

**WHAT DO THEY MEAN BY “SUCCESS”? A STUDY OF
HIGH SCHOOL STUDENTS’ JUDGMENTS OF SUCCESS
IN AN ONLINE MENTORING PROGRAM**

by

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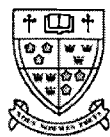
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ABSTRACT

On-line mentoring or “Telementoring” has been implemented with increasing frequency in both elementary and secondary schools over the last decade as a way to link students’ school work with that of adult communities of practice, and open their work to a wider responsive audience. This thesis is based on a curriculum development project involving telementoring called “Tracking Canada’s Past” (TCP). TCP investigates the application of telementoring in the high school history curriculum through the use of Knowledge Forum® software. The goal of the project is to help students understand the concept of history as a discipline through telementoring and the use of “primary” sources, in addition to standard textbooks.

It is widely acknowledged that in telementoring programs, maintaining participants’ interest and engagement is vital; but little empirical research has directly addressed the question of what rewards participants (particularly mentees) seek through their participation. Program designers have their own sense of what it means for their work to succeed, but what do the participants *themselves* think of as success? Knowing more about this would potentially enable program designers to provide more effective orientation and support.

Research participants were high school social studies students, their teachers, and adult volunteers. The research used a combination of questionnaires for both students and mentors, interviews with students and mentors after the completion of the unit, and

automatically generated computer records of students' and mentors' activities with the Knowledge Forum® throughout the curriculum unit.

Findings from this study indicate that students' judgments of success were best predicted by: their mentors' helpfulness in asking questions about their research; their mentors' helpfulness in recommending reading materials and other resources to support their work; their mentors' helpfulness in helping students develop questions to investigate; students' enthusiasm for the on-line discussion space in which they worked with their mentors; students' trust of their mentors.

In the analysis of the full dataset, I also examined how and to what degree students' and mentors' expectations of the mentoring relationship differed from each other, and how students' expectations were influenced by actual experience with telementoring.

DEDICATION

To my mother, Touran Bijavari (may her soul rest in peace)

and,

To my father, Asgar Asgari,

with love.

لعدم به مادر و پدر عزیزم
توران بیجاوری

و
عسگر عسگری

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1 INTRODUCTION

There are different ways that knowledgeable adults become involved in education. Visiting schools and giving presentations for students, meeting students through field trips and career days, and tutoring are some of the traditional ways. While these activities have been significant, they have not always been available for students because of the physical distance or the conflicting schedules separating schools and adults (O'Neill and Harris, 2000).

O'Neill (2001) describes another limitation of such traditional ways through a quotation from one of the teachers involved in his work:

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. (p.8)

Another way that adults contribute to students' education is through mentoring. The term 'mentoring' describes "the support given by one (usually more experienced) person for the growth and learning of another, and for their integration into and acceptance by a specific community" (Hobson, 2002, quoting from Malderez, 2001, p.57). In the context of K-12, mentoring often involves a relationship between a student and an older, more experienced person on a regular basis over a period of time to

improve educational achievement. Today, the Internet and electronic communications provide flexible communication environments in which students and knowledgeable adults can have relationships on-line without time and space constraints. This kind of on-line mentoring is called “telementoring”.

In telementoring, students and mentors’ communications are not limited to weekly visits. No matter where they are, students and mentors can communicate and benefit from telementoring (O’Neill and Gomez, 1998; Foster, 1999; Wheeldon and Lehmann, 1999; Hamilton and Scandura, 2003). Moreover, in telementoring, students have the opportunity to pursue their specific curriculum-related interests and get a deeper understanding of them (Foster, 1999; O’Neill and Harris, 2000; Neils, 2002). This is because the students have the freedom to explore their curiosities even if their teacher has limited expertise in that specific subject or does not have time to support them (O’Neill and Harris, 2000). Telementoring also provides an avenue for students to pursue their interest in subjects that they may not feel comfortable in discussing face-to-face (Cravens, 2002). Finally, orchestrating mentoring relationships on-line increases the teachers’ pool of available mentors. They do not need to rely on only the businesses in their communities as sources of mentors (Foster, 1999; Hamilton and Scandura, 2002).

For these reasons, telementoring has been implemented with increasing frequency in both elementary and secondary schools over the last decade as a way to link students’ school work with communities of specialist adults (Neils, 1994; Harris et al., 1996; O’Neill, Wagner, et al., 1996; O’Neill and Gomez, 1998; Tsikalas and McMillan-Culp, 2000; O’Neill and Scardamalia, 2000; O’Neill et al., 2003). Some of these telementoring programs are global in size such as the “Electronic Emissary Project” run by Dr. Judi

Harris at the University of Texas at Austin since 1993, and the “International Telementor Program” founded and directed by David Neils since 1994.

One of the recent efforts to implement telementoring in the high school is “Tracking Canada’s Past” (TCP), designed and run by Dr. Kevin O’Neill under funding from the Social Sciences and Humanities Research Council of Canada. Tracking Canada’s Past has been conducted in five schools in two phases since 2002. The goal of the project is to help students understand the concept of history as a discipline through on-line mentoring by historians, and using “primary” sources, in addition to their textbooks. The thesis presented here is based on data from this research project.

The participants in TCP have included Grade 10 social studies students, their teachers, and a variety of adult volunteers (mentors). A communal database technology called “Knowledge Forum”¹® was used in this project, in which participants could post their notes and share their work on-line. In this thesis, I have used data from three schools involved in the second phase of the project. There were 17 mentors participating in this project, to whom each was assigned between 5 and 11 mentees. Mentors and mentees were matched based on their common research interests, and worked together for about 10 weeks.

Telementoring literature contains an array of guidelines on how to implement “successful” telementoring programs for K-12 (Harris, 1996; Sanchez and Harris, 1996; Robb, 1997; O’Neill and Gomez, 1998; Tsikalas and McMillan-Culp, 2000; O’Neill et al. 2000; O’Neill and Harris, 2000). However, there has been no research addressing what

¹ Knowledge Forum is the registered trademark of the developers *Learning in Motion, Inc.*

students mean by "success" in telementoring relationships. This is the major focus of my research.

In a telementoring relationship, we may define "success" as meeting the pre-determined outcomes of the program. For instance, the Tracking Canada's Past team had hoped that after the completion of the project, the level of sophistication in students' thinking about historical evidence and methodology would increase. This outcome has been produced on a limited scale (O'Neill and Sohbat, 2004) and from this perspective, the project has been successful.

We can also define success relative to mentors' and students' individual satisfaction. This satisfaction is important to reach the first goal; i.e., meeting the pre-determined outcomes of the project. If mentees are not sufficiently satisfied with their mentoring relationships, they may abandon them, thus, endangering any learning outcomes the relationships are intended to produce. It is also important in sustaining the program. Previous research (O'Neill and Gomez, 1998) has shown that in a telementoring program, students may not anticipate the potential benefits of telementoring as they begin it. O'Neill and Gomez refer to this as the "developmental catch-22". However, students with more experience can anticipate the benefits of the program; i.e., their previous experiences influence their expectations, the types of functions they desire, and their ultimate satisfaction. Consequently, understanding mentors' and students' satisfaction is complex and variable. Hence, it is worthwhile to study it rigorously.

In this thesis, I have used the data from students' and mentors' pre- and post-project surveys, post-project interviews with students and mentors, and automatically

generated computer records of students' and mentors' activities with the Knowledge Forum to develop a greater understanding of what shapes students' judgments of "success" in telementoring relationships. Within the program structure, I was interested to know how and to what degree the functions that mentors provided for their mentees, the mentees' expectations of the mentoring relationship, and students' demographic characteristics shaped high schoolers' judgments of success in the relationships.

In post-project surveys, students were asked to rate the overall success of their mentoring relationships; but since "success" is a subjective, relative term, students may have had different definitions and measurements of success. They may have thought of various things while they were answering the post-survey question. For instance, they may have considered their final grade on the telementored project, their relationship with their mentor, or the change in their understanding of history as success. These measurements may have influenced students' judgment of success all or in part.

In this thesis, I have examined *the mentoring relationship* specifically, and tried to explain what students meant by success from the perspective of their relationship with their mentor, and their expectations. In particular, I have investigated what students' initial expectations of particular mentoring functions are, how their expectations differ from their mentors' initial desires, and how students' expectations are influenced by actual experience with mentoring. Detailed examination of these questions is important in obtaining a better understanding of students' and mentors' relationships, and consequently increasing students' satisfaction in their telementoring relationships. These findings will also have important implications for the design of curriculum-based telementoring programs and their supporting materials.

This thesis includes the following chapters:

1. Introduction: A brief overview of the background, goals, and context of the study.
2. Literature Review: A review of the literature in the field of mentoring and on-line mentoring with a detailed description of students' and mentors' expectations and relationships in addition to a review of adolescents' perceptions of success.
3. Context of the Study: A detailed explanation of the procedure of the project including how the participants were chosen and/or recruited, how mentors and mentees were matched, what topics of interest they could choose, and what the software was like.
4. Methodology: An outline of the research questions, data sources, and sample size followed by a detailed description of quantitative analysis of data supported by the qualitative data, and the results.
5. Discussion: A summary of the study and conclusions followed by the limitations of the study, future research, and the significance of the study.

2 LITERATURE REVIEW

2.1 Introduction

The term 'mentoring' derives from Greek mythology. It dates back thousands of years to Homer and his epic poem, *The Odyssey*. In the poem, "Mentor" was "a friend of Odysseus entrusted with the education of Odysseus' son Telemachus" (Merriam-Webster Dictionary) to guide the son on how to manage the results of his father's absence because of the Trojan war. Kram (1985) says, "the name ["mentor"] implies a relationship between a young adult and an older, more experienced adult that helps the younger individual learn to navigate the adult world and the world of work. A mentor supports, guides and counsels the young adult as he or she accomplishes this important task" (p.2).

Beyond this general definition, mentoring clearly has different connotations in different settings. Noe (1988) states that a mentor is "... usually a senior, experienced employee who serves as a role model, provides support, direction and feedback to the younger employee regarding career plans and interpersonal development, and increases the visibility of the protégé to decision-makers in the organization who may influence career opportunities". (p. 458) According to O'Neill and Harris (2000), the term 'mentor' is used today as "to describe people in a wide variety of both pre-arranged and spontaneous relationships in school and business communities." (p.4) In the context of K-12 schools, mentoring usually involves a relationship between a student or a group of students and an older, more experienced person on a regular basis over a period of time to improve educational achievement.

Mentoring may take place in many different formats, including formal vs. informal, one-on-one vs. group, school-based vs. community-based, and face-to-face vs. on-line mentoring. Moreover, mentoring relationships can be shaped for very different purposes: they can be implemented to improve academic achievement, to enhance career development, or to provide personal counselling, for example. Mentoring programs may also have different durations. Some may last just a few weeks and some may last an entire year or more.

Mentoring has a wide array of potential benefits. According to a research brief from Child Trends, mentoring programs for youth can improve educational achievement, social and emotional development, and prevent substance abuse (S. Jekielek et al., 2002). Mentoring may also enhance mentor's self-esteem (Wheeldon and Lehmann; 1999, Rhodes, et al., 2002), his/her self-satisfaction and personal growth (Allen et al., 1997), and professional development (Wheeldon and Lehmann, 1999).

While mentoring has many potential benefits, orchestrating mentoring in a purposeful way within a school or community always poses challenges. Mentoring activity is constrained in time and space (Noe, 1988; O'Neill and Gomez, 1998; Wheeldon and Lehmann, 1999). Geographic barriers, travel, and finding time for mentors to work with their mentees/protégés are some of the challenges to face-to-face mentoring.

In attempt to alleviate these problems, some educators have conducted on-line mentoring or "telementoring" in the past several years. Harris has conducted curriculum-based telementoring since 1993, Neils since 1994, and O'Neill since 1996. In telementoring, mentors and mentees are able to write to each other whenever they have

time, and from wherever they are. This is also a benefit for mentors who cannot get involved in face-to-face mentoring because of disability. Through telementoring, they have the opportunity to serve as mentors.

As mentioned above, there is no space constraint in telementoring, and the time constraint is reduced; i.e., mentors and students do not need to be available at the same time in order to be able to work together. However, they need to allocate enough time to work on a joint project and exchange notes in a timely way that will sustain engagement on both sides.

Among the other potential benefits of telementoring mentioned in the literature are:

- Increasing students' educational and personal growth, and providing opportunities for students to work with adults who are not their teachers or parents (Tsikalas and McMillan-Culp, 2000);
- Helping students discover their areas of interest and developing those interests (Foster, 1999; O'Neill and Harris, 2000; Neils, 2002) especially when students are interested in some subjects that may not feel comfortable to pursue or discuss face-to-face (Cravens, 2002);
- Developing students' social skills, especially the shy students (Lewis, 2002); and
- Enabling the teacher to spend more time supporting students in other ways (O'Neill, Wagner, and Gomez, 1996).

Telementoring programs have some limitations, as well. Some of the limitations are described below.

- *Finding volunteers.* Recruiting suitable number of telementors can take time from teachers. (O'Neill, et al., 1996).

- *Sustaining activities.* It is a big challenge to develop a sustained reciprocal telementoring relationship over the duration of a student's project (O'Neill, et al., 1996).
- *Bridging diverse experiences.* While having different mentors from different workplaces is beneficial to all participants, it can be difficult to help them understand what they are expected to do because each volunteer mentor sees the program from his/her own work experience (O'Neill and Harris, 2000).

2.2 Two Ways of Implementing Telementoring

On-line mentoring has generally been arranged in two ways: via private e-mail and in a public, "open" forum. In email-based mentoring the interaction among mentors and mentees is private, however, in mentoring in an "open" forum, mentor-mentee activities are more public; i.e., mentors and mentees post messages in a shared forum where mentees can read their mentor's notes and also their peers' mentors' notes.

Wheeldon and Lehmann (1999) note that e-mail mentoring demands several different kinds of support from educators to work well. For example, they need to monitor interactions and anticipate possible difficulties between the parties, support new ideas when they see online interactions decrease, and ensure that there is mutual respect between all involved in the relationship.

O'Neill, et al. (1996) point out that sustaining give-and-take throughout a telementoring relationship, designing the mentoring program in a way that every student could engage actively in the relationship and experience the benefit of the program are some of the challenges in an email-based mentoring program. In a later paper, O'Neill and Gomez (1998) explain that when students are new to telementoring relationships, they may not be aware of the possible benefits that such relationships might have for them to make their work sufficiently "visible"; i.e., explaining to their mentors what they

have done so far, where their work is going, and what challenges they are facing. To increase the visibility in on-line mentoring relationships, they suggested the use of groupware products such as Knowledge Forum, where mentors and students could communicate and share their ideas.

In addition, according to O'Neill and Scardamalia (2000), email-based telementoring relationships may develop a "rich get richer" dynamic, in which "the students with previous experience of supportive learning partnerships actively pursue the opportunity to work with telementors, while those with relatively little experience throw the chance away" (p.2). However, telementoring relationships carried out in a public forum, such as a bulletin board system or "Knowledge Forum" database can potentially overcome the rich get richer dynamic.

2.3 Some Contributors to Successful Mentoring/Telementoring Relationships

The aforementioned strategies for sustaining mentoring relationships on-line provide a good base for implementing telementoring. However, researchers would also like to know what factors contribute to the success of individual mentoring/telementoring relationships. This is hard to determine, since every mentor and mentee potentially comes to such relationships with a different set of personal characteristics and expectations. Moreover, different mentoring programs have different formats and goals. Therefore, it may not be possible to empirically verify a set of factors that can be applied to every mentoring/telementoring program. For instance, same-gender or cross-gender matches of mentors and mentees, and same-race or cross-race matches, have been occasionally

reported as important factors in the success of mentoring programs; though other empirical studies have contradicted these findings. However, in the mentoring literature, we find some factors that are generally agreed to increase the likelihood of success.

