

Research Project Report

Galileo Educational Network Association and the Chinook's Edge School Division

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Research Project: *A Professional Development Initiative Designed to Facilitate the Creation of an Inquiry-based Humanities Project that Integrates Technology*

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Statement of Purpose

This case study is designed to examine the impact of the Galileo Educational Network approach to on-site professional development designed to support and facilitate the creation of a robust inquiry-based Humanities project with technology integration.

Research Questions

This study examines three major research questions:

1. How effective is the Galileo on-site teacher professional development initiative in supporting the infusion of technology in an inquiry-based learning project?
2. How has technology integration within an inquiry-based learning project changed the ways in which teachers and students think about learning?
3. What characteristics of this professional development initiative have made a difference to teaching and learning outcomes?

Study Methodology

This naturalistic, exploratory study seeks to understand what functional elements contributed to the success of this single inquiry-based Humanities project. The project, entitled *Independence*, included a collaborative online debate. Given the exploratory nature of this study, a case study approach has been chosen. The investigation focuses on on-site teacher professional development (mentorship) that facilitates the creation of an inquiry-based learning project and incorporates the integration of technology and learning.

Ethics clearance for this project has been received from the University of Calgary's Conjoint Faculties Research Ethics Board. All participants have been informed verbally and in writing of their involvement in the study. All participants signed consent forms prior to data collection.

This research has been carried out concurrently at H. J. Cody School and Cremona School. Humanities 10 teachers at both schools along with the Galileo Education Network mentor have been part of the Humanities 10 planning team throughout the 2001 – 2002 academic year.

Humanities 10 teachers, school principals, Director of Technology Services for the School Division, and Galileo mentor (n = 7) agreed to be interviewed about their involvement with the Humanities 10 project and program. A purposeful sample of students (n = 10) from the two schools agreed to be interviewed to gain their perceptions of and reflections on the learning experience and have given the researcher permission to analyze the archived online debate and the reflective journal assignment or the in-class essay. Data has been analyzed using a coding process and constant comparative method of data analysis for the purpose of creating categories. The online debate has been analyzed using an abbreviated version of McKenzie and Murphy's (2000) adaptation of Henri's model for the evaluation of online discussion groups. Content analysis has been used to analyze student artifacts (e.g., reflective journal, essay). In addition, other artifacts (e.g., planning document, rubric, website) have been examined to determine the intention of the work. The archived online asynchronous debate, students' written work and teacher artifacts have been used for the purpose of triangulation. The use of multiple sources of information enhances the trustworthiness of the information.

Overall Research Findings

From the findings, it is clear that:

- 1) The collaborative and collegial environment is an integral part of the teacher planning process, which has an impact on teachers' practice and on student performance. Sustained and intensive professional development, grounded in content, context and daily work, provides a new image of teaching and learning.
- 2) The nature of student work is based on the design and development of project-based inquiry that integrates technology. Through an engaged learning setting, authentic tasks and the infusion of technology, students and teachers develop new perspectives on learning.
- 3) Technology, when infused with project-based inquiries, helps to nurture and support the creation of meaningful learning opportunities for students. Used as an enabler to foster student construction of knowledge, technology influences the ways in which teachers and students think about learning.

Report Format

This report summarizes research findings specific to the Humanities 10 program in the Chinook's Edge School Division.

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Part I: Overview Of Galileo Education Network and the Humanities 10 Initiative

The Galileo Educational Network Association (GENA) is a “professional development and research initiative focused on the fundamental changes to teaching, learning and staff development that information and communications technology both requires and enables” (Galileo Educational Network Association, n.d., p. 1). This organization is focused on new ways of teaching and learning that deeply engage students in work that is personally relevant and academically rigorous. GENA supports this work within a cross-curricular environment, within which technology is one of the curricular areas. The mandate is not so much to provide technological professional development for teachers, but to help support teachers in creating and designing projects that are inquiry-based and that engage student learning. Within such projects, technology functions as an enabler, but not as the main thrust of the project work.

As a transformational leader in implementing Information and Communication Technology (ICT), GENA strives to achieve its mandate through four target areas: *leading and learning*; *capacity building*; *effective integration of technology* and *research and development* (Galileo Educational Network Association, n.d., p. 1). With leading and learning, the focus is on bringing change to teaching and learning practices within classrooms and school structures with the purpose of improving student achievement. First, educators use the power of technology through an inquiry-based learning approach for transforming traditional learning environments into more innovative and dynamic learning spaces for students and teachers. Second, capacity building of teachers and school staffs is approached through an “immersion model” of professional development that is both systemic and systematically supported over time. Galileo teachers work to coach, facilitate and mentor classroom practitioners using both on-site and online support. Third, effective integration of technology addresses network services, hardware, software, and integration of technology issues at the classroom, school and jurisdiction levels. Fourth, as part of its mandate, GENA draws upon and contributes to research in the areas of effective implementation of ICT, ICT leadership and professional development. Galileo is able to provide “systemic, systematic and sustained” (Galileo Educational Network Association, n.d., p.1) services designed to meet individual requests and the needs of particular schools and jurisdictions.

GENA supports and facilitates teachers who are interested in the infusion of technology into teaching and learning environments. Jacobsen (2001) states, “The Galileo Network responds to the unique culture of the school by working collaboratively with the entire school staff, with parents, with district technical support people, and district personnel. Galileo staff does not impose set methods or models on the school, or on individuals but rather invite stakeholders to participate in the process of creating learning environments at the school that are engaging and reflective of high technology performance” (p. 9). The Galileo Educational Network teachers work “on-site to provide coaching and mentorship to classroom teachers and administrators that demonstrate new images of teaching, learning, student capabilities and staff development” (Galileo Educational Network Association, n.d., p.1).

Chinook's Edge School Division's Humanities Initiatives

GENA's on-site work with students and teachers in Chinook's Edge School Division began in 2000 with the creation of the Humanities program. Two factors influenced the establishment of this program. First, at the school jurisdiction level, a professional development model has been implemented for the CTS program where teachers can meet on a regular basis for professional development and can work together and mentor each other. The School Division has arranged release time to enable them to participate in the program. In discussion at the jurisdiction level around the work and the model, questions were raised about the direction and the next step in the journey of technology integration.

At the same time, the teachers and the principal of H. J. Cody School raised concerns about the way the Integrated Learning Room had evolved. This room was designed for use as a non-subject specific, computer-technology-based learning environment. It was to be more than a CTS lab. The principal of the school had envisioned and articulated the need for an interdisciplinary work environment, where technology is integrated into this type of learning environment. The focus of student learning needed to be around these connections. Through the school's contact with the Director of Technology Services and the Coordinator of Curriculum and Instruction about technology and curricular aspects, the idea of integrating technology into a Humanities program evolved.

The Director of Technology Services and Dr. Pat Clifford and Dr. Sharon Friesen have known each other for a number of years. The Director approached these two individuals about the Humanities idea. Galileo Educational Network was invited to the school jurisdiction to discuss the concept and to determine what GENA could bring to this initiative. The Galileo mentor, who has been working with the Chinook's Edge Humanities program from its inception, has extensive experience with Humanities and did attend an early planning meeting. Following approval of the project, a series of planning meetings occurred to outline the initiative and to formalize the work of the Galileo Network.

This is the second year for the Humanities 10 program. In 2000-2001, H. J. Cody School piloted the Grade 10 Humanities program. In 2001-2002, teachers from Cremona and H. J. Cody Schools became part of the Humanities 10 planning team with the Galileo mentor. This year, the Galileo teacher has also been working with a team of Humanities 9, 10 and 20 teachers within the school jurisdiction.

This Humanities initiative with GENA fits into the School Division's third level of its "Teaching and Learning with Technology" program, Mentor/Leader Development. The focus of the project has been cross-curricular, with ICT being one of the curricular areas. With GENA's on-site professional development, the project is focused on planning, implementing, and assessing Humanities through authentic learning opportunities for students. The power of technology is used as an enabler to assist students in meeting identified learning outcomes.

Overview of the Humanities 10 Sovereignty Project Entitled “Independence”

In the fall of 2001, the Galileo mentor and the Humanities 10 planning team began to plan a Canadian sovereignty project entitled, Independence. Using Dr. Pat Clifford and Dr. Sharon Friesen’s *Knowledge Matters Instructional Design Process* (2001), they collaborated in designing a project-based inquiry that involves engaged learning and that nurtures an environment in which students are responsible for their own learning. In this design, they have created tasks that require students to grapple with the issues of independence and sovereignty. Through the planning process the educators worked through the following three stages: *what matters*, *learning matters* and *teaching matters*.

In the *What Matters Instructional Design Process* (2001), educators identify and focus the topic, establish fundamental concepts and determine how to integrate technology within the project. While meeting the curricular learning outcomes, a topic that will entice students had to be negotiated. Given the events and aftermath of September 11, 2001, educators used this event as a catalyst for raising such project questions as “How should Canada react to terrorism? What should Canada’s role in the world be? Should Canada strengthen her ties to the United States? What does it mean to be Canadian” (Artifact - Independence Planning Document, 2001, p. 1)?

