LEARNing Landscapes

Inquiry: *Perspectives, Processes and Possibilities*

The views expressed in this journal are not necessarily those of the Editorial Staff or LEARN. It is the responsibility of the authors to ensure that proper standards of scholarship have been followed, including obtaining approval from review boards, where applicable, and ensuring that informed consent has been given from participants involved in any research studies.

Comments to the Editor: landscapes@learnquebec.ca

Table of Contents

Spring 2011 Vol. 4 No. 2

Statement of Purpose

LEARNing Landscapes™ is an open access, peer-reviewed, online education journal supported by LEARN (Leading English Education and Resource Network). Published in the autumn and spring of each year, it attempts to make links between theory and practice and is built upon the principles of partnership, collaboration, inclusion, and attention to multiple perspectives and voices. The material in each publication attempts to share and showcase leading educational ideas, research and practices in Quebec, and beyond, by welcoming articles, interviews, visual representations, arts-informed work and multimedia texts to inspire teachers, administrators, and other educators to reflect upon and develop innovative possibilities within their own practices.

Review Board

Editorial

*A*cts of inquiry (Brizuela, Stewart, Carrillo, & Berger, 2000) permeate our lives. We seek information, ask questions, listen, observe, touch, and reflect on these processes to make meaning of our worlds. This is what it means to be human. From a very early age, young children are inquirers as they explore their physical, social, cognitive, and emotional worlds to understand, learn, and grow. They do this naturally with curiosity, energy, enthusiasm, engagement, and determination. They are unstoppable in their quest for new understandings and knowledge about their increasingly complex lives. It is not surprising, therefore, that theorists have been examining over centuries this natural human propensity to inquire and the implications it has for teaching and learning.

Constructivists, such as Piaget and Vygotsky, have shown that meaning making is social, and dependent on what understandings and perspectives one brings to a situation and the context in which it takes place. As a result, multiple interpretations are not only possible, but also probable, and desirable. Pragmatists such as Dewey and Bruner have illustrated the importance of understanding and learning by *doing*. As ideas about inquiry have become more nuanced, advocates have included the need for reflection (Schön, 1983) to understand not only *what* one knows, but also *how*, and the need for reflexivity (Brookfield, 1995) to illuminate how one's belief system or identity influences meaning making and that of others. It has become apparent how important it is to encourage and legitimize multiple ways of doing and knowing not only to develop particular talents and propensities for meaning making (Gardner, 2000), but also to make space for different ways of understanding (Eisner, 1991). In addition, there is a need to develop a critical perspective (Freire, 1970) to ensure that inquiry is a "stance" (Cochran-Smith & Lytle, 2009) that is consistently meaningful, equitable, and ethical. Learners use their talents and interests in inquiry, and those responsible for it work alongside with the learners in a relational, inclusive, and encouraging environment, scaffolding the work as needed. Increasingly, these basic tenets of inquiry have had substantial impact on curricula and pedagogy in schools and higher education, as well as on research, and professional development.

In the 1930s, the idea of inquiry learning most frequently permeated the science curriculum. It was a way to help students learn to emulate scientists in their quest for new understandings of the physical world. It did not remain in the science domain, however. Educators such as Hilda Taba, Louise Rosenblatt, and others, pushed these ideas into the arenas of literature (reader response) and social studies (project learning), and beyond. Later in the 1970s and 1980s, sociolinguists such as Shirley Brice Heath helped educators to see the need for inquiry to be an integral part of all pedagogy.

In the last 30 years, inquiry has taken a prominent place in research circles as qualitative inquiry has burgeoned to include narrative and artful forms of exploring and portraying the work. These forms of inquiry not only provide new, relational, and different lenses for understanding, but also make research more accessible and help to promote important social justice agendas.

Professional development in education, too, has been touched by inquiry. Action research and teacher/practitioner inquiry are examples of how educators can explore their practices to develop professionally, legitimize what they do, and get their voices heard. Increasingly, many forms of professional development take place in professional learning communities, or communities of practice which are networks of educators who, using the tenets of inquiry outlined above, explore collaboratively and over time, issues that are germane to them and their practice. As the community develops through shared work, so does the level of trust and the participants are able to take on roles as "critical friends" to each other to push the learning deeper and further. The collaborative work reduces the isolation so often present in the lives of educators, and helps to build capacity within the circles in which they work.

Unfortunately, reductionist ideas about inquiry tend to push back against the tenets of inquiry because they include demands for and advocates of prescriptive agendas and frameworks, as well as recipes for teaching and learning. These notions eliminate curiosity, engagement, discovery, and interpretation, as well as the relational, meaningful, and inclusive aspects of inquiry. The standards and accountability/evidenced-based movements of the last two decades also push back at inquiry because they promote conformity over possibility and competition over collaboration. It is with these tensions in mind that I hope you will enjoy the wonderful array of articles in this issue that represent a multifaceted look at inquiry in schools, higher education, research, and professional development.

Invited commentaries

We are very fortunate to have a number of eminent people who have provided commentaries for this issue. Cochran-Smith and Lytle, both professors of education at Boston University and the University of Pennsylvania respectively, and long-time innovators in practitioner inquiry, develop the notion of "inquiry as stance" or world view, and address the gap between university discourse and the reality of the daily life in schools. Cole and Knowles, also professors of education at Mount Saint Vincent University and OISE/University Toronto, and the authors who coined the term "arts-informed" research, discuss how the new era of accountability should challenge researchers to use the arts to make spaces for questions, engagement, reflection, and conversation, rather than delivering answers to the public and funding agencies. Gallas, a veteran elementary teacher and a current educational consultant, eloquently shows us the naturalness of inquiry that she documented while watching her young grandson in his everyday interaction with toys and objects around him, and how her decision to write reflectively each day after teaching school ultimately paved the way for her teacher research in her classroom. Alexandra Hillcoat, a grade six student in a Montreal school, elaborates in a videotaped interview how through a guided form of classroom inquiry she delved into the life of artist Marie Laurencin and what she learned about the artist and the process as a result. I was privileged to have seen her present her project at McGill to an audience of undergraduate students. I was very impressed with what she learned as a result of her inquiry and how easily and capably she was able to use technology in her investigation. Hollingsworth, a visiting professor at Berkeley and emeritus professor at San José State University, in an audiotaped interview defines inquiry as a collaborative conversation. She shares her 20-year experience of working collaboratively on an open-ended inquiry with a group of her undergraduate students after they indicated to her that they did not learn anything from the literacy class she taught. She discusses the challenges that emerged among the group, as well as those they faced getting published, and the profound insights they gained about inquiry in this longitudinal process. The commentaries end with an audiotaped interview with Jane Yolen, a well-known and prize-winning author of children's books. She describes her process of writing as inquiry focusing on her wonderful story of "Owl Moon."

The articles by the contributors to this issue are presented in alphabetical order by author. Here I discuss their work in a thematic way.

Landscapes of inquiry

Using specific classroom examples as well as what theorists in the field have to say about inquiry, Cordeiro, a professor at Rhode Island College, helps to lay out a

landscape for classroom inquiry emphasizing the important role of puzzlement in personal and real-world dilemmas. Chichekian, Savard, and Shore, a graduate student, assistant professor, and professor emeritus at McGill University, add to the inquiry landscape more locally by tracing its roots in both English- and French-language work. They develop a useful lexicon of inquiry terms to help bridge the two communities particularly in the Quebec context where the curriculum is predicated on constructivist notions of inquiry.

Artful inquiry

Elza, a recent PhD graduate from Simon Fraser University, discusses how her natural propensity to write poetry and her study of philosophy, once very separate, became intertwined and complementary, and how the role of the critic/reviewer can have a transformative, or a devastating impact, when taking the risk to write poetry. Dobson, a PhD student at McGill University, uses the work of Anne Sullivan, a well-known poet and arts-based researcher, who suggests that one needs to "find an occasion" for poetry. Dobson not only finds this poetic occasion, but also makes a pivotal connection between finding poems and educating youth. Prosser and Burke, working out of Leeds University and the University of Cambridge, kindly permitted a reprint of their chapter on image-based research from the "Handbook of the Arts in Qualitative Research: Perspectives, Methodologies, Examples and Issues," edited by Cole and Knowles in 2008. They discuss how central to and empowering images are in the visual culture of children and demonstrate a variety of ways that visual approaches can engage children and tap into their worlds. Patterson, an associate scholar at OISE/University of Toronto, describes the power of collaboration and performative inquiry in her work with a collective of colleagues who explored ways to artfully portray avenues to trouble notions about and provide spaces for difference in ability, race, gender, and ethnicity. Starko, a professor at Eastern Michigan University, uses autobiographical inquiry to examine how her experience in pursuing an art course on mosaics became a metaphor for how to implement inquiry in any classroom. And last, but not least, Cardinal, a PhD student at the University of Alberta, shares the process of conducting an autobiographical narrative study of her own aboriginal experience and that of her relatives that helped her to understand the power of narrative inquiry and to reconnect with her roots from which she had strayed. All of these contributions attest to the power and potential of artful inquiry.

Inquiry in teacher preparation

Schaefer, a graduate student, and Clandinin, a professor, both at the University of Alberta, show how a fictional "sanding" of beginning teachers' experiences

which they created by reducing excerpts from interview field texts to templates and numbers, produces a very different understanding of what is going on in the lives of novice teachers than what is revealed through narrative inquiry. Because narrative inquiry attends to the complexities and multidimensionality of their lives as teachers, it offers deeper insights into their needs and challenges they face and suggests how this might shape and improve teacher preparation. Elliott-Johns, an assistant professor at Nipissing University, describes how she has encouraged her undergraduate teacher education students to make use of digital and other multi-modal responses to literature in her literacy classes. This work not only helped students to bridge print and digital literacies, but it also engaged them in a form of inquiry that would be helpful to them in their future classrooms. Hyperlinks to their projects are included in the article. Delcourt, a professor at Western Connecticut University, and McKinnon, a principal of Branchville Elementary School in Ridgefield, Connecticut, discuss how inquiry is not stressed enough in teacher preparation programs and argue for an increased emphasis on questioning because of its importance in inquiry. They offer some tools for monitoring questioning in the classroom and developing questions to scaffold higher order thinking.