Below are some of these factors in regard with *face-to-face mentoring* programs:

- Frequent mentor-mentee contact over a significant period of time (Noe, 1988; DuBois et al., 2002; S. Jekielek et al., 2002);
- Participant's positive perception of the mentoring relationship in youth mentoring programs (S. Jekielek et al., 2002);
- Some individual-level factors such as "self-efficacy", and the quality of the interaction (Noe, 1988).

In addition, researchers have offered the following general design guidelines for maximizing success in assigned mentoring programs:

- Up-front and ongoing training for mentors (DuBois et al., 2002; Jekielek et al., 2002, Ryan et al.; 2002);
- Providing structured activities for mentor-mentee (DuBois et al., 2002);
- Matching mentors and mentees on the basis of mutual interests (S. Jekielek et al., 2002); and
- Monitoring the implementation of the mentoring program (DuBois et al., 2002, Ryan et al.; 2002).

In *telementoring* programs in K-12, studies have suggested that the following factors are important in increasing the chances of successful outcomes in such relationships:

- The students' preparation for their relationships (Tsikalas and McMillan-Culp, 2000);
- Students' active engagement (O'Neill and Gomez, 1998);

- Students' explicitness about what they mention in their notes, and reporting about their research progress to their mentors regularly (O'Neill and Harris (2000) from Kimball and Eunice's study (1999));
- Students' motivation (O'Neill et al. 2000); and
- Having a clear goal for the project in mind throughout the curriculum (Sanchez and Harris, 1996).

Published work has suggested the following general guidelines to successfully designing and implementing telementoring programs:

- Developing students' skills to represent what they do and do not understand (Tsikalas and McMillan-Culp, 2000);
- Providing up-front training for mentors, and defining goals and expectations for all participants (Robb, 1997);
- Providing up-front training for mentees (Kasprisin, et. al., 2003);
- Having an on-line facilitator to help participants adjust the amount of time they commit to the program, the frequency of their messages exchanged, and the types of communication they engage in (Harris, 1996);
- Educating students about mentors' different roles and functions (Tsikalas and McMillan-Culp, 2000);
- Having a schedule and sticking to it (Sanchez and Harris, 1996); and
- Communicating with mentors to inform them of the students' reactions to messages (Sanchez and Harris, 1996).

Telementors also need to take the following into account (Tsikalas and McMillan-Culp, 2000):

- be aware of their different roles and multiple functions, and
- be clear and explicit about the advice they offer on-line.

While there is no shortage of recommendations on how to implement successful mentoring and telementoring programs, unfortunately, these recommendations are often quite vague and general. For instance, it is clear that some up-front training or orientation

for mentees is useful (Kasprisin, et al., 2003), but one thing that past cognitive research has shown very clearly is that training can fail to influence behaviour unless it addresses students' prior conceptions; or it fails unless it relates the new knowledge to the information that students bring with them to the learning environment (Bransford et al., 2000). To be truly effective, training for mentees must address their prior conceptions about the nature of the mentoring relationship. To do this, we must know what these conceptions are. One way for mentees to express their ideas about mentoring is to ask them what they think mentors might do for them. This is the approach taken here.

2.4 Students' and Mentors' Expectations in a Telementoring Relationship

Kram (1985) states that any two individuals involved in a mentoring relationship at work bring their unique set of needs and concerns. When a relationship gives the opportunity to individuals to address their needs, that relationship is enhanced. Alternatively, when a relationship does not provide such an opportunity, it becomes unsatisfying. In order to understand how the relationship develops over time, we need to examine these needs and concerns.

Likewise, in a telementoring relationship, a mentor and a student or a group of students have both their own needs and expectations. Depending on what these expectations are, whether they are addressed or not, and in what ways, students can judge their relationships satisfying or unsatisfying. Feelings of dissatisfaction, whatever their basis is, can cause the participants to disengage and the relationship to fail.

It is reasonable to suspect that if we better understand what students' particular set of expectations are, we may understand how they would judge the success of their telementoring relationships. Equally, we need to consider mentors' desired activities to see if they are complementary with students' expectations.

Moreover, the *type* of expectations that students have of their mentors is important. For instance, students who expect to receive only resources and information from their mentor define the success of their mentoring relationship differently from students who want their mentors to ask them questions and challenge them intellectually.

Another example is students who expect their mentor to *guess* what their needs are and do not take time to explain them to their mentors. Likewise, some mentors rely entirely on their mentees to explain their needs, expectations, and frustrations. If this does not happen, the mentee may hold back and hence the relationship becomes unsuccessful (O'Neill et al., 1996). This kind of student expectation can affect their judgment of success of their mentoring. Since telementoring is an on-line relationship, and unlike a face-to-face relationship there is no audio information and visual cues, mentees and mentors both need to explain their needs precisely and not expect the other to guess their needs or frustrations.

Tsikalas and McMillan-Culp (2000) mention similar points. They state that students need to know that they should be honest and specific with their mentors; i.e., if they do not understand the kind of advice that their mentors have provided for them, they should inform their mentors about it. Sometimes, in such cases, students hesitate and do not ask questions about what they have not understood from their mentors because they

do not want to look ignorant! Sometimes, just as they do in the classroom (Dweck, 2000), they would rather please their mentor, or preserve an image of success. In these situations, mentors do not know to what extent they can offer help to the students because the students have not revealed their confusions. Unlike a classroom teacher, the telementor cannot assess students' understanding through assignments or informal contact. Consequently, the relationship does not yield productive results and students may judge the success of their mentoring relationship based on such conditions.

While students' types of expectations from their mentors play a role in their judgments of success, students' perceptions of their mentors are also important. A study by Ryan et al. (2002) describes the implementation of a face-to-face *elementary* school-based mentoring program. They reported, based on the responses of the majority of participating students, that mentors were viewed as caring friends who provided academic assistance. However, the type of academic assistance that students were interested to receive from their mentors was not specifically discussed in their study.

What *high school* students think of their mentors in a telementoring program is not clear, however, it is likely that they expect to see their mentors as "experts". How students define experts, or what their attitudes towards experts are, vary from each other. Unfortunately, students' *beliefs* about "experts" have been studied infrequently (Tynjala et al., 2002). It is possible that many of the ideas students have about experts come from the popular media: depictions of "experts" in movies, appearances of professors on TV news to provide "analysis" of news events, etc. In this case, students might expect their mentors to answer and analyze all their questions, be very knowledgeable about the specific topics they inquire into, and to respond quickly. This set of issues is not explored

fully in the present study, given the data available, but is a fruitful area for future research.

2.5 Students' Perceptions of "Success" in Curriculum-based Telementoring Programs

To describe students' perception of "success" in their telementoring relationships, it is reasonable to consider whether students have already had experience in telementoring programs, or if it is their first experience. O'Neill and Gomez (1998) state that many first-time mentees appear to judge the success of mentoring with whether they receive lots of resources and lots of "knowledge-telling" from their mentors and whether their mentors "delivered the goods". However, by orchestrating three successive telementoring relationships over the course of a school year, they found that students' desired functions developed from focusing purely on "help finding data" to deeper functions such as "mentors asking useful questions", "providing feedback on progress", and "explaining scientific ideas".

In addition, in an analysis of data from a 2-year design experiment in Toronto-area science classrooms, O'Neill (in press) showed that telementoring in an "open" mode may positively influence students' ideas about "success" in such relationships. He explains that telementoring in an open mode enables students to see the successful cases of mentoring relationships. This kind of looking at others' dialogues can lead students to seek models for their own behaviour in the telementoring relationship. This "opportunistic model-seeking", as it is called, allows the students to develop more mature understandings of the telementoring relationships and the kind of advice or help they

want from their mentors. Therefore, students may become “choosier” about what they want from telementoring or change their ideas about what “success” means.

Generally, what students mean by “success” is not a straightforward question, since “success” is a relative and subjective term. It can be defined differently by different people and from different perspectives. Depending on what someone sees as success, and what his/her individual, cultural, and social values are, the definition of success may vary (Marshall, 1997; Kalas, 2000). In “Tracking Canada’s Past”, participating students could see different things as the measurement for success. For example, they may focus on their final report grade, or the change in their level of understanding in history, their relationship with their mentor, or even the accessibility of Knowledge Forum, and see these as success.

In a study about adolescents’ perceptions of success, Kalas (2000) mentioned that adults’ ideas of success are not always the same as teens’ ideas for success and their incentives. This is because their goals are likely different. Since in our telementoring relationships, the mentors were all adults and the mentees were adolescents, it is likely that they had different measurements for success of their mentoring because of their different goals. For instance, mentors’ goal could be trying to help their mentees understand the material they needed for their project, however, mentees’ goals could be getting more resources and answers from their mentors.

Marshall (1997) explained in her study that adolescents may define success relative to: achieving goals, being their best, and working hard. Therefore, it is possible that the students in this telementoring project have had different judgments of success

based on whether they achieved their goals, they were their best, or worked hard in their telementoring relationships.

Each of the aforementioned perceptions of success, or a combination of them, might have influenced the participating students' overall impression of success in their mentoring relationship. In the present study, data were not available to address all these possible influences on students' judgments of success in telementoring relationships; but I have examined the functions sought and provided in such relationships and tried to explain what students meant by "success" in these terms.

3 CONTEXT OF THE STUDY

3.1 Introduction

The research outlined in this thesis took place within a larger telementoring project that has been implemented in an “open” mode. The project is called “Tracking Canada’s Past” (TCP). The goal of the project is to help students understand the concept of history as a discipline through on-line mentoring and using “primary” sources, in addition to their textbooks. In TCP, teachers involve their students in research relating to Canadian Pacific Railway as a curriculum unit. This was Canada’s first transcontinental railway, which transformed the country in many important ways.

Over the course of several assignments spread over 10 weeks, each student develops a research question or topic of interest, and explores it using primary sources such as archival material, letters, local historic sites and artefacts. They also work on-line using a communal database technology called Knowledge Forum. Students bring their diverse evidence to the Knowledge Forum, consult with their on-line mentors, teachers, and other students and learn about history in the way that historians do. They finally write a report about their research and present their findings in the form of a historical narrative.

Tracking Canada’s Past has been conducted in five schools (three in the Lower Mainland of British Columbia, and two in Toronto) since 2002: The first phase of the project was conducted in two public high schools in British Columbia and was completed

in June 2002. The second phase of the project was conducted in 5 schools starting Feb. 2003; three public high schools from the large municipality in the Lower Mainland of B.C., one elementary school and one high school in Toronto. The participants in this phase of the project were 5 teachers, 17 volunteer mentors, and 145 students. Data was collected over a period of 10 weeks. This thesis uses the data from *three* schools in the Lower Mainland of B.C. participating the second phase of the project.

3.2 Recruitment

The interested teachers and mentors were recruited through personal contacts and notices in professional listservs for B.C. Social Studies teachers and graduate students in History across Canada. We also invited volunteer teachers and mentors through sending out posters to schools, and historical sites such as museums and archives. On the “Tracking Canada’s Past” website², we included two on-line application forms: one for volunteer teachers and one for volunteer mentors. In the “Mentor Application Form”, we asked mentors about their personal and professional history, education, teaching experience, and their areas of historical interest/expertise. Among our mentors, there were both academics such as graduate students of History, and non-academics who volunteered because of their special interest in the subject of the railway in Canada.

In the “Teacher Application Form”, we asked teachers about the class they wished to involve in the project, local resources available for students’ investigations, their experience with open-ended projects, and technical resources they had available. The last section contained some technical questions such as whether their school/district had a

² <http://www.trackingcanadaspast.org/>

firewall that restricted access to some Internet services or not, etc. This was important for us to know, since all the activities between mentors and students were done in the Knowledge Forum. We had to make sure that they were able to login and read/post notes on-line from the beginning of the project.

3.3 Topics of Interest

A list of 91 topics and subtopics related to the Canadian Pacific Railway on the TCP website was prepared by the facilitator of our project. The list incorporated the themes researched by students in the first phase of the project. There were eight areas or themes in the first phase of the project:

- Technology in the 19th Century
- Arts in Canada
- Native People of Western Canada
- Settlement of Western Canada by Non-Natives
- Communication in Canada
- History of Work and Working People's Lives
- Exploration of Canada by Non-Natives
- Development of Tourism in Canada

The list of topics in the second phase was an expansion of the above list. Our facilitator took the following points into account while expanding the topics:

- She looked at the areas of interest that the volunteer mentors had mentioned in their volunteer forms, and then did research on those areas to find as many topics as she could.
- Since the project "Canadian Pacific Railway" may not be as interesting to girls as boys, our facilitator included the project topics that may be of greater

interest to girls, such as Tourism, Arts and Culture, Interior d'Ecor of the railway hotels, etc.

- She tried to have a variety of topics, showing the broadness of the CPR subject.
- She also tried to have some overlaps among some topics so students could go to other working groups in Knowledge Forum and look at that topic from another perspective.

3.4 Mentor Matching

As mentioned above, the list of topics was posted on the TCP website. Students were asked to connect to the website and declare a topic of interest through their teachers by a specific date. Our volunteer mentors also had access to the list of topics through TCP website. They could choose as many topics as they were interested in, and felt comfortable with. When a mentor filled out an application form³, his/her information was stored for future use by the program facilitator. The facilitator responded to each application, to first confirm that she had received the application and second to let the volunteer mentor know that they could contact her for further questions or concerns. After our facilitator got the areas of interest from mentees, she matched groups of students with the same or similar topic of interest to one mentor.

The matched working groups in our Knowledge Forum workspace were as follows:

- Architecture (10 mentees)
- Arts and Culture (9 mentees)
- Building the Railway 1 (9 mentees)

³ This form is a small part of a software system called Telementoring Orchestrator, developed to support online mentoring programs. It is highly customizable, and can be downloaded free for non-commercial use at <http://www.telementoring.ca/>

- Building the Railway 2 (8 mentees)
- Building the Railway 3 (7 mentees)
- Environmental History (8 mentees)
- Labour History 1 (8 mentees)
- Labour History 2 (8 mentees)
- Labour History 3 (10 mentees)
- Legal History 1 (9 mentees)
- Legal History 2 (10 mentees)
- Native Peoples (8 mentees)
- Political and Military History (7 mentees)
- Social History 1 (5 mentees)
- Social History 2 (11 mentees)
- Tourism (8 mentees)
- Transportation and Communication (10 mentees)

Each working group or “view” had a different number of students, ranging from 5 to 11, based on the popularity of the research theme.

Each match between students and their mentor was given its own view in the Knowledge Forum. Then, the biographical description of the respective mentor was posted on the related view. Each mentor was also issued his/her own Knowledge Forum account.

There was a list of the above views on the front page, or “Welcome” view, of the Knowledge Forum. Each theme or view was linked to its own working space, where students could discuss their ongoing research with one another and with their mentor. The students and mentors were able to access all the views and read other students’ and

mentors' notes in the Knowledge Forum. Each mentor was asked to log on to the system and check his/her mentees' notes three times a week if possible.

3.5 Working On-line

Mentors were provided with instructions on using the Knowledge Forum software through an email. We also made a website with all the necessary information and instructions on how to use Knowledge Forum and gave the URL to the mentors. The students received the same instructions from the administrator of the project, Dr. O'Neill, and his research assistants. He also introduced the idea of on-line mentoring or telementoring to the students in one session. Many of the students were familiar with MSN Messenger and talking on-line with friends; however, they were not familiar with the idea of working on-line with an adult on a research project. In addition to that, Dr. O'Neill made two videos: one on 'getting started with TCP project' explaining what the goal of the project was, who the participants were, etc.; and the other describing the roles of the mentor and students in a telementoring relationship. Each class received a copy of the video to review. In addition, the videos were posted on the project website for reference.