Through discussion during the planning process, the Humanities 10 planning team identified the following fundamental concepts for this project:

Students will acquire an understanding of forces and events that have influenced their development as individuals and as citizens of a nation. The recent terrorist attacks in Washington and New York have caused us all to pause and re-examine our own priorities as well as those of our country. How we conduct ourselves as individuals within our growing multicultural society and how Canada conducts itself in the larger global community will attest to the values and attitudes that we hold dear. Now is the time to decide where on the continuum between national sovereignty and global welfare we want to live as Canadians. It is also a time when our tolerance of diversity and understanding of others will be sorely tested (Artifact - Independence Planning Document, 2001, p. 6).

The foundation of this project is based on the following five critical inquiry issues:

- “To what extent should Canada maintain her sovereignty?”
- “Should Canada continue to be a part of various alliances?”
- “Should Canadians pursue a strong national identity?”
- “To what extent should Canadians attempt to maintain their sovereignty in the face of global threats?”
- “How have events in other countries affected Canadian sovereignty?”

(Artifact - Independence Planning Document, 2001, p. 6)

Throughout this Independence project, students completed various tasks such as creating a timeline of milestones in the development of Canadian sovereignty; writing an in-class essay addressing the question of *how important is it for Canada to maintain her sovereignty*; and collaborating in an online debate entitled *Canada’s Response to Terrorism*. As part of this

project, a Humanities 10 website has been created by the teachers with the support of GENA staff. This website provides project information for students, parents and educators to access for the purpose of gaining information about project tasks, schedule of events and other pertinent information (e.g., assessment rubric). Although teachers jointly planned the project, each teacher was free to vary the tasks to meet specific learning needs and to respond to specific classroom situations.

Part II: Research Design

Introduction

This is a naturalistic, exploratory study designed to understand what elements contributed to the success of this inquiry-based Humanities project, involving a collaborative online debate. A case study approach has been chosen because of the exploratory nature of the study. Yin (1984) defines case study as “an empirical study that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; in which multiple sources of evidence are” (p. 23). In this study, the phenomenon to be investigated is the on-site teacher professional development that facilitated the creation of an inquiry-based learning project with the infusion of technology.

Purpose of this Study

This case study is designed to examine the impact of the Galileo Educational Network approach to on-site professional development designed to facilitate and support the creation of a robust inquiry-based Humanities project that includes technology integration. This study will address three major research questions:

- How effective is the Galileo on-site teacher professional development for supporting the infusion of technology in an inquiry-based learning project?
- How has technology integration within an inquiry-based learning project changed the ways in which teachers and students think about learning?
- What characteristics of this professional development initiative have made a difference to the teaching and learning outcomes?

Significance of this Study

It is important to study how situated on-site teacher professional development impacts the teaching practices and learning experiences for both teachers and students. It is critical to examine how professional development factors such as ongoing and on-site mentoring, collaboration with peers, individual reflection, group inquiry into teaching practices, utilization of a constructivist approach, and support of a school-based teacher initiative influence a teacher’s pedagogical perspective and practice and students’ appreciation of such a learning experience. Jacobsen, Clifford and Friesen (in press) state “when you begin to think differently about technology and learning, and you have different spaces in which to learn and teach, you can design different approaches to learning” (p. 8).

Data Collection

For this study, the researcher gathered data using three data sources: semi-structured interviews with Humanities 10 teachers, administrators (e.g. school principal and Director of Technology Services), the Galileo mentor and Humanities 10 students; documents such as course materials and planning documents and student materials (e.g., response journal, an in-class essay); and media materials (e.g., archived online student project debate). Archived online, asynchronous debate and students' written work have been used for the purpose of triangulation. Using multiple sources of information enhances the trustworthiness of the information.

Data was collected three to four months after the completion of the project. Due to this time factor, people at times had difficulty remembering various facets of the project. Students and teachers have also been involved in additional Humanities projects since the Independence project. At times they would refer to other projects when responding to interview questions.

Data Analysis

Data gathered from interviews have been analyzed using the process of coding to find patterns and emphases that existed across the interviews and among the various groups of people. The constant comparative method of data analysis has been used for the purpose of creating categories. Data has been broken down into categories and subcategories. These categories establish the framework for discussion of the findings.

A sample of written work has been gathered from each student. The samples were either in-class essays on sovereignty or final journal responses. The contents of these documents have been analyzed using content analysis. The information gleaned from this analysis has provided greater insight into the actual work, understandings and perceptions of their experiences.

Artifacts such as the planning document, instructional materials and assessment rubrics have been examined in this study. They have been used to frame the intention of the work which then has been explored through the analysis of student work and data gleaned from the other sources. These documents are evidence of the kinds of planning and the work teachers are creating in conjunction with the Galileo mentor.

The participation and interaction section of McKenzie and Murphy's (2000) adaptation of Henri's model for the evaluation of online discussion groups has been used to analyze the online debate. This model provides a structure for classifying and measuring students' online participation and interactions. Participation has been categorized according to level of participation (e.g., number of messages, length of messages), structure of the participation (e.g. time of posting, subject of the posting) and type of participation (e.g., social, content). In addition, interactivity has been examined in terms of implicit and explicit interaction or independent responses.

Participants

This has been the first year for these students to enrol in a Humanities program. Based on the class list for the online debate, 81 students participated in this project. Fifty-two students are from H. J. Cody School and 29 from Cremona School. A purposeful sample of students (n = 10)

from both schools has been interviewed to gain their perceptions and reflections on the learning experience.

The Humanities 10 teachers (n = 3), school principals (n = 2), the Director of Technology Services and Galileo mentor have also been interviewed for this study. Only one of the Humanities teachers had been involved in the Humanities 10 pilot during the previous year. The two teachers from H. J. Cody School team-teach the Humanities Program. The teacher from Cremona School is new to Humanities and to the school.

Part III: Summary of the Research Findings

The findings for this study are reported from two perspectives: educator and student perspectives. The data from the educators' perspectives provide insight into their view of the impact this work has had on student learning, how the on-site work of Galileo is having an impact on teachers, students and learning, and how the teachers' thinking about teaching and learning has changed as a result of this professional development opportunity that is grounded on specific course work. Data gleaned from students informs how the work has been completed, what students like or dislike about Humanities, how the learning environment has changed from previous years' experiences, and views of learning using technology.

A. Educator Perspectives

Data from educators, including Humanities 10 teachers, Galileo mentor, school principals and Director of Technology Services, have been classified into the following seven categories: nature of the Independence Humanities project; student learning; technology factors; change of practice; the immersion professional development experience; mentorship and professional development for the integration of ICT.

1) Nature of the Independence Humanities Project

The Galileo mentor has worked with the Humanities 10 planning team to design a project that bridges curricular learning outcomes with personal student connections to the issue through authentic learning experiences. The planning process began by asking the question, "What's the topic that we want to begin to generate a study around? And then, we start with the 'what matters' of the process." A critical role for the Galileo mentor has been to facilitate the planning discussion around the 'big picture' understandings that ground this particular inquiry-based project.

Galileo Mentor – "...really pushing at keeping the discussion around those higher concepts, like not allowing them to degenerate in to the small minute details, but keeping it at the big fundamental umbrella understanding level, and then always making sure that whatever task we come up with actually gets to that level...frequently we'll spend the first half of the day just clarifying what is really important and what are the key understandings that we want students to arrive at as a result of digging in around this way."

Teacher – “...there’s a lot of discussion at the beginning. Sort of hammering out what are the key understandings. That’s the crucial thing, you know, that’s the first thing we do. Is what really do we want our students to learn from these; what do we want them to take away; what are some of the transferable skills that they’ll leave this unit with? So we get those organized first, and then we figure out how we’re going to make that come to life in the classroom.”

Educators indicated that the Humanities 10 planning team wanted to create an engaged and active learning environment for students. The performance-based tasks parallel real-world scenarios. In this project, students have confronted questions such as *is our sovereignty being threatened? To what extent is our sovereignty being threatened, what effect and what impact does this have on you in your life?* The students discussed issues rather than topics. They researched history to follow events that have shaped current Canadian sovereignty in the post September 11th world. They have used this information in preparing arguments for the online debate. Within this project, current and historical events, aspects of communications and technology have come together for both students and teachers.

The design of this project required students to become engaged in the learning process. It required students to be independent learners and to take responsibility for their own learning. The design focused on a learning process requiring students to question, investigate and understand concepts and to present their information and findings in a “professional way.” One teacher describes the project as fostering life-long learning skills.

Teacher – “I guess we really wanted to look at the idea of life-long learning, other than just something that’s said, actually looking at it. I’m trying to see it at work...every unit that we get together with and plan, that’s our focus really, is try to extend it out to the students and try to recreate that active learning environment where they’re participating and they’re independent learners. That was the focus on all our units, not only the sovereignty one.”

Director of Technology Services – “For the students, it’s a much more engaging way of doing things. They have performance tasks, or tasks that they complete along this situation or scenario that’s created and it’s a real-world scenario- the whole discussion over sovereignty and the response to terrorism – that was real, and they were part of those discussions so they feel like they are included in part of the world rather than living inside an artificial world inside the classroom where they’re fed information. So I think that’s that inclusiveness of the world, like it’s including them but it’s expanding their horizons.”

Teacher – “I don’t know if they get bored but they seem to really go when something is really kind of neat and that there’s a scenario and that’s applied outside and that it relates to, or they can see that this is something that they can definitely use when they’re done school.”

NCREL (1995) describes engaged learners as being collaborative. The learner values the skills required to work with others. Through this collaborative experience, students appreciate diversity of perspective. A key focus in the Humanities 10 program has been on perspectives. This has

been a common thread throughout the various projects. This appreciation of collaborative work and multiple perspectives is evident in the online debate.