Practitioner/teacher inquiry

Couture, a teacher at Heritage High School in the suburbs of Montreal, McBride, who is a research coordinator there, Saha, who is a vice-principal at another high school in the same school board, Schellhase, who teaches Canadian history at Heritage, and Von Eschen, who teaches senior mathematics there, have developed a Centre for Inquiry into Professional Practice (CIPP). In this article they discuss the principles that undergird their inquiry context and provide snapshots of how this inquiry plays out in their work. Hughes-McDonnell, an associate professor at Emmanuel College in Boston and Burgess, a professor at River College in Nashua, New Hampshire, describe how science teachers are often pulled between promoting inquiry and "covering" content. In order to help teachers see that they can do both, they have involved a group of teachers in a multi-year program that helps them to explore science inquiry themselves and then to create authentic and sustained inquiry opportunities among their students. Shagoury, the Mary Stuart Rogers Chair of Education at Lewis & Clark College in Portland, Oregon, has been involved in teacher inquiry for many years. She discusses how by using "crystallization" (the use of different lenses to understand what is being studied), a term adopted from the work of Laurel Richardson, she encourages the teachers with whom she works to use narrative, art, reflection, metaphors, and imagination in their inquiry processes.

Professional inquiry in learning communities/communities of practice

Brown, the coordinator for the MA program for school leaders at the University of Northern British Columbia, and Cherkowski, an assistant professor in educational leadership at the University of British Columbia-Okanagan, believe that educators cannot create conditions for learning that they have not experienced themselves. They call this "social symmetry" and use this idea as the basis for a four-meeting structure to scaffold the understanding and implementation of inquiry among groups of practitioners. Mullen, a professor of educational leadership at the University of North Carolina in Greensboro, discusses why and how professional learning communities, where educators learn alongside each other and in community, create democratic spaces for inquiry that can effect realistic and important changes in education. Finally, Wall, a retired professor and Breuleux, an associate professor, both at McGill University, Heo, an educational consultant at the Centre francophone d'informatisation des organisations in Montreal, Rye and Lemay, teachers at St. John's Elementary School in the suburbs of Montreal, and Goyetche, the principal of Arundel Elementary School, have created the Building Community through Telecollaboration (BCT) Project. This has involved creating a lead team that has worked with groups of elementary school teachers over four years to encourage and facilitate the use of ICT-supported learning in their classrooms and to build a community of learners through face-to-face meetings and telecollaboration. They describe important lessons they have learned about ICT-supported learning and the potential of telecollaboration for sustaining professional inquiry in learning communities. Their work underscores the magnitude of the potential that exists in technology for inquiry and serves to remind us that grade six students such as Alexandra are often more comfortable and ahead of educators in using technology to benefit and expand their inquiries. The pros and cons of technology in inquiry merit more exploration.

References

Brizuela, J. P., Stewart, R. G., Carrillo, R. G., & Berger, J. G. (2000). Introduction. *Acts of inquiry in qualitative research*. Harvard Educational Review, Reprint Series No. 34, xi–xxii.

Brookfield, S. (1995). *Becoming a critically reflective teacher*. San Francisco: Jossey-Bass.

Cochran-Smith, M., & Lytle, S. L. (2009). *Inquiry as stance: Practitioner research for the next generation*. New York: Teachers College Press.

Eisner, E. W. (1991). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York: Teachers College Press.

Freire, P. (1970). *Pedagogy of the oppressed*. New York: Herder and Herder.

Gardner, H. (2000). *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

Schön, D. (1983). *The reflective practitioner*. San Francisco: Jossey-Bass.

Lynn Butler-Kisber (B. Ed., M. Ed., McGill University; Ed. D., Harvard University), a former elementary school teacher, is a Professor in the Department of Integrated Studies in Education in the Faculty of Education at McGill where she is Director of the Centre for Educational Leadership and the McGill Graduate Certificate in Educational Leadership Programs. She has served as Director of Undergraduate Education Programs, Director of Graduate Studies and Research in Educational Studies, Associate Dean in Education, and Associate Dean and Dean of Students, and on numerous committees inside the University and in the educational milieu. In 2007, she was appointed to the Board of Directors of St. George's Schools. Winner of the 1997 YWCA Women of Distinction award (Education) and 2008 Canada Post award (Educator), she teaches courses on language arts, qualitative research, and teacher education. She has a particular interest in feminist/equity and social justice issues, and the role of arts-informed analysis and representation in qualitative inquiry. Her current research and development activities include the Home Instruction for Parents of Preschool Youngsters (HIPPY) Efficacy Study, as well as projects with Trinidad and Tobago, Turks and Caicos Islands, England and Indonesia, and teachers and school leaders in Quebec. The focus of this work is on literacy learning, student engagement, leadership, professional development, and qualitative methodologies and she has published and presented extensively in these areas. Most recent is her book entitled, *Qualitative Inquiry: Thematic, Narrative and Arts-Formed Approaches*, published by Sage.

LINK TO:

http://www.thelivingclassroom.com

http://www.mcgill.ca/edu-dise/centres/cel/

Commentary:
Changing Perspectives on Practitioner Research

Marilyn Cochran-Smith, Boston College
Susan L. Lytle, University of Pennsylvania

ABSTRACT

The authors of this article have been writing together about practitioner research and inquiry for more than 25 years. In this article, they trace the roots of this interest to their work with K-12 teachers and school leaders over many years and their dissatisfaction with the idea that external researchers produce all the knowledge necessary to change teaching, learning and schooling. The article also highlights the notion of "inquiry as stance," which contrasts with the idea that inquiry is a project or a problem-solving technique.

For the last 25 years, we have been writing together about practitioner research. When we started, the phenomenon of "teacher research" was just surfacing in North America (e.g., Goswami & Stillman, 1987). Like many university-based practitioners and researchers at the time, we were deeply concerned about the significant inequities in the educational opportunities, resources, achievement, and outcomes for differently raced and advantaged students. But we were also concerned about the way practitioners were being positioned in the discourse about teacher education and professional development and with the way university-generated knowledge was assumed to encompass everything there was to know about teachers, teaching, and reforming the schools. In our first article on this topic (Cochran-Smith & Lytle, 1990), we referred to the then recently published *Handbook on Research on Teaching* (Wittrock, 1986). We pointed out that among the 35 research reviews and the 1037 pages in that massive volume that purported to

contain "everything we need to know about teaching and learning," there was not a single citation to teachers' research or to insiders' perspectives and knowledge about the issues being discussed.

It was our close work with teachers that heightened our awareness of the gap between university discourse and the reality of daily life in schools and made us reject the claim that those located at universities or external research agencies could be the primary agents of enduring change inside schools. Early on we realized that external researchers were not the only actors who had developed critical perspectives about the social and political arrangements of schools and schooling.

Working at the Intersection of Two Worlds

Although our work with teachers was central to the genesis of our interest in practitioner research, we trace the roots of this interest to our work as K-12 teachers, part-time instructors, supervisors of student teachers, and lecturers at the university. In retrospect, we realize that our unwillingness to privilege either scholarship or practice in those early years also pushed us to try to construct a critical integration. We endeavored to locate our work at the intersection of two worlds, a space that deeply informed and continuously called into question our perspectives on collaboration and power, voice and representation, culture and difference, the purposes of teaching and teacher education in terms of social change and social justice, and the interrelationships of inquiry, knowledge and practice.

Working jointly with teachers, student teachers, teacher educators and school leaders, we used teacher research as a way to rethink practice, question our own assumptions, and challenge the status quo, not only in the schools and other sites of professional practice but also in the university. Over time we came to use the term "teacher research"—and later the broader language of "practitioner research" and "practitioner inquiry"—as shorthand for a larger set of premises about knowledge, practice, power, school-university relationships, and educational systems, which are elaborated below.

Our early ideas about teacher research were consistent with the emerging view of the teacher as knower and researcher that was part of the paradigm shift in researching, teaching, and assessing writing that evolved during the 1970s and 80s. At roughly the same time, in critical and social democratic theory, there was an

emerging focus on the role of teachers in research conceptualized as a form of social change. These ideas were in sync with the growing interest in ethnographic and qualitative research methodologies and methods. Much of this work examined the cultures of schools and classrooms and attempted to represent educators' knowledge from their own perspectives inside schools. It also began to unpack many inequities in the structures, opportunities, and outcomes of schooling for various groups of students based on race and culture as well as socioeconomic, linguistic, and experiential backgrounds.

Working the Dialectic

Throughout all our years working at research universities, we have never been solely practitioners or solely researchers. Rather, we have always seen ourselves as negotiating the borders of educational practice and research by wrestling with the daily dilemmas of practice and simultaneously theorizing the emerging domain of practitioner research. From the beginning, each of the papers and presentations we gave about teacher research came from a question that surfaced directly from our practice, usually in the midst of intense discussion about what was going on in our various projects and programs, which we regarded as strategic sites for both research and practice. What we were trying to do was theorize practitioner research and act on its premises in our daily university work as well as in various partnerships and collaborative contexts in K-12 schools and in community-based settings. We came to think of these efforts collectively as "working the dialectic." Here the term dialectic refers to the tensions and presumed contradictions between a number of key ideas and issues that have to do with research, practice and knowledge, in particular the assumed dichotomy between research and practice and the assumed disjuncture between the role of the researcher and the role of the practitioner.

Working the dialectic emphasizes that instead of being oppositional, inquiry and practice relate to each other in terms of productive and generative tensions, and they are understood to have a reciprocal, recursive, and symbiotic relationship. Thus it is not only possible, but also beneficial to take on simultaneously the role of both practitioner and researcher. In addition, this involves challenging and intentionally muddying the distinction between conceptual and empirical research and between practical knowledge and formal knowledge.

Marilyn Cochran-Smith & Susan L. Lytle

Inquiry as Stance

With the background we have provided above, we use the remainder of this commentary to outline the idea of "inquiry as stance" and its potential meanings and usages for the next generation. We first coined this phrase in the late 1990s. Our book, *Inquiry as Stance: Practitioner Research for the Next Generation* (Cochran-Smith & Lytle, 2009), extends previous discussions.

To call inquiry a "stance" is to regard inquiry as a worldview, a critical habit of mind, a dynamic and fluid way of knowing and being in the world of educational practice that carries across professional careers and educational settings. This contrasts sharply with inquiry as a time- and place-bounded classroom research project or a method or set of steps for solving problems. When inquiry is a project, the message is that inquiry is something turned off and on at given points in time with the lines separating teaching and inquiry clearly drawn. When inquiry is a method or steps for solving problems, it positions practitioners as receivers of information with little space for questioning the ways problems are posed in the first place or for problematizing the terms and logic of larger frames. Fundamental to inquiry as stance is the idea that educational practice is not simply instrumental in the sense of figuring out how to get things done, but also (and more importantly), it is social and political in the sense of deliberating about what gets done, why to get it done, who decides, and whose interests are served.