To help structure students' work over the lengthy project, a set of milestone assignments was provided on the project website at www.trackingcanadapast.org. At the time that the students were assigned to their mentors, they had completed Assignment #1, "Choosing a broad theme or topic", with the help of their teacher. After that, they went through the remaining assignments with the help of their mentors and teachers:

- Milestone Assignment #2: Creating a framework for your research

- Milestone Assignment #3: Doing exploratory research and organizing your sources
- Milestone Assignment #4: Drafting your prospectus
- Milestone Assignment #5: Your final prospectus
- Final paper

Having access to resources: The students from three schools (Riverside School, Metro South School, and King's Cross School) had very different levels of access to primary sources and the Internet. The students in Riverside School had good access to primary sources because of their local Archive and had already had several visits before their mentors came on-line; however, their access to the Internet and Knowledge Forum was not as good as students in Metro South School. On the other hand, students in Metro South School did not have Archives and Museums nearby. The students in King's Cross School had good access to the Internet, and were within a few minutes drive of several CPR-related sites and archival resources.

The role of our facilitator: In addition to pre-training for the volunteer mentors and students in our project, we provided the participants with some external support from a facilitator who was a Ph.D. student in History. Besides the aforementioned supports that she provided in preparing the list of topics of interest (Section 3.3), our facilitator followed the on-line conversations, helped mentors with issues that arose, and assisted the students when their own mentors were not able. More precisely, she performed the following throughout the project:

- Checked Knowledge Forum in the first weeks of the project to make sure all the students were on board.

- Checked each view almost every day to see if new things were happening; however, she did not read all the notes posted by every mentor or student so as not to give the impression of checking upon them.
- Helped mentors who had questions or concerns about their mentoring performance. This was done behind the scenes by e-mail, not in the Knowledge Forum.
- Helped some mentors find resources for their students through introducing them to those resources (short-cutting).
- Put mentors in touch with each other in case one's mentee had a question that the other could answer.
- Was in touch with mentors by email continuously for mostly practical details.

4 METHODOLOGY

4.1 Data Sources

The thesis presented here is based on the data from the second phase of the Tracking Canada's Past project, using data from three high schools in the Lower Mainland of British Columbia. The data analyzed include:

- Surveys administered to students and adult mentors both prior to and after the curriculum unit. (Appendices B to E)
- Automatically generated computer records of students' and mentors' activities with the Knowledge Forum throughout the curriculum unit.
- Videotaped small-group interviews with small samples of students conducted after completing the unit. Interviewees were selected based on their activities in the Knowledge Forum.
- Face-to-face/telephone interviews with mentors after the completion of the unit (30-45 minutes long, semi-structured).

In this thesis, I have used a quantitative method of analysis and also illustrated the findings from the quantitative analysis with quotations from the semi-structured interviews. Combining different sources of data helped me get a better understanding of what students meant by success in their telementoring relationships.

4.2 Sample Characteristics

Research participants were high school students in the Lower Mainland of British Columbia, their teachers, and selected mentors. Eighty-nine students from four Social Studies 10 classes in three schools provided research consent forms (out of 108). Thirty of the students were from one Social Studies 10 class at Riverside Secondary School. The

school was located in a small industrial town of 30,000 people which was chosen because of its proximity to the railway. The town has also been influenced by CPR in many ways. The class was largely Caucasian, and the majority of the students did not expect to attend university. Twenty-nine students were from one Social Studies 10 class at King’s Cross School, located in an affluent urban neighbourhood. These students were traditionally successful in school, and all but one expected to attend university. The remainder of the students, 49, were from two Social Studies 10 classes at Metro South School, located in a densely populated metropolitan area. Both the school population and the population of the participating regular-track class were quite racially mixed. The majority of the students declared they would like to attend university after graduation. There were 17 mentors in this project, approximately one mentor for each group of 5-11 students.

After excluding those students who had missed one of the pre- or post-unit surveys, the number of data points available for analysis was 77. Five of these students had not posted or read notes in Knowledge Forum, therefore, their responses to questions about their relationships with their mentors or their mentor’s helpfulness were also deleted from the dataset. This brought the number of data points available for the analysis to 72. In regard to the adult mentors, we had permission to use data for 16 of the 17.

Table 4-1: Sample Size

School	Students	Mentors
Riverside	15	Total: 16
King’s Cross	23	
Metro South	34	
	Total: 72	

4.3 Research Objectives

The major purpose of this thesis is to gain a better understanding of which variables in our dataset best predict perceived success in curriculum-based telementoring relationships. This should help inform the designers of telementoring projects like TCP as to how they might maximize student satisfaction in such relationships.

4.4 Data Analysis

To better understand high schoolers' judgments of the success of their telementoring relationships, I examined students' and mentors' expectations of their mentoring relationships, the mentoring functions provided in the relationships, students' conceptions of an "ideal" mentoring relationship, student demographic characteristics, students' expectations for future schooling, and students' activities in the Knowledge Forum workspace.

The main questions addressed in this study are:

1. What were students' and mentors' expectations of telementoring?
2. Among those measured in this study, which variables best predict students' impressions of the overall success of a telementoring relationship?
3. Does students' experience of telementoring influence their conceptions of an "ideal" mentoring relationship? In what ways?
4. How can we maximize student satisfaction in assigned telementoring relationships?

In all telementoring relationships, both the mentors and mentees have some initial needs and expectations (Kram, 1985). Depending on what these expectations are, and whether they are complementary or not, students can judge their mentoring relationships

satisfying or unsatisfying. As the first step in the statistical analysis of data in this study, descriptive statistics was used to see what percentage of students expected to receive each telementoring function and what percentage of mentors desired to provide each of those functions. Comparing these two percentages could help us understand whether students' and mentors' expectations were complementary or not. It could also help us identify the *type* of the functions that each group desired to receive or provide; i.e., whether they both expected the same functions or different ones.

It was expected that the mentoring functions that students recognized their mentors provided for them throughout the project would have an influence on students' judgements of success. Through descriptive statistics, the percentage of students who reported each mentoring function, was computed. Depending on the functions that students thought their mentors tried to provide for them during the project (whether their expectations were addressed), they could have a satisfying or unsatisfying impression of their mentoring relationships.

To understand which variables, among those measured in this study, associated with students' impressions of the overall success of their telementoring relationship, Pearson Bivariate Correlation was used. Correlation reflects the direction and the strength of association between two variables. A strong association between variables may indicate a causal link. According to the variables which correlated significantly with the 'success' variable, multiple regression was then implemented to see how many and which of the independent variables (IVs) contributed significantly to prediction of students' judgements of success as the dependent variable (DV). In multiple regression, the goal is prediction; i.e., to predict the score on the DV from scores on several IVs. The regression

strategy applied in this analysis was statistical (stepwise) because this strategy is used for model-*building* as opposed to model-testing (Tabachnick, B. G. and Fidell, L. S., 2001); hence, to build a model consisting of the variables that best predict judged “success”.

How students’ experience of telementoring changed their desires for future telementoring functions is another objective of this study; therefore, students’ conceptions of an “ideal” mentoring relationship were investigated. It was suspected that students’ experiences of telementoring would have an influence on their desires for particular functions in their future telementoring relationships. Using descriptive statistics once again, the percentage of students who rated each function was measured and then compared with the percentage from the pre-surveys. To understand whether the pre-post changes in students’ expectations of telementoring functions were significant the Wilcoxon Signed-Rank Test was used. Wilcoxon Signed-Rank Test is a nonparametric test for the median difference in paired data. This test, unlike the t-test, does not make assumptions about the distribution of the variables; but in a similar fashion, it takes into account information about the magnitude of differences between paired observations, and gives more weight to pairs with large differences than to pairs with small differences. The Wilcoxon test is based on the ranks of the absolute values of the differences between the two test variables.

It was also suspected that students’ activities in the Knowledge Forum such as the number of posted and read notes by them would have an influence on the impressions of success of their mentoring relationships. Therefore, the level of students’ activities was investigated through measuring the rate of success for those who had posted and read less notes than the others.

To understand whether student demographic characteristics, and their background such as their plans for work or further schooling after graduation, contributed to prediction of students' judgements of success or not, this data was also examined. It was important to know if students' gender, parents' education, or their post-graduation plans, for example, had any association with students' judged "success" since these are variables that are not under the control of a program designer.

In addition to the quantitative analysis, I examined closely students' and mentors' interviews to get a richer understanding of the quantitative results. Quotations are used selectively throughout the analysis to illustrate students' and mentors' perspectives on the phenomena under study.

4.4.1 Students' and Mentors' Expectations of Mentoring

As mentioned earlier, in a telementoring relationship, a mentor and a student or a group of students have their own needs and expectations (Kram, 1985). Depending on what each party thinks of the other, the expectation differs. It is likely that many students think of their mentors as "experts"; but how students define experts, or what their attitudes towards experts are, may vary. It is reasonable to suspect that these attitudes and expectations shape students' relationships with their mentors; therefore, if we are aware of these expectations we may be able to increase the rate of success in such relationships. With this in mind, I present below descriptive statistics regarding students' and mentors' expectations of mentoring supported by some quotes from their closing interviews.

4.4.1.1 Students' Expectations of their Mentors

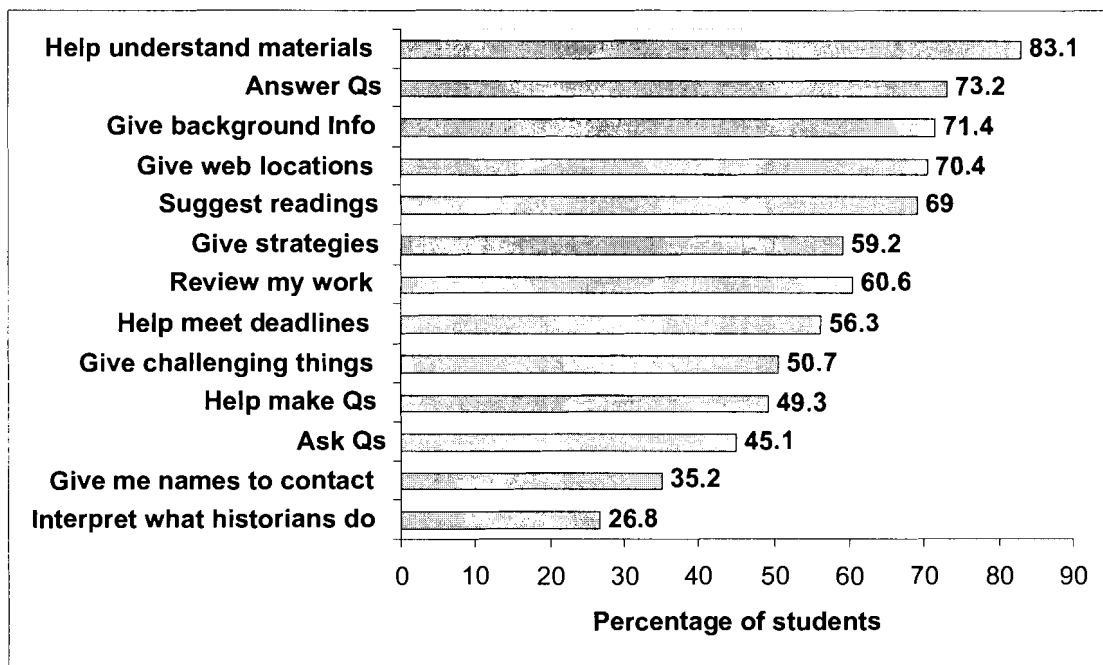
The following list of 13 telementoring functions (types of advice, guidance or help that mentors might provide for their mentees) was given to the students in the pre-survey, asking them what they thought a “mentor” might do for them. The list was designed to fit the context of an inquiry telementoring project like Tracking Canada’s Past. An early version of this list was collaboratively developed by Kevin O’Neill and Rory Wagner, a high school science teacher who participated in some of his early research on telementoring. The list was based on classroom observations and conversations with students participating in his own email-based mentoring projects. The list was later modified by O’Neill for use in TCP. Some of the statements were altered to better fit the nature of inquiry in the domain of history, and the last statement “Help me understand what historians do each day” was added to the list to capture in student-friendly language the notion of historians’ research practices. Students were asked to indicate what they thought a “mentor” might do for them, by rating the extent to which they expected to receive each function on a scale from 1 to 7 (where 1=a little and 7=a lot):

- Help me come up with a project question/idea to investigate
- Ask me questions to help me think about my project
- Answer questions I have about specific people, events or ideas in history
- Give me background information on my topic
- Give me locations on the Internet where I can find resources to answer my questions
- Help me to understand material I read about my topic
- Suggest challenging things for me to do that could improve my project

- Review my work as I go along and help me keep on track
- Give me the names and addresses of other people to contact about my project
- Help me to meet project deadlines
- Suggest specific strategies that will help me get my work done
- Suggest books or other sources that I should read
- Help me understand what historians do each day

The percentage of students who showed a high desirability in receiving a function by rating 5-7 has been shown in Figure 4-1.

Figure 4-1: Students' Expectations of Their Mentors (n=71)



According to this Figure, the top five functions that students were interested to receive were⁴:

- Help me to understand material I read about my topic (83.1%)

⁴ Numbers in parenthesis show the percentage of students who expected to receive each function.

- Answer questions I have about specific people, events or ideas in history (73.2%)
- Give me background information on my topic (71.4%)
- Give me locations on the Internet where I can find resources to answer my questions (70.4%)
- Suggest books or other sources that I should read (69%)

The bottom five functions were:

- Suggest challenging things for me to do that could improve my project (50.7%)
- Help me come up with a project question/idea to investigate (49.3%)
- Ask me questions to help me think about my project (45.1%)
- Give me the names and addresses of other people to contact about my project (35.2%)
- Help me understand what historians do each day (26.8%)

As these frequencies make clear, at the start of the project students mostly expected their mentors to help them find background information, web locations, and reading materials about their chosen topics rather than being asked questions or having their thinking challenged by their mentors. Since these are the types of guidance that students tend to associate with getting started on a project, O’Neill (in press) refers to them as “inquiry jumpstart” functions.

Students’ post-project interviews shed light on these responses. As one of the students remarked in response to the question of what he thought his mentor would do for him:

I thought that he would give me some sources like where I could go, like some websites or some books that I could go and like find some more

information on the topic, like he could give me the name of the books and find out the information I required.

Another student remarked:

... tell us information that is about our topic, like how to get it and where to look, and tell us factual information on it.

Some explanation of these responses comes from a student whose mentor had posted a “getting started” message in the Knowledge Forum at the start of the project. He commented in interview:

That was very helpful. It gave us like a good starting point, like to have somewhere to begin... because getting started is one of the hardest parts because you are so sort of overwhelmed by, like, “where do I go next?” and things like that.