Galileo Mentor - “So naturally, when we were planning together we were always kind of looking for ways that the teachers could work together and also ways for the students to connect with one another. And so that’s how the sovereignty debate online came about. It was a curriculum topic that both teachers had to address at the Grade 10 level and we thought maybe a really interesting way of grouping the students would be to have, you know, groups of five but a mixture of Cody kids and Cremona kids and in those groups of five they would discuss the topics from the perspective of one of the federal parties in Canada.”

Within this project, access to technology has helped to promote engaged learning. First, access to the Internet has provided students with a vast quantity and quality of resources. Educators noted that the majority of resources used in this project have been from online sources and that very little information was accessed from textbooks or library materials. Second, students used multi-media computer applications (e.g., Adobe Photoshop, Macromedia Director and M.S. PowerPoint) to present their ideas and issues. Third, the use of WebBoard, a computer-mediated communication application, has provided a forum for students from the two schools to engage in an online debate. In this debate, students representing a political party had to debate the issues of sovereignty and Canada’s response to terrorism. Fourth, the creation of the Humanities website provided a location where project information could be shared outside of the classroom walls. The use of the website and WebBoard has moved the learning experience from the private confines of the classroom to a public forum, where parents and the world can observe student learning.

The planning team approach for this project and other Humanities projects has been a positive experience for participating teachers. One teacher acknowledged that the administrative support for this initiative gives teachers “the freedom to take risks and plan and do something new.” As a planning team, they are working in a collaborative and collegial environment where they share ideas, problem solve, work through planning issues and provide support for each other. This type of collaborative planning experience is a model that teachers can use within their classrooms.

Teacher – “...teacher collaboration... to me is just crucial. I mean that’s what makes it happen.”

Teacher – “I’m seeing the value of being flexible, as a teacher, especially if you are going to collaborate with other people, you don’t want to just get stuck and set in your ways. ...It’s my first year through the curriculum, so I’m more than willing to adapt and change and roll with the collaborative effort.”

2) Student Learning

In response to the question of whether or not learning outcomes were achieved, the majority of educators indicated that they had been achieved. These individuals have expressed a positive image of the learning experience, using such terms as “strong work”, students are “happier when

they are actively learning”, “enjoying and having fun”, “majority of them are very motivated” and “more confident in front of a group of people” when delivering presentations. In addition, they described how students have a clearer and deeper understanding of sovereignty, how they are applying what they have learned in this project to other issues and areas of study and that there is a difference in the quality of their writing.

Teacher – “I guess more importantly to me is how it affects them. It’s not just a concept. Most of them have an understanding that these decisions that are being made do translate down to an effect on their own lives.”

Teacher – “I think that you can honestly go up to any student in our class and ask them how they feel about sovereignty and whether our sovereignty is being threatened and they’d probably be able to answer you. I know we’ve had kids that have talked about sovereignty issues with their parents at the supper table and they’ve come back and said, ‘You know, my parents didn’t really understand the whole idea and realized perhaps that our sovereignty was’ ...It’s pretty fascinating that way.”

Galileo Mentor– “You know, I think one of the things that you see are kids debating there passionately about sovereignty. So it no longer was this dead term from an outdated textbook. I think they saw it as a real and meaningful issue in today’s world, that has huge implications for the way Canadians are viewed in the world and has huge implications for our future direction.”

A difference has been identified in the educators’ observations of students’ success with their learning experience. Two of the seven educators noted that this project impacted some students more than others. For one group of students, an educator found that an estimated 40% of the students have been successful with this learning experience. Of the other 60%, approximately 20% tried but likely needed more structure to be successful. For the remaining 40% of students who are thought of as not being successful, the educator identified several factors that might have contributed to this situation. For example, this was a new style of learning for these students. Some students did not take full responsibility for or ownership of their own learning, low motivation level, possibly not enough teacher-led discussion to help focus the students or not enough background information had been provided to build on the basics. This educator expressed concern that the majority of this group of students did not engage in the topic and did not gain from the experience as much as they could have.

In this study, parents were not interviewed with regard to the project. A few educators indicated that they have received positive feedback from parents. One administrator told of a conversation he had with a parent about a student’s writing in Social Studies. The parent’s comment to the administrator was: “I could not believe the thoughts that were on the paper there, I just never would have given her credit for that.”

Administrator – “Their writing, it’s more than just hoop jumping and part of it of course has to do with knowing they have to defend whatever it is they’re putting down in front of their peers ...So we’re seeing a real improvement in the quality and focus of the writing they’re doing.”

Administrator – “We’re asking them (students) to go instead an ‘inch wide and a mile deep’ so that the project work that they do, because it will cover all of CTS, Social Studies and English objectives. They can spend a lot more time doing a quality job on, and it’s interesting because we’re starting to see as a general trend. The quality of work the kids are doing throughout the school now is improving as teachers are seeing, getting some of the work that is coming in from these other kids...(W)e’re just starting to see this kind of creeping effect but for a change, it’s not an erosion it’s a building up, which is wonderful.”

The online debate gave students an opportunity to research, synthesize and utilize information in the formation of an argument from a political party’s perspective and to sustain the debate in an online forum. To be successful in this situation required students to create valid arguments based on serious research and to carefully articulate their thoughts and perspectives in a text-based environment. In addition, teachers commented on the online debate as being motivating, exciting and engaging. However, one teacher commented that students were disappointed when others did not respond to their messages.

Director of Technology Services – “They’re engaged in that critical thinking of ‘what kind of messages should I be posting to this board?’ And so, the conversations were very powerful, very compelling and when I shared these conversations with other people they were quite surprised at the level of discussion that the students were having—the level of understanding that they had in such a simple forum. I think that to me makes it a success alone—that they’re engaged in number one, Canadian Politics which is often hard to get a lot of people excited about. And, then the conversations.”

Teacher – “I thought it was really neat that they couldn’t wait to get into the computer to see what the responses were going to be to what they wrote. And they were actually quite disappointed if they didn’t have any responses during the day. And then that was also a problem because we had computer time booked and if there was nothing for them to respond to it led to some off-task behaviours in the computer lab, ... which kind of took some of my focus away from helping the kids who were in debate ... I was busy seeing the other ones who were bored or choosing to opt out of really participating properly.”

From the educator perspective, this inquiry-based learning project has had a positive impact on student learning. The deep approach used to cultivate understandings surrounding this issue has engaged students in an active learning environment. Their exploration of issues and materials and their creation of connections between the issues has led many students to a greater understanding and appreciation of sovereignty and has given them an opportunity to develop various skills. Moreover, their learning is occurring in an atmosphere that supports student risk taking as part of their learning.

Galileo Mentor – “I think that they have a much deeper understanding of sovereignty and all of its complexities, for one thing, so they take in a fairly difficult concept and they’ve examined it, not only through different time periods, but examined it in light of contemporary events...I think they also developed an understanding of the various

perspectives that individuals would have around this issue and why different individuals or different political parties would hold those perspectives...I think they were required to take a position and argue it from a particular perspective, which I think is a fairly sophisticated procedure to go through. So it really did require them, like there's no way that they could just regurgitate information, they had to think critically....They had to learn to articulate their ideas in an online format."

Teacher – "But the difference is that we are giving them the opportunity to take those risks."

3) Technology Factors

The design of this inquiry-based project is not driven by technology. Rather, students and teachers have used technology as a tool and a resource. Educators have stressed that the technology has to be used appropriately to create and support student learning. The educators have designed a project that has created an opportunity for students to use the technology as an extension of their learning, rather than using technology in isolation.

One teacher has described the transition students have made in using PowerPoint presentations. At first, when using PowerPoint, students would recite facts with no extension to their learning. Now, they are using the technology as a learning tool to reach their audience (e.g., peers). This individual noted: "Generally, we've seen the students progressively improve with their presentation skills."

The two Humanities 10 classroom situations are unique in terms of access to technology. For the H. J. Cody students, Humanities is offered in the Integrated Learning Room that provides every student with a computer connected to the Internet. In this room, the technology is available on an 'as-you-need' basis because the environment has been planned in such a manner. This room is located adjacent to the school library and on-site technical support is readily available. In contrast, the Cremona students worked in a conventional classroom and computer lab setting. In this case, the teacher had to schedule time in the computer lab for students to access to the computers for this project. These students also had limited access to the Internet through a few computers in the school library. Only one computer is available in the Humanities 10 classroom. Access to technology for this project has been a major difference between the two Humanities classes. Nevertheless, both schools have well equipped computers with the necessary software to accommodate the student projects.

Educators have identified three technological issues that have had an impact on this learning experience. First, in both schools the Internet speed is slow due to the use of Switch 56 lines. As a result, they have found that the dialup Internet access is somewhat restrictive. Second, on the first day of the online debate, all students who logged in at that time, logged in under one student's name. This resulted in all students being placed in one group, postings being placed in the wrong conference forums and postings being lost. However, a teacher who has administrative control of WebBoard addressed this technical issue quickly. Third, due to the differences in computer environments, the Cremona teacher had to schedule time in the computer lab for the students to participate in the online debate. During that time, students were only able

to read and respond during school hours every other day. In contrast, H. J. Cody students had access to the online debate everyday because of their access to the technology. One teacher noted, that this two-day delay in responding might have affected the “heat of the moment arguments and responses by the students.”