As we have conceptualized it, inquiry as stance rests on three foundational ideas and four critical dimensions. First, we regard inquiry as stance as a theory of action grounded in the problems and contexts of practice and in the ways practitioners work together to theorize, study, and act on those problems in the best interests of the learning and life chances of students, educational institutions, and communities. Second, inquiry as stance is a counterhegemonic notion that repositions the collective intellectual capacity of practitioners at the center of educational transformation. Third, inquiry as stance assumes that the knowledge and expertise needed to transform teaching and learning resides in the questions, theories, and strategies generated by practitioners and in their interrogations of the knowledge, practices, and theories of others.

There are four key dimensions of the construct of inquiry as stance: knowledge, practice, communities, and democratic purposes. The view of knowledge central to inquiry as stance rejects the prevailing assumption that two kinds of

knowledge, formal and practical, account for the universe of knowledge types for understanding teaching, learning and schooling. From this prevailing perspective, practical knowledge (which is what practitioners have) is bounded by the situation, not necessarily capable of immediate expression, and is about how, when and where to do things. Formal knowledge (which external researchers produce), in contrast, is generated from conventional scientific methods that yield a replicable, cumulative knowledge base generalizable across contexts and people. In contrast to the prevailing view of knowledge, with the notion of inquiry as stance, the local knowledge generated by practitioner researchers is considered a key to educational transformation.

The second dimension is an expanded and transformative view of practice. In discussions of schooling, practice is often juxtaposed with theory and research to suggest disconnections. From the perspective of inquiry as stance, however, neither the work of practice nor inquiry about practice is captured by the idea that practice is simply practical. Rather, practice is centrally about inventing and re-inventing frameworks for imagining, enacting, and assessing daily work in educational settings. Here, what practitioners choose to do at any given moment is understood to be informed by their nuanced sense-making about learners, languages, culture, race, class, gender, literacies, disciplinary content, social issues, power, institutions, neighborhoods, histories, communities, materials, texts, technologies and pedagogies. In this sense, practice is deeply contextual, but also and always theoretical and interpretive.

The third dimension is communities, which are the primary mechanisms for enacting inquiry as stance. This not just about individuals, but rather about collectivities of all sorts—pairs, groups within or across schools, face-to-face or virtual networks, school-community partnership groups—that are linked to larger change efforts. Over the last decade, the concept of learning communities has become extremely common, with some iterations of communities becoming what Diane Wood (2007) called "catalysts for change," and others a new "infrastructure for the status quo." In the practitioner inquiry communities central to our concept of inquiry as stance, practitioners work together to uncover, articulate, and question their own assumptions about teaching, learning and schooling.

The fourth dimension of inquiry as stance is democratic purposes and social justice ends. These purposes emphasize that learning communities are not tools for more effectively producing the nation's labor force and thus preserving its place in the global economy. But these purposes also emphasize that learning communities are not intended simply to elevate the role of practitioners in educational change

efforts and to solidify their professional status once and for all. Rather, when practitioner researchers take an inquiry stance, they are engaged in work both within and against the system—an ongoing process, from the inside, of problematizing fundamental assumptions about the purposes of the existing education system and raising difficult questions about educational resources, processes, and outcomes.

Ways Forward

Currently it seems self-evident that the current United States educational regime is based on the assumption that policy is the driver of education reform with standards and accountability the major policy levers. When these are in place, the logic goes, students perform better, practitioners work more effectively, and everybody tries harder. From this perspective, the relationships among research, policy, and practice are straightforward and more or less linear, and the roles of researchers, policymakers, and practitioners are separate.

Inquiry as intellectual stance and theory of action disrupts this approach. As we have said, it emphasizes how practitioners generate knowledge of practice from practice, as well as how they are informed by, but also challenge and talk back to, research in the interest of greater public engagement about education in a democratic society. This inside-outside perspective has long been at the heart of the practitioner research movement. Fortunately, at this point in time, others have somewhat similar views, and there are a variety of current efforts to the day-to-day problems of practice at the center of the research agenda.

References

Cochran-Smith, M., & Lytle, S. (2009). *Inquiry as stance: Practitioner research for the next generation*. New York: Teachers College Press.

Goswami, P., & Stillman, P. (1987). *Reclaiming the classroom: Teacher research as an agency for change*. Upper Montclair, NJ: Boynton/Cook.

Wittrock, M. (Ed.). (1986). *Handbook of research on teaching* (3rd ed.). New York: Macmillan.

Wood, D. (2007). Teachers' learning communities: Catalyst for change or a new infrastructure for the status quo? *Teachers College Record, 109*(3), 699–739.

Marilyn Cochran-Smith is Cawthorne Professor of Teacher Education for Urban Schools and directs the Doctoral Program in Curriculum and Instruction at Boston College's Lynch School of Education. She is an elected member of the National Academy of Education, a Laureate member of Kappa Delta Pi, and a Past President of the American Educational Research Association. Cochran-Smith is the author or co-author of 9 books and many articles, including *Inside/Outside: Teacher Research and Knowledge* (1993) and *Inquiry as Stance: Practitioner Research for the Next Generation* (2009), co-authored with Susan Lytle. Cochran-Smith and Lytle are co-editors of the *Practitioner Inquiry* book series, published by Teachers College Press.

Susan L. Lytle Ph.D., is a Professor in the Language and Literacy in Education Division, Graduate School of Education, University of Pennsylvania. She is Director of the Program in Reading/Writing/Literacy and Founding Director of the 25-year-old Philadelphia Writing Project (PhilWP), an urban school-university collaborative network focused on teacher-to-teacher professional development and fostering practice-based research on teaching, learning and schooling. She and co-author Cochran-Smith have recently published *Inquiry as Stance: Practitioner Research for the Next Generation* (Teachers College Press, 2009). In spring 2011 they received the David Imig Award for Distinguished Research in Teacher Education from AACTE.

LINK TO:

http://www.teacherscollegepress.com/practitioner_inquiry.html

Commentary:
Call and Response: The Importance of "Telling Truth Slant"

Ardra L. Cole & J. Gary Knowles

ABSTRACT

Funding agencies are restructuring programs, rewriting priorities, and restating accountability demands all founded on the very basic point that research funded by public tax dollars must be relevant and accountable to diverse publics. This new wave of accountability challenges researchers to "translate" and "mobilize" knowledge so that research is understood by those publics and makes a difference in people's lives. While goals of research accessibility are laudable, we argue that researchers' goals need not be focused on finding better ways to translate knowledge for public consumption. Rather, the time has come for inquiry to be more about actively engaging people in meaning making. As a community of researchers with long-standing commitment to using the arts in research as a vehicle for engagement, this is an opportunity for us to provide leadership in this area.

In his book *A Hidden Wholeness: The Journey Toward an Undivided Life*, Parker Palmer (2004) writes of the need to approach and explore important topics metaphorically through art. Art forms such as poetry, story, music, visual art, he says, embody the depth and complexity of important issues by creating "third things" with voices of their own "that tell the truth about a topic but, in the manner of metaphors, tell it on the slant" (p. 93). "Telling truth slant" is, itself, a metaphor taken from a poem by Emily Dickinson (1955). Palmer uses the poetic phrase as a reminder that "truth," neither definitive nor conclusive, cannot be proffered in an objective telling. Rather, "Truth evolves within us, between us, and around us as we participate

in the "eternal conversation'" (p. 128). "Mediated by a third thing," says Palmer, "truth can emerge from, and return to, our awareness at whatever pace and depth we are able to handle–sometimes inwardly in silence, sometimes aloud in community" (p. 93).

The many and diverse perspectives on the concept and meaning of truth, and how, even whether, a search for truth defines academic research continues to be debated vigorously in scholarly contexts, especially within the social sciences. These differences in epistemological perspective are reflected in a vast array of method-ological approaches and practices. Dominant among them, still, are research methodologies based on assumptions and goals directed at finding and delivering answers and outcomes on complex issues and problems. Telling truth straight up, not slant, is the goal that typically defines researchers' work. Perhaps, though, the time has come for inquiry to be more about: asking questions than delivering answers, creating spaces for reflection and conversation rather than filling spaces with conclusions and exclusive, definitive answers, actively engaging people in meaning making rather than telling them what to think or do or be. Perhaps those of us who have been advo-cating and practicing these approaches for years now have an opportunity to show leadership in response to recent admonitions for the academy to be more relevant to its publics.[1]

Funding agencies, within Canada at least, are restructuring funding pro-grams, rewriting research priorities, and restating accountability demands all founded on the very basic point that research funded by public tax dollars must mat-ter to those publics, must be "translated"[2] so that it is understood by those publics, and must show its potential to make a difference in people's lives. These are laudable goals; admittedly more readily accepted in some institutions than others, more easily achieved in some disciplines than others, more openly embraced by some researchers than others. Regardless, the point is that, echoes of Renaud's call to "get public or perish" have been made, heard, and are being answered. For those of us, who, for decades, have preached, practiced, and professed alternative ways of researching, this is good news.

This is our time to show and tell what "going public with research" could and does look like. It is our time to describe and demonstrate what happens when a broad goal of research is to connect with people and make a difference in their lives, to cre-ate spaces within which truth telling on the slant can take place, where metaphorical forms invite viewers, listeners, readers to gain insights into deep questions and issues through metaphorical third voices.

In the early 1990s, a community of educational researchers formed in North America inspired and fueled by the work and words of the likes of Elliot Eisner and Maxine Greene, among others. Our common goal was to shift educational research away from a focus on the creation of propositional knowledge and toward representations of forms of understanding that came closer to the sentience and complexity of human experience. And, to varying degrees, we also wanted to make research more accessible to people outside of academic contexts. Our means of doing this was by bringing together methods and forms of researching and processes and representational forms of the arts. As happens in communities of creative thinkers and writers, different interpretations of the art-research relationship led to a number of iterations such as arts-based research, arts-informed research, a/r/tography, autoethnography, ethnodrama, lyric inquiry, and so on (see *Handbook of the Arts in Qualitative Research: Perspectives, Methodologies, Examples, and Issues* [Knowles & Cole, 2008]). Since those early days the community of researchers infusing research with art has burgeoned.

Almost 20 years later we now hear the calls of funding agencies to make research more directly meaningful and relevant to the public, to make research matter. These are the very goals we have worked towards. And so it is with excitement and new challenge that we can heed these calls. But, in heeding these calls, we must be clear that we are not interested in "translating" knowledge, dumbing it down, putting it in "lay" terms, preparing easily digestible sound bytes—all different ways of passing on knowledge created in the academy for various publics and public consumption. What we are interested in is creating new research spaces, spaces that will invite engagement—sometimes private and introspective, other times public and interactive—"about things that matter, conducted with passion and discipline" (Palmer, 2004, p. 127).