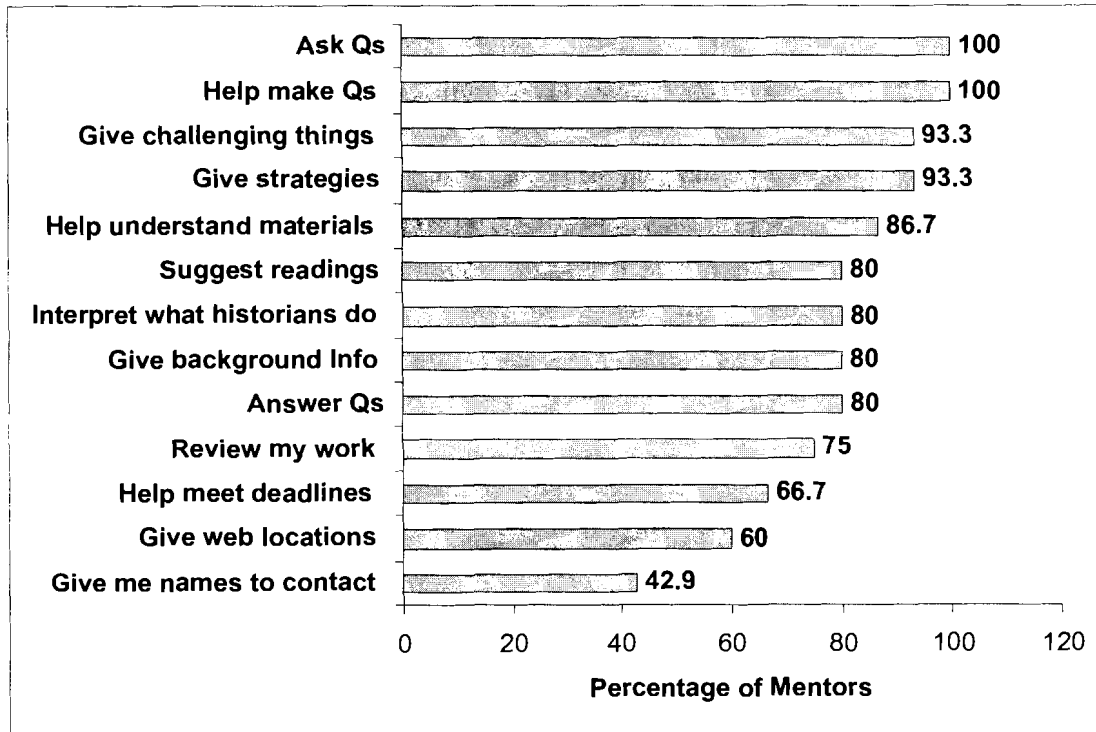
4.4.1.2 Mentors' Desired Activities

Volunteer mentors for Tracking Canada's Past were given the same list of 13 mentoring functions as the students in their pre-project surveys, and asked to rate each one with respect to how enthusiastic they were to provide it. This was intended to show how complementary the mentors' expectations were with those of their prospective mentees.

Perhaps not surprisingly, as a group, our mentors declared quite different expectations from their mentees. Almost all of the mentors showed a strong desire to offer functions that would keep them continuously involved in their mentees' work; the types of advice that put them in a role of “prodding partner” as O'Neill and Scardamalia

(2000) discuss. Figure 4-2 shows the percentage of mentors who rated each function 5-7 on a scale from 1-7 (1= a little and 7= a lot).

Figure 4-2: Mentors' Desired Activities (N=16)



As the above Figure shows, the top five functions that mentors desired to offer were:

- Ask students questions to help them think about their project (100%)
- Help students come up with a project question/idea to investigate (100%)
- Suggest challenging things for students to do that could improve their project (93.3%)
- Suggest specific strategies that will help students get their work done (93.3%)
- Help students to understand material they read about their topic (86.7%)

The bottom five functions that they desired to provide for the students were:

- Answer questions students have about specific people, events or ideas in history (80%)
- Review students' work as they go along and help them keep on track (75%)
- Help students to meet project deadlines (66.7%)
- Give students locations on the Internet where they can find resources to answer their questions (60%)
- Give students the names and addresses of other people to contact about their project (42.9%)

The percentages of mentors in the bottom five shows that our mentors were interested in offering almost all of the types of advice, except giving students the names and addresses of other people to contact about their topic – which was not actually desired by students either.

Comparing Figures 4-1 and 4-2, it is worth noting that almost 100% of mentors cited the first three functions (Help them come up with an idea or question to investigate, Ask them questions to help them think about their research, and Suggest challenging things for students to do that could improve their work); and that these were among the functions that students *least* expected to receive – at least initially. Results from closing interviews suggest similar findings; i.e., mentors, unlike mentees, wanted to offer guidance on the substance of students' work, rather than offering specific answers to questions, or solely help them to get started. This will be discussed in detail in the next sections.

4.4.2 Students' Relationships with their Mentors

At the beginning of the project, we asked students and mentors to post a note in the Knowledge Forum to introduce themselves and declare what their interests were. This

was meant to be an introduction for students and mentors to start communication. The rest of the mentor-mentee discourse generally focused on work and students' projects.

To get an impression of the tenor of students' relationships with their mentors, we asked students to rate the following statements in the post-survey. Students needed to circle a number from 1 to 7 (1=disagree strongly and 7=agree strongly) to show how strongly they agreed or disagreed with those statements. Percentages given beside each statement below shows that the majority of the students (over 70%) agreed with the following statements by choosing a rating of 5, 6, or 7.

- 1. My mentor was friendly to me (80.6%)
- 2. My mentor seemed to have carefully read the notes I posted (72.2%)
- 3. My mentor showed respect for me (86.1%)
- 4. I trust my mentor (73.2%)
- 5. I respect my mentor (88.9%)

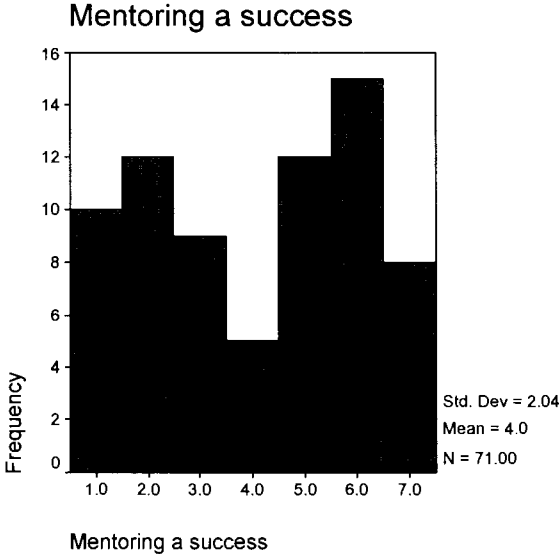
This shows that the majority of the students involved in the project felt they had a trusting and respectful relationship with their mentors. One might naturally expect, based on these responses, that students' ratings of the overall success of their relationships would be quite high; but this was not the case, as described below.

4.4.3 Students' Overall Impressions of Success

In the post-project surveys, we asked the students to rate their agreement or disagreement with the statements "Overall, the mentoring was a success for me" and "Having my mentor looking at my work on the project was helpful". They rated these statements on a scale from 1-7 (1= disagree strongly and 7= agree strongly).

Descriptive analysis showed that the ‘success’ variable is bi-modally distributed (See Figure 4-3) and the ‘helpful’ variable is a bit negatively skewed. 49.3% of the students agreed that the mentoring was a success for them by rating 5-7 and 55.6% of them agreed that having their mentor looking at their work on the project was helpful by rating 5-7.

Figure 4-3: Students’ Overall Impression of Success of Mentoring



To understand why mentoring was not considered successful by so many students, despite their evidently positive attitudes about their mentors’ trustworthiness, friendliness, and so on, we included eight statements in the post-survey asking students for their own understanding of the reasons why their relationships were not successful. Students were encouraged to check as many statements as they thought applied in their particular case. Out of 72 respondents, 34 students explained a lack of success in their mentoring relationships by checking one or more of these statements. The remaining 38 students did not check any of them because they judged their mentoring relationships

successful. In the following list, the numbers in first parentheses show the number of the times that these statements were checked by students. The second parentheses show the percentage of students who checked the given reason.

1. My mentor never answered me; not even ONE response (5) (6.8%)
2. My mentor was too busy to help me very much (5) (6.8%)
3. My mentor responded too slowly to be helpful (13) (17.8%)
4. My mentor tried to help, but didn't understand what I needed (14) (19.2%)
5. My mentor tried to help, but didn't know much about my topic (3) (4.2%)
6. I didn't keep in touch with my mentor because I didn't really need or want help (15) (20.8%)
7. I didn't start communicating with my mentor early enough (9) (12.5%)
8. My mentor and I didn't get along (0) (00.0%)

A quick look at this data shows that 20.8% of the students did not invest effort in the relationship because they did not need or want help; 19.2% of the students believed that their mentor tried to help but he/she did not understand what they needed.

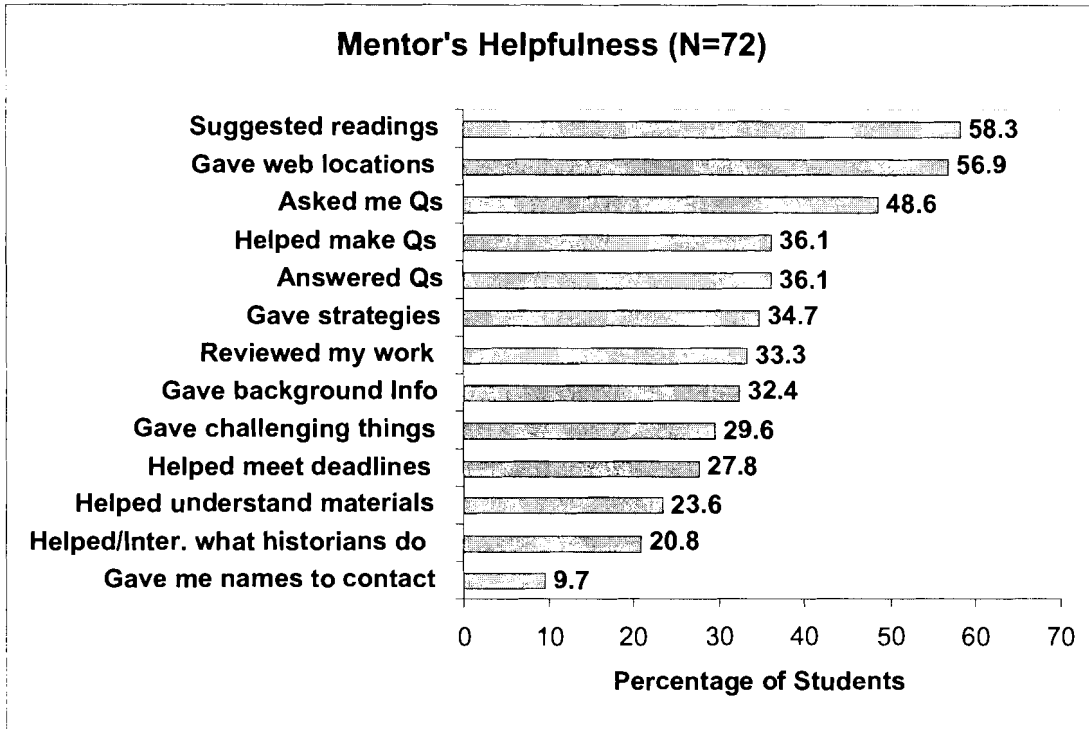
Altogether, nearly half of the 34 students (15 students) who found their relationships unsuccessful did not feel they needed help for their projects — though the project was quite demanding by high school standards. By removing these 15 students from the dataset (Total number=72), the rate of “success” increases from 49.3% to 62.5%.

4.4.4 Mentor's Helpfulness

The same 13 statements about mentoring functions were given to the students at the end of the project, asking them what their mentors actually tried to do for them in the course of their research. As shown in Figure 4-4, around half of the students reported that

their mentors introduced them to web locations and books to answer their questions, and also asked them questions to help them think about their research. With regard to the rest of the functions, less than half of the students found their mentors helpful.

Figure 4-4: Mentor's Helpfulness (N=72)



Based on what students recognized their mentors did for them throughout the project, mentors were not as helpful as they had declared they would be in their pre-surveys. However, in fairness to the mentors, one must understand the challenges they face in providing advice.

In telephone interviews, mentors were asked about their experiences of telementoring: whether their experiences were much like what they thought they would be, and what was different from their expectations. For the most part, they declared that they had expected more frequent and continuous participation by the students. Mentors

wanted to help their students, but felt that the students were not there to benefit from that help.

Another related issue raised by some mentors was that they liked to be seen by students as advisors, who were there to help them understand how historians work or think, instead of as information resource. As one of the mentors explained:

[I wanted] to be there to answer the academic questions as best you can, but not to sit and baby-sit the students with – oh here’s all the texts you’re going to need and here’s the completed paper just hand it in – it’s a case of just sort of paving the way for them to be able to do it themselves.

Another mentor gave a more elaborate answer:

I think there was a gap there. My understanding going into it was that I would act as somewhat of an advisor answering questions, you know, students coming to me and I would be able to kind of steer them into the right path ..., whether that be recommending books, answering questions or that sort of thing, um ... it ended up being a little bit different than that...

Interviewer: In what sense?

I think a lot of the students were coming to me for different reasons, they were coming to me to get motivated, to get clear on a topic, to, I think, just show the fact that they had done something for their teacher, you know, I think only three of the students that I had this last time around actually used me in the way I thought that I would be used as a mentor.

In addition to the different expectations that mentors and students brought to their telementoring relationships, mentors encountered some other challenges that are discussed below.

4.4.5 Some Other Challenges

An overall look at mentors' ratings of their desired activities shows that the majority of them rated highly all the types of advice listed. This is what they expected to experience before the project. However, during the project, they realized that there were practical constraints on the advice they are able to provide. For instance, in addition to expecting more participation by the students, mentors found themselves wanting to know much more about the classroom context in which students were working. Despite the details provided through the milestone assignments about what the students and the mentors would be doing during the project and when, some explained in their interviews that they were not clear about what was happening in the various classrooms. This concerned them because they felt that such knowledge would help them to offer advice that would fit in better with the other activities or guidance that students were getting in the classroom:

Well I should have contacted their teachers or had some way to contact people so that I could actually find out what was happening.

Moreover, some mentors were not clear about what or how much they could ask their mentees to do. One essential part of the TCP project was to have students working with primary sources, but some mentors were unclear on students' access to primary sources and their abilities in working with them.

...here you're running into the problem of not knowing exactly.... As a grad student you have certain expectations, you're expected to be very exhaustive and that sort of thing. But [with] these high school students I find I'm not sure where to kind of draw the line and say, "well this is a bit beyond your abilities." To start referring them to archives, to go dig through microfilm, reels of old newspapers... I wasn't sure about that.

4.4.6 Relationship Between Success and Other Variables Measured

To gain an initial sense of the variables that associate with students' impressions of the overall success of mentoring, I computed the correlation between the 'success' variable and the following additional variables:

- Demographic variables, including students' gender, and their parents or guardians' educational attainment
- Students' school interest and experience including their average grade, and their orientation to subjects such as English, math or fine Arts (See Appendix A)
- Their ideas about learning in school (See Appendix A)
- Their ideas about intelligence (measured using an instrument from Dweck (2000))
- Their expectations for future work or study
- Their mentors' helpfulness (the functions that students reported their mentors provided for them during the project)
- Their relationship with their mentors, including a) their mentors' friendliness, b) the degree to which they felt their mentors read their Knowledge Forum notes carefully, c) the degree of respect they felt their mentors showed for them, d) the trust they placed in their mentors, and e) the respect they held for their mentors.
- Their impression of the on-line discussion space
- Their idea about the final report; and
- The number of messages posted and read in the Knowledge Forum

Analyses revealed that the following variables correlated significantly and positively with students' impressions of the overall success of mentoring.