4) Change of Practice

Educators reflected on the project, the Humanities program and the on-site professional. Some of these individuals described a change or shift in the teachers’ practices and pedagogy. One administrator has identified two critical aspects in the shift of teacher practices. First, there is a shift in the teacher-student relationship from an “I teach-you learn” philosophy to a changed relationship amongst students and teachers. Second, being in this type of environment can be somewhat threatening and demands collaboration and cooperation. “It’s more like a communal learning environment than ...a more controlling environment, so, in the traditional classroom.” Teachers working in this environment need to be open to such changes in practice.

Educators have identified three key changes that have occurred with teacher practices as a result of this on-site teacher professional development experience within the Humanities program. First, the planning process has had an impact on the teachers. Having Social Studies, English and ICT within the Humanities program has “blurred the boundaries of all three of those disciplines into one or into several large inquiries about important issues.” Issues and questions have become catalysts used by the educators in the planning process. These teachers start the planning process by thinking and talking about the ‘big picture’. The whole initial discussion is around “what do we want the students to really know?...key understandings ... looking at what content and tools are required to engage them ... sometimes it’s not technology.” One teacher said that, in the previous year, it was exciting to have students use the technology. As a result, the technology took precedence over learning and some understandings were lost. Now, for this teacher, the understandings come first, followed by thoughts of how the technology can be used as a learning tool.

Administrator – “(W)e probably are more focussed on curriculum objectives than we were before... coverage of the objectives is much closer than what it used to be ... we’ve moved from the K part of the KSA’s, a lot more into the K and A part, skills and attitudes.”

Teacher – “So it’s almost natural now that we sit down and we start thinking about, you know, the big picture, something really neat and really cool for the kids to do rather than doing the basics, you know, we need to get this idea across.”

Teacher – “(I)t feels good to know that you have the opportunity to plan something new and unique and that might help with education.”

Second, the experience of working as part of a planning group and receiving on-site professional development has had an impact on how the teachers think about their teaching. It is apparent that there has been a shift away from the delivery model where the teacher teaches chapter by chapter from a textbook. One teacher describes past practice as “a lot of information dumping.” Now they

are designing or structuring learning situations where students are engaged and are creating their own learning.

Teacher – “I think I view education and teaching from a different perspective than I did three or four years ago.”

Director of Technology Services – “(C)hange in the pedagogy from ‘stand and deliver’ for the teachers to building engaged tasks that the students work through and they don’t need the teacher at the front giving them information...inquiry-based, and so the whole process is changing the way we teach, so for teachers, when they start down this path, they may be more comfortable standing and lecturing...I think it’s enabling us to shift away from that style of teaching. So I see teachers starting to think differently about ‘How am I going to engage the students in this’? For the students, it’s a much more engaging way of doing things.”

Teacher – “I feel my program is so much stronger and I think that my teaching is much better and that my planning is definitely, like my approach and my planning has definitely crystallized for me. I have more clarity about what I’m doing, I think, with the planning that we do together.”

Third, educators explored the question of how technology integration within an inquiry-based learning project has changed their thinking about learning. The integration of technology has not necessarily changed their thinking. Rather, some have developed a new and enlarged perspective on learning and teaching with technology. For others, it has been a matter of re-balancing technology and major understandings, losing their fear of infusing technology when they lack confidence, and using technology appropriately as a natural extension of student learning.

Teacher – “(S)ometimes we don’t need to get into the big graphics and all this junk and all the flashes...So now, when I go into plan, technology is something that we think about but also it’s the understandings that we want to have them know first...(W)hat are the understandings first, and how can we use technology to help them understand the understandings.”

Changing their teaching perspective and practice has required new insights and guidance in making it happen. The experience has given teachers an opportunity to gain a better understanding of the planning process for inquiry-based learning, how to use technology appropriately to support learning within a cross-curricular learning environment and it has created a venue for teachers to use various instructional approaches in fostering a student-centred learning environment.

5) Immersion Professional Development Experience

It has been reported that, through a mentorship program, the school division does support and provide opportunities for teachers to learn to plan for technology use within the curriculum areas. This support is provided over time. It is within the Director of Technology Services role to

provide time and opportunities for this type of mentoring to occur. This kind of activity is directed at developing a technology-infused learning culture.

In this study, educators have identified three strengths of Galileo on-site professional development. First, this activity is based on and embedded in daily work. What teachers create is an authentic learning environment and not something fashioned in isolation as in a workshop. Second, resources, both human and material, are brokered and in place to support this program. Financial support provides release time for teachers to work with the Galileo mentor. For example, support through such initiatives as AISI funding is contributing to longevity and sustainability in the program. In addition, the GENA provides a great deal of expertise and resources to support the program. The Galileo mentor has a wealth of experience with Humanities and with inquiry-based projects that integrate technology and learning. In addition, the teachers have drawn upon other Galileo staff members' expertise to accomplish specific tasks (e.g., assistance in the creation of the web page). Third, the collaborative process affords teachers opportunities to openly share, to develop a sense of trust, and to work together. At the same time, this collaborative environment models an image of collaboration that teachers can re-create in their classrooms.

Administrator – “You can see the results faster I think doing that kind of a thing rather than a general overall PD session where staff sits at a computer and does a project that they learn how to do it and then they take it back to the classroom and try to do it. This way it's sort of all encompassing.”

Administrator – “The whole idea of learning your craft while you're practicing your craft and doing it with other people who have got great insights.”

Director of Technology Services – “(I)t's really important to have someone who can help them (Humanities teachers) visualize or get an image of what it can look like. And so, I feel it's the person who makes the difference in this.”

The teachers and administrators who have had direct experience with Galileo's work in Humanities 10 are unanimous in affirming the effectiveness of the on-site professional development in supporting the infusion of technology in an inquiry-based program. They are very satisfied with the work that has been done. The Humanities teachers are able to draw upon the Galileo mentor's expertise in both Humanities and technology. In addition, the Galileo mentor provides guidance, direction and support based on the needs of both teachers and students. The Galileo mentor nurtures the cross-curricular work through the planning process to ensure that activities are related to furthering student understandings around key issues. In addition, the teachers are given support over time through face-to-face and/or online support (e.g., NetMeeting, e-mail).

Teacher – “I had said to my Principal,... ‘I couldn't have done this without Galileo's support.’... Putting it all together in this Humanities environment with 50 kids and having to team teach and plan and mark and teach all my other courses, there's just no way I would have kept up...Galileo support was critical. But, it wasn't just that they supported

me and kept me going, they keep me excited and motivated and you know, pretty happy with what I was doing.”

Director of Technology Services – “You have to just sit back and look at the team as they work over the year and the complexity of the projects that they are developing; the continued enthusiasm for the project work and the fact that, to me, the most effective part is that the Humanities project in particular, it’s a Humanities project. We’ve never ever referred to it as a technology integration project. And that’s what makes it successful because a lot of people that I talk with, talk about their ICT program, and we don’t.”

Administrator – “...it costs some money but it’s an AISI project right now. But if it all falls apart tomorrow we’ll probably still try to find the money to continue because it’s a worthwhile relationship at this point in time.”

Teacher – “Being new to the curriculum, for me, it’s just a struggle to get through the curriculum, let alone bringing in, I know that we’re suppose to be bringing in technology into each level of curriculum...So, having somebody say, ‘Hey, this is a good way to bring technology in’ has been great because I probably wouldn’t think of that myself.”

The educators have been asked to describe what makes this on-site professional development experience different from other on-site professional development opportunities. First, Galileo Educational Network strives to provide professional development support that meets the needs of the people and specific situations. Second, this professional development experience fosters a collegial and collaborative environment for educators. It gives them opportunities to bounce ideas around, to give and receive support, to question without feeling inadequate or intimidated, to draw upon the strengths of the members, and to adapt to meet the needs and direction of the group. Third, the process is different. It is a planning process that requires teachers to create a plan, implement it, monitor it and make necessary changes along the way. One teacher has described this difference as “the method for implementation is built right into it.” In traditional professional development settings, information is given out and it is expected that the teacher is to do the work on his/her own in his/her own school setting. As a result, the work may never be accomplished. GENA does not use a preset model for professional development. Rather, professional development is content and contextually based on the teachers’ and the schools’ needs and circumstances.

Educators have identified a number of characteristics of this professional development initiative that have made a difference in teaching and learning outcomes. Although there are no general common characteristics in this group, three single characteristics have emerged from the data. The first characteristic is having not only the time and support to plan and work with colleagues, but also the opportunity to work as a team with colleagues who have expertise and experience in this area. The second characteristic is collaboration. Through the planning process, teachers are co-authors and collaborators. This project provides a model or an image of what collaboration can produce and how it can be nurtured within classrooms. There is a sense of transferability from the Humanities planning team approach and experience to the classroom. Third, this professional development initiative fosters a new way of thinking about teaching and learning. It

extends learning within an environment that supports risk taking and doing new things in meeting curricular outcomes and improving student achievement.

Administrator – "... a community of learners. That is really what it's all about. This is a learning institution for everybody, not just the students."

Teacher – "I think the available planning has made a difference obviously. I think that our environment that we have here is crucial. I don't know that we could have extended the learning as far as we have unless we had this environment. So we're really fortunate to have this, I think."