Whether through poetry, literary prose, two- or three-dimensional visual art, dramatic performance, music, film or digital media, we can show how our goals as researchers need not be to translate knowledge for public consumption but rather to engage publics in the act of knowledge creation. Poetry readings about poverty and homelessness, multi-media installations about caregiving and Alzheimer's disease, novels aimed to re-engage disenchanted youth, photography exhibits about people's relationships with animals, documentary films about the sex trade and sex trade workers, dramatic performances enacting experiences of living with metastatic disease, painting exhibits depicting issues and realities of homophobia and racism; these research-based representations have the power to do more to invite public engagement and transformative action than any number of sound bytes of "translated" research results. Moreover, readers, listeners, or viewers are more likely to come

to understand inherent complexities of subject matter than to accept simplistic interpretations and solutions.

As we think about new learning and inquiry landscapes and the possibilities for the next phase in our development as researchers and as a research community, we need to continue to create these spaces and to show what it looks like to make research accessible, not by translating knowledge but by engaging people in meaning making, knowledge creation, interpretation, and truth telling … slant. While this approach to inquiry requires a considerable shift for some, perhaps it is our responsibility, as a community of scholartists,[3] to provide leadership in this area. We can continue to show how to create spaces, live questions, embrace silence, foster connections, so that the research work that we offer to the public is focused on inviting people to think deeply about issues and topics that matter to them. We can subvert the challenge to find more accessible, easier ways to pass on knowledge by creating spaces to invite engagement. We can show what happens when research becomes more democratic, and knowledge "production" becomes more epistemologically equitable; when researchers' responsibilities shift from telling, proving, and convincing to creating, inviting, and engaging. And, perhaps most important, we can continue to trust people to understand, make meaning, and take action.

Rather than looking to researchers for answers, people can use the tools researchers provide and spaces researchers create to find workable solutions to problems and issues that matter. No one person, no matter how well qualified, expert, experienced, methodical or eloquent, can offer definitive answers about complex social issues. "Truth," as Parker Palmer (2004, p. 127) says, "is an eternal conversation about things that matter, conducted with passion and discipline." Truths are personal and socially mediated. They "cannot possibly be found in the conclusions…because the conclusions keep changing."

We live in a time of urgency—a time when, as New York Times journalist, Thomas Friedmand, in an interview with a Microsoft researcher, put it, "The assumption now is that you are always in. Out is over…. And when you are always in you are always on" (cited in Kabat-Zinn, 2005, p. 158). Within contemporary academic contexts this urgency translates at all levels—students, faculty, administrators—to pressures to work harder and faster, to bring in larger amounts of funding, to produce more (not necessarily better), to be more competitive, to develop skills in areas such as communications technology that will enable a longer reach and more efficient management systems. The demands and pressures have increased so much that every time the productivity bar is raised or a new task is added to the list, it is

presented as an "opportunity" in an attempt to disguise the reality that one more thing, one more challenge, task, or demand may be the proverbial straw. This is the reality within which researchers, educators, and scholars live and work. This is the context within which a "new wave of accountability" in research is demanded by funding agencies and public institutions.

As researchers we take on important issues, and we do our utmost to understand and represent truths. In order for research to have the kind of new wave accountability demanded, researchers must be enabled and encouraged to approach research in dramatically different ways, ways that engage people in spaces of trust to tell truth slant and make informed decisions that matter. Funding agencies now need to heed the response from the community of scholartists about what it means to translate knowledge and get public with research.

Notes

1. For an enlightening history and analysis of the origin and development of "the modern publics," link to CBC Ideas series, "The Origins of the Modern Publics, Parts 1-14" (http://www.cbc.ca/ideas/episodes/features/2010/04/26/the-origins-of-the-modern-public/). Marc Renaud, President of the Social Sciences and Humanities Research Council of Canada 1998-2005, was known for his challenge to researchers to "get public or perish." This could be considered as the beginning of a new wave of research accountability.

2. The terms "knowledge mobilization" and "knowledge translation" are increasingly used by funding agencies and institutions to describe new priorities related to public accountability.

3. The term "scholartistry" was coined in 2000 by Lorri Neilsen to characterize the work of researchers who infuse their scholarship with artistry and artistic genres.

References

Cayley, D. (2010, December 17), Producer, "The origins of the modern publics, parts 1-14," *CBC Ideas*. Retrieved May 2, 2011, from http://www.cbc.ca/ideas/episodes/features/2010/04/26/the-origins-of-the-modern-public/

Dickinson, E. (1955). In T. H. Johnson (Ed.). *Complete poems of Emily Dickinson* (Poem 1129). Boston: Back Bay Books.

Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness*. New York: Hyperion.

Knowles, J., G., & Cole, A. L. (Eds.). (2008). *Handbook of the arts in qualitative research: Perspectives, methodologies, examples, and issues*. Thousand Oaks, CA: Sage Publishing.

Palmer, P. J. (2004). *A hidden wholeness: The journey toward an undivided life*. San Francisco: Jossey-Bass.

Ardra L. Cole is Associate Vice-President, Academic and Research, Mount Saint Vincent University, Halifax, Nova Scotia. As a teacher educator and qualitative research methodologist, and former Professor and Co-director, Centre for Arts-informed Research, OISE, University of Toronto, Ardra has published extensively in conventional and non-conventional academic prose and in alternative, scholarly, non-print media. Her research (with Maura McIntyre) on caregiving and Alzheimer's disease involves multi-media installation, performance, and the World Wide Web. Ardra's most recent venture is as Founder and Director of the not-for-profit organization, ElderDog Canada—an exciting new venture that honours older dogs and older adults and the special bond between them.

J. Gary Knowles is a visual artist, Professor of Creative Inquiry and Adult Learning, and Co-director of the Centre for Arts-informed Research, Ontario Institute for Studies in Education, University of Toronto. Co-editor of The *Arts-informed Inquiry Series* (Backalong Books) and *Handbook of the Arts in Qualitative Research* (Sage), Gary has helped numerous graduate degree candidates complete arts-informed doctoral and Master's degree theses employing poetic, fictional, performative, and visual arts inquiry processes and forms for addressing educational and social issues. Gary's educational scholarship is located in educational journals and books, as well as found hanging on walls.

LINK TO:

www.oise.utoronto.ca/research/mappingcare

www.utoronto.ca/CAIR

Commentary:
Inquiry: Doing What Comes Naturally

Karen Gallas

ABSTRACT

We are all born with basic habits of mind that enable us to successfully learn about and master our world. Gradually, however, those abilities are sidelined as children progress through school. Inquiry becomes confused with research, and the agency of children as inquirers is lost. This exploration of the meaning of inquiry identifies three elements that are crucial to the process. Choice, curiosity and gut instinct—hardly fodder for educational research or the standardization of curricula—are presented as central to maintaining healthy lifelong learning.

> Suddenly a White Rabbit with pink eyes ran close by her. There was nothing so very remarkable in that; nor did Alice think it so very much out of the way to hear the Rabbit say to itself, "Oh dear! Oh dear! I shall be late!" (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually took a watch out of its waistcoat-pocket, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge. In another moment down went Alice after it, never once considering how in the world she was to get out again. (Carroll, 1865/2006, pp. 1–2)

Thus began Alice's adventures. And here, I begin a brief exploration of the meaning of inquiry. It seems important, first, to recall what was happening before Alice dove down the rabbit hole. She was sitting by the

riverbank with her sister, doing what she was expected to do, but with little enthusiasm. Suddenly, the rabbit appeared. Surprisingly, Alice did not take notice of the fact that a rabbit ran past talking to itself. Rather, her split-second decision to follow was based on the flash of the pocket watch which triggered her curiosity and caused her to abandon both her sister and the outward reality of her daily life. In that moment, human nature triumphed over Alice's very British conditioning.

Alice's jump into uncertainty highlights what I consider to be key elements of healthy inquiry. First, there is the element of choice: Alice determines what she will pursue. Second, her curiosity compels her to follow an uncertain path. Third, she is going on her gut instinct that there is something important to be learned, although she is not at all aware of what that might be. Choice, curiosity, gut instinct; we will return to these throughout this discussion.

We humans are born with a deep desire to explore and understand our world. Our early efforts, if we have a healthy family, are encouraged and supported. We reach for objects; they are put closer to our hands. We grab the fur of the family dog and pull; larger hands come in and guide the pressure of our touch. We initiate learning opportunities; our caretakers support our learning. Inquiry is the vehicle through which we begin to adapt to our world and develop the physical, mental and psychic abilities necessary for survival.

Then we reach school age, and for most of us our natural gift for inquiry is shunted aside to be replaced by the belief that real inquiry is something children do not know how to do. Questions, timetables, protocols for inquiry are outlined by adults who have been given the responsibility for, and the power over, our educational journey. (Notice here, I did not say, "by our teachers." If we look at the domino effect in education—how decisions made at the policy level factor down into control over classroom practice, it is much clearer that the adults who design standards and legislate policy, the adults in the academy who study and theorize what I believe are natural abilities, do the shunting aside. As the white rabbit would say, "Oh dear, oh dear.") In the process of codifying the educational process, "inquiry" in schools most often loses the three qualities critical to growth and development that Alice helped us identify. The helping and guiding hand of the caring adult is replaced by the absolutism of standards and prescribed curricula. Choice, curiosity, and gut instinct are sidelined.

The reality of the modern era is that those three descriptors, when referring to children, often evoke fear and concern in adults. (In the United States, at least. I am

not able to generalize about Canada.) Many parents struggle to find a balance between their concerns about safety, and their desire to foster their children's natural curiosity and creativity in order to develop all of their potential. We want our children to feel they have choices in their lives, but we'd like to determine those choices. We love and celebrate their curiosity, but only if it is exercised in a safe way, that is, under conditions that we deem to be safe. We do not so much like the actions that emanate from gut instinct because we cannot anticipate the circumstances and timing under which they will occur. What is most noticeable here for the adults involved is the issue of control. We want to control our children's experiences so they can be safe, and, in the case of schools, productive. Our behavior comes from love, caring and fear, but also from mislabeling what children are doing. Adult conservatism in this regard reflects a pervasive societal value that children have bad judgment and can't possibly know what's good for them. In this paper, I want to briefly suggest that we misjudge, and thereby mis-serve the development of our children, and ourselves.

