracking Canada’s Past: Questions and Data



What does the classroom implementation look like?

- Classroom observations
- Teacher interviews
- Student Interviews (stratified sample)

What does students’ historical Reasoning look like?

- Historical Causation Task (pre & post)
- Account Comparison Task (pre & post)

Quality of Milestones and Finished Work

- Teachers’ Grades
- Researcher Ratings
- Mentor Ratings

How does students’ historical reasoning relate to background and participation?

- Students’ Backgrounds And Orientation
  - Grades on Other Work in History
  - Knowledge About CPR (pretest)
  - Ideas about Telementoring (survey)
  - Writing Apprehension Test (survey)
  - Academic Self-concept (survey)
  - Theories Of Intelligence Scale (survey)
  - Parents’ Educational Attainment (survey)
- Engagement Measures (computer log data)
  - KF Notes Written
  - KF Notes Read (how many, by whom)
  - KF Scaffold Use

Who are the telementors?
What makes a goodtelementor?

- Demographic Variables
  - Age, degrees, years in job (survey)
  - Satisfaction With Life Scale (survey)
- Orientation Variables
  - Motivations To Mentor (survey)
  - Theories Of Intelligence (survey)
  - Mentor Function Ratings (survey)
  - Loyola Generativity Scale (survey)
- Volunteer experience
  - Generative Behavior Checklist (survey)
- Engagement Measures
  - KF Notes Written (how many, To whom)
  - KF Notes Read (how many, by whom)

Appendix B: Causal reasoning task

Use the boxes around the outside of the page to make the box in the middle happen, by drawing arrows from one box to another. An arrow from one box to another means, “the first box helps to explain the second box”.

You do not need to use every box if you do not think it belongs. Just make what you think is the best explanation for the result in the middle box.

Building the CPR was so expensive its directors began immediately looking for every possible way of making money.

kodaking” became an increasingly popular hobby.

William Van Horne introduced a policy of “capitalizing the scenery.”

BY 1900, TOURISM HAD MADE CANADA FAMILIAR TO TRAVELLERS FROM ALL OVER THE WORLD

Between 1886 and 1920 tourism revenues were relatively small, compared to immigration and local passenger revenues

Through CPR advertising, Canada was “sold” to the rest of the world.

“Among the Selkirk Glaciers” by William Spotswood Green was the first account by a CPR tourist about the mountain wilderness off the main line.

Describe this explanation in words as well:

Appendix C: Competing Narratives of the Canadian Pacific Railway

1905

The building of a transcontinental railway to connect the seaboard of British Columbia with Canada within two years of British Columbia entering confederation is detailed in Article II, Order in Council respecting the Province of British Columbia Statutes of Canada 1982, p. Ixxxviii. The question was introduced in parliament in 1872 by Sir John A. Macdonald, but construction was delayed by the Pacific Scandal, when the government was accused of having sold the charter for money to be used for election purposes, and the defeat of the conservative government. When the new government, under Alexander Mackenzie, proposed to build the railway line gradually British Columbia protested, sending a delegation to England to protest any further delay. Lord Carnarvon, the colonial secretary acted as arbitrator between the Dominion and British Columbia and, according to the Carnarvon terms, the government agreed to construct immediately a wagon road and telegraph line along the route of the projected railway, and by the year 1890 to complete the railway itself from the Pacific to Lake Superior to connect with American roads and Canadian Steamship Lines. When Sir John A Macdonald and the Conservatives came back to power he immediately took up the question of a transcontinental road again. Reverting to his former policy the premier entrusted the work to a syndicate of capitalists under the name of the Canadian Pacific Railway Company. Construction began at both ends, meeting in the Rockies, where the last spike was driven by Lord Strathcona in 1885, five years earlier than the projected completion date. "The importance to the Dominion of the enterprise thus successfully carried out was very great. Without a transcontinental railway the union of the East and West could never have been permanent."