6) Mentorship

Mentoring is not new to the Chinook's Edge School Division. It provides a teacher mentorship program for its teachers. In addition, the jurisdiction and GENA provide their own immersion models for mentoring in support of the integration of technology in curriculum.

The three teachers agreed that GENA on-site professional development is in essence a mentorship experience. They appreciated the value of a mentoring environment and they felt that it has impacted them in various ways. One teacher compared this mentoring experience with the School Division's mentorship program. This person has found the Galileo/Humanities program to be "far more beneficial" for the reason that the Humanities planning team are people who have common interests and experiences and are on the same "wave length" working together throughout the year. One teacher describes the relationship with the Galileo mentor as one of "creative energy."

Teacher – "This has been very much a mentorship experience... makes me reflect on why I do what I do and what works and what doesn't and gives me, I guess, a lot of different strategies to add to my tool kit...can articulate my needs....bounce ideas off each other...tailor-made for my needs."

A second teacher felt that the Humanities program would not exist without the Galileo mentor's input. The Galileo mentor brings the following to the planning team and to the program:

Teacher - "...lots of Humanities experience and she brings that holistic new learning theory to the table...well read and she brings those ideas to the table...always in there with another idea... really cherish her planning... she just adds so much to it. It's fantastic."

7) Professional Development for the Integration ICT

The educators have identified six characteristics they believe are important for effective ICT professional development. First, ICT professional development requires curricular content and context. Stand alone ICT workshops do not include content, and relevancy to curriculum is not addressed. This needs to be an integral part of professional development. ICT and curriculum implementation are not a "separate entity anymore." It needs to be embedded into daily work. Second, there needs to be time for teachers to plan. Third, is the teacher's attitude. The teacher needs to be self-confident and recognize that one does not have to know everything. The teacher

needs to be “open to new ways of doing things” and open to being a learner. Fourth, there is need for administrative support for providing the financial means and resources to meet the needs. Fifth, there must be access to technology and support within each school. Sixth, there must be a collaborative environment where strong relationships are nurtured among participants.

Administrator – “I think with technology, it’s kind of like riding a bike. You can’t learn how to ride a bike by watching a film and then having somebody tell you about it – you have to dive in there and do it. So if you’re going to have effective PD for ICT outcomes, you’ve got to set up a program, make it possible for people, and encourage people to use it.”

Galileo Teacher – “...being on-site, online and on target...The fact that all of these notions have a basis in the research, in the most current research, about effective professional development and effective technology integration and implementation. It’s really helping teachers understand that they don’t have to be the experts in the technology, they just have to be open and willing to allow kids to become experts in those areas and to be willing to design learning experiences that are engaging and that allow kids to discover those processes in the context of their own learning. And to be willing to be learners themselves as they go through it.”

Conclusion

This immersion model is having an impact on teachers in terms of their thinking about teaching and their teaching practices. The collaborative and collegial environment nurtured by this on-site professional development has created an opportunity for teachers to enhance and enrich their teaching. Working through the planning process has strengthened their teaching and has given them new perspectives on technology integration within inquiry-based learning projects.

B. Student Perspectives

Student information gathered through interviews and the examination of written work and archived online debate has been allocated among eight categories: nature of the Independence Humanities project; online debate; role and impact of technology; positive attributes of the Humanities project; negative attributes of the Humanities project; reasons for more Humanities projects; differences in the learning experience; and Humanities.

1) Nature of the Independence Humanities Project

Students in this project-based inquiry have been required to complete a number of tasks including defining sovereignty, creating a sovereignty timeline, researching historical events that had an impact on Canadian sovereignty (e.g., World War I, World War II, United Nations, NORAD, NATO), writing assignments (e.g., journal, essay) and participating in an online debate. These tasks have been designed to integrate various curricula learning outcomes. For example, students described how they created an advertisement depicting their political party as part of a CTS and Humanities project.

The students have identified what they believe to have been the important or critical learning outcomes for this project. Although there is no consistency in the students’ responses on this

topic, their responses parallel what the teachers have set out to accomplish in the design of the project. The following is a summation of their responses:

- Historical events that impact Canadian sovereignty.
- Canadian political parties positions on sovereignty.
- Understanding of government and government decision making.
- People’s responsibilities to their country and their countries’ responsibilities.
- Understanding of the various viewpoints in response to terrorism.
- How to express themselves so that other people understand what they are communicating.
- Thinking skills.

Student work has been evaluated using various assessment tools. The students’ research and debating skills, understandings, knowledge and comprehension of content, and the quality and quantity of their interaction in the online debate have all been of part of their assessment. In addition to the teachers’ assessment of student work, students have been given the opportunity to do self-assessment and group assessments. One assessment tool that has been used is a rubric. Rubrics are posted to the Humanities website so that students are aware of how their work will be assessed. One student made the following comment about rubrics, “You know exactly how they mark you ...it’s not kind of like a shock when you get your mark back.”

From the analysis of the student in-class essay (n = 2) addressing the question of *how important is it for Canada to maintain her sovereignty*, it is apparent that students examined the issues addressing both the costs and benefits associated with Canadian sovereignty. From the essays examined, students articulated and supported their arguments by referring to present and past events and current organizations in which Canada is a member (e.g., NATO, United Nations, NORAD). These essays demonstrate the level and depth of understanding students have gained from the project.

In their final journal response (n = 8), students have been asked to reflect on their learning and understanding about Canadian sovereignty. Seven of the students presented a position on why Canada should or should not strengthen its ties with NATO and NORAD. In their arguments, they drew upon what they have learned through this project experience and they used both historical and/or current events to support their positions. Their responses to this question provided an opportunity for students to express what they have learned about the issues surrounding Canadian sovereignty.

Student – “I now know that sovereignty is something that we must constantly work to build on and protect. I also understand that there are some things we must do that may jeopardize our sovereignty, but are still for the better of our country. Sovereignty is a fragile thing, but it’s all in the balance.”

Student – “I have learned that our sovereignty is something that we should always value. Our country on a whole, has worked extremely hard to earn it, and I don’t think, after all that work, that we would give it up in a matter of days, months, or even years.”

2) Online Debate

One major task for this project has been *Canada's Response to Terrorism – A Collaborative Online Debate*. Eighty-one students between the two schools were placed in groups of 5 or 6 to form 15 groups. Within their groups, each student was assigned to represent one Canadian political party. Students were responsible for researching what their political party's response was to terrorism. Based on this research, students were to present an opening statement on their party's position on this issue and to represent their party's position in the ongoing online debate using WebBoard. As part of the debate, each student was expected to respond a minimum of one message for each of the opening statements.

One opening statement was posted on November 26, but the majority of the opening statements were posted starting on November 27. Eighty percent of the postings occurred between November 27 and 30th. Nineteen percent of the postings occurred from December 3 through 6.

This study's student participants (n = 10) represented nine of the discussion groups. Of the nine groups, the maximum and minimum number of messages per group was 65 and 33 respectfully. The mean number of messages per group was 46, including opening statements and responses to postings.

Of the study's participants, the maximum and minimum posting per person was 24 and 3 respectfully. The mean average of messages posted per person was 12. Within the total messages per group, the student who posted the most posted 37% and the one who posted the least at 9% of their total group's online postings. The mean average of postings by an individual posting within a group was 25%. To further examine the degree of participation, three students' participation in the discussion will be examined. The first student posted 24 of 65 messages within her group. Thirteen of her online messages were within her political party's discussion thread, which equals 45% of her political party's discussion. A second student contributed 4 of the 37 messages within his group. All his postings were within his political party discussion, which constituted 40% of that discussion. A third student contributed 12 of the 33 of her group's messages. Two of the messages were within her own political party which equals 50% of the party's discussion. This examination of the distribution of student messages gives an overview of the number of messages and the level of debate that occurred within the various groups.

Students were given class time to participate in the online debate. It has been found that 82.8% of the messages were posted during the morning, which represented their regular class time, and 5.7% of the messages were posted during the afternoon of the school day. Only 5.7% of the messages occurred after school hours. The analysis of the type of participation revealed that 89% of these students' messages were content related and 11% were either social in nature or off topic.

There is a variation in the number of postings per political party thread within each of the nine groups. For example, the range varied from a minimum of one and a maximum of 29 postings per political party in the asynchronous discussion thread. Given the five political parties and the 9 debate groups, the mean average of messages posted per party are as follows: Progressive

Conservative – 10, Bloc Quebecois - 13.5, New Democratic Party - 9.1, Canadian Alliance - 10.8, and Liberal - 8.4. Within the groups, there was a range of postings for each political party thread. For example, in the group that posted 65 messages, five students were involved in posting the following number of messages per party: Progressive Conservatives – 29, Bloc Quebecois – 13, New Democratic Party – 11, Canadian Alliance – 0, and Liberal - 8. In contrast, the group that posted 33 messages, had 6 students posting the following number of messages per party: Progressive Conservative Party – 6, Bloc Quebecois – 0, New Democratic Party – 4, Canadian Alliance – 16, and Liberal - 7. The number of messages posted per party indicates the level and range of student participation in the online debate.

Students from the two schools had not met each other in person prior to the online debate. As a result, in the debate groups one or more of the students were strangers. Two students acknowledged that this contributed to an atmosphere that fostered openness to other perspectives and to the debate process.