My three-year-old grandson, L., has been inquiring into the physics of momentum and the mechanics of wheels and axles for two years. Here are a few examples of how that process has looked:

May 10 – 27 months: The Slide

L. spends much of his outdoor playtime climbing the slide itself rather than using the ladder or being lifted up to the top of the slide by an adult. At first, his mother and I make sure he gets safely up the slippery surface by holding his hands and helping him climb. He slides down, then turns and tries to scramble on all fours up the slide, without success, repeating this over and over. We continue to help him get back up the slide, holding his hands as he walks upright back up the slide, jumping to catch him if he starts to slip.

In the afternoon, when we return from the beach, we help L. take off his shoes to get the sand out, then turn our attention to unpacking the car. When we finish, we find him standing with evident pride at the top of the slide, barefoot, waiting for us to notice. He spends much of the next hour running up the slide, then sliding back down on his stomach, on his back, on his bottom. He tries going up slowly holding onto the side of the slide with both hands. He tries climbing without holding on, then realizes that a combination of speed of takeoff and grappling with his hands is most effective. He has also decided, when shoes are re-offered to him, that shoes do not help.

Note in this observation how L.'s actions represent inquiry into the properties of surfaces as well as how to move an object (his body) up a ramp. What are the variables he was considering? Speed/velocity, hands only, feet only, tensile outcomes of shoes versus none, traction. Were we afraid that he would fall and hurt himself? Yes. Did he? No. Choice, curiosity, and gut instinct. He exercised them all. We gained a little bit of courage.

July 1 & 2 – 28 months: The Wagon

L. spends the long weekend trying to master the red wagon. The first day he struggles to pull the wagon around obstacles in the garden (chairs, bench). Occasionally, he walks back and forth around the wagon, squatting down to examine the axle and the wheels as he tries to figure out how to make the wagon turn sharply. At one point he is wedged in between two Adirondack chairs and a bench. He pushes the wagon back a bit, picks up the handle, pushes it right to the edge of the garden where the hill drops off sharply, (we gasp!), straightens the wagon out and extricates himself.

The next day, I am pulling the wagon with him. He says, "L. wants to park the wagon on the hill" (a small mound around the oak tree). He tries unsuccessfully to pull the wagon up and have it stay at the top. Finally, I ask him if he wants help. He says, "yes." So I pull the wagon up to the top of the mound and rest the handle against the tree trunk. We are satisfied and walk away. A bit later, he is back outside trying again to pull the wagon up and over the mound. I watch as he becomes frustrated. He squats down, scrutinizes the wheels and the axle, stands up and tries to turn the handle to pull it, but seems to lack the strength. He leaves the wagon and returns to the house. Ten minutes later, after a drink of orange juice, he heads back to the wagon, pulls it down onto the lawn, backs it up, then, turning sharply, he pulls it as fast as he is able toward the mound. This time he gets the momentum he needs to achieve the top. I clap. He smiles very briefly, then turns the wagon around, pulls it down the little hill and around the garden.

Sunday, late afternoon: L., barefoot, has the wagon at the front of the house and is pulling it along the flagstone path. I am sitting on the steps by the door, watching. He is very absorbed in pulling the wagon to the end of the path, backing it up, turning it in a very small space, then pulling it back the other direction. He repeats the entire sequence several times. Finally, he gets stuck in the perennial garden that borders the path. One wheel has dropped onto uneven ground and is threatening to pull the wagon into the flowers. L. sees the dilemma and tries, unsuccessfully, to turn the

wagon so it comes out. He stops, puts down the handle, walks around the other side of the wagon and squats down to get a better look. He stands up, picks up the handle and tries turning the axle the other way without good results. He repeats this procedure of stopping, squatting, looking. He stands up and makes a smaller different turn; the wagon starts to roll quickly and rolls over his bare foot. He stops suddenly, obviously in pain, but doesn't cry, puts down the handle, walks over to the stone steps opposite me, sits down on the bottom step, puts his head in his hands and leans his elbows on his knees for several seconds. Then he looks up at me. I say, "That hurt, huh?" He nods slightly, stands up and runs pell-mell around the side of the house toward the porch where he knows his mother is sitting. He arrives there, then begins to cry. Priceless.

Choice, curiosity, and courage. Also, knowing where to go for sympathy if those traits result in pain and suffering.

Although I could continue this narrative with detailed notes on how L. has continued to explore the work of axles, wheels, momentum, balance, I will only summarize by reporting that he has recently explored how far the body can tilt off a stable object before it falls, how much momentum one needs in order to leap successfully onto a stable object using one leg only as the catapult, how wheels and dials turn and the resulting actions that occur in electrical devices. When I describe his inquiries in this way, it is obvious to me that they are about physics. They are scientific inquiries. However, when his mother and father observe them, their gut response focuses on his safety, or lack thereof. They put their fear, based on a long history of reading about tragic accidents that occur in homes, onto the template of his actions. Yet his actions are inherently neutral; they are not value laden. He is just trying to exercise (yes, you know what's coming) choice, curiosity, and gut instinct in the pursuit of his own growth and learning.

Oh, you might say, there is a limit to how long children should be allowed to exercise those choices. At some point, adults must intervene to push them towards the full achievement of their potential. Perhaps, perhaps. But let me just throw in a tangent that may seem off topic, but allows me to indirectly bolster my argument. Consider eating: the process of taking food into our bodies.

Our children's food intake has increasingly become a focus of concern for health care professionals, teachers, and parents. Childhood obesity and diabetes are on the rise. Eating disorders are serious health concerns. Too much eating; too little eating; or, too much eating and purging. Our solutions focus on prevention: healthier

choices, more exercise. But what does healthy eating in young children actually look like? From birth, children know when they are hungry and when they are full. They also know what they want to eat. Essentially, they graze.

Most parents believe that it is their job to help their child eat a balanced diet. So, when the child begins to eat solid food, parents are the deciders. They determine what should be eaten and how much. Often, "how much" is too much. What, you may ask, is my point? This is a commentary on inquiry, not eating. However, for young children food is one of their first areas of inquiry. Left to their own devices with a healthy array of choices, they will graze their way through a balanced diet. I would describe L.'s forays into my vegetable garden in great detail if space allowed because it would be yet another description of inquiry in action. Briefly, he roams the garden like a wild turkey: a taste of red currants, a few blueberries, some dill and basil, seven cherry tomatoes, parsley as a chaser. Now, mom, could I have a snack of cheese and crackers… You get the drift.

My next two examples of inquiry will certainly appear benign in comparison with a two year old hurtling through space, but I want to extend this discussion to the lives of teachers. Choice, curiosity, and gut instinct look different there, but they are still asking to be recognized. In September of 1989, before I became involved in classroom research, I decided to write a daily account of the life in my first grade classroom (Gallas, 1988). I knew it was a crazy idea, given the tremendous amount of energy and time I devoted each day to provisioning my classroom, planning for teaching, and the teaching itself, but I just had to do it. What I experienced every day with my students was astonishing, but I had no way to hold onto the days. There were so many things I wondered about, so I decided to write. Essentially I began a yearlong inquiry into the life of my classroom.

Every day I would return from school, sit down at my computer, write for an hour, fix dinner for my children, talk a bit with my husband, get the children to bed, and resume writing. Sometimes I would wake in the middle of the night and write. The teaching brought me joy and constant surprises; the writing enabled me to process the days. By the end of the year I had written hundreds of pages. The following September, I saw a notice inviting teachers to join the Brookline Teacher Research Seminar, which was just forming. I joined. From that point on, my inquiry evolved into a formal practice of teacher research.

I raise this example so that we can move into a consideration of how inquiry looks for teachers in the classroom and to briefly raise the distinction between

inquiry and research. For many educators, the words inquiry and research are used interchangeably. For example, consider this definition of inquiry from the International Reading Association website:

> The process of inquiry begins with a genuine question, that is, a question that motivates the questioner to persist in seeking the answers. Authentic questions are rarely well formulated or structured at the outset. Rather, structure emerges through the process of inquiry. Inquiry is not merely a matter of asking and answering questions. It is a way of engaging the world and other people. Communication and social relationships play an important role in inquiry as questioners seek the advice and expertise of peers and more knowledgeable others, share their findings, reflect upon the results of the inquiry, and take up new questions that arise. (Inquiry section)

Here, the question is highlighted as the beginning point, and the process, as described, is a research process: question, systematic methodology, literature search, reporting, new questions. This definition illustrates how inquiry is often lumped into the same clay as research. I propose that it is not, really, a true description.

Inquiry [enquire]: Middle English *enquere* (later *inquere*), from Old French *enquerre*, from a variant of Latin *inquirere*, based on *quaerere* 'seek'. (Oxford English Dictionary)

Inquiry, in its original usage, is defined as a seeking. What are we seeking? We are seeking to understand our particular "small-ly" defined universe for the purposes of our growth, our development, and maybe even to find truth. As such, we conduct an inquiry. We can't conduct a question. There is no set time frame; inquiries are notorious for spiraling from weeks into years. We aren't always sure what we're trying to find out or achieve. Our methods aren't formalized and structured; our questions often remain unarticulated. Inquiry is a process of seeking. I conducted an inquiry through the writing process. Artists carry out inquiries through media. Actors use performance; dancers work through movement. Children play.

Although my yearlong inquiry into the life of my classroom did eventually lead me into the field of research, that is not necessarily the goal of teacher inquiry. Research is an avocation that suits some people in some circumstances. Inquiry is a process of learning that is essential to our complete development as human beings. It is highly individual; we can't predict which rabbit hole we will want to dive down, although, if we are fortunate enough to be able to find the correct series of rabbit holes for ourselves, our lives are hugely enriched and we find the life work we are

superbly fitted to do. But how many of us and how many of the children in our schools truly have the opportunity to dive down those rabbit holes based on the exercise of our choice, curiosity, and gut instincts? And what if each of us could go down, say, one rabbit hole a year? How would the world be different? What if we stepped out of what other people tell us we should be curious about, sat down for a short spell by the riverbank, or the side of our classroom, and simply opened ourselves to the possibility that the rabbit dressed in the waistcoat might run by? What would be gained for us and our students? What would be lost?

"One thing flows into another and cannot be grasped. Before the rain stops we hear a bird. Even under the heavy snow we see snowdrops and some new growth" (Suzuki, 2006, p. 138).

References

Carroll, L. (2006). *Alice's adventures in wonderland*. United States: ReadHowYouWant. (Original work published 1865)

Gallas, K. (1988). *Diary of an American classroom*, unpublished manuscript.