Table 4-2: Correlations Between the “Success” Variable and the Other Variables

Tenor of the Relationship with the Mentor	Correlation
I trust my mentor	0.595**
My mentor seemed to have carefully read the notes I posted	0.572**
My mentor is friendly	0.566**
I respect my mentor	0.537**
My mentor showed respect for me	0.435**
Student Background	
Students' average grade (self-report)	0.324**
Students' ideas about learning in school (All the questions should get answered as we learn more and more)	0.308**
Students' post graduate plans (work, university, community college, or other)	0.302**
Students' academic self-concept (their orientation to math subject)	0.278*
Students' Expectations of Mentoring	
My mentor asks me questions to help me think about my research	0.299**
My mentor helps me understand material I read about my topic	0.247*
Student Work on Project	
The number of hours put into writing the final report (self-report)	0.402**
On-line Activity and Attitude	
Doing my work in Knowledge Forum, where other students could see it and I could see their work, was helpful to me	0.406**
The number of notes posted in the Knowledge Forum	0.406**
The number of messages students read from their own mentor in the Knowledge Forum	0.267*
Mentor's Helpfulness	
Asked me questions to help me think about my research	0.686**
Suggested specific strategies that will help me get my work done	0.616**
Helped me come up with a project question/idea to investigate	0.612**
Gave me locations on the Internet where I can find resources to answer my questions	0.597**
Answered questions I have about specific people, events or ideas in history	0.555**
Reviewed my work as I go along and help me keep on track	0.551**
Suggested books or other sources that I should read	0.531**
Suggested challenging things for me to do that could improve my project	0.512**
Helped me to understand material I read about my topic	0.481**
Gave me background information on my topic	0.476**
Helped me to meet project deadlines	0.473**
Helped me understand what historians do each day	0.423**

* = $P < 0.05$

** = $P < 0.01$

As shown in Table 4-2, students' average grade, their plans for work or further schooling after graduation, and their academic self-concept, were among the least

strongly correlated with their judgments of success in their telementoring relationships, while the particular functions provided by mentors were among the most strongly correlated. Students' demographic characteristics including their gender and parents or guardians' educational attainment were not significantly correlated with their judgments of "success". This is a positive finding, since unlike variables such as the functions that mentors provided for the students, these are the variables that cannot be changed or controlled from the outside.

Based on the correlation results, multiple-regression was performed using "students' impression of the overall success of mentoring" as the dependent variable and the above variables that showed correlations with "success" as independent variables. Multiple regression allows us to examine the effect of several independent variables on the dependent variable (Frankfort-Nachmias and Leon-Guerrero, 2002).

As Table 4-3 shows, among statements in students' understanding of what their mentors actually tried to do for them or 'Mentor's helpfulness', three of them contributed significantly to prediction of success: "My mentor asked me questions to help me think about my research", "My mentor suggested books or other sources that I should read", and "My mentor helped me come up with a project question/idea to investigate". In addition, "Doing my work in the Knowledge Forum, where other students could see it and I could see their work, was helpful to me", and "I trust my mentor" were significant contributors. Variables such as students' average grades in school, their academic self-concept, and their plans for work or further schooling after graduation did not provide any additional predictive power to the model, although they were significantly correlated with the success variable.

Table 4-3: Predictors of “Success”

Independent variables	R Square	R Square change	Sig. F change
1. My mentor asked me questions	44.6%	44.6%	<.001
2. I trust my mentor	54.4%	9.8%	<.001
3. Knowledge Forum helpfulness	58.7%	4.3%	.014
4. My mentor suggested books or other sources to read	62.7%	4%	.012
5. My mentor helped me come up with a project question/idea to investigate	65.1%	2.4%	.044

Probability of F: Entry: .05 Removal: .10

According to this model, the significant contributors to students’ perception of success were:

- the helpfulness of the questions that mentors ask students,
- the trust that students place in their mentors,
- the reading materials that mentors suggest to students,
- how helpful students consider Knowledge Forum to be, and
- mentors’ help to students in shaping questions to investigate.

Looking back at Figure 4-4, it is shown that three of the top five functions that were the most frequently reported, i.e., “My mentor asked me questions”, “My mentor suggested reading materials”, and “My mentor helped me make questions to investigate”, were exactly the same as the three variables that the regression model showed contributed most strongly to students’ judgments of success. It is encouraging to see that our mentors provided the type of advice to the students that contributed to their success of telementoring relationships.

It is also interesting to note that the two functions students *least* expected to receive at the beginning of the project, “Ask me questions” and “Help me come up with

project questions or ideas to investigate”, were the two functions shown in the regression model to most strongly contribute to students’ impression of success in mentoring. While most of the students did not enter the project expecting their mentors to ask *them* questions or help them come up with questions or ideas to investigate, these were ultimately the strongest apparent influences on their perceptions of success. One explanation for this reversal might be that students simply did not have the experience to anticipate which types of advice would be beneficial to them in the kind of authentic historical inquiry demanded by Tracking Canada’s Past. As two students explained in their post-project interview:

Student 1: At the beginning I was really really confused, and now that I look back I can’t really remember what I was confused about, so I think it’s just sort of it works out throughout the project.

Student 2: Yeah, it works out eventually.

Student 1: It’s just because it’s so new, yeah, it’s *so new* that you are so confused about what to do.

Student 2: Yeah.

4.4.7 Students’ Activities in the Knowledge Forum

As the regression model shows, students’ impression of the helpfulness of Knowledge Forum was a good predictor of the perceived success of their telementoring relationships. To investigate this in detail, students’ level of activities in the Knowledge Forum is discussed below.

Students' activities in the Knowledge Forum show that they were more active in reading notes than posting notes. The total number of notes posted by the students in all views over the course of the project was 405, while the total number of notes read was 2773 (See Table 4-5). Comparing the number of notes posted and read by students, and the percentage of students who agreed that mentoring was a success for them, we find that those with less notes posted and read in the Knowledge Forum were less satisfied with their mentoring. To be more specific, the number of notes posted per student in the Knowledge Forum ranged from 1 to 21, with a median of 5. Only 27% of students who posted between 1 and 4 notes (N=33) reported success in their relationships. The number of notes read by students ranged from 1 to 229, with a median of 27. Only 39% of students who read between 1 to 26 notes (N=34) believed that their relationships were successful.

Table 4-4: Students' Activities in Knowledge Forum (N=72)

	Created notes	Read notes
Mean	5.62	38.51
Median	5	27
Mode	5	10
Sum	405	2773

As described earlier, the regression model showed that one of the variables that best predicted students' success of mentoring was "Knowledge Forum helpfulness", where students could see each other work. This may suggest that students were more interested in reading notes to get resources and information for their projects. As one student pointed out in his post-project interview:

I thought that [being able to see what they were doing in the Knowledge Forum] was a really good idea because I looked around a couple of times and I found really good sources by looking at other people's.

Since "My mentor asked me questions" and "My mentor helped me come up with a project question/idea to investigate" were also predictors in students' judgments of success, students might have been more active in reading notes than posting so they could see what others' mentors had asked their mentees and also how other students set their questions:

It gives you ideas like how to ask the mentors your questions. Like sometimes you don't know how to set your question, so you just go through [other] people's and you read it and you get like an idea of how to ask your questions ...

A group of two students gave a more elaborate answer to this question:

Interviewer: what did you think of the way we used... Knowledge Forum, where you could see what others were doing and they could see what you were doing during the project?

Student 1: I didn't really look at that...

Students 2: I looked at some other people's, it was kind of helpful. Like if you didn't know what to send to your mentor,... because you don't know, like, who they are or what they are like or anything ... like, I checked all of yours [to S1]...

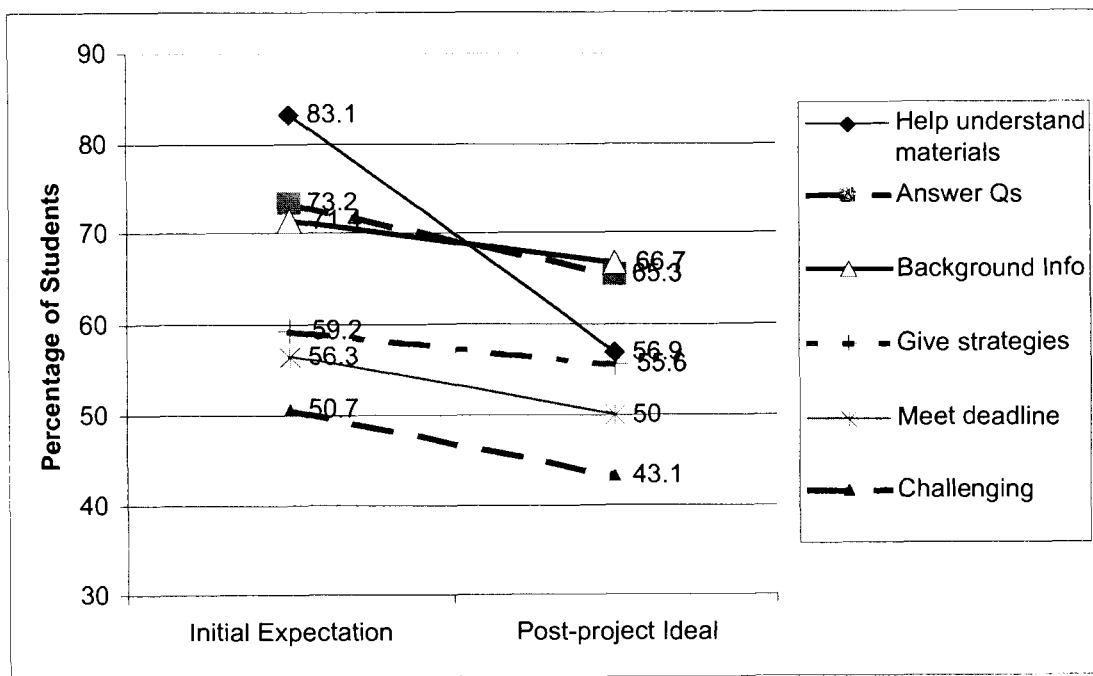
4.4.8 Pre-Post Changes in Students' Desires for Telementoring Functions

Another objective of this study was to understand how the experience of telementoring changes students' desires for telementoring functions. To this end, students completed an item on the post-project survey asking "What would your mentor ideally

have done?” This item paralleled the design of the pre-project survey, in that students were asked to rate the same list of 13 mentoring functions.

Figures 4-5 and 4-6 display the results of this analysis. Once again, percentages indicate the percentage of students who rated each function between 5-7 in terms of its importance. For clarity, the functions for which students’ desires decreased are presented in Figure 4-5, and the functions for which students’ desires increased are shown in Figure 4-6.⁵

Figure 4-5: Comparing Students’ Desires to Receive Each Function in Pre- and Post-Surveys, Functions Going Down



⁵ The function “Review my work as I go along” remains pretty much unchanged from pre to post (the amount of decrease is less than one); thus, we did not include it in Figure 4-5.

As shown in Figure 4-5, the sharpest decline is in students' desire for help in understanding the source materials they collect for their investigations. This decline can be due to students' realization over the course of the project that close guidance in interpreting texts or other source evidence is not very effectively provided at a distance under the conditions provided in this study. Because many students were pursuing questions relating to local history, their mentors frequently did not have access to copies of the same materials they were studying (for example, unpublished archival material). These conditions made this type of advice quite impractical. Students also appear to have learned that it was of less use than they initially thought for their mentors to provide them with background information, or answers to factual questions.

To see whether the above pre-post decline in students' expectations of mentoring functions was significant, Wilcoxon Signed-Rank Test was used. The Wilcoxon test takes into account information about the magnitude of differences within pairs. In this nonparametric test, two related samples are compared for differences between paired scores. Table 4-5 shows the Z statistic and the significance level for each of the functions that students desired to receive less in their future mentoring relationships.

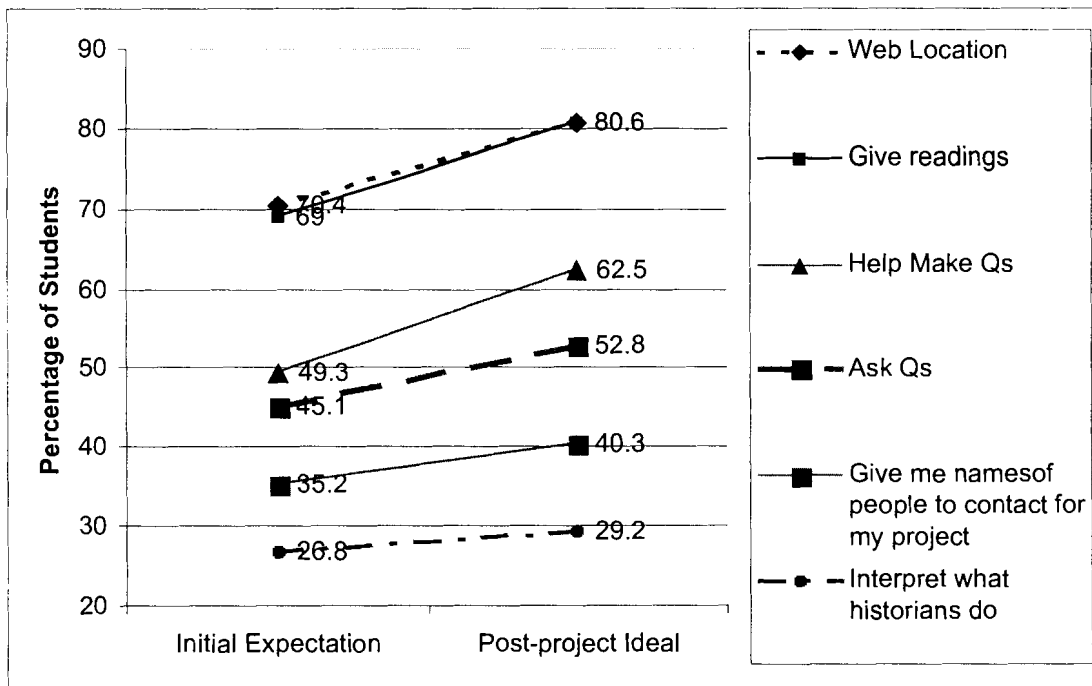
Table 4-5: Wilcoxon Signed Rank Test Result for Pre-post Changes in Expectations, Functions Going Down

	Help understand material	Answer my questions	Give background information	Give strategies	Help me meet deadlines	Suggest challenging tasks
Z	-4.035	-.337	-.317	-1.116	-2.149	-2.651
Asymp. Sig. (2-tiled)	.000	.736	.751	.244	.032	.008

As the above table shows, while the pre-post decrease in students' desires to receive background information, or answers to factual questions is not significant, the change in students' desires for help in understanding source materials is strongly significant.

On the other hand, Figure 4-6 shows the functions that students were *more* interested to receive in their future telementoring relationships. The numbers indicate percentages of students who rated each function between 5-7 in terms of their desire to receive that function.

Figure 4-6: Comparing Students' Desires to Receive Each Function in Pre- and Post-Surveys, Functions Going up



Once more, the Wilcoxon test was used to examine the significance of the pre-post differences. As Table 4-6 shows, the increase in students' desire for the functions "Ask me questions" and "Help me come up with ideas/questions to investigate" is not

significant; however, the functions “Give me books and other reading material” and “Help me understand what historians do” are highly significant. It is interesting to see that throughout the course of TCP, mentees appear to have developed more appreciation for understanding how historians work. This may be an indication of how they understand the potential of these relationships relative to their own goals.

Table 4-6: Wilcoxon Signed Rank Test Result for Pre-post Changes in Expectations, Functions Going Up

	Give web locations	Give books and reading materials	Help me make questions to investigate	Ask me questions	Give names of people to contact	Help me interpret what historians do
Z	-1.551	-3.074	-.815	-.724	-.767	-3.542
Asymp. Sig. (2-tiled)	.121	.002	.415	.469	.443	.000

Another indication lies in how mentees view the functions as relating to one another. To examine this, I computed correlations between the function “Help me understand what historians do each day” and the remaining telementoring functions. As Table 4-7 shows, at the beginning of the project, the function “Help me understand what historians do” correlated with the functions that students tended to associate with getting started their project; i.e., “inquiry jumpstart” functions (O’Neill, in press). However, at the end of the project, this function correlated significantly with “prodding partner” functions (O’Neill and Scardamalia, 2000); i.e., the functions that keep mentors continuously involved in their mentees’ work and challenge their mentees intellectually.

As shown in Table 4-7, the variable “help me understand what historians do” has the highest correlation with “my mentor asked me questions to help me think about my

project”. We find it encouraging that over the course of Tracking Canada’s Past, students appeared to develop an appreciation of the relationship between the understanding of what historians do and the posing of questions about their ongoing investigations – the latter of which was strongly predictive of their judgments of success in the telementoring relationship.

Table 4-7: Correlations Between “Help me understand what historians do each day” and Other Telementoring Functions.