Student – “The people in my class I’ve known since Kindergarten—nobody changes really. And so, I already know all of them, and in fact I can anticipate—you start to work with their style of thinking so you say, you apply what you think will sway them best to them. So if you know someone is say anti-gun legislation, then you bring up all the points of your group that applies to that. So, you know these people so well it’s really easy to sway their opinions. And when you’re suddenly put on the spot and there’s all these people you never knew anything about before, you can’t anticipate their next move. And so, you have to debate it fairly.”

Student – “... it’s easier to debate with people you don’t know sometimes because they’re going to bring new ideas...you’re freer to say what you want to say because when you’re saying it to someone you know, you’re afraid of ‘Oh what if I offend her or something.’ In fact if you are a friend you just don’t say the same thing as you would...You’re not going to have to deal with their reactions face-to-face either so you can say what you mean.”

In addition, in their final journal responses and in their interviews, students shared information about their online debate experience. In their journal responses, six of the eight students wrote positively about the online debate learning experience.

Student – “I personally thought that this online debate was an excellent tool for learning, because it forced us to consider the flaws of our party platforms and consider the good points of our party platforms.”

Student – “I feel that by participating in such a thing has given me the chance to view this issue from both sides of the spectrum, which has broadened my knowledge of it all.”

Student – “I think that I have learned a lot better due to the process that was used. I think that I learn better when we are participating in hands on activities.”

One student described getting caught up in the debate experience as being comparable to “a novel that you like reading where you don’t want to put it down.” However, to engage in the debate did require students to be prepared to articulate their party’s position in both the opening statement and in responding to the other parties’ viewpoints. This required them to research and formulate responses. Two students noted that other students in the debate would point out flaws in their arguments. One student described the situation as: “(S)ometimes though if you had the wrong information, people would just nail you for it...So you kind of have to do really thorough research.”

Students who support an online debate acknowledged both the advantages and disadvantages of using an asynchronous communication medium. For one student, the virtual presence has been an advantage due to her nervousness in face-to-face situations. The students also appreciated the opportunity to reflect on and refine their work. Working in an asynchronous environment gives a person time to do this, compared to the immediacy in a face-to-face debate. However, communicating in a text-based environment added a new communication challenge for these students. One student noted, “It kind of gets you to think more about what you’re writing because you have to interpret your emotions. You can’t just write what you are saying...I want to make sure you get the right reaction ... I wanted to word it more carefully so that we didn’t get into like arguing instead of debating.” This student went on to describe her group experience in which at times she felt that another student was really mad at her. She finally realized that the student was not really mad but rather was caught up in the intensity of the debate. She concluded this discussion by saying, “I liked the intensity but I don’t know if I would really like to do that face-to-face.” Therefore, the comfort of the faceless online environment did not impair the intensity of the debate for this student.

Two of the eight students in the journal response did not find the online debate a positive experience. In the interviews, students did identify a number of challenges encountered in the online debate, which they had not encountered in previous face-to-face meetings. This was the first time the students had engaged in a Humanities online computer-mediated communication situation. The experience raised several new issues for them. For example, they found it difficult to have a dynamic debate when other participants did not fulfill their responsibility to post their messages to the online forum. This failing impeded the conscientious students ability to complete their requirement of responding to each of the political party positions. One student preferred face-to-face debate because debaters are put on the spot to provide a response. A student who preferred face-to-face debate felt that the online debate was not well thought out, that a number of responses were off topic or poorly written due to lack of effort on the part of some students.

Student – “(It) was a little over rated. It was really easy to get off topic, and it wasn’t interesting enough ...I don’t think this really helped us learn anything either because we really just said that we agree, or argued our point...By arguing we just know what our assigned group believe, and forgot about what the other group was telling us, thus it was a waste of learning time. I do think that it was a good experimental project.”

3) Role and Impact of Technology

Technology has been accessed and used in various ways throughout this project. First, the Internet has been a crucial source of information for the students. They have indicated that nearly all their information came from the Internet and very little, if any, from hardcopy magazines and books. Students have described online research as a faster way to do research and a means of getting more up-to-date information. However, one student did note that information from the Internet was not always accurate. Students expressed themselves and presented information using various applications to complete their project tasks. Computer applications such as Macromedia Director and M.S. PowerPoint were used in their assignments. Students indicated that they felt comfortable negotiating with the teachers about using other computer applications to complete tasks. Third, computer-mediated communication, WebBoard has given students a new forum for debate. Fourth, students had the freedom to electronically transfer files to their teachers. The flexibility of the technology has given students the ability to electronically submit assignments from anywhere at anytime.

Students articulated how the use of technology within an inquiry-based project has influenced their learning. They expressed an appreciation of various approaches used for learning. They also said that this experience made some people more open to using technology, gave them an opportunity to become more capable users, gave them exposure to more information, provided options in terms of end product (e.g., presentations) and provided an opportunity to refine their work. One student commented that this learning experience gave students a “more well-rounded education.” This opportunity and access to technology has given another dimension to their learning experience.

Student - “Book learning is one thing and then you have computer learning and it gives you a broader perspective of your education in general.”

Student – reference to technology – “...more variety in what we hand in, as opposed to filling out worksheets all the time.”

Student - “...made me a little bit more excited about projects.”

The following excerpt from one student’s response raises the issue of what will happen to students’ learning when this type of program and approach to learning is not available to them in their Grade 12 year. This individual expresses concern about future learning within the traditional subject areas and with traditional instructional approaches:

Student – “I really prefer it over the normal textbook and notes. I think I learn better this way but the thing is it doesn’t feel like I’m doing all the right stuff. I’m kind of scared that when I get to Grade 12 and I can’t do Humanities anymore, like it’s going to be English and Social because then you have Diplomas, right. I’m either not going to be challenged enough or I’m not going to want to do the work that we have to do, like the memorizing and the notes.”

Students agreed unanimously that they would like to continue to do more Humanities projects involving the integration of computers and technology. First, students enjoyed and appreciated

having the technology component integrated into the projects. Several students referred to it as *fun* and *more interesting* to learn through the use of technology. For them, the technology has added to the learning environment and has enriched their learning. Second, they liked the project-based learning that infuses technology. Some liked the opportunity to work with other students, the freedom to use technology without being bound by a textbook environment and the value it adds to their learning.

Student – “I really loved the technology application...It seems like we’re finally bringing the Internet into the school, into the classroom, and that’s amazing. It’s brilliant because it’s so easy to get all the viewpoints off the Internet and it makes you think about different things and questions the things that you personally believed.”

Student – “Simply put, computers are fun and they are a lot more interesting to work with instead of the traditional materials we’ve been using since grade one. And it gives us, it give me at least, a much better opportunity to express whatever it is they would like us to express on whatever project they give us.”

Student – “(M)y work is better quality because I just feel more, you know, free, and I’m not just tied to a textbook.”

4) Positive Attributes of the Humanities Project

Students liked many things about the Independence project learning experience. Individuals responded by identifying specific items. One person liked being able to create funny items in PowerPoint. Two acknowledged that they had learned more about Canada through this project. Another student appreciated the freedom the project has given students in terms of their ability to express themselves.

Student – “...express myself completely without being confined to any sort of boundaries...I like representing how I feel and I also like working with technology...so any time I’m given the opportunity to integrate technology. “

Six of the ten students liked the project debate component best. They indicated that they enjoyed the challenge of debating. It required them to research and formulate responses that they may or may not personally believe. However, they recognized that they had to be informed, to be critical of the information being shared and to use accurate information if they were to succeed in the debate.

Student – “...debating. I loved it. It was awesome...So in debating you have to be on your toes.”

Student – “...difficult to debate something that you didn’t necessarily believe in yourself and you hadn’t thought about as clearly. So my favourite part of it was just the new perspective, ‘How do I deal with this new view of it and argue it so that it sounds convincing?’ ”

Student – “Basically the whole debate part...interacting with other people that you don’t know, I think, makes it a little easier too because you’re not holding anything back...”

5) Negative Attributes of the Humanities Project

Students also described a number of items that they did not like or liked the least about the learning experience in this project. No major themes emerged from the data because there was no consistency in their responses. Rather, each person raised his/her own particular dislike or issue with the project. The following is summary list of these items:

- Wanted a different political party for the debate.
- Limited information on party perspective on the topic of sovereignty.
- Needed more time to research.
- Lack of computers resulted in loss of time and lack of interest.
- Difficult to stay on topic and use time wisely because it was difficult to concentrate in this environment.
- Difficult to understand what people are communicating online.
- Issues with the online debate being not well thought out and poorly written responses due to lack of student effort and off-topic responses.
- Did not agree with the party’s perspective on the issue.
- Issue with translating information from French to English.

From this list, it is evident that students did not raise critical concerns about the Humanities project or program. Rather, they identified specific issues or environmental issues (e.g., lack of computers) that has had an impact on their learning experience.

6) Reasons for More Humanities Projects

Eight of the ten students indicated that they would like to do more of these types of projects. Two students indicated they did not know if they would like to do more of these projects, but they did respond by describing what they did like about the projects.

Students identified three reasons why they wanted to do more humanities projects. They recognized that project-based learning is engaging and requires learners to be dynamic participants in the learning process. They acknowledged that they are not passive learners, but they are expected to actively investigate for themselves and find out why things happen. This approach is motivating and holds their attention. One student expressed appreciation for the project’s flexibility. Such projects do require more self-directed learning.

Student – “I like projects. I don’t know. They’re my favourite part of school, doing like research projects and stuff.”

