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Abstract

Abstract: This paper describes interpretive empirical research with five teachers who: a) articulate their pedagogy as defined by an inquiry-based stance, b) use digital technologies within their teaching, and c) engaged in online and/or face-to-face professional development with the Galileo Educational Network (GENA). Four questions guided the inquiry: what does inquiry mean to teachers; what is it like to be an inquiry-based teacher; what supports teachers in fostering inquiry, and; what is the relative impact of the three models of supports offered through GENA – face-to-face only, online only, and combination face-to-face and online. Analysis revealed that meaningful and regular connection with GENA staff serving an animation role superseded the support model; it did not matter whether the supports were provided at a distance or face-to-face. Recommendations derived from the experiences of the five teachers inform the professional supports necessary to nurture teachers' inquiry-based stance and approaches.

Résumé: Cet article décrit une étude empirique interprétative réalisée avec cinq enseignants qui a) articulent leur pédagogie autour de l'investigation, b) utilisent des technologies numériques pour enseigner, et c) se sont impliqués dans du développement professionnel en ligne ou en face à face avec le Galileo Educational Network (GENA). Quatre questions ont guidé l'enquête : que veut dire investiguer pour les enseignants, que veut dire être un enseignant utilisant l'investigation, qu'est-ce qui soutient les enseignants dans leur encouragement de l'investigation, et, quel est l'impact relatif des trois modèles de soutien offerts par l'équipe de GENA, face à face, en ligne et une combinaison face à face et en ligne. L'analyse a révélé qu'un lien significatif et régulier avec l'équipe de GENA, qui joue un rôle d'animation, remplace le modèle de soutien. Il importait peu que le soutien soit offert à distance ou en face à face. Des recommandations découlant des expériences des cinq enseignants nous informent du soutien nécessaire pour encourager les enseignants utilisant des approches par investigation.

Positioning Narrative

Kirsten[1] begged to go to pre-school so that she could be just like her older neighbourhood friends who were already in elementary. Kirsten loved the routine of school and the learning, and decided to be an author when she grew up. Her pre-school teacher noted her advanced vocabulary and problem solving skills and appreciated Kirsten's constant adherence and almost reverence of classroom rules. Kirsten's favourite school activity was 'show-and-tell' and she loved to provide rationales and analyses within her presentations. The teacher predicted that Kirsten would one day be a television commentator. Kindergarten was highly structured and skill-based, but Kirsten adored her teacher and formed a core group of friends. One-and-a-half weeks into Grade 1, Kirsten asked the neighbourhood friends if they too "hated" school and told her parents that she was "no good" at Grade 1. Her parents went to 'meet the teacher' night. It served to orient them about which day of the week was spelling test day, how many days the children had to learn each of the word lists, that there would be "no time" for show-and-tell and no Christmas concert or drama of any sort, and why the parents should expect no greater than "C's" on the report cards. Kirsten's desk was already stacked with worksheet-filled duo-tangs, on which each repetitious word and number was laboriously printed, and the coloring all in the lines. Kirsten's parents learned that because Kirsten "took too long" to complete these worksheets, she was denied "playtime" on a daily basis. Kirsten stopped talking about being an author.

Implications of the positioning narrative

All of the *Kirstens* are what matters about the research to follow. Kirsten is not a case of one. Her school experiences are a common manifestation of the disconnect many children feel between learning and schooling. Phenomenological experience and contemporary literature present many children as unfulfilled, unengaged, and disappointed by school (Jardine, Friesen & Clifford, 2006). Worksheets continue to prevail in the tasks that fill most school children's days (Pincus, 2005). Pincus' concerns with respect to worksheets are that they are "not interesting, do not provide rich instructional possibilities, lack clear objectives, allow false-positive feedback, consume teachers' time in scoring them, and, most importantly, occupy time that can be otherwise spent teaching students what they do not already know" (p. 79). Postman (1993) presented a compelling argument that schools are failing our children; he articulated a vision of grounding narratives engaging our children as global citizens. Noting the disengaging impact of schooling, Egan (2005) called for a revitalization of the imagination in teaching and learning. Bowman's (2004) bleak image of schooling is within "an era of dwindling resources, compelling student needs, burgeoning violence, and escalating performance expectations for students and faculty alike" (p. 187). Despite an emerging body of literature presenting a bleak ethnography of grade-school classrooms, optimism is expressed by teachers who have articulated an inquiry-based stance on learning.

What is inquiry and the relationship with digital technology?