Telementoring Functions	Pre	Post
Help me come up with a project question/idea to investigate	0.202	-0.015
Ask me questions to help me think about my project	0.012	0.545**
Answer questions I have about specific people, events or ideas in history	0.263*	0.147
Give me background information on my topic	0.319**	0.226
Give me locations on the Internet where I can find resources to answer my questions	0.156	0.132
Help me to understand material I read about my topic	0.291*	0.432**
Suggest challenging things for me to do that could improve my project	0.332**	0.507**
Review my work as I go along and help me keep on track	0.051	0.345**
Give me the names and addresses of other people to contact about my project	0.335**	0.490**
Help me to meet project deadlines	0.319**	0.082
Suggest specific strategies that will help me get my work done	0.268*	0.381**
Suggest books or other sources that I should read	0.281*	0.265*

* = $P < 0.05$

** = $P < 0.01$

5 DISCUSSION

5.1 Discussion

The main purpose of this thesis was to develop a deeper understanding of what high school students mean by “success” in their telementoring relationships and what variables best predicted their perceptions of success in such relationships. In addition, I wished to discover how the designers of a curriculum-based telementoring program could maximize student satisfaction in telementoring relationships. To achieve these goals, I used quantitative methods of analysis to examine the data from students’ and mentors’ surveys and also their activities in the Knowledge Forum regarding the number of notes they posted and read. I used descriptive statistics (frequencies), correlations, multiple regression, and also data from semi-structured interviews with students and mentors to support the quantitative analysis.

While the telementoring literature provides an array of recommendations and guidelines about implementing “successful” telementoring programs for K-12, the application of these recommendations should ideally be informed by some detailed knowledge of the expectations that mentees carry into their telementoring relationships. Clearly, some up-front training or orientation for mentees is useful (Kasprisin, et al., 2003), but to be truly effective, this training must address students’ and mentors’ specific expectations. This study aims to begin filling this important gap in research knowledge.

In this thesis, I examined in detail 72 adolescents' expectations of their relationships with assigned telementors in a curriculum-based program, both prior to and after the project. I compared students' expectations with their mentors' desired activities to see if they were complementary. In addition, I looked at students' reports of their actual experience of mentoring, and their conceptions of an "ideal" mentoring relationship. Regression model was also computed to understand what variables best predicted students' impressions of the overall "success" of their telementoring relationships.

The quantitative analysis showed that:

- The 'success' variable was bi-modally distributed. In total, 49.3% of the students agreed that the mentoring was a success for them by rating their agreement with the statement "Overall, the mentoring was a success for me" from 1-7 (1= disagree strongly and 7= agree strongly).
- Students' judgments of success were best predicted by the helpfulness of the questions mentors asked, reading materials they recommended, help they got from their mentors with questions or ideas to investigate, students' trust of their mentor, and the helpfulness of the on-line discussion space where students could see each others' work.
- Students' demographic characteristics including their gender, and their parents or guardians' educational attainment were not correlated with students' judgments of "success", and
- Variables such as students' average grades in school, their academic self-concept, and their plans for work or further schooling after graduation did not contribute any additional predictive power to the regression model, although they were significantly correlated with the "success" variable.

It is a positive finding that students' demographic characteristics were not correlated with students' overall impression of success of mentoring, since these variables reflect attributes that cannot be changed or influenced by program designers serving a general school population. Likewise, students' average grades, their academic

self-concept, and their post-graduation plans are not under the control of a designer.

However, the most important determinants of success such as the functions that mentors provided for the students, are the ones that program designers have the ability to refine over time.

As the regression model suggests, the strongest contributors to students' judgments of success in their telementoring relationships were:

1. My mentor asked me questions (44.6% of variance)
2. I trust my mentor (54.4% of variance, 9.8% increase)
3. Knowledge Forum helpfulness (58.7% of variance, 4.3% increase)
4. My mentor suggested reading materials (62.7% of variance, 4% increase), and
5. My mentor helped me make project questions (65.1% of variance, 2.4% increase)

It was interesting to see that among the variables that best predicted success, "My mentor asked me questions" and "My mentor helped me come up with project questions or ideas to investigate" were among the functions that students least expected to receive from their mentors before the start of the project. Only 45-50% of the students expected to receive such advice before the project began. Students mostly expected their mentors to provide them with background information, web locations, and reading materials about their topic. These are the types of guidance they associate with "getting started" on a research project. Although approximately 45-50% of the students did not *initially* expect to be asked questions by their mentors or to be helped to develop questions to investigate, these functions were ultimately the ones that best predicted a sense of "success".

To understand how students' expectations to receive mentoring functions differed from mentors' desires to provide the same functions, we also asked mentors about their desired activities. In the pre surveys, mentors declared quite different expectations from participating students. Mentors were interested in offering almost all of the of mentoring functions listed, showing particularly strong desires to offer functions that would help keep them continuously involved in their mentees' research. These findings were reinforced by interview data suggesting that mentors wanted to offer guidance on the substance of students' work, rather than offering only answers to factual questions, or helping students to get started. Mentors wanted to be seen by students as advisors, who were there to help them understand how historians work and think, instead of merely information resources.

In response to questions about mentors' helpfulness (i.e., the functions that mentors actually offered to the students during their mentoring experience) the following four functions were the most frequently reported:

- My mentor asked me questions
- My mentor suggested reading materials
- My mentor gave me web resources, and
- My mentor helped me come up with a project idea or question

Interestingly, three of these four variables are the same as those that the regression model showed contributed to students' judgments of success.

Another objective of this study was to understand how the experience of telementoring changes students' desires for telementoring functions. The results of pre-

post changes in students' desire of telementoring functions showed some increase in students' desire to receive the functions "My mentor asked me questions" and "My mentor helped me come up with project questions or ideas to investigate"; however, the Wilcoxon significance test did not indicate that these changes were significant. On the other hand, the increase in students' desire to understand how historians work was strongly significant. It is interesting to see that throughout the course of TCP, mentees appear to have developed more appreciation for understanding how historians work.

Among the functions for which students' desires decreased was desire for help in understanding source materials. Wilcoxon test showed that this sharp decline was highly significant. This could be due to students' realization over the course of the project that close guidance in interpreting texts or other source evidence was not very effectively provided at a distance under the conditions provided in this study.

Overall, the analysis showed that while the pre-post decrease in students' desires to receive background information, or answers to factual questions is not significant, the change in students' desires for help in understanding source materials is strongly significant. In addition, it is shown that at the end of the project, students place more value on understanding what historians do and how they work.

In conclusion, the above discussion and the suggested regression model demonstrate that in future inquiry telementoring projects, designers might need to ask their volunteer mentors to emphasize asking their mentees questions to help them think about their research, help them come up with project questions or ideas to investigate, and provide them with books, and reading materials since these functions best predicted a

sense of “success”. In addition, establishing a trusting and respectful relationship is strongly advised, as previous studies by Rhodes et al. (2002) and DuBois et al. (2002) have suggested. Finally, providing an on-line discussion space where students can see each other work, get hints on how to frame their questions, or use the resources that other mentors have suggested to their mentees appears to be a positive influence on overall impression of success.

5.2 Limitations

Some limitations of this study deserve mention here. First, while it seems likely that the disjunction between students’ initial expectations and their actual impressions of success reflects learning, it is impossible to know, given the design of this study, whether this learning is the consequence of students’ experience of telementoring relationships, their experiences in our history curriculum, (e.g. working with primary sources), or some combination of the two.

Second, it should be noted that the findings of this study cannot be generalized to every telementoring program. They may prove to be similar to those in other curriculum-based telementoring programs which use an “open” telementoring scheme. We rely on our colleagues to conduct parallel analyses on their own telementoring projects to test the robustness of our findings. As this work is carried out, it may prove that mentees’ needs and expectations are influenced by the program in ways that will not generalize to programs in other domains (Science, for example).

5.3 Future Research

Further studies should also be designed to investigate the contribution of the interpersonal skills of participants to their judgments of success in telementoring relationships. Kram (1985) states that interpersonal skills influence the range of participants' take-and-give functions in a relationship. For instance, if a mentor knows how to offer help and a mentee knows how to ask for help, the relationship is nurtured. Therefore, research studies could include questions about interpersonal skills in their surveys to examine how participants' perceptions of success could differ or not.

It is also significant to know how participants' personality characteristics determine the amount of mentoring they receive (Turban and Dougherty, 1994) and so their success. Future research could be designed to include questions about participants' personality characteristics in their surveys to investigate their influence over mentees' judgments of success. One concern about this research could be the measurement since such lengthy questionnaires might not be of interest to students.

Future research can also be conducted on students' conceptions of expertise – in particular, what they think “experts” are good for. From our experience it appears that in curriculum-based telementoring programs, students are prone to cast their mentors as “experts”. For this reason, it would be extremely useful to have a deeper understanding of the range of ideas that students across the developmental spectrum hold about who experts are, what they do, and what can be learned from them.

Since telementoring is providing a greater degree of involvement for knowledgeable adults in education, it is worth doing more research on using curriculum-

based telementoring in different subjects of school in addition to sciences and social studies, and also with different kinds of participants such as students with special needs, or ESL learners, and examine the results. Implementing telementoring in countries which have not used telementoring yet or countries which are using different curriculum and methods of teaching and learning than North America may also be valuable.

5.4 Significance of the Study

As discussed in Chapter II, telementoring programs have many potential benefits for students. However, these benefits are dependent on implementing the program well (Robb, 1997; Tsikalas and McMillan-Culp, 2000). Research has shown that poorly implemented mentoring programs can have an undesirable effect on youth (DuBois et al., 2002). Therefore, it is important to examine how to carry out a mentoring/telementoring program well in order to attain successful outcomes in such relationships.

While there are many published guidelines in the literature on how to implement successful mentoring and telementoring programs, these are largely based on the reflections of program developers, rather than careful research. For instance, it is clear that some up-front training for mentees is useful (Kasprisin, et al., 2003), but one thing that past cognitive research has shown very clearly is that training can fail to influence behaviour unless it addresses students' prior conceptions (Bransford et al., 2000). To be truly effective, training for mentees must address their prior conceptions about the nature of the mentoring relationship. In this research, we have tried to understand these conceptions by asking students what they think mentors might do for them.

In addition, there is no previous research on what students mean by “success” in such relationships. In order to be able to design and implement successful telementoring programs, researchers must know what shapes participants’ judgments of success in telementoring relationships. This study will help designers take a step forward to increasing students’ satisfaction in similar telementoring programs by revealing what adolescents’ perceptions of success are in a curriculum-based telementoring program.

APPENDIX A: FACT SHEET

	Mean	SD	Median
% Notes read in Home view	38.6	26.08	33
% Own mentor's read	34.8	27.88	28.57
% Other mentors' read	1	2.29	0.26
% Notes read overall	9.7	10.18	6.86
# Notes created	5.6	3.97	5
# Notes read	38.5	39.83	27

Students' Demographics		
Age (N=72)	14: 1.4% (1) 16: 8.3% (6)	15: 88.9% (64) 17: 1.4% (1)
Sex (N=72)	Female: 61.1% (44) Male: 38.9% (28)	
Ethnicity (N=71) Missing: 1.4% (1)	Canadian or half Canadian: 18.1% (13) Chinese or half Chinese: 20.8% (15) Other: 59.7% (43)	
Attend BC school (N=72)	Yes: 88.9% (64) No: 11.1% (8)	
Average grade (N=72)	Mostly A: 23.6% (17) About half B and half A: 26.4% (19) Mostly B: 23.6% (17) About half B and half C: 19.4% (14) Mostly C: 5.6% (4) About half C and half D: 1.4% (1)	
Mother's education (N=72)	College/university degree: 38.9% (28) Some post high school education: 25% (18) High school/not finished high school: 27.8% (20) Don't know: 8.3% (6)	
Father's education (N=72)	College/university degree: 41.6% (30) Some post high school education: 18.1% (13) High school/not finished high school: 25% (18) Don't know: 15.3% (11)	
Post graduate plan (N=72)	Attend university: 73.6% (53) Attend college/vocational: 11.1% (8) Work fulltime: 9.7% (7) Other: 5.6% (4)	
Work hours (N=69) Missing: 4.2% (3)	0: 75% (54) 6: 1.4% (1)	1-5: 18% (13) 12: 1.4% (1)
Homework hours (N=71) Missing: 1.4% (1)	0: 2.8 (2) 6-8: 5.6% (4)	1-5: 90.2% (65)

Students' Academic Self-Concept	
Being a Math person (N=72)	Yes: 40.3% (29) Neutral: 38.9% (28) No: 20.8% (15)
Being an English person (N=72)	Yes: 25% (18) Neutral: 50% (36) No: 25% (18)
Being an Artistic person (N=72)	Yes: 61.1% (44) Neutral: 18.1% (13) No: 20.8% (15)

Learning in School (N=71)	Scale 1-6 1: Disagree 6: Agree	Mean
As you learn more, Qs get all answered	Agree: 52.2% Undecided: 39.3% Disagree: 8.5%	4.44
As you learn more, Qs get easier	Agree: 33.8% Undecided: 43.7% Disagree: 22.5%	3.76
As you learn more, Qs get more complex	Agree: 36.6% Undecided: 46.5% Disagree: 16.9%	4
The most important thing to do in school is to do the work T says	Agree: 47.9% Undecided: 40.9% Disagree: 11.2%	4.3
The most important thing to do in school is try to make sense of the work	Agree: 73.3% Undecided: 22.5% Disagree: 4.2%	5.04
The most important thing to do in school is to remember everything	Agree: 66.2% Undecided: 29.6% Disagree: 4.2%	4.70
To learn the most from a book is to read correctly	Agree: 77.5% Undecided: 21.1% Disagree: 1.4%	5.14
To learn the most from a book is to remember what it says	Agree: 54.9% Undecided: 39.5% Disagree: 5.6%	4.49
To learn the most from a book is to think deeply about what it says	Agree: 71.8% Undecided: 25.4% Disagree: 2.8%	5.07
To learn the most from a book is to relate it to prior knowledge	Agree: 67.6% Undecided: 31% Disagree: 1.4%	4.94

APPENDIX B: TRACKING CANADA'S PAST INITIAL STUDENT SURVEY⁶

Today's Date: _____

Your Name (first and last): _____

Your School: _____

Purpose of this Survey

- This survey is meant to tell your teacher and the researchers at Simon Fraser University what your class got out of the CPR project, what parts of it worked best, and why.
- This is not a test, but every survey will be read and analyzed carefully.
- Your teacher will be told how your class answers the questions *on average*, but your individual answers will be strictly confidential.

- We ask for your name at the top because we would like to be able to compare your answers at the beginning and the end of the project.

1. Demographics

What is your age? _____

Are you female or male? (please check one)

Female

Male

2. School Interests and Experience

Where did you attend school before now? (Please check *all* that apply.)

Here in BC

Another Canadian province (please name the province)

Another Country (please name the country)

⁶ Appendices B-I are copyright Kevin O'Neill, used by permission.

Please circle one number for each of the following three scales:

a.	I am NOT a "science" or "math" person	Neutral	I AM a "science" or "math" person
	1	2	3 4 5
b.	I am NOT an "English" or "history" person	Neutral	I AM an "English" or "History" person
	1	2	3 4 5
c.	I am NOT an "artistic" or "musical" person	Neutral	I AM an "artistic" or "musical" person
	1	2	3 4 5

Which of the following best describes your average grades so far in school?
(please check only one)

- Mostly A
- About half A and half B
- Mostly B
- About half B and half C
- Mostly C
- About half C and half D
- Mostly D
- Mostly below D

What is the one thing that is likely to take the largest share of your time in the year after you graduate/leave high school? (please check only one)

- Working full time
- Attending a community college or a vocational, technical, or business school
- Attending university
- Other (what?) _____

How many hours per week do you usually work in a part-time job?
(Exclude vacations. If you do not have a job, write a "0".) _____ hours

How many hours do you usually spend on homework each day? ___ Hours

3. Family Education

These questions are designed to help us learn more about who you are.
Who are the adults that live in your home? (please check *all* that apply)

- | | | |
|-------------|--------------------------|-------------|
| Father | <input type="checkbox"/> | mother |
| Stepfather | <input type="checkbox"/> | stepmother |
| Uncle | <input type="checkbox"/> | aunt |
| Grandfather | <input type="checkbox"/> | grandmother |
| other _____ | <input type="checkbox"/> | other _____ |

What level of education does your mother (or female guardian) have? (please check one)

- She did not finish high school.
- She graduated from high school.
- She had some education after high school.
- She graduated from college.
- She has a graduate degree (i.e. Master's or Ph.D.).
- I don't know.