Student – “In all your classes you kind of, you read textbooks and you write notes and it’s all kind of uniform and by doing something different, it kind of, I don’t know, it kind of gets your attention again ‘Oh, it’s a project’ and it kind of wakes you up again I guess. New energy kind of to start again, ...I think it’s always good to have something you look forward to that’s unusual that you can do.”

The integration of technology within projects has been another positive factor in the student support for more Humanities projects. Using computers and the Internet added substantially to the learning environment. As noted earlier, students found the work more interesting than using traditional materials (e.g., markers and paper). The technology has given students greater scope and a different forum within which to communicate with their peers and teachers.

In one school, students in the first semester during the morning classes were enrolled in Humanities and CTS. Within the two subject areas, students worked on integrated projects. One student acknowledged that this scheduling provided greater time to work on the projects. However, a change in the semester timetable resulted in students no longer having the CTS time period. The following excerpt is one student's view of this experience:

Student – “But the first semester of Humanities was kind of laid back because we had Humanities in CTS, like first three blocks of the day, which is all morning until lunch. So we had a lot of time to work on our stuff, but now that the semester has changed. Instead of CTS, we all have different classes so we have to work twice as hard to do twice the amount of work because we kind of slacked off I guess. So now it's getting kind of harder to keep up with what we're doing.”

The third reason for having more Humanities projects is the impact it has had on student learning and understanding. Students described how experiencing different perspectives makes learning more informative. One student explained that the Internet provided a forum in which they could gain different perspectives and could better check information. In addition, another student noted that she liked the politically based projects because she felt she was getting to know more about the country.

Student – “I'd like to do a few more projects like the ones we did at the beginning of the year. I've gotten better at working in this type of environment, and I'd like to see how much I could do better if we tried some of those types of projects again.”

Student – “(A)t first I was kind of worried that we weren't learning everything that we had to be because it seemed like the other class was learning more facts and stuff...This is more interpretive, kind of like, you get to actually find out what happened and why it happened. Not just 'this is what happened, this is when it happened'...(W)e evaluate ourselves based on this work skills thing, like one that employers actually use to rate their employees. And it's most stuff that actually applies to what we're doing. So I think that's pretty cool...It's a lot more hands-on...(W)e get to actually learn about it ourselves and if you're doing it yourself you seem to remember it better than if somebody is just telling you.”

7) Difference in the Learning Experience

Students did report a definite change in their learning experiences compared to previous years' learning experiences. They described how, in past year, they had to complete essays and worksheets and had to do rote learning of facts for tests. They attributed the difference in this learning experience this year to the tools available to them and the focus on lifelong learning skills. With the integration of technology, students have more access to a range of tools beyond paper and pen to express themselves. They can use such software as Macromedia DreamWeaver to animate and express their ideas. The technology provided "different ways of expressing yourself. Not limited to writing oral reports for everything...Actual imagery, sound and multimedia integrated into our work."

Being independent learners, developing time management skills, working in teams and taking responsibility for their learning are lifelong learning skills identified by the students. They recognized that they are being given more responsibility for their work, and that they have to be personally motivated to complete their tasks. As part of this new responsibility, working independently or in teams, they have had to organize their time to meet deadlines and accept consequences if they did not. Within this learning environment, they were given guidelines and outlines, but they had to make decisions about their own work. This environment nurtures the development of independent learners and fosters respect for students as learners.

Student – "I've learned a lot more to motivate myself to get my work done and not so much just have my teachers telling me everything I need to do and you know 'do this'. I'm much more independent, I think."

Student – "It's more hands-on...You actually have to do the work...in other classes ...you read stuff and memorize it out of a textbook and write it on a test, it's not really that hard. But, this, you actually have to know what you're talking about or other people will get you for it...you really have to know what you're talking about and you have to know you did good work."

Student – "It was a lot more informative. It was a lot less condescending in a way. It treated you like you were an adult and you had an opinion and so it treated you like you were able to comprehend the subject matter and you could really understand and get a personal viewpoint".

The majority of students believed their teachers' teaching styles were different with this project and/or program. The teachers had created an environment where students need to be independent learners and not to be so dependent on teachers. The teachers did not spend a large amount of time 'telling students.' Rather, information is posted on the Humanities website and the teachers act as learning facilitators. The teachers addressed questions and assisted students in finding information.

Student – "Usually the teachers' roles are to sort of suggest ideas and provoke thought more than to outline, like they outlined our assignments, but they don't guide us through them. They sort of try and encourage us to work independently."

Student – “...different environment makes a difference. They can’t teach in the traditional fashion and it’s a lot more technology integration.”

Student – “(Y)ou were given the basic knowledge and like I said you have to apply it to the stuff. So it was more interactive with the students. You got to see what everyone believed and take it from there, and the critical thinking again. It was more interesting.”

The majority of students found a change in the way technology is being used within the Humanities project compared to other subjects or previous years. First, they acknowledge that they are using more technology than in previous years. Second, they describe the change in the way they are learning with technology as being more practical. The technology is wrapped around the work and research they are doing in this program. Third, they are developing a better understanding of how computers and technology work and how these elements are being integrated into their learning environments.

Student - “It’s really broadened my perspectives on a lot of issues and also gave me better, how can I say this, um, like I’ve learned more on different programs that I never knew about before on the computers.”

Student – “I hate computers...Except for the Internet and projects. This project made me realize that not only is it a part of personal life and you know, what you’re doing, it’s also a part of just our life...technology is, it’s got so much information.”

Student – “... whole different method of learning you have to kind of adopt to work with the technology that we’re given. You have to sort of change our traditional learning styles.”

8) Humanities

As students reflected on this project and the Humanities program in general, they expressed positive comments about the program and their learning experiences. Students talked about the experience in terms of three perspectives. First, some of them focused on the personal impact the project or this program has had on them.

Student – “It’s just I love it so much now.”

Student – “I loved it and I thought it was amazing for a project – I’ve never done anything like this before in my whole life...It changed me so much I thought.”

Student – “(Y)ou have the responsibility to make your own choices and you can choose to do it this way or not. And I thinking that’s why some people also didn’t want to get in this class because they don’t have enough self control...(I)t helps you to develop responsibility.”

Second, some students described the experience in terms of developing lifelong learning skills and how this experience will assist with their transition to life after high school.

Student – “I think this program is definitely better for us because it’s going to teach us more about what we really need to know. Like some of the teamwork skills and the public speaking... We are learning a lot more relevant to what we’re going to be doing in the future than just leaning about various events in history.”

Student - “I think when we graduate we’re going to know a lot more about the real world, doing Humanities, than we would doing English and Social. Um, plus we’re going to know a lot of computers skills. That’s always a plus on our resume... We do assessments on how much we learned and if we think we’re improving on things. We have employability skills.”

Third, the Humanities program is different from the way they have previously gained knowledge, skills and attributes in Social Studies and English. The program’s use of a project-based, inquiry approach that strives to integrate technology is different from their other school experiences. This new learning environment has required these students to make a transition to a more self-directed and responsible way of learning. It has been a year of change and adaptation to this new learning environment. However, one student’s reflection on the program provides insight into the status of this Humanities program.

Student – “I think that the Humanities program, it’s sort of under-development, it isn’t perfect yet. There’s a couple of holes that sort of the integration of regular teaching with technology has kind of created, but I can’t isolate anything in particular... And I think another thing is that these sort of classes should be begin at an earlier stage in the educational course, earlier grades, so that it’s kind of, it’s not like a culture shock. But it’s kind of a completely different method of learning we have to adopt this year because everything is, like this computer environment and a lot of it is on computers. We’re on computers everyday of the year, pretty much, so that it’s different than we’re used to. It’s a little bit odd at first but it’s a lot better I found.”

Conclusion

It is evident from the data that the majority of students are satisfied with their learning experience within the Independence project and that they are strong supporters of this type of Humanities program. They recognize their own responsibility for learning and they appreciate the value of working within a project-based inquiry-learning environment. They have come to view the technology component as an integral part of the Humanities project and program and see that it has given them new venues for learning and for expressing themselves. They are aware of a change in the ways teachers design learning opportunities and cultivate experiences that foster the development of independent and lifelong learners.

Part IV: Discussion of the Findings

This study has captured only a snapshot of the changing educational practice that is occurring within the Humanities 10 program in the Chinook's Edge School Division. From the findings, it is clear that the Galileo on-site professional development initiative, designed to support an inquiry-based Humanities project with the integration of technology, is having an impact on teachers and students. Three key factors have contributed to this impact: a collaborative and collegial environment that surrounds the teacher planning process; the nature of the student work; and the appropriate integration of technology within an inquiry-based learning environment.

One of the critical factors that is having an impact on teachers and in turn on student learning is the collaborative and collegial environment that is an integral part of the planning process. Teachers and the Galileo mentor have been working in a collaborative environment designing and developing inquiry projects. Through administrative efforts, they have been given dedicated time during the school day to plan project-based inquiries. Sharing responsibilities, sharing expertise, negotiating and developing mentoring relationships, the teachers work through a process that not only impacts the learning design, but impacts their own thinking about teaching and learning. This collaborative process has extended into the classroom, where students work collaboratively in addressing real-world problems. Collaboration is fostered and nurtured in the teacher-to-teacher relationship, in the teacher-to-student relationship and in the student-to-student relationship.