The professional development extended to teachers informing this research was grounded on a conceptualization of *inquiry* as pedagogical stance. This is one of three conceptual frameworks described by Schulz and Hall (2004):

- as social inquiry (where knowledge is constructed collaboratively by all stakeholders);
- as ways of knowing in communities (inquiry as stance, central to which is the idea that the work of inquiry communities is both social and political);
- as practical inquiry (generating or enhancing practical knowledge). (p. 259)

The second model presented above, *ways of knowing in communities,* is uncommon

throughout the literature and difficult to define. As a result, those turning to the literature for clarification tend to model their approaches on one of the other two conceptualizations.*Inquiry as social model* is dominant among research literature. For example, Preissle (2006) used the term *qualitative inquiry* to signify a community of practice differentiated from quantitative methodology. Application of the concept of *scientific inquiry* characterizes the third conceptualization *as practical inquiry* and is prevalent throughout the literature. For example, Hapgood, Magnusson, and Palincsar (2004) presented an extended case study illustrating the application of the scientific method with a group of primary school students. They defined the three skills of inquiry as, "using data as evidence, evaluating investigative procedures, and making sense of multiple forms of representations" (p. 455). Teachers are encouraged to engage in a process of *teacher inquiry.* Dawson and Dana (2007) described the linear process as progressing through the identification of a critical question deriving from day-to-day teaching and learning, through data collection, analysis, recommendation, and action application. While inquiry as pedagogical stance is not explicitly defined in the literature, there is an emerging body of research and theory urging teachers to "teach thinking skills" (Baumfield, 2006, p. 185) and to conceptualize schooling as "an adventure of the mind" (Strother, 2007, p. 17).

The contemporary literature addressing transformative teaching and learning within grade-school classrooms often describes implementation through digital technologies (e.g., Rakes, Fields, & Cox, 2006; Shields & Rogers, 2005). While infusion of technology into kindergarten through Grade 12 classrooms is recognized as critical (Jacobsen & Lock, 2004), the current research is premised on the belief that the incorporation of technology in and of itself does not improve learning. Technology can only benefit learners when infused as one element of inquiry-based learning (International Association for the Evaluation of Education Achievement, 2003; Shields & Rogers, 2005). Further, the principles of inquiry-based learning, including infusion of technology, can only be actualized in the presence of intentional, collaborative, ongoing professional development (Fox, 2007).

Professional development for inquiry-based teachers
Anecdotal and empirical evidence is accumulating to support the efficacy of inquiry-based classrooms (Bay Area School Reform Collaborative, 2003; Kozma, 1994; Palinscar, Magnusson & Collins, 2001; Tretter & Jones, 2003; Von Secker, 2002; Wenglinsky, 1998). The unanswered question is how best to educate our teachers for an inquiry stance. Most of the literature on professional development is commercial or didactic rather than empirical. For example, Elb (2002) wrote about the benefits and contraindications of online professional development for teachers and educational administration. Treacy, Kleiman, and Peterson (2002) celebrated the "successes" of their U.S. online professional development program for educators seeking to incorporate technology into their classrooms. Sheerer's (2000) didactic paper described a collaborative model of professional development whereby a teacher and university faculty together design, develop, administer, and support professional development. Backhouse (2003) presented

the *Curriculum Navigator*, described as a Web-based software application supporting integration of information and communication technology into face-to-face classrooms. In one of the few empirical contributions, Hughes and Ooms (2004) conducted a fifteen-month longitudinal case study of a group of teachers working together to determine how to incorporate technology into their teaching of arts and humanities.

The goal of this paper is to contribute to the body of empirical research situated in the teacher experience of inquiry-based teaching and learning and professional development. Consistent with the principles of teacher education as outlined by Sheerer (2000), the design of this research was such that teachers were invited into the role of interlocutor, thus promoting their opportunity for contribution to the evaluation and development of their own professional development.

The Inquiry

The purpose of this research was to explore the experience of inquiry-based teaching and learning and of professional development from the perspective of teachers from kindergarten through grade twelve. Five teachers were interviewed for this research. These particular teachers were selected as a purposive sample because the population for the study is highly unique. All of the participating teachers considered themselves to be inquiry-based, employed educational technologies to support their teaching and learning, and were supported through the Galileo Educational Network (GENA). GENA fosters inquiry in Kindergarten through Grade 12 classrooms by providing: mentors to work alongside teachers with the children; educational seminars; face-to-face consultations with teachers and administrators; and an interactive online learning portal that connects educators at all levels, and helps them identify rich authentic questions and methodologies in the contextual field of practice, and map back to the curriculum. GENA's seven guiding principles are: (a) stewarding the intellect through inquiry-based learning, (b) infusing digital technologies, (c) providing high-quality assessment, (d) honouring collaboration and teamwork, (e) providing ongoing professional learning, (f) fostering scholarship of teaching, and (g) providing practical thought-provoking preparation for pre-service teachers (http://www.galileo.org).