What level of education does your father (or male guardian) have? (please check one)

- He did not finish high school.
- He graduated from high school.
- He had some education after high school.
- He graduated from college.
- He has a graduate degree (i.e. Master's or Ph.D.).
- I don't know.

4. Learning in School

Using the 6-point scale below, indicate the extent to which you agree or disagree with each of the possible endings to each statement:

As you learn more and more about something...	Disagree			Agree		
the questions should all get answered	1	2	3	4	5	6
the questions should get easier and easier	1	2	3	4	5	6
the questions should get more and more complex	1	2	3	4	5	6

In school, the most important thing you can do to learn is...	Disagree			Agree		
do the work the teacher tells you to do	1	2	3	4	5	6
try to make sense of the work you are asked to do	1	2	3	4	5	6
try to remember everything you are supposed to know	1	2	3	4	5	6

To learn the most you can from a book, you have to ...	Disagree			Agree		
read correctly what it says	1	2	3	4	5	6
remember what it says	1	2	3	4	5	6
think deeply about what it says	1	2	3	4	5	6
relate what it says to what you already know	1	2	3	4	5	6

5. Ideas about Intelligence

The next question has been designed to investigate different ideas about intelligence. There are no right or wrong answers. We are interested in your ideas.

Using the scale below, indicate the extent to which you agree or disagree with each of the following statements.

	Disagree			Agree		
You have a certain amount of intelligence, and you can't really do much to change it.	1	2	3	4	5	6
Your intelligence is something that you can't change very much.	1	2	3	4	5	6
To be honest, you can't really change how intelligent you are.	1	2	3	4	5	6
You can learn new things, but you can't really change your basic intelligence.	1	2	3	4	5	6

6. What do you think a “mentor” might do for you?

As part of this project, you may have the opportunity to work with an adult “mentor” over the Internet, who can offer you advice and guidance on your research.

Below we have listed some of the things a mentor might do for you during your CPR project. *We are interested in how important you think each of these things will be to you.* Please rate each item in the list to tell us how much you care about it.

What you would like your mentor to do	Don't Care	A Little						A Lot
Help me come up with a project question/idea to investigate		1	2	3	4	5	6	7
Ask me questions to help me think about my project		1	2	3	4	5	6	7
Answer questions I have about specific people, events or ideas in history		1	2	3	4	5	6	7
Give me background information on my topic		1	2	3	4	5	6	7
Give me locations on the Internet where I can find resources to answer my questions		1	2	3	4	5	6	7
Help me to understand material I read about my topic		1	2	3	4	5	6	7
Suggest challenging things for me to do that could improve my project		1	2	3	4	5	6	7
Review my work as I go along and help me keep on track		1	2	3	4	5	6	7
Give me the names and addresses of other people to contact about my project		1	2	3	4	5	6	7
Help me to meet project deadlines		1	2	3	4	5	6	7
Suggest specific strategies that will help me get my work done		1	2	3	4	5	6	7
Suggest books or other sources that I should read		1	2	3	4	5	6	7
Help me understand what historians do each day		1	2	3	4	5	6	7
Other (describe)		1	2	3	4	5	6	7
Other (describe)		1	2	3	4	5	6	7

7. Should we not use your answers?

Sometimes people aren't at their best when they are asked to fill out surveys. They may be sick, or bored, or find it hard to concentrate for some other reason.

If you filled out part or all of this survey randomly, check the box below and we will ignore your answers (you must still hand it in).

Don't use my answers

Comments on the Survey

Do you have anything to say about this survey, or any suggestions about how it could be improved? Please write them below.

APPENDIX C: TRACKING CANADA'S PAST FINAL STUDENT SURVEY

Today's Date: _____

Your Name (first and last): _____

Your School: _____

Knowledge Forum View You Worked In: _____

Purpose of this Survey

- This survey is meant to tell your teacher and the researchers at Simon Fraser University what your class got out of the CPR project, what parts of it worked best, and why.
- This is not a test, but every survey will be read and analyzed carefully.
- Your teacher will be told how your class answers the questions *on average*, but your individual answers will be strictly confidential.
- We ask for your name at the top because we would like to be able to compare your answers at the beginning and the end of the project.

Your research view and mentor

Your "home view" (research theme) in Knowledge Forum:

Your mentor's name: _

The place (university, company, etc.) where your mentor works or studies:

1. Home Internet Use

	Yes	No
Did you have Internet access at home during this project?		

(If yes) *Approximately* how much of your Knowledge Forum posting/reading did you do at home? **(Circle one)**

All of it 3/4 1/2 1/4 None of it

2. Overall Impression of Knowledge Forum

	Disagree Strongly					Agree Strongly	
Doing my work in Knowledge Forum, where other students could see it and I could see their work, was helpful to me	1	2	3	4	5	6	7

Do you have comments on Knowledge Forum?

3. Final Report

Circle a number to show your strength of agreement or disagreement with each statement below.

	Disagree Strongly					Agree Strongly	
This report was different from others I have done in the past	1	2	3	4	5	6	7
Writing the final report was difficult for me	1	2	3	4	5	6	7

Do you have comments on the final report, the guidelines, etc.?

Roughly how many hours did you put into actually *writing* your report? **(Circle the closest option)**

Ten or more seven five three One or less

4. Your relationship with your mentor

For each of the statements below, circle a number to show how strongly you agree or disagree with it.

Statement	Disagree Strongly						Agree Strongly
My mentor was friendly to me	1	2	3	4	5	6	7
My mentor seemed to have carefully read the notes I posted	1	2	3	4	5	6	7
My mentor showed respect for me	1	2	3	4	5	6	7
I trust my mentor	1	2	3	4	5	6	7
I respect my mentor	1	2	3	4	5	6	7

5. Overall Success of Mentoring

Circle a number to show your strength of agreement or disagreement with each statement below.

	Disagree Strongly					Agree Strongly	
Having my mentor looking at my work on the project was helpful	1	2	3	4	5	6	7
Overall, the mentoring was a success for me	1	2	3	4	5	6	7

If the mentoring was a NOT a success, check the reasons that you think best explain why:

- My mentor never answered me (not even ONE response)
- My mentor was too busy to help me very much
- My mentor responded too slowly to be helpful
- My mentor tried to help, but didn't understand what I needed
- My mentor tried to help, but didn't know much about my topic
- I didn't keep in touch with my mentor because I didn't really need or want help
- I didn't start communicating with my mentor early enough
- My mentor and I didn't get along

Why do you think you didn't get along?

Other problem (explain)

6. Mentor's Helpfulness

In the list below, rate in importance the things you think your mentor tried to do for you during your last project. Check the "no" box to show things your mentor didn't try to do.

Mentor's Action	No	Not Helpful						Very Helpful
Helped me come up with a project question/idea to investigate		1	2	3	4	5	6	7
Asked me questions to help me think about my research		1	2	3	4	5	6	7
Answered questions I had about specific people, events or ideas in history		1	2	3	4	5	6	7
Gave me background information on my topic		1	2	3	4	5	6	7
Gave me locations on the Internet where I can find resources to answer my questions		1	2	3	4	5	6	7
Helped me to understand material I read about my topic		1	2	3	4	5	6	7
Suggested challenging things for me to do that could improve my research		1	2	3	4	5	6	7
Reviewed my work as I went along and helped me keep on track		1	2	3	4	5	6	7
Gave me the names and addresses of other people to contact about my project		1	2	3	4	5	6	7
Helped me to meet project deadlines		1	2	3	4	5	6	7
Suggested specific strategies that would help me get my work done		1	2	3	4	5	6	7
Suggested books or other sources that I should read		1	2	3	4	5	6	7
Help me to understand what historians do each day		1	2	3	4	5	6	7
Other (describe)		1	2	3	4	5	6	7
Other (describe)		1	2	3	4	5	6	7

7. What would your mentor ideally have done?

In the list below, rate in importance the things you think your mentor would ideally have done during your last project. Check the “don't care” box to indicate things you don't care about.

What you would have liked your mentor to do	Don't Care	A Little						A Lot
Help me come up with a project question/idea to investigate		1	2	3	4	5	6	7
Ask me questions to help me think about my research		1	2	3	4	5	6	7
Answer questions I had about specific people, events or ideas in history		1	2	3	4	5	6	7
Give me background information on my topic		1	2	3	4	5	6	7
Give me locations on the Internet where I could find resources to answer my questions		1	2	3	4	5	6	7
Help me to understand material I read about my topic		1	2	3	4	5	6	7
Suggest challenging things for me to do that could improve my research		1	2	3	4	5	6	7
Review my work as I went along and helped me keep on track		1	2	3	4	5	6	7
Give me the names and addresses of other people to contact about my project		1	2	3	4	5	6	7
Help me to meet project deadlines		1	2	3	4	5	6	7
Suggest specific strategies that would help me get my work done		1	2	3	4	5	6	7
Suggest books or other sources that I should read		1	2	3	4	5	6	7
Help me understand what historians do each day		1	2	3	4	5	6	7
Other (describe)		1	2	3	4	5	6	7
Other (describe)		1	2	3	4	5	6	7

8. Should we not use your answers?

Sometimes people aren't at their best when they are asked to fill out surveys. They may be sick, or bored, or find it hard to concentrate for some other reason.

If you filled out part or all of this survey randomly, check the box below and we will ignore your answers (you must still hand it in).

Don't use my answers

Comments on the Survey

Do you have anything to say about this survey, or any suggestions about how it could be improved? Please write them below.

APPENDIX D: PRE-TELEMENTORING SURVEY FOR MENTORS

Today's Date: _____

Your Name (first and last): _____

1. Demographics

Your full name: _____

Your sex (M/F): _____

Your age: _____

Name of your employer (company, university, etc.):

Your occupation:

Number of years you have been in this occupation: _____

Your education:

- High school diploma
- Some post-secondary education
- Bachelors degree (B.A., B.Sc.)
- Masters or professional degree (including M.B.A., law degree, teaching certification, nursing degree, etc.)
- Ph.D. or M.D

Your current status in the labour force:

- Employed part-time
- Employed full-time
- Unemployed but searching for work
- Retired

Your approximate household income:

- Less than \$20,000
- \$20,000 to \$39,999
- \$40,000 to \$59,999
- \$60,000 to \$79,999
- Over \$80,000

Do you have a religious affiliation? (Y/N) _____

Do you attend church at least once each week? (Y/N) _____

2. Your motivations to mentor

In the past, we have found that adults have a variety of reasons for volunteering as telementors. Please examine the list below, and check **all** the reasons that apply to you:

- Doing outreach for my employer (making the public more aware of what we do)
- Cultivating interest in my field (making the public more aware of what I do personally)
- Encouraging students to pursue challenging studies in my field
- Learning more about teaching
- Learning more about myself
- Increasing the representation of women and minorities in my field
- Giving something back to my field
- Giving something back to society
- Realizing the potential of the Internet to change how society works
- Other reason
(Explain) _____

3. Ideas about intelligence

The next question has been designed to investigate ideas about intelligence. There are no right or wrong answers. We are interested in your ideas.

Using the scale below, indicate the extent to which you agree or disagree with each of the following statements.

	Disagree			Agree		
You have a certain amount of intelligence, and you can't really do much to change it.	1	2	3	4	5	6
Your intelligence is something that you can't change very much.	1	2	3	4	5	6
To be honest, you can't really change how intelligent you are.	1	2	3	4	5	6
You can learn new things, but you can't really change your basic intelligence.	1	2	3	4	5	6

4. Desired Mentoring Activities

The following question is about the types of mentoring activities that you would most like to undertake in the future. Please rate each of the types of advice, guidance or help below, according to your own desire to offer it.

What you would like to do	Not At all						A Lot
Help students come up with an idea or question to investigate	1	2	3	4	5	6	7
Ask students questions to help them think about their research	1	2	3	4	5	6	7
Answer questions students have about specific people, events or ideas in history	1	2	3	4	5	6	7
Give students background information on their topics	1	2	3	4	5	6	7
Give students locations on the Internet where they can find resources to answer their questions	1	2	3	4	5	6	7
Help students to understand material they read about their topics	1	2	3	4	5	6	7
Suggest challenging things for students to do that could improve their work	1	2	3	4	5	6	7
Review students' work as they go along and help them keep on track	1	2	3	4	5	6	7
Give students the names and addresses of other people to contact about their research	1	2	3	4	5	6	7
Help students to meet project deadlines	1	2	3	4	5	6	7
Suggest specific strategies that will help students get their work done	1	2	3	4	5	6	7
Suggest books or other sources that students should become familiar with	1	2	3	4	5	6	7
Help students to understand the everyday practice of historical preservation or research	1	2	3	4	5	6	7

5. Satisfaction with Life

Below are five statements about your satisfaction with life, with which you may agree or disagree. Using the 7-point scale, indicate your agreement or disagreement with each statement.

	Disagree						Agree
In most ways my life is close to my ideal	1	2	3	4	5	6	7
The conditions of my life are excellent	1	2	3	4	5	6	7
I am satisfied with my life	1	2	3	4	5	6	7
So far I have gotten the important things I want in life	1	2	3	4	5	6	7
If I could live my life over, I would change almost nothing	1	2	3	4	5	6	7

6. Interest in future generations

The following question focuses on your interest in future generations. Using the 4-point scale given, indicate your agreement or disagreement with each of the statements.

	Disagree			Agree
I try to pass along the knowledge I have gained through my experiences	1	2	3	4
I do not feel that other people need me	1	2	3	4
I think I would like the work of a teacher	1	2	3	4
I feel as though I have made a difference to many people	1	2	3	4
I do not volunteer to work for a charity	1	2	3	4
I have made and created things that have had an impact on other people	1	2	3	4
I try to be creative in most things that I do	1	2	3	4
I think that I will be remembered for a long time after I die	1	2	3	4
I believe that society cannot be responsible for providing food and shelter for all homeless people	1	2	3	4
Others would say that I have made unique contributions to society	1	2	3	4
If I were unable to have children of my own, I would like to adopt children	1	2	3	4
I have important skills that I try to teach others	1	2	3	4
I feel that I have done nothing that will survive after I die	1	2	3	4
In general, my actions do not have a positive effect on others	1	2	3	4
I feel as though I have done nothing of worth to contribute to others	1	2	3	4
I have made many commitments to many different kinds of people, groups, and activities in my life	1	2	3	4
Other people say that I am a very productive person	1	2	3	4
I have a responsibility to improve the neighborhood in which I live	1	2	3	4
People come to me for advice	1	2	3	4
I feel as though my contributions will exist after I die	1	2	3	4

7. Recent Experiences

Below is a list of specific behaviors or acts. Over the past two months, it is likely that you may have performed some of these behaviors. It is also likely that you have not performed many of them as well during this time.

Please consider each behavior to determine whether or not you have performed the behavior during the past two months. If you have performed the behavior, please try to determine how many times you have performed it during the past two months. For each behavior, provide one of the following ratings:

- Write a "0" in the blank before the behavior if you have not performed the behavior during the past two months.
- Write a "1" in the blank if you have performed the behavior one time during the past two months.
- Write a "2" in the blank if you have performed the behavior more than once during the past two months.