International Reading Association. "Standards for the Assessment of Reading and Writing," Retrieved April 29, 2011, from http://www.reading.org/General/Current Research/Standards/AssessmentStandards/Assessment_standards_Glossary.aspx

Oxford English Dictionary. Definition of "enquire." Retrieved April 29, 2011, from http://oxforddictionaries.com/definition/enquire

Suzuki, S. (2006). *Zen mind, beginner's mind*. Boston: Shambala Publications, Inc.

Karen Gallas taught for more than thirty years in urban, suburban and rural public schools as an early childhood and elementary teacher. Her publications include numerous articles and four books, *The Languages of Learning, Talking Their Way into Science, 'Sometimes I can be Anything': Power, Gender and Identity in a Primary Classroom*, and *Imagination and Literacy*. Her involvement in education continues through consulting with schools, colleges and universities, museums and teacher research groups. She also works with children and adults as a psychotherapist and a yoga teacher.

Commentary:
When Art Speaks: One Student's Inquiry Process

Alexandra Hillcoat

ABSTRACT

In this interview, Alex Hillcoat, a cycle three elementary school student, shares her experience in developing a special project related to the life of artist Marie Laurencin. Her project included several creative art forms: poetry, painting, writing, crossword puzzle making and even developing a museum floor plan with the works of the artist. Alex reflects on how perseverance in her research served her well and how these skills will be useful for her in the future. Finally, she has practical advice for students engaging in similar projects as well as for their teachers.

I want to speak to you today about a project you did at school in cycle three elementary this year. First of all, can you tell us how the project was introduced to you by your teacher?

Our teacher—we had just finished the last theme and she always introduces our topics by opening up a PowerPoint project that she made and starting off with a question. She started off with the question, "Art speaks. What does it say?" and then there's this whole thing of answering the question and then she told us about the art project. For the past years we've been watching the grade sixers do the project and always at the end the rest of the school would go and watch them. So it's really exciting to be the ones in grade six now. Our teacher gave us a paper that said, "Choose the artist you want to research." We went to choose.

Can you outline what you were expected to do in this project?

What we were expected to do is to take a three-sided Bristol board and choose three of the options she gave us to explain the life of our artist. So we had to find 20 facts to start us off and that would be used to make the three items, the three options we each chose, along with a poem. We had to explain the artist's life using just those materials.

How did you decide to do your research on Marie Laurencin?

Marie Laurencin was on one of the lists she gave us and there was two girls—and I wanted to do a girl, just didn't want to do a boy—and I also wanted to do one that no one had ever done before. So, one of them, Marie Cossette, plenty of people had done her before but with Marie Laurencin I realized I hadn't seen anyone that had done research and I looked up her life and she had an interesting life so I chose her.

How did you go about doing your research?

I typed in her name and I chose anything that looked interesting. I read the little like—in Google there's the title of what the website's called and then there's a description of what's in the website. So I'd look at that, find it interesting and I'd click on the link. At school our computer teacher found this tool on Google where you typed in something that you wanted to find and it would give you what to type in to find exactly what you wanted. So I did that and slowly picked up little pieces.

What are some of the products that you produced?

So one thing I did is a crossword and I found a crossword-making website. It took me a few tries because a lot of them wouldn't let me print the actual crossword part. The questions were about her life so someone who had been listening to me when I had done my presentation, they would have been able to answer the crossword. And then I made a poem. It's based on the five senses. Basically I chose a painting and it's what I think would be in the painting if you were to actually step in it and what it would feel like. I also made a painting that I think she could have made because she painted scenery, she painted a whole lot of things. One of the things I

found when I was looking at paintings by her is that there were a lot of women with dogs. So I painted—I tried to at least—to paint a picture of a woman with a dog and then I had to write what I would call this painting and why I tried to paint it.

Fig. 1: Highlights from the Marie Laurencin research project

What are the main things that you learned about Marie Laurencin as a result of your inquiry?

First of all I never learned about the Impressionists before, the Impressionist painters. I didn't know anything had happened like that in the world. I learned that she, at first, was going to be just like everyone else, painting mythology and everything, but she was inspired by the other Impressionists, so she started to paint, to become an Impressionist artist even though she knew the consequences.

What did you learn about doing research?

I learned that you have to keep trying to find things even though it seems impossible. I searched so many websites and got only teeny bits of information about her. I found that when there was supposed to be a whole biography of her that it was a paragraph that didn't explain half of her life. It was hard but I went through, like, a million websites and finally collected the things I needed.

One of the things you did in your project was a floor plan of a museum. Can you talk about this?

Alright, so the floor plan. I didn't know what floor plan meant. I had to look it up on the Internet and try to figure out for myself what it was. So I found pictures of it on the Internet. There's another boy in the class who did it. He just did a room separated into teeny bits—there wasn't even any doors. I wanted to make it a bit different so I made different shapes with rooms. I put very detailed things on it. I put the paintings I liked most that she did in the rooms categorized by scenery, or dancers and with the one I did "le pont" in the middle in the scenery one. And I tried to be creative as I could. I put benches, garbage cans, a ticket booth, an information booth, the museum place for a tour, where the tour would start. And then I had to explain in each room why I put everything there, why I wanted to place that there.

What would you say to other students who are working on projects?

First of all don't try to do it all at once. It may seem like you're getting it over with but it's actually much longer because you start not wanting to do it anymore. So if you do it in small bits then you get it done faster even though it seems [it would take longer to do].

What would you say to teachers who want to assign projects?

Don't give them a due date that's so close that they have to do it in one night or whatever, because it's not always such a good project and it's kind of stressful if you have to do it in one night.

Last of all, what have you learned from this inquiry that will help you in the future?

Just keep trying. I'm going to have to research things in the future, that's for sure. I'll have to do many things like this in the future and if I have to get more than 20 facts it's going to take even longer than the hours I spent trying to get information for this. Basically just to keep trying and not just say it's not out there, I can't find it.

Alexandra Hillcoat is a grade six student in Montreal. She has two sisters, a dog and a cat. She spends her time hanging out with her friends, snowboarding in the winter, camping, hiking and longboarding in the summer and loves to read and write. She is currently working on a fantasy adventure novel.

Commentary:
Reflections on Literacy, Education and a Twenty-Year Inquiry Process

Sandra Hollingsworth

ABSTRACT

In this interview Sandra Hollingsworth describes a unique experience in open-ended inquiry that lasted over 20 years. As a new professor at Berkeley she began with a study of her teaching literacy to preservice teachers from a traditional anthropologic perspective. When the study showed that her students had learned "nothing," she invited an informal group of them to share their experiences as beginning teachers learning to teach reading. The group transformed with time and became recurring occasions for all to reflect and learn about topics like social justice in urban schools, multiple literacies, race and other teaching issues. She describes some of the challenges the group encountered when trying to publish its findings and some of the key things she learned from participating in this inquiry—such as the importance of longitudinal inquiry. Finally, she introduces fellow members of the group and describes their current professional endeavours.

There is a wonderful story of inquiry in your book on "Teacher Research and Urban Literacy Education: Lessons and Conversations in a Feminist Key." I wonder if we might talk about this work. First, can you describe how your group came together, who you were and how the focus of your work came about as a result?

Twenty-five years ago I was a new professor at Berkeley—that is, the University of California at Berkeley—and I was assigned to teach literacy classes. I also taught a course on action research and because of the interaction

of the two I decided to study my own teaching of the literacy course through traditional qualitative methods. I hired Marsha Smith, a graduate student in anthropology, as a research assistant. During the two-semester course, she took notes on every lecture and interviewed students about what they were learning about my teaching of literacy.

At the end of the year I felt very happy; I'd thought I'd done a very good job and that those teachers-to-be had really learned a lot from me. Because I was a literacy teacher and a grade one teacher, I was very happy to share also my professional knowledge from my master's and doctoral programs on literacy. I thought I had done a very good job. So I asked Marsha to send me a paper on what she had learned. At the end of the second semester I didn't get the paper, nor did I get it during the summer. I was a little frustrated.

At the beginning of the next term I said, "Marsha, I really am anxious to read what you wrote and what you learned about this course." She said to me, "Oh Sam (that's my nickname), I just filed that in our project file cabinet before I left for the summer. I didn't think you'd really want to read it." And I said, "What"? And she said, "I don't think you're going to like it very much." And when I pulled it out and read it, I was, indeed, totally astonished, in spite of all my expertise, the reality was that my students didn't learn very much about literacy at all. After I got over my shock and put my brand-new professor hat in a drawer, I decided I'd better learn what happened. There were fifty-two students in the class and I asked for any volunteers who wanted to stay with me during their beginning years of teaching so that I could learn from them. I think at the beginning there were maybe 10 or 12 who volunteered and we met the first evening in my home. I opened the conversation by saying that I really wanted to know what happened in that class, and also I wanted to be with them while we were applying principles of literacy in their beginning teaching years.

That approach totally backfired! They didn't say anything except some perfunctory comments that were meaningless. They definitely didn't want to talk about reading. What they wanted to talk about was what they'd noticed about social injustice in their beginning year. (I'd like to add a footnote there: that became our focus, sort of, social justice in urban schools). Some of the group who were not interested in that topic left and we wound up with six of us. But I didn't know how to continue, I really didn't know how to get the information that I wanted. I had a national U.S. grant and I knew I had to report and publish on something about the beginning teachers' learning to teach, I just sat there and listened to them talk.

Learning how to get the "real" information involved a lot of change, actually, within the group—and in every aspect of my life. I knew I still had power as a university member of the group but I had to be aware of that power and when to step back and when to allow the conversation to go where it needed to go, rather than for me to control it. I also had to develop a different style of inquiry because the traditional style was not going to work. We started where they were with the politics of schooling and then it wasn't until our second year that they really became interested in how a new teacher would teach literacy.

Will you tell us about the process over that time and some of the highlights and challenges you faced?

We had to challenge, all of us really, our thinking about traditional teacher education and the apprenticeship approach where student beginning teachers are supposed to learn what they're to do—and then apply it. Also, we had to—of course this is mainly for me—let go of the idea of methods of study that involved objectivity and generalizations. We eventually evolved into what we came to call a collaborative conversation, as both support for learning to teach and a means of studying the process of our learning. Now what I mean by that is we became—over time—a safe conversational group where we could raise problems with practice, real problems that we were experiencing, exchange ideas, challenge each other, reformulate ideas and then we all returned to our classrooms and came back the next month. We met socially at someone's home with a potluck once a month for twenty years. Over that time we began to understand the complexity of teaching for social justice in urban schools—a much broader concept than just learning to teach literacy.