Four questions guided the research: what does inquiry mean to teachers; what is it like to be an inquiry-based teacher; what supports teachers in fostering inquiry; and what is the relative impact of the three models of supports offered through the Galileo Educational Network—face-to-face only (one participant), online only (one participant), and combination face-to-face and online (three participants). Because the goal was depth of analysis, a small number of participants were included. There were two reasons for the disproportionate representation across the three conditions. First, the blended model of professional supports extended through GENA meant that only one teacher who had only experienced face-to-face supports and one teacher who had only experienced online supports could be identified. Second, saturation of thematic phenomena was achieved through three informants within the complexity of the support combination condition.

The teacher informants were purposively selected by the team of professional developers at GENA; they reviewed their school caseloads and intentionally selected teachers whose experiences would richly inform the research. Ethical clearance was obtained through their respective school boards and the researcher's university. Data was collected through interviews and multiple field visits within the teachers' classrooms.

The interviews were conducted one-on-one and face-to-face. Each interview lasted approximately two hours in duration. Framed through the research methodology literature of Berg (1995), Marshall and Rossman, (1989), Merriam (1998), and; Neuman (1997), the interviews were conducted as conversations with the purpose of gathering information. The interviews were loosely structured by the following themes: defining inquiry; alternate terms; application and examples; described philosophy of teaching; teacher training; background, grade and experience; applications of inquiry throughout grades and with exceptional learners; influences on philosophy and practice; changes and supports to philosophy and practice; role of educational technology; application of technology; supports for inquiry; and programs such as the GENA. The interview transcripts were coded using Emerson, Fretz, and Shaw's (1995) methods of open coding, memoing and reflections. Analysis used Alvesson and Skoldberg's (2000) quadri-reflexive framework, whereby the researcher engages with the empirical material, in this case telling the stories of the five teachers, interprets the narrative with respect to the inquiry questions, and engages in critical theoretical reflection and discourse analysis.

The Participants

Frances[2] has been a teacher for 19 years. She has taught every grade from pre-school through Grade 3, including kindergarten, and is currently in her second year of a Grade 2/3 split. Her school is located in a hamlet of fewer than 100 people, and the school itself has 200 students from kindergarten through Grade 8. Frances stated that her post-secondary education was inquiry-based and that she has always been a non-linear, creative teacher, although it is only in the last few years through her affiliation with GENA that she has begun to see herself as an inquiry-based teacher and be true to the stance. For two years, Frances was supported by GENA in an exclusively face-to-face model, as their online portal —Intelligence Online (IO)—had not yet been developed. GENA staff work with her and three of her teacher colleagues. They also spend time as team teachers working collaboratively with the students. Frances' interview focused on the period of supports prior to her exposure to the online supports.

Olive has been teaching for twenty-two years. Her teaching experience is in junior and senior high school in a variety of subjects including social studies, mathematics, and English. Olive is currently employed by an urban school board providing professional education to classroom teachers and engaging in a pilot initiative for English as a Second Language. Similar to Frances, Olive has always defined and conducted her teaching practice consistent with an inquiry-base, although she has used the contemporary terms of reference. She perceives her current inquiry-based teaching to be grounded in the social studies curriculum introduced to her in her post-secondary training. Olive uses Intelligence

Online (IO) as her means of professional development and support for inquiry. She was oriented to IO through a face-to-face orientation and thereby met some of the people she corresponds with online.

It is Barb's first year of teaching. She teaches Grade 7 language arts in a community school in a town of just over 3500 people. She also teaches Grade 3 to 6 students in a special project for enhanced reading across the curriculum. She plans her inquiries and collaborates with other teachers and GENA staff using IO. She also meets face-to-face with a GENA staff-person. They meet for one full day per month at the division head office in a neighbouring town.

Bill is a principal for one-third of his working hours and a junior high school teacher in the same school the other two-thirds. He teaches Grade 8 and 9 humanities and mathematics and Grade 7 leadership. He has been teaching for nine years and won a teaching award for organizing a student-run history fair as an authentic demonstration and sharing of learning. His school is located in a town of just over 300 people. The school has approximately 160 students from Kindergarten through Grade 9. Bill communicates with GENA staff via e-mail (approximately four times per week), telephone (once per week), IO, and occasional face-to-face meetings. On occasion, GENA staff have come into Bill's classrooms to work directly with the students.