For these teachers, a social network has evolved, which is built around the mentoring experience. The teachers have characterized the on-site professional development experience as a mentorship. Hardgreaves and Fullan (1999) recommend that mentoring moves away "from hierarchical dispensations of wisdom to shared inquires into practice" (p. 11). The Galileo mentor assists in facilitating the sharing of understandings. In turn, teachers value her expertise, knowledge and facilitation skills. This collegial learning environment and these growing relationships have been critical and valuable elements in the professional growth of these educators. Their use of such terms as "we started thinking about," "they supported me," "collegiality and collaborative environment to help me understand those things," and "reflect on why I do what I do" captures the tone and nature of the mentoring experience within this social network.

A second factor having an impact on teachers and students is the nature of student work. The primary focus is not the application of technology within a curricular area. Rather, the catalyst for change in teachers' practices is grounded in the collaborative planning process within which they design inquiry-based learning through a cross-curricular environment. The changes that have been identified in this study are based on how teachers are thinking about student learning and how they plan inquiries that use technology to facilitate greater complexity in student work. This change occurs as teachers work through a process that begins with identifying fundamental understandings, designing projects that have students making personal connections with the issues, developing authentic learning opportunities to engage student learning, and designing assessment tools that fairly evaluate student understanding and performance. The Galileo mentor and teachers are all focused on a process.

As students work through a learning process within a Humanities project, they use technology for the purpose of accessing and analyzing resources, for research, communication, collaboration, and for the creation and publication of their work. The power of technology interwoven with the inquiry process has enabled students to think and work in a more sophisticated manner than has been their experience in previous years. As a result of this inquiry-based experience, students are using higher levels of thinking skills, are engaging in more complex work, where technology has opened doors to new levels of sophistication in addressing issues and problems. This concurs with Taft's (2000) exploration of the literature and research, which has found that "technology based instruction plays an important role in developing higher order thinking skills among students" (p.3).

The third factor that has influenced change has been the appropriate integration of technology within an inquiry-based learning environment. From the data, it is apparent that the students are strong supporters of technology integration in the Humanities program. They appreciate the opportunity to access and use technology within a contextual, practical application. Meaningful learning within the project is supported through the use of technology appropriately designed to have students address real-world issues and to use the technology within real-world applications. The use of technology in the Humanities program and in this project did not occur in an isolated or non-contextual manner. Rather, the power of technology, used in conjunction with specific tasks, has enabled students to gain greater understanding of the critical concepts employed in the project. Attention has been directed at ways in which learning environments accommodate the effective use of technology to enhance learning opportunities for students. Consideration is also being given to 'best practices' and strategies for providing 'just-in-time' professional development for teachers focusing on pedagogical issues rather than technological issues in learning with technology.

This study has revealed some other critical elements having an impact on teachers and students within this particular Humanities project and program that merit investigation. First, from the data, students and teachers indicated that the learning outcomes for this project had been achieved. Not only did students gain understanding of the critical issues around independence and sovereignty, they also continued to develop lifelong learning skills. It has been noted in the data, however, that some students have not been successful in achieving the learning outcomes. For students who have been perceived as not fulfilling their potential within this project, educators may need to re-examine how to design scaffolding to facilitate and assist in the student transition to an inquiry-based learning environment. This is an environment in which students are to take charge of their own learning, be self-motivated and engaged in the learning process. This scaffolding needs to be addressed both in terms of the educator's self confidence in this new role as an educator and in terms of what strategies and techniques can best be used to nurture student inquiry. Educators need to ask specifically what issues need to be addressed to enrich this type of learning experience for those students who have been perceived as not being successful? Further research into these students' understanding of the project expectations and of their own experiences should identify ways to enhance the learning experience for these students.

Second, the degree to which learning outcomes have been addressed and the full impact that this type of professional development is having on teachers and students cannot be fully measured

within the scope of this one study. This study has examined only a small part of what is occurring within the Galileo on-site professional development process within this Humanities 10 program. From the data, it is apparent that teachers and students are satisfied with the project and program and with the results of Galileo's role in fostering the Humanities program. Students strongly support the Humanities program and would like to do more of these types of projects. To more fully determine the impact of this on-site professional development initiative on student achievement, teacher transformation of practice and on seamless integration of technology within cross-curricular areas will require ongoing monitoring and evaluation over an extended period of time. Clearly, this is an area that holds great promise and will benefit from further research through a longitudinal study using various other assessment instruments.

North Central Regional Educational Laboratory (1995) provides a framework that can be used to identify and measure engaged student learning. Twenty-six indicators within the following eight categories of learning and instruction may be one instrument that can be used to examine the relationships between effective learning and teaching: *vision of learning, task, assessment, instruction, learning context, grouping teacher roles and student roles*. This framework is one option that can be used to study the impact the Humanities program and projects is having on the relationship between learning and teaching.

Third, the students in each school had a different physical classroom and/or computer environment. In the one school, time had to be scheduled for students to access the computer lab and they had limited access to computers in the library. This raises the question of how does 'as-you-need' access to technology within the schools impact student work? To what degree does this influence the quality of student work, student motivation and independent learning? To what degree can teachers appropriately integrate technology within curricular areas if they have limited access to technology? Such questions need to be investigated and recommendations made to assist teachers, administrators and technology specialists in the school jurisdiction in designing learning environments that enable the infusion of technology for meaningful student learning opportunities.

Part V: Conclusion

Evidence from this study indicates that Galileo's on-site professional development is effective in supporting the infusion of technology in inquiry-based learning projects. Working through a planning process by having teachers focus on what matters in student learning must begin with determining what it is that students need to understand and to gain from their work. Technology provides the instruments and the mechanism that can be used to support the work and to complement student capacity and capability throughout the work. Through the design of project-based inquiry, technology must not dominate the project. Rather, it must function as an integral part of the student learning experience.

In their review of the professional development literature, Jacobsen, Clifford and Friesen (2001) have identified five factors that impact good professional development practice for technology integration.

(1) (T)echnology is best learned just-in-time, instead of just-in-case, (2) planning, designing, implementing and evaluating are best done in collaboration with others, (3) learning must be situated in authentic, challenging and multidisciplinary tasks, (4) a culture of inquiry around technology for learning supports risk-taking and knowledge creation, and (5) teachers needs intentional and meaningful opportunities to reflect on professional development and growth (p. 4).

From this study, it is evident that this on-site professional development opportunity has incorporated these factors as an integral part of the initiative. The collaborative nature of the planning process, the just-in-time learning of technology situated in authentic complex and multidisciplinary project that fosters inquiry has resulted in teachers reflecting on and modifying their practices. Educators have an appreciation of how this experience has fostered growth in their professional practice. The collegial and collaborative nature of the work they create and implement is having an impact on themselves and on their students. New or altered images of student learning and thinking within project-based inquiry designed to integrate technology has evolved as a result of the Humanities 10 planning team experience.

Research by Garet, Porter, Desimone, Birman and Yoon's (2001) found that "professional development that focuses on academic subject matter (content), gives teachers opportunities for 'hands-on' work (active learning), and is integrated into the daily life of the school (coherence), is more likely to produce enhanced knowledge and skills" (p. 935). Rodriguez and Knuth (2000) advocate that effective professional development for technology integration needs to provide "activities in the context of practice" (p. 4) for teachers to learn to infuse technology into the curriculum to meet the needs of their students. The findings of this report are congruent with the findings noted by these researchers.

Garet, et al. (2001) recommend that concentrated and sustained professional development will likely have a greater impact on teachers than short-term professional development approaches. In addition, the North West Regional Laboratory's (1998) exploration of professional development research has found that "effective professional development is intensive and sustained; it occurs through collaborative planning and implementation; and it engages teachers in opportunities that promote continuous inquiry and improvement that is relevant and appropriate to local sites" (p. 1). These findings parallel what has been identified in this study in terms of the impact sustained and intensive professional development is having on teachers and students.

The Galileo mentor's relationship with teachers in creating connections between those involved followed by determining what teachers want to do in the context of *what matters* in student learning has resulted in the creation and implementation of a dynamic project-based inquiry. The collaborative nature of the collegial work, the peer support, and the sharing of expertise within a content and contextual environment in this immersion model of professional development are having an impact on students' and teachers' thinking about learning. Time has been granted to these educators through purposeful funding sources to ensure they have both the time and the opportunity to be designers of innovative learning opportunities for students. As a team, they can plan, implement, reflect and continue this cycle over the course of the year. Dedicated support

over time for this type of intensive, on-site work to happen is essential within this particular professional development initiative.

Results from this study suggest a clear direction for educators to pursue for the successful integration of information and communication technology in schools. This direction calls for a systematic and sustained commitment to high-quality professional development that is embedded in the content and context of learning. A constructivist philosophy fostering project-based inquiry learning with technology is a shift in pedagogy and traditional practice in how teachers have used technology with students. For this type of innovative work to occur and to be sustained within schools requires educators to design and nurture engaged learning environments that foster technological fluency, rather than mastery of computer applications. For educators to be prepared to adopt this way of facilitating learning requires a commitment by educational stakeholders at all levels (school, jurisdictional, ministerial) to provide adequate funding, dedicated time for collaborative teacher planning, and long-term strategic planning that provides teachers with intensive professional development focused on pedagogy and technology with the purpose of designing innovative student learning. This type of professional development program, which is strongly supported by teachers, has to be comprehensive and sustained, if it is to make a difference to teaching and learning in this revolutionary age of information, communication and technology.

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