Other challenges we had were how to collect and analyze the data, because that was certainly something that would have to be described if we were to write up what we were learning. We tape-recorded every conversation, had it transcribed and then collectively looked through for emerging themes and patterns … so it took a long time. In our book you refer to, we actually went on a retreat and we all had copies of the chapters that we had written and we all commented back and forth. It was a very collaborative process on coming out with what we'd learned, and of course the learnings were very different depending on who we were in life, where we stood, our histories and backgrounds … but it felt like an honest inquiry process.

The next challenge was publishing because major journals really didn't understand this methodology at all. We had a great deal of trouble getting published

initially; there was, as you know, a single author, a first author, that created a big struggle for us (and publishers) to come to terms with how that would play out. It actually was a Canadian journal, "Curriculum Inquiry," that chose to publish one of our first collaborative pieces. After that, we were able to publish as a group for many, many years. Related to that, we presented at many conferences in the U.S. and Canada and in the U.K. and Australia. Many times people didn't understand the collaborative process of presenting and they would ask the teachers to sit down and for me to do the explaining because I was the "expert." In fact, when we presented the first-year results of our work to my colleagues at the University of California-Berkeley, many left the room early on because listening to teachers was not the "norm." The other aspect of the conferences was that my travel, of course, was paid for but the teachers in our group could not get released from their schools—they had to use sick leave to attend…and pay their own expenses. I started, with Karen—a graduate school research assistant and middle school teacher—and her husband Woody, a foundation to help pay some of the teachers' travel expenses.

Personally within our group, we had some major interpersonal challenges. One of the biggest was the issue of race and our own racism. We struggled with that topic from about the fourth year together. I'm not sure that any of us would ever say that we came to a final understanding of the role of race in teaching and learning, but we continue to struggle with that. Secondly, I moved to Michigan State University and didn't know how we were going to continue our monthly meetings. What the group decided to do was to tape their meetings, then mailed them to me. I had the tapes transcribed, and we continued the process from long distance.

Three years ago we stopped having our meetings because of one of our life partners—who had supported our group all of this time—died, and we all felt we had semi-finished the process. We planned on writing a final chapter together at the end our careers where we all are now. So I guess this is the final chapter!!

Can you explain the most important things you've learned during this inquiry?

In addition to the actual methodology of conversational inquiry, I learned the importance of praxis, or the relationship between thought and action, subjectivity and objectivity, theory and practice in learning to teach. The practical use of that was critical action research to achieve social justice in our teaching, including our own self-reflection and changes. The idea of praxis was so important that we did not do research on an instructional method but looked instead at the method through

the relationship between us in our group and our outside—teachers and students in our classrooms—both of which resulted in learning to read or learning to teach reading. I changed my teaching absolutely to that approach and have had much better results over the years. The other point related to that is that I feel that the instructional perspective of practice informed by student and teacher relationships is the ultimate way to learn to teach both during pre-service and in-service education. Finally, I learned about the concept of multiple literacies, a concept that I may never have discovered without this open-ended inquiry process. We all want children and students to speak a standard school literacy, but we also want them to be appreciative of their home or community literacies and also their personal literacies which might stand in critique of both their community literacies and the standard way to read and write.

Looking back now, what might you do differently?

I struggled with that question and I talked to the group, and we couldn't come up with a thing. We talked about the importance of meeting informally, the importance of food, the importance about learning about ourselves and our teaching—but we couldn't think of anything that we would do differently.

What suggestions or advice do you have for others who might want to engage in this type of inquiry?

Jennifer Davis-Smallwood, one of our group members, wrote to me that she thinks it should be required that beginning teachers have an inquiry group during their beginning years of teaching. She called it a "caring focus group that won't let you get away with being sloppy in your teaching; you. . . have to justify your actions through student results." Fortunately now—many years after our book was published—there are many teacher-support projects. I think we are very fortunate that this has evolved into a very important way to learn to teach and also that teacher research/action research is also now very much supported as an inquiry method. We were at the beginning of those developments and we struggled for legitimacy, but now we are happy to say that those changes have occurred.

From my own perspective, I think we might want others engaged in inquiry to explore political aspects of education in inquiry. Too often, that's avoided. It's hard to talk about, just as it was hard for us to talk about race. It's hard to think in terms of power relations in schools and even in relationships impacting learning and teaching.

I particularly would hope that we look at less critique of the methodology and more critique of the broader system and the power relationships between them. I also think it's very important for those in inquiry groups to include the researcher in the research so that there's not a standing apart but a realization that we are viewed with more expertise than the teachers even though that realization is false. We need to be open and not judgmental in the inquiry. That's the hardest lesson I have learned—to just sit and accept that people did what they did for very good reasons and try to understand why, instead of critiquing them with my predetermined beliefs, but really be nonjudgmental and open to shifts in my beliefs.

Finally, I'd like to see much more longitudinal research. Snapshots are not that informative of the real questions of learning and teaching in classrooms. It's hard to get funded for longitudinal research; in fact, we worked most of our twenty years without funding, with just a perspective that we all considered a priority in our lives and something that we wanted to do personally as well as professionally. I'd love to see more research that's longitudinal in the way that ours has been.

Could you talk a little bit about the members of the group now?

We are all at the end of our careers. We started together in 1988 and the only one of us who has really remained in a classroom is Leslie Minarik. She's always been a second-grade teacher; she's always researched her practice; she's published extensively even though she didn't get recognition from her school or her district. She's going to retire next year after 25 years and now is personally working to support children in Swaziland.

Anthony Cody was an eighth-grade science teacher in a challenging Oakland, California school when we first started. As he's moved through his career he began to work in professional development for that Oakland school district, and 24 years later he continues now to work on teacher research with a professor from Mills College in Oakland. He's gone way beyond our group to other groups. He's well known in the state of California for his work on action research and he is going to retire also next year.

Mary Dybdahl, who began as a fourth-grade teacher and then went on to become a principal at two very challenging schools in Vallejo, California, is now director of curriculum and inquiry of elementary schools in Vallejo. If anyone has done any reading about Vallejo and Vallejo schools, it is apparent that it is one of the most

challenging place to work, but she has carried her spirit of social justice and the importance of inquiry in teaching throughout her career. She hopes within three more years that she will be retired.

Jennifer Davis-Smallwood worked as a classroom teacher, and then for many years she worked on real-life action research with kids learning in gardens and on farms—very fascinating out-of-school learning that should inform all of our work.

Karen Teel, at the time we began was a doctoral student and research assistant on a project and also taught social studies in the Richmond, California urban school district. She studied her own teaching as she was teaching African-American students, and invited an African-American partner, Jennifer Obidah, to look at her teaching and they would debrief in a similar way that we did in our group, and published a book called, "Because of the Kids," TC Press, 2001. Later she taught Educational Psychology at the university level and directed secondary teacher education in two different universities in California. Karen and Jennifer are about to publish their third book.

I continue to teach at the university level with action research as the centre of my work. It's the centre of my teaching, it's my own personal life … the project of social justice still is very strong with me. Beyond the stories in the book you've cited, I've collaborated with teachers and others at a challenging urban school in San Jose, California. That was very illuminating. The progress of the students was labelled so low, so I learned a new method of inquiry called "image-based research" where the children and the teachers actually use the changing image of their school within the district as an indicator of success. That work in San Jose, California along with our own work in our "Berkeley Group," I was happy to publish a book in TC Press (2000) called, "What Counts As Literacy: Challenging the School Standard," with Margaret Gallego—Leslie Minarik also had a chapter in that book.

I retired from San José State University in 2008 and I am finishing up helping with a doctoral program for school superintendants at UC-Berkeley this spring. If you think that inquiry for social justice is difficult for teachers, it's also extremely difficult for the administrators as well—there are so many political challenges to urban education. I've also been working internationally with action research through U.S. aid-sponsored literacy and assessment programs such as the "Early Grade Reading Assessment." I've been privileged to work with schools and ministries in Pakistan, Haiti, Ethiopia, Mali, Niger, British Guyana, South Africa and now in Nigeria. I too am hoping to retire in a year or two.

Sandra Hollingsworth is Visiting Professor at the University of California, Berkeley and a Professor Emeritus of Teacher Education at San José State University. A former published historian and K-12 classroom teacher, Dr. Hollingsworth studied teachers' understanding of the equity issues in minority students' literacy development throughout her career. She recently co-edited the *American Educational Research Journal — Social and Institutional Analysis*. Dr. Hollingsworth now works in developing countries to support literacy including South Asia, the Middle East, and many countries in Africa.

LINK TO:

https://www.eddataglobal.org/

https://public.me.com/samholl

Commentary:
Writing Picture Books

Jane Yolen

ABSTRACT

In this interview Jane Yolen, award-winning author of children's picture books, talks of how her books come into being and the sometimes long period between the first spark of an idea and the time writing begins. She explains the many types of research that can be required for different types of books, giving examples from her own work. She also provides insight as to the role of the writer, the illustrator and the editor in creating the final version of a children's picture book. Finally, she reveals her own favourite children's picture books and gives advice to those wishing to write in this genre.

The theme of this issue of LEARNing Landscapes is "inquiry" and we're trying to get as many different perspectives on how people do inquiry. We thought it would be both interesting and inspiring to hear from an eminent author such as yourself and to learn how you go about creating a book. Can you describe the process you engage in from the onset of the idea or question until the work is completed?

Sometimes the time between when you get an idea and when you actually figure out where to go with it may be years, even in a picture book. "Owl Moon," for example, was based on my husband's taking our children owling and I knew I wanted to write about that but from the moment I knew I wanted to write about it until I actually started sitting down and writing something that looks like "Owl Moon" was probably about 15, 20 years. So sometimes there's this encysting of a pearl, but it takes more time than anybody knows about except the writer. So that's a hard question to answer.

Can you say a little bit about the ingredients that go into the process even if it's over a long period of time?

Well, first of all there has to be a moment when something real—and I don't mean it has to be actual. It has to be real inside the writer and that connects with an emotion. So, an element of the story has to connect with an emotion and that's when—for me at any rate—everything starts to come together. For example, I had the idea of a father taking a child owling, that was the idea but I needed the emotional grounding, the base of what the story was going to be about. Interestingly enough it didn't come together for me until my children were grown and two, I was not at that moment living in the U.S. next to the Owl Moon Woods, I was [living] in Scotland. It's almost as if I needed distance from both the children and the place to see it more clearly. Now that doesn't always happen. Sometimes a picture book comes whole cloth. A book such as "How Do Dinosaurs Say Good Night?" was a whole-cloth book. But with "Owl Moon" I needed that kind of distance, a kind of recollection in tranquility of the particular memory that became so strong and so powerful inside of me that I turned it into a story. So then it was no longer just a memory, but a story.