The fifth teacher in this study, Betty, has been teaching for six years, and has recently complimented her bachelor's degree in education with a master's degree. She describes herself as an avid lifelong learner. She teaches in one of the largest elementary schools in her city. She teaches the majority of subjects to her Grade 5 class. She receives periodic face-to-face supports from GENA staff and also corresponds with them regularly through e-mail. She is a member of IO and lists its advantages, but much to her own surprise, she does not engage through the invitational and public communities through the online bulletin board. She greatly values her affiliation with GENA and asserts that if her school were ever to withdraw their support of that membership, she would see it necessary to relocate to an alternate school.

Questions One and Two (Inquiry)

The first and second questions of this inquiry are: (i) what does inquiry mean to teachers, and (ii) what is it like to be an inquiry-based teacher. Four of the five teachers used what they were currently doing in their own classrooms to exemplify inquiry. Frances described her three-year community-based local history project[3]. The learners collaborated online with students from other communities. A local artist came to help them represent their work. They built a Web-site showing the development of their community including from the land's perspective, and used that historical knowledge to help the community shape the future. With a language arts focus, Barb used Anne Frank's writings and virtual tours of her house to launch an inquiry into human rights. The students chose countries in strife to inquire into what it is like to have one's human rights violated and what Canadians can do to help. The learners in Bill's school produced Canadian history minutes, recreated a 1913

community newspaper and juxtaposed it with a contemporary newspaper, and developed an electronic magazine humorously depicting major economic systems[4]. Betty described an iterative project wherein the students explored the wetlands and presented them through various media with the help of a local artist[5]. This led them beyond the curriculum into a fascinating journey of inquiry to discover whether melting of polar ice caps would prevent a major drought.

Olive clarified what inquiry is through asserting what it is not. As a professional developer, Olive perceives one of her main responsibilities as helping other teachers see that inquiry is not having a preconceived notion of where you want your students to go, or the answers or even questions that you want them to derive, and then "tricking" them into voicing it as if it were their own journey of discovery. She explained that having learners rediscover their own from-birth curiosity is key to inquiry (Gardner, 1991). Olive perceives inquiry to blend elements of art and traditional approaches to science (in terms of linear sequence and a systematized method). "When you start talking about who's in front of you in a passionate way and what you really, really, really want them to explore and have the opportunity to understand. When you really start talking passionately about the art of learning, that's when you start looking at inquiry."

All of the teachers talked about inquiry as creating meaningful learning environments and as reflecting on central questions. Three of the five talked about upending the intuitive lesson planning system to engage with those meaningful questions. Frances explained,

> It's that whole different way of looking at how you're going to get to where you are going. It's opposite to 'Okay, I'm going to do apples or I'm going to do mealworms.' … Whereas, in the other sense, you're saying, 'Okay, well what do I really want to do here?' I'm supposed to be giving these kids a sense of these different animals, and the food chain and the life cycles and these sort of things, so how am I going to do that? What is it that they want to know and what is going to really intrigue them, and now where do I go from here? So, it's different in the kind of way that you think about how to get to where you want to end up.

Some of the terms to describe inquiry that emerged most frequently in the conversations were *flexible, teamwork, real* and *authentic, meaningful*, and *fun*.

It was obvious from the pages of transcripts dedicated to fixing the organic, evolving stance of inquiry into concrete language, that inquiry is complex. Across teachers accessing all three types of embedded professional development (face-to-face, online, and a combination), there continues to be confusion as to the meaning of inquiry-based learning. Some of the definitions contrasted markedly from the examples of application. For example, one of the teachers simplified inquiry to "posing a question and finding an answer to that." All five teachers used "project" or "project-based learning" interchangeably with "inquiry-based learning" at least once during the interviews, with one teacher substituting the terms six times. For example, one of the teachers said, "Nobody feels like they're not being challenged enough. That's the nice thing about project-based, or inquiry-based learning."

Three of the five interviewed teachers referenced inquiry-based learning as a counterpart

to traditional approaches such as the lecture. In other words, to these teachers inquiry was operationalized as a pedagogy that is optional, bounded, time-limited and substitutable. For example, one of the teachers responded to the first interview question—*Is 'inquiry' a term you use,* by replying affirmatively and elaborating, "I use it in the classroom to let the kids know that they're changing gears with me. So that they know when we're moving from the seat-work into [an] inquiry project." Often the literature, and sometimes the interviewed teachers, present inquiry as if it were distributed through an alternate tap than traditional blackboard and lecture-style teaching. In other words, the teacher turns on a little hot water through the inquiry tap, and a little cold water through the traditional tap, and then turns one or the other off again at will.