1937

The construction of a transcontinental railway through Canada as part of a highway to the Orient ... gave Canadians confidence in their own country, and brought investment, industries, and population which have enabled Canadians to realize and develop their own now apparently unlimited resources. There is not question now of investment opportunities in Canada, provided the credit of the country in not endangered by tinkering with state socialism or continued extravagance in government expenditure. By its untiring enterprise, and paying its own way, the Canadian Pacific is in the forefront of Canadian development. Through the exercise of economy and efficiency in operation, and through its conservative financing, it has enabled Canada to enjoy a lower scale of freight rates on primary exportable products than exists in any other country. Its organization is recognized in the world of transportation as second to none - efficient, honest and based of sound business principles. Its directorate is recruited from the leaders of Canadian industry and commerce. Its statesman-like and forceful chairman and president is a Canadian of Canadians, whom many consider Canada's outstanding citizen, and whose reputation as head of the world's greatest transportation system which he himself raised to its preeminence, is justly international.

1970

The railwaymen coveted the North West. "I have an awful swallow for land," the Northern Pacific's General Cass told the Grant Trunk's Edward Watkin. In 1869 —during the Red River uprising — the Governor of Vermont, John Gregory Smith, who also happened to be president of the Northern Pacific, determined to build that line so close to the Canadian border that it would forestall any plans for an all-Canadian railway. In a conversation with Charles Brydges, a leading Canadian railway man, he made no secret of Washington's willingness to take advantage of the uprising and subsidize the line in order to get possession of the North West for the United States. On one side of the mountains, the American railway would siphon off the products of the rich farmlands; on the other side it would drain the British Columbia mining settlements. "Drain" was the operative verb; it was the one the Senate committee used. As for the Minnesotans, they saw their state devouring the entire Red River Valley. Their destiny lay north of the 49th parallel, so the St. Paul Pioneer Press editorialized. That was "the irresistible doctrine of nature".

In the Canada of 1871, "nationalism" was a strange, new word. Patriotism was derivative, racial cleavage was deep, culture was regional, provincial animosities savage and the idea of unity ephemeral. Thousands of Canadians had already been lured south by the availability of land and greater diversity of enterprise, which contrasted with the lack of opportunity at home. The six scattered provinces had yet to unite in a great national endeavour, or to glimpse anything remotely resembling a Canadian dream; but both were taking shape. The endeavour would be the building of the Pacific railway; the dream would be the filling up of the empty spaces and the dawn of a new Canada.

1971

The agreement between Canada and British Columbia, which led eventually to the construction of the Canadian Pacific railway, resulted largely from the acquisitiveness characteristic of eastern Canada. This acquisitive temperament was especially significant in the attitude of Canada, especially of Toronto and Upper Canada toward the increased trade between the United States and the settlements which had grown up in the Hudson Bay drainage basin and in the Pacific coast drainage basin.... In the Pacific Coast district (now British Columbia) the discovery of gold-mines and the consequent rapid immigration and development of the country were occasions for alarm (which) hastened the agreement with British Columbia. The terms of the contract were designed to develop the trade of the northwest and of British Columbia, and to divert that trade from the United States to eastern Canada.... The diversion of traffic to eastern Canada by the Canadian Pacific and other roads has been accomplished successfully, but to some extent at least at the expense of Western Canada.... Western Canada has paid for the development of Canadian nationality, and it would appear that it must continue to pay. The acquisitiveness of eastern Canada shows little sign of abatement.

1991

The most obvious and immediate result of the line's completion was Vancouver's rise.... The influence of the Canadian Pacific railway was everywhere visible in the city. A visitor of 1889 noted how, in Vancouver, it is the great thing to be connected with the real estate or the railway station; it assures you your position in society, these being the two excitements of existence.... everything in Vancouver is CPR.... By 1891 the CPR accounted for upwards of one-quarter of city revenue and employed between five and six hundred workers as officials, trainmen, or labourers out of a total Vancouver work force of about five thousand. Vancouver's role as a service centre was already taking shape: about three-quarters of employed men and women were working in trade, clerical, or domestic work, the professions or transportation.

1997

"The myth of the CPR as creator of the country is, in fact, as old as the railway itself, which is not surprising given that it was the railway itself which created the myth. Once the CPR had built the line, it set about promoting its achievement in countless books, pamphlets, stores, and movies. "The construction of the Canadian Pacific consummated Confederation," the company crowed in one of its early publications. The mundane act of constructing a railway was transformed into an heroic narrative of nation building. After a while it was almost impossible to imagine one without applauding the other."