Of course there are other things that go on when you're writing a picture book. When I teach picture book writing to students I say that there are ten words that every picture book writer needs and that you must keep clear in your thoughts, even if not thinking about them every moment. Those ten words are *lyricism, compression, child-centeredness, focus, hook, words* (because we don't dumb down the words, we use the right words), *illustratability* (key in picture books, you have to write something that can be illustrated). And then, as in any other kind of writing, there has to be *motion, emotion, resolution*. So those are the ten words that I tell them. The difference most clearly when you're writing a picture book is the illustratability because [in] other kinds of writing—though you need lyricism and some sort of compression, especially if you're doing poetry, and child-centeredness if you're doing any kind of children's books whether they're for young children or middle-grade children—it's that illustratability that's key for the picture book.

What kind of research do you carry out to pull together the ideas for a book?

Well, it depends on the kind of book of course. If it has a historical basis you're going to do historical research. For "Owl Moon," I had my husband right there. He was very well considered within the birding community and so I could check with

him: what would you be doing in the wild? What does a Grey Horned owl sound like? That sort of thing. I'd gone out owling with him, had heard owls calling. We had more books in the house about birds and birdcalls and what else is going to be out in the winter woods than you could shake a stick at. So even if he hadn't been around I could have done my research easily. But let me mention three other picture books that I've done recently. One is the dinosaur books. There's not a lot of research in those books. They're bouncy and rollicking. The research, if you think about it, has to do with what issues do we want to attend to in the next dinosaur book. Do we want to deal with anger, do we want to deal with birthdays, do we want to deal with how to treat your cat or your dog. So talking it over with the editor is really the research there, about what things we want to pinpoint within the book. Then I did a picture book called "All Star" which is about the life of Honus Wagner, the great shortstop in the early days of baseball. That needed a tremendous amount of research. I read about four, five or six books on Honus Wagner and more on early baseball in order to write, oh, I don't know, 1800 words? Because you had to know as much as you could possibly know in order to bring it to the lyrical level and still be talking about Honus Wagner. The third picture book that I want to mention is a picture book that J. Patrick Lewis and I did, in poems, that's coming out, about the life of Chagall. So again we had to read books, we had to look at his paintings because we were tying each poem to one of Chagall's pictures but also to his life. So we were doing research both in his life, in Vitebsk where he came from and his early life in the old country, then during the time of the Nazis and what happened to him there… but also, as much as we could read about his life, we also were reading about his art. So those are just three possible ways where research comes in to writing picture books, but in very different ways.

Obviously the final representation of a book as an author is particularly important. What are the kinds of things that you consider when you are putting your book together in its final form?

First of all you have to understand that only very, very rarely does an author get to choose an illustrator. This is the provenance of the editor and the art director at the publishing company. Now, they will consult with you, they will [tell] you, "We were thinking of so-and-so" or "Here are five illustrators that we've been considering." You may have talked ahead of time with them about the kind of art, you may even have suggested a couple of illustrators to them. But none of that guarantees they will choose any of those illustrators. So, remembering that, the next step is that the writer will probably be sent sketches, especially if it's technical stuff. For Honus Wagner I sent a couple of the books I was using for research to illustrator James Burke because

there were some interesting photographs and memorabilia in it that I thought he might be able to use for the pictures. If something is technically wrong—say you say in the book, "She raised her right hand and waved at the owl" and the picture shows her waving her left hand at a crow—then you have a problem. There are two ways to solve that problem. If the pictures are only in sketch stage, the illustrator can change it. If the illustrator has already finished the picture, the writer has to decide: "Is it important for her to raise her right hand or her left hand?" If it didn't matter, the writer can change it to the proper hand and proper bird. However if it matters that it's an owl and not a crow then you have a further problem. Either the illustrator has to re-illustrate which is a long and laborious process or you have to find another way around it.

Can you give us maybe four or five key things that you would look for in a final picture book that would set it up as an interesting and exciting type of inquiry that has reached fruition?

I'm not quite sure I understand the question because once I've finished the manuscript and it's been revised for the editor, and once the illustrator has done his/her magic, and perhaps I've done some more revisions in order to have the two connect in a more interesting or better or more compressed fashion, I'm done with the book. I can look at it and say, "This book has won the Caldecott, I love this book." Or, "Oh my gosh, I loved this book and it sank in six months." If a book wins a prize or doesn't win a prize or it doesn't do well it does not necessarily mean it's good or bad, because that's in the hands of the gods, that's fairy dust. There's no way that an author can really influence that. You can get out there, you can sign books, you can talk to people, you can write about the book on-line, do bookstore events, but in the end the writer really cannot influence what happens to the book, how it is seen, how it is used in classrooms, whether the book becomes a hit.

I wonder, if you were a judge of a book, what kinds of things you would be look-ing for?

Shall I tell you some of my favourite picture books—I mean not any of mine but in general? I loved "Where the Wild Things Are" and "In the Night Kitchen"; I love a book by Barbara Berger called, "Grandfather Twilight"; I love a book by Florence Parry Heide, "Princess Hyacinth: The Surprising Tale of a Girl Who Floated"; I love a recent book by Lane Smith called, "It's a Book." I like witty books, I love beautifully

written and illustrated books, I love books that make me laugh and books that make me weep. I don't like the endless repetition of the same kind of "I love you" books; I don't like the fart books and the poop books that are coming out now. I just find them distressing. But that's very old-fashioned of me.

Finally what suggestions do you have for authors about doing the research or travelling the journey that is required for creating a book, a thesis, a research project?

The first thing for anyone who wants to do a book for children is to sit down, and for several months do nothing but read books for children. Read the ones you remember from your own childhood and then read the ones that are winning the awards now, and the ones that are the best sellers now. Because you don't want to keep reinventing the wheel. That's the first thing. That's the first basic research that anyone should do who wants to get in on this. This is why I hate it when celebrities come in and they say, "Oh, I can't find any good books for children so I'm going to write one," which just means they haven't read anything.

Next, it depends on what kind of book you're doing as to where you are going to go for the research or the research element of that book. Again, if the book is historical, you may visit where it took place. If it's a book about emotional content, you're going to go research somewhere else for that. Perhaps, go inside yourself, or your children or your grandchildren or your neighbour's children to find out about that emotional moment. If you are writing a book that seems straightforward but then realize you don't know, for example, what animals would be out in the winter time or, what songs the birds would sing as you're walking along, or what trees are in bloom as the child is going on a spring visit to grandma's, then you need to find out. There are things that we take for granted, but once writing them down, the author needs to find out if they are true. If I have someone tromping through the woods and stepping on flowers in the springtime and the flowers I have chosen are fall flowers, that's a big mistake. I certainly don't want to send the story off to an editor, who may live in New York and may not know any better than I do about spring flowers. If I'm retelling a fairy tale, I need to make sure it's an old tale, not a new tale that someone else has told or written for the first time. If I want to quote a line of poetry or song lyrics, I may need to get permission, so that's another kind of research. There are all kinds of research pitfalls that the writer may fall into, even when writing something as short and as compressed as a picture book.

Photo credit:
©Jason Stemple

Jane Yolen, often called "the Hans Christian Andersen of America," is the author of over 300 published books, including "Owl Moon," "The Devil's Arithmetic," and "How Do Dinosaurs Say Good Night?". The books range from rhymed picture books and baby board books, through middle grade fiction, poetry collections, nonfiction, and up to novels and story collections for young adults and adults. She has won two Nebulas, a World Fantasy Grand Master Award, and been named a Grand Master of sf/fantasy poetry by SFPA, the Science Fiction Poetry Association. Six colleges and universities have given her honorary doctorates.

LINK TO:

www.janeyolen.com

Owning Our Learning: Scaffolding Professional Inquiry for Educators

Willow Brown, University of Northern British Columbia
Sabre Cherkowski, University of British Columbia Okanagan

ABSTRACT

The authors advocate *professional inquiry* as purposeful, site-based learning for teacher leaders and school administrators. A key argument, *social symmetry*, proposes that creating engaged, inquiring learners requires teachers to own their learning through professional inquiry. A four-meeting model scaffolds collaborative inquiry from problem framing, through experimentation, and toward new convictions and commitments. The design of this professional inquiry platform has been informed by action research and school improvement and inspired by 21st Century Learning.

ormative assessment experts have advocated a series of instructional innovations, from clear learning intentions and criteria to descriptive feedback and goal setting, all aimed at developing students who *own their learning* (Kaser & Halbert, NPBS website, n.d.; Black & Wiliam, 1998). Learners who have achieved the ultimate goal, a sense of ownership, understand their unique strengths and needs and routinely identify personalized goals. Familiar with inquiry processes, these students can frame and pursue personally meaningful topics of investigation and share their discoveries in their own confident voice (Brown, Klein, & Lapadat, 2009). They know what they want to work on next and their learning has been energized by the ability to make these choices. Recent case studies have established that developing school-wide student ownership of learning in an elementary school is indeed possible and of great benefit to the young learners (Koehn, 2011).

However, in our experience as teacher educators and school improvement researchers, schools where a majority of students own their learning are rare. To bring about this kind of energized learning on a broad scale, we have contributed our efforts to the formative assessment movement that we believe has great potential for creating schools that are sustainable learning communities for both children and adults (Mitchell & Sackney, 2009), specifically through the British Columbia Network of Performance Based Schools (NPBS). Our learning partners in this Network are teacher leaders who have learned to create the conditions for student ownership by following a progression of six important strategies (Kaser & Halbert, NPBS website, n.d.; Black and Wiliam, 1998). They began by setting clear learning intentions and generating criteria with their students. After learning to provide feedback based on criteria, they branched naturally into routinely setting personalized goals with students and inviting students to shape their own inquiries. However, we also know of teachers who share their intentions and criteria with students but have not progressed toward developing student ownership of learning. As student inquiry gains significance as an instructional strategy (Alberta Learning, 2004), we believe that most teachers have had little experience with the kind of energizing and meaningful learning opportunities they are charged with creating for students. If we are to achieve widespread improvement in student achievement through increasing student ownership of their learning, we must pay attention to the conditions that create this sense of ownership of inquiry among teachers.

We have observed that teachers who are successful at moving toward student ownership of learning are inquirers themselves—constantly curious and empowered to ask questions as well as seek and share answers applicable to their practice. The watershed between teacher-directed and student-owned learning appears to lie between setting clear intentions