GENA asserts that inquiry is a stance, or a philosophy, rather than a method. It is probable that the confusion and field substitution of pedagogical stances is fostered through exposure to multiple conceptualizations of inquiry. Evidence of the antithetical conceptualizations of inquiry facing teachers can be found in Branch and Oberg's (2004) release of a draft document entitled *Focus on Inquiry: A teacher's guide to implementing inquiry-based learning* disseminated by Alberta Learning (the provincial educational authority encompassing the jurisdiction of all five of the interviewed teachers). While the document differentiates between inquiry-based and project-based learning, their definition of the latter mirrors their definition of the former. Project-based learning is defined as "begin[ning] with the student's own interests and questions. Learning activities are long-term, interdisciplinary and student-centred and are integrated with real-world issues and practices" (p. 5). The substitution of the two concepts is further reinforced in the document's outline of "a systematic approach to inquiry" operationalized in the steps: planning, retrieving, processing, creating, sharing, and evaluating (pp. 39-63). These steps are traditional linear, sequential elements of a research project.

The contrasting view of inquiry, as a stance or pedagogy, rather than as a bounded exercise, was expressed throughout two of the interviews. One of the teachers, who described herself as teaching in an inquiry-based way for 22 years explained,

> It starts becoming such a part of your practice, you don't even know you're doing it. ... I start every unit including our meetings ... with what's our essential understanding that we need to have? What is our essential question? ... Or, what is the outcome we are looking at? So it starts becoming your language. So you're not even thinking, "Okay, I would like to plan an inquiry unit now." It just is! I need to plan, and then the language starts flowing.

The other teacher said that she tries never to ask the students a question to which she, as the teacher, already knows the answer.

It was obvious that all five of the teachers felt that inquiry was a rewarding means of participating in learning. When asked what it is like to be an inquiry-based teacher, all five of the research participants used the word *exciting*. At least two of the teachers also used the words—*awesome, fabulous, fun, honouring,* and *amazing.*

Three of the teachers described inquiry as *sometimes overwhelming,* and all of them described it as *hard work* and *time consuming*. Mentions of *time* ranged from once to

twelve times with a median of seven mentions. Two teachers linked time with exhaustion. However, all of the teachers said that the work was worth the time spent. For example, one teacher said, "It's hard work, but it's work you know is going to have meaning and make a difference in the lives of those kids. It's hard work, but it's fun work." Another said, "It is very time consuming, but so it should be. You are responsible for the education of this child for an entire year. That shouldn't take you overnight. You shouldn't just pull something from a file to give to all the 26 kids in the class."

Consistent with Baker, Lang, and Lawson's (2002) analysis, the teachers indicated that the time was spent primarily in the preparation and planning stages. Betty commented that the lessons in which she had already dedicated extensive thinking about what matters (because the questions were meaningful to her) were not nearly as time consuming as those for which the significance is less obvious. For example, she admitted that she has trouble visualizing how to engage children in a mathematics inquiry, whereas if possible, she would "never let go of" the wetlands inquiry, riding it through many journeys across multiple years of students.

Questions Three and Four (Professional Development)
The emergent interpretations tightly intertwine the third and fourth research questions – what supports teachers in fostering inquiry, and what is the relative impact of the three models of supports offered through GENA. What clearly emerged through the conversation with the five teachers, regardless of the model through which they were supported, was that the essential element of support was the meaningful engagement with the people employed by the GENA. Frances, who was awarded a Canadian Governor General's Teaching Award, claimed that she would not have achieved the award, nor the classroom successes leading to her nomination, without the long-term relationship with the GENA staff. Barb attributed the success of an entire school division to the received supports,

> Now our division is fully into inquiry-based learning and … even the really tiny schools have got these inquiries going on … and they're doing fabulous things – fabulous things – that they wouldn't have done if they didn't have this opportunity presented to them through the division and through Galileo coming out to our division to get the ball rolling in inquiry-based learning.

It was evident that it was not only the presence of the GENA staff, but their qualities and characteristics, as well as the construction of the professional development relationship that made the difference. Across the interviews, the GENA staff persons were described as responsive, available, knowledgeable, personable, diligent, and enthusiastic. Betty enthusiastically described the GENA staff,

> It's a network of people who have the exact same common goal in mind and that's learning from each other and understanding that one person can't possibly know everything. … It's completely inspiring! They'll do anything they can do to help you bring an inquiry to its full potential. You e-mail someone and the next thing you know, she's got you investigating the history of all this, and she's already talked to her colleague. I don't think they sleep – I don't think any of them sleep. … They just are the most unbelievable people I've ever met.