- ___ 1. Taught somebody a skill.
- ___ 2. Served as a role model for a young person.
- ___ 3. Won an award or contest.
- ___ 4. Went to see a movie or play.
- ___ 5. Gave money to a charity.
- ___ 6. Did volunteer work for a charity.
- ___ 7. Listened to a person tell me his or her personal problems.
- ___ 8. Purchased a new car or major appliance (e.g., dishwasher, television set).
- ___ 9. Taught Sunday School or provided similar religious instruction.
- ___ 10. Taught somebody about right and wrong, good and bad.
- ___ 11. Told somebody about my own childhood.
- ___ 12. Read a story to a child.
- ___ 13. Babysat for somebody else's children.
- ___ 14. Participated in an athletic sport.
- ___ 15. Gave clothing or personal belongings to a not-for-profit organization (such as "Goodwill," "Salvation Army," etc.).
- ___ 16. Was elected or promoted to a leadership position.
- ___ 17. Made a decision that influenced many people.
- ___ 18. Ate dinner at a restaurant.
- ___ 19. Produced a piece of art or craft (such as pottery, quilt, woodwork, painting, etc).
- ___ 20. Produced a plan for an organization or group outside my own family.
- ___ 21. Visited a non-relative in a hospital or nursing home.
- ___ 22. Read a novel.
- ___ 23. Made something for somebody and then gave it to them.
- ___ 24. Drew upon my past experiences to help a person adjust to a situation.
- ___ 25. Picked up garbage or trash off the street or some other area that is not my property.
- ___ 26. Gave a stranger directions on how to get somewhere.

- 27. Attended a community or neighborhood meeting.
- 28. Wrote a poem or story.
- 29. Took in a pet.
- 30. Did something that other people considered to be unique and important.
- 31. Attended a meeting or activity at a church (not including conventional worship service such as Mass, Sunday morning service, etc.).
- 32. Offered physical help to a friend or acquaintance (e.g., helped them move, fix a car, etc.).
- 33. Had an argument with a friend or family member.
- 34. Contributed time or money to a political or social cause.
- 35. Planted or tended a garden, tree, flower, or other plant.
- 36. Wrote a letter to a newspaper, magazine, Congressman, etc. about a social issue.
- 37. Cooked a meal for friends (nonfamily members).
- 38. Donated blood.
- 39. Took prescription medicine.
- 40. Sewed or mended a garment or other object.
- 41. Restored or rehabbed a house, part of a house, a piece of furniture, etc.
- 42. Assembled or repaired a child's toy.
- 43. Voted for a political candidate or some other elected position.
- 44. Invented something.
- 45. Provided first aid or other medical attention.
- 46. Attended a party.
- 47. Took an afternoon nap.
- 48. Participated in or attended a benefit or fund-raiser.
- 49. Learned a new skill (e.g., computer language, musical instrument, welding, etc.).
- 50. Became a parent (had a child, adopted a child, or became a foster parent).

8. Comments

Do you have any remarks on the survey, or any of the questions in it? We would like to hear them.

APPENDIX E: POST-TELEMENTORING SURVEY FOR MENTORS

1. Phone number and best times for interview

If you wish to be considered for interview in the next few weeks, please give us a telephone number to reach you at, and the best times to call.

Phone number (and extension):

Best hours to call:

2. Impressions of your most recent telementoring experience

For each statement, please circle a number to express your degree of agreement or disagreement.

	Disagree						Agree
	1	2	3	4	5	6	7
I felt I understood what the students were expected to do in the project	1	2	3	4	5	6	7
I felt I understood how I was expected to contribute to the students' work	1	2	3	4	5	6	7
I was confident in my ability to advise and assist my mentees in their work	1	2	3	4	5	6	7
My mentees' engagement in the project met my expectations	1	2	3	4	5	6	7
I feel that my mentees' expectations of me were reasonable	1	2	3	4	5	6	7
My mentees kept me regularly informed of how their work was progressing	1	2	3	4	5	6	7
I feel that I learned something from my participation in this project	1	2	3	4	5	6	7

2. Overall Satisfaction with your most recent telementoring experience

	Disagree Strongly						Agree Strongly
	1	2	3	4	5	6	7
I was satisfied with my most recent telementoring experience	1	2	3	4	5	6	7

3. Relation of Telementoring to Paid Work

(if not currently employed, proceed to question 4)

Where did you do your telementoring from (write your notes to students)?

- At work
- At home
- Both

Did you ever discuss your telementoring experience with your co-workers? Yes No

Did you ever discuss it with your boss? Yes No

Did you feel that your co-workers supported what you were doing? Yes No

Did you find that telementoring influenced your work life in any way (positively or negatively)? (explain):

Did you feel that this experience taught you anything that will be useful in your job? (explain):

Would you try telementoring again? Yes No

Is there some kind of recognition or incentive that might be helpful in getting more people at your workplace involved in telementoring? (explain):

Was your telementoring experience very different from what you expected? Please explain how:

What do you think could have been done to make this a more rewarding experience for you?

4. Desired Mentoring Activities

The following question is about the types of mentoring activities that you would most like to undertake in the future. Please rate each of the types of advice, guidance or help below, according to your own desire to offer it.

What you would like to do	Not At all						A Lot
Help students come up with an idea or question to investigate	1	2	3	4	5	6	7
Ask students questions to help them think about their research	1	2	3	4	5	6	7
Answer questions students have about specific people, events or ideas in history	1	2	3	4	5	6	7
Give students background information on their topics	1	2	3	4	5	6	7
Give students locations on the Internet where they can find resources to answer their questions	1	2	3	4	5	6	7
Help students to understand material they read about their topics	1	2	3	4	5	6	7
Suggest challenging things for students to do that could improve their work	1	2	3	4	5	6	7
Review students' work as they go along and help them keep on track	1	2	3	4	5	6	7
Give students the names and addresses of other people to contact about their research	1	2	3	4	5	6	7
Help students to meet project deadlines	1	2	3	4	5	6	7
Suggest specific strategies that will help students get their work done	1	2	3	4	5	6	7
Suggest books or other sources that students should become familiar with	1	2	3	4	5	6	7
Help students to understand the everyday practice of historical preservation or research	1	2	3	4	5	6	7

7. Comments

Do you have any remarks on the survey, or any of the questions in it? We would like to hear them.

APPENDIX F: TCP 2003 STUDENT POST-INTERVIEW GUIDE

Introduction

I asked you here because we are interested in what you thought about Tracking Canada's Past. We are not out to prove how great it is -- we want to hear in your own words how you understood it, what you liked about it, what you think could be improved, and how we might do that. We won't share your comments with anyone in a way that you could be identified, so you should feel free to say what you really think.

Before we start, do you have any questions for me? (Give 5 seconds wait time)

OK, here's my first question.

What did you understand the purpose of Tracking Canada's Past to be?

- Probe: Why did you think your teacher wanted you to do this?
- Probe: What do you think of that?

How did you see Tracking Canada's Past relating to the rest of what you were doing in class?

- Probe: How do you think it fit in? Or did it?

We're interested in your thoughts about the milestone assignments. What did you think of them?

- Probe: If you like, I have a list of them here (offer list).
- Probe: Why did you think we wanted you to do that?
- Probe: Do you think that prepared you for the next step? How?

One of the goals of the project is to encourage students and teachers to work with what historians call "primary sources". Can you tell me what a primary source is, and what primary sources you got to work with in the project, if any?

- (If they really seem to have worked with primary sources) What was interesting or difficult for you about working with primary sources?
- (If they don't seem to have worked with primary sources)
 - Did your teacher talk about this idea in class?
 - Why do you think we wanted you to work with primary sources?
 - Why didn't you work with primary sources?

What did you understand the purpose of the mentors to be in Tracking Canada's Past?

- Probe: What did you think your mentor would do with you and the others in your view?
- Did you watch the little videotape we prepared about "working with your mentor?"
- What do you remember about that?

Was your mentor's actual role in the project different from what you expected? If so, how?

What would you say makes a "good" mentor?

What did you think the way we used Knowledge Forum, where you could see what other students were doing and you could see what they were doing during the project?

- Did you read many of the notes by the other students in your view? What did you get out of that?
- Did you read many of the notes read by students or mentors in *other* views? What did you get out of that?

Can you tell me how your mentor, teacher, fellow students, or others shaped the research you did?

- Probe: I'm interested in where you found advice, guidance or help with your research.

Was the final report for this project different from reports you have been asked to write before? If so, how?

Do you think of history any differently now than before you did Tracking Canada's Past? If so, how?

That's it for my questions. Is there something you think I should know that I didn't ask you about? For example, if you have any suggestions for us that didn't come up already, I'd like to hear them.

Thanks very much for your time! It really is a big help to us.

APPENDIX G: STUDENT RESEARCH CONSENT FORM



252 Bloor St. W.
Toronto, Ontario
M5S 1V6



Simon Fraser University
Burnaby, BC
V5A 1S6

October 11, 2001
Dear Parent or Guardian,

As your child may already have informed you, he or she is currently enrolled in a class which is using a relatively new educational approach called "telementoring". This process involves volunteer experts providing ongoing advice and guidance (mentoring) to students as part of a long-term history project about the building of the Canadian Pacific Railway. They are using a shared Internet discussion environment called Knowledge Forum. This work is being coordinated and overseen by their teachers and myself, as part of a research project centred at the Ontario Institute for Studies in Education at the University of Toronto and at Simon Fraser University.

This project extends research begun more than seven years ago. In that time, we have been documenting the positive effects that on-line collaborative research projects and on-line mentoring relationships can have on students' learning in school. This project will investigate ways of applying these findings to history learning. In order to learn about the effectiveness of the upcoming project in supporting your child's studies this year, and to understand how we can improve it in the future, we would like your permission to collect and use several different kinds of information in a research study.

First, we would like to use your child's written work (both on-line notes and paper project report) as data in our research study. We will also distribute short surveys in class, to help us select students to interview for a few minutes during the school day about their experiences with the project. These interviews will be useful in understanding how students understood and carried out their work with peers, teachers and adult volunteers on-line. Some of these interviews will be recorded on video tape. Finally, to gauge how telementoring affects the quality of your child's work, that is whether it has a beneficial effect, we would like to collect some of his or her grades from the classroom teacher.

Please note that while your child's work and statements on surveys and in interviews may be quoted and discussed in research reports about this project, and there may be

occasions when short clips from the video tape interviews will be shown to other researchers at academic conferences, *your child's name will not appear in any reports, nor will any other information which may identify him or her specifically for readers or viewers.*

If for any reason you do not wish us to use the information described above in our research study, check the "I do not consent" box on the form provided. Otherwise, please check the "I consent" box. In either case, please have your child return the form to his or her teacher.

Thank-you for taking the time to read this letter. We appreciate your cooperation.

Respectfully,

Marlene Scardamalia, Professor
Ontario Institute for Studies in Education
University of Toronto

Kevin O'Neill, Assistant Professor
Faculty of Education
Simon Fraser University



252 Bloor St. W.
 Toronto, Ontario
 M5S 1V6



Simon Fraser University
 Burnaby, BC
 V5A 1S6

Research Consent for Telementoring Study

By checking one of the boxes below, I give or withhold my consent for my child's written work, class grades, research surveys and in-person interviews to be used in the research study described by Drs. Scardamalia and O'Neill in the attached letter, dated October 11, 2001. I am aware that my decision to include or exclude my child from this study will have no influence on his or her school grades, and that I can withdraw him or her from the study at any time with a written note to the researchers. If I choose to give my consent, my child's work and other statements relevant to the study may be quoted and/or described in published research reports about the project. Short interview clips may be played at research conferences, but he or she will not be identified by name. The only persons who will have access to the source data for the project (interviews, surveys, etc.) are the members of the research team, and all records will be destroyed once the research is completed.

- I consent
- I do not consent

Signed,

 (Signature of parent or legal guardian)

 (Signature of child)

 (Please print the student's full name clearly)

APPENDIX H: MENTOR RESEARCH CONSENT LETTER



252 Bloor St. W.
Toronto, Ontario
M5S 1V6

Simon Fraser University
Burnaby, BC
V5A 1S6

Dear Volunteer Mentor,

Thank you for generously offering to donate your time and expertise to my on-line mentoring project on the history of the Canadian Pacific Railway, "Tracking Canada's Past".

Attached, you will find a brief survey. It was designed for two purposes:

To contribute to the body of knowledge about the people who typically volunteer for telementoring. This information is of interest to teachers, school administrators and other potential volunteers as well as researchers.

To contribute to knowledge about the specific desires that telementors like you have for their work with students.

We would appreciate it if you could fill this survey out and return it to us in the enclosed envelope. The questions should be self-explanatory, but please do not hesitate to contact Dr. O'Neill with any questions or concerns you may have about them, or about the research in general. For more background on the research that motivates this survey, and copies of some related publications, please see: <http://www.sfu.ca/~koneill>

The questionnaire should take only a few minutes to complete, and is strictly voluntary. You may decline to participate in the study without any adverse consequences. If you choose to participate in the study, your responses to all questionnaires and interviews will be kept strictly confidential. The only persons who will have access to source data for the project are the members of the research team, and all records will be destroyed once the research is completed. Some of the answers you provide below may be quoted verbatim in project reports and publications, but your name, address, employer, and other identifying information will not be published without prior request, and your written permission.

Thank-you once again for your efforts to improve history education in secondary schools through telementoring. We hope to hear from you soon.

Respectfully,

Marlene Scardamalia, Professor
Ontario Institute for Studies in Education
University of Toronto

Kevin O'Neill, Assistant Professor
Faculty of Education
Simon Fraser University

APPENDIX I: MENTOR POST-PROJECT INTERVIEW GUIDE

I'd like to thank you for taking part in our project, and working with our students. I'd also like to thank you for taking the time to talk with me. A lot of people are very interested in your experience and what we can learn from it.

Part of this research involves trying to determine whether, and how orchestrating telementoring relationships on a volunteer basis will be able to assist education reform efforts in the long run. So what I need from you is your honest view of your own experience.

- Do you mind if I record our conversation on tape? **(start tape if yes)**
- Do you have any questions for me before we begin?

Q. First, I'd like to ask you a very open-ended question. What do you have to say about your experience of telementoring?

o Expectations

Q. Was your experience as a telementor much like what you thought it would be?

Q. What did you expect or hope it would be like?

Q. What was different from your expectation?

Q. Is there something you think you should have known that would have better prepared you for the experience?

o Salient Story

Q. Is there one part of your experience that stands out in your mind that you could tell me a story about? For instance, something you found funny or frustrating or especially satisfying?

o Role Issues

Q. Were you asked by either the students or teacher to do things or answer questions that you thought were unreasonable? _____

Q. Can you give me an example?

o Question-steering Issues

Q. What did you think of the students' ideas and the work they were doing? _____

o Relationships

Q. How would you describe the relationship(s) you developed with the students?

Q. How would you describe the relationship(s) you developed with the teacher(s)?

Q. Would you have liked these relationships with teachers and students to be different? If so, what would you have liked them to be like?

o Fit With Work Context

Q. Did you do all of your telementoring from your place of work, or some at home?

Q. Did telementoring influence your work life? How?

Q. Did you ever discuss what you were doing with any of your co-workers?

Q. Did you feel that others at work supported what you were doing?

o Desire to Repeat and expand

Q. Did this experience teach you anything new about yourself or your job?

Q. Do you think you would like to try telementoring again?

Q. Do you think there would be any opposition to this in your workplace?

Q. Are there any kind of recognition or incentives do you think would be necessary or helpful in getting telementoring to be accepted in your workplace?

o Advice to coordinators

Q. What do you think could have been done to make this a more rewarding experience for you?

o Wrap-up

I've run out of questions. Is there anything else you'd like to say before we end?

APPENDIX J: ETHICS APPROVAL

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