The teachers were clear in their depictions that the ethic of care embodied in the GENA staff did not preclude their transformative disposition. They questioned, challenged, unmasked, and inspired. Frances explained that because the way in which inquiry-based

teachers operate is so different from the way in which they themselves were educated, straying from an inquiry stance is inevitable. She described the "traditions" as "embedded" and that they "have to go." In order to embody such change, one requires "mentors – having somebody available to just help you along when you go out of step."

The relationship between the classroom teachers and the GENA staff is the enactment of what Miller and Boud (1996) referred to as *animation.* The word derives from the French –*animateur* – and includes meanings of "to give life to, to quicken, to vivify, to enliven, to inspire, to encourage, to activate or to put in motion" (p. 7). The authors described the function of animators (in this case, the GENA staff) as "acting with learners, or with others, in situations where learning is an aspect of what is occurring, to assist them to work with their experience" (p. 7).

Miller and Boud (1996) derived the theoretical underpinnings of animation from explorations of learning from experience. The authors presented five propositions and accompanying implications for the role of animators (pp. 9, 10). First, "experience is the foundation of, and stimulus for, learning." Barb depicted the GENA supports as "embedded" professional development. The animators directly supported the synchronous inquiry-based classroom work of the teachers.

Second, "learners actively construct their own experience." When asked to describe examples of inquiry in their classrooms (prior to the interviewer's probing of GENA supports), four of the five teachers offered examples of troubling issues that were resolved through 'long conversations' with the animators. The animators supported meaning making, thereby honouring the teachers as reflective practitioners. The teachers provided multiple examples in which the animators "challeng[ed] interpretations and offer[ed] alternative ways of viewing knowledge" (Miller & Boud, 1996, p. 9).

Third, "learning is holistic." Miller and Boud (1996) explained that "learning is normally experienced as a seamless whole; there is continuity between experiences even though they may be perceived as separate" (p. 9). Jardine, Clifford, and Friesen (2003) applied Gadamer's (1999) understanding of hermeneutics to the classroom. Gadamer depicted the interplay of part and whole in writings such as "each can be seen in the whole and all can be seen in each" (p. 29). The child's experience of school should not be offered in a vacuum from life, giving rise to the interviewed teachers' frequent and passionate entreaties to make learning *real* and *authentic*. Likewise, the teacher's experience of professional development should not be one truncated from her experience in the classroom. The resultant suggestions, as applied to teachers of elementary and secondary classrooms as learners, are to encourage the teachers to define their own classrooms as embedded learning systems, to value the empirical input from experiences in those classrooms, to critically reflect on those classroom experiences, and to encourage "active experimentation" in classrooms (p. 29). When Olive was asked to identify and describe the greatest influences on her teaching practice, without hesitation she replied – "direct experience."

Miller and Boud's (1996) fourth proposition is that "learning is socially and culturally constructed." In accordance with Foucault's (1972) critical theory, interpretations derive from our shared social life-space. The construction of meaning is shaped by a time and place context. Rhetorical and voiced, conscious and subconscious questions, inform the practices of these Canadian teachers. Donaldson (1994) framed some of these questions as "Do they teach students to be pale shadows of British and American culture? Or do they represent a unique expression of what it is to be an Albertan, a Canadian?" (p. 55). Frances' depiction of three years of incremental evolving inquiries with three different classrooms of division one elementary students is a testament to the situating of teaching by an Albertan teacher. She explained that her interdisciplinary inquiries are often situated in the context of the school community – a scenic small-town in the mountain foothills.

With respect to the social and contextual contexts, Miller and Boud (1996) wrote, "animators should be sensitive to the constructions within which learners operate and assist learners to work within the constraints of power and oppression which are present in all settings" (p. 10). Bill, with his administrative perspective, acknowledged the valuable positioning of GENA staff outside of the school boards.

> *It's just absolutely wonderful to have people to call when you need help ... and these people are there for the same reasons as you. And it's not someone who you're worried about [whether they are going to] think I'm not doing my job or something like that, [because] they're not connected to the school division as far as employment in concerned.*

Bill's comments illustrate how the GENA staff fulfill one of Miller and Boud's directives to animators in that one of their responsibilities is "establishing a micro-context which (within any broader context) provides an opportunity (or space) for learners to investigate, disclose and construct meanings away from inappropriately oppressive or limiting influences, and which ensures these outcomes" (p. 10). In other words, teachers need to feel safe to engage with the students in inquiry. Safety is vitally important when transforming one's teaching practices to be inquiry-based.

Miller and Boud's (1996) final proposition regarding learning from experience is "learning is influenced by the socio-emotional context in which it occurs" (p. 10). The authors explained, "emotions and feelings are key pointers both to possibilities for, and barriers to, learning. Denial of feelings is denial of learning" (p. 10). Dreyfus (2001) described seven stages of learning from novice through to practical wisdom. We cannot move to the fourth stage of proficiency until we have had emotional experiences that allow us to engage with the task at hand or the role we have assumed. Inquiry is also complex, eroding feelings of security and assurance in one's professional practice. Inquiry is soul-work. Betty said, "It's hard for me to imagine not being an inquiry teacher. It's because this is just part of who we are."

The teacher's depictions of the specific approaches that support them to be inquiry-based resonate with Glazer's (2004) depiction of the cognitive apprenticeship model. He described six tasks of animators, each of which is exemplified in the teachers' comments regarding their relationships with the GENA staff. The teachers described *modeling* in their emulation of the language used in the online discussion forum, in observing how the GENA

staff interact with the children when directly in the classroom and then trying out the same approaches themselves later, and in observing how to use the digital camera or how to design a Web-page and later applying these skills with the children.

Betty described *coaching and fading* in that she had regular scheduled meetings online and face-to-face with GENA staff, who encouraged her, said "Go for it!," and reviewed her progress with the children making recommendations along the way. She looked to the next year as the next phase of her relationship with GENA wherein communication would be faded to unscheduled conversations that would need to be teacher-initiated.

Olive used the term *scaffolding* three times in her interview, on three levels: with respect to her online support from GENA, her guidance to teachers as a professional developer, and her work with the students. The metaphor of scaffolding is to put temporary beams in place to support a structure until the actual frame is formed. Through asking probing questions, Intelligence Online (IO) scaffolds the development of an inquiry. Bill described IO as "very, very structured in determining how to create a unit based on inquiry." The same scaffolding questions can be applied face-to-face.

Articulation emerged as a key support strategy for all of the participants. Bill said that you come out of the supports "very well planned," because you cannot come out of a series of meetings with a GENA staff or out of planning your inquiry through IO without being able to articulate your inquiry.

> When you plan these units, you start with 'what do you want to come out of it?' and then you plan by determining, 'how do I get there?' ... And that's a big part of what Galileo does and what they do with IO. Their whole planning process does that – forces you to do that – which is good, because a lot of teachers wouldn't do that, you know.

In order to articulate, you need to *reflect*. Each of the teachers described engaging conversations with GENA staff either online, on the telephone, or in-person. They said that sometimes the reflection was clarification of the task at hand, and other times it was engaging in their own inquiry with respect to what it means to learn, and how to make the whole experience of schooling engaging for the students.

Finally, apprenticing involves *exploration*. Each of the teachers commented on the capacity to explore other inquiries in their grade and/or subject area and to explore ideas and facts through networking with 'experts' connected through GENA. Bill said that one of the roles of GENA is "helping you connect with people around the world who are doing what you're doing, or who are experts in this particular topic or who are just other teachers interested in this and they have … their own network of people."

Conclusion - Animating Inquiry with Teachers

Notably, while each of the interviewed teachers expressed their preferences for the model that they were experiencing (face-to-face, online, or blended), the theme of human supports superseded the models. Across depictions of specific GENA support strategies, there were few examples in which qualitatively what they described could not have been alternatively provided face-to-face or at a distance and possibly online. Support strategies

can be offered face-to-face or at a distance, largely interchangeably. For example, reflective conversations can be held sitting across from someone in the same room, through e-mail, chat forums, or bulletin boards, or on the telephone for voice contact. Some of the teachers commented on hosting occasional sessions in the classroom between GENA staff and the students. This can also be effectively facilitated at a distance. For example, to help her students recognize elements of their community through exploring a society that was markedly different from their own, Frances hosted an online correspondence between an undergraduate education student, who was completing his teaching internship in China and her grade two and three students. The university student answered their questions through text-based e-mail and by posting photos of the artefacts into which the children were inquiring.

When probed, instances in which the teachers insisted that they required face-to-face supports were not about elements of the interchange that could only be offered when in the same room with someone else. Thinking about the essential qualities was blocked by the means in which they were commonly experienced. For example, Barb stated that the face-to-face connection with her GENA mentor was necessary. However, she and her mentor meet at a location away from the school. Neither the students, nor the classroom learning artefacts are present with them for the interchange. A possible interpretation of the exchange is that what is important is that the teacher and the GENA mentor have a regularly scheduled day booked for one another. That intentional, non-negotiable dedication to inquiry could also be achieved at a distance through shutting office doors, turning off cell phones, and turning on voice-mail.

So why, when she is able to articulate the benefits of online supports, does Betty resist using the online tool, Intelligence Online (IO). Although she queries possible explanations, Betty herself does not know why. She is very positive about IO. "It's like a big staffroom online. It's like a hallway where everyone can meet and be like, 'what are you doing today for such and such?' 'Oh, here's what I'm doing, or did you try this?'" She goes on to say,

> *It's a great place for some people and I struggle with it. I don't know why either because I check my e-mail at least once a day. ... I'm not sure what it is. So my partner that I'm planning that math unit with and I have committed to being more of a participant on IO. But see, now it's the end of September and we haven't been.*

One of the explanations Betty ponders is time. Olive said, "You can't take planning time away from teachers and expect good instruction." Regular planning time would certainly be a helpful factor. Another explanation Betty tries on is the embarrassment of a public forum, should the content of a message not demonstrate articulate thought, correct spelling, and consistency with an inquiry stance. However, Betty and most of the other teachers stated that GENA staff and others associated with GENA are non-threatening and non-judgmental.

Perhaps the answer to Betty's, and others', resistance to online communication can be found in Stephens and Hartmann's (2004) criteria for effective online discussion. First, teachers must have access to the computers and to a network. Although the network provided by Betty's school board is occasionally down, she has fairly consistent access. The second criterion is a community of learners who need the online discussion forum

because they do not have opportunity to have face-to-face discussions. They also must have objectives in common. Betty and her colleague both need the forum to plan their math inquiry. Also, as shared by Frances, you do not need to be hundreds of miles away from one another to need to communicate online. This can be a facilitating forum for those in the same school who simply do not have the opportunity in their day-to-day schedules to have a reflective conversation. The third requirement is a concrete and shared task, which is present for Betty in the form of the desired math inquiry. Fourth is "a sense of responsibility to the group and/or task" (p. 60). Betty herself said that this is an important factor and should prove motivating. Betty is adamant that she maintain in contact and retain active supports from GENA. With the phasing out of her school-based face-to-face supports she recognizes that it is incumbent upon her to be an active member of the IO network if she wants to remind GENA staff of her presence and commitment.

Finally, the last criterion is "strong leadership and final evaluation of the group task" (p. 60). Here is where a recommendation might be made to GENA staff and other animators of inquiry-based learning. When monthly face-to-face sessions are scheduled, the teachers are not required to initiate feedback. Part of the implicit function of the meeting is to update and 'check the teacher's work.' There is a tendency to leave distance and particularly online supports asynchronous and unscheduled. Perhaps distance sessions should be scheduled with the same rigor as face-to-face. The knowledge that someone is going to ask about your progress at a designated time is an effective strategy to resist procrastination.

Recommendations

Three recommendations regarding how best to support inquiry-based teachers emerged:

1. *Teacher release time*
   Teachers require uninterrupted, scheduled time to plan, reflect, and consult regarding inquiries. One paid full day on a weekday once per month worked effectively for participants in this research.
2. *Face-to-face orientations to online supports*
   Although the majority of teachers were not normally satisfied with 'one-stop workshops' they found a face-to-face orientation to online systems effective. This allowed them to 'get going on' their inquiry, and facilitated identification of who the people are that they will later be corresponding with online.
3. *Built-in accountability*
   Whether the teacher is supported face-to-face or at a distance, regular, scheduled monthly appointments should be set between GENA animators and teachers. This provides accountability, and a periodic check to ensure that the teacher is on track with his or her inquiries.

Closing Narrative

Kirsten is now in Grade 2. The meet-the-teacher event marked her final day at that school. At a Celebration of Learning at her new school, Kirsten proudly holds up the community newspaper to show her editorial disputing the proposed paving of the pathways of a natural park because of the harmful impact on nature; Kirsten is well-along into achieving her rediscovered dream of being a published author.

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End Notes

1. Kirsten is the author's daughter and inspiration for this research. Pseudonyms have been used for all other research participants to protect their anonymity.

2. To aid recall, the first letter of each of the pseudonyms is consistent with the model of support. i.e., Frances received face-to-face supports. Olive received online supports. Barb, Bill, and Betty received blended supports.

3. http://www.galileo.org/schools/millarville/heritage/index.html

4. http://www.galileo.org/schools/district-clearview/bigvalley/resources.shtml

5. http://136.159.139.15/schools/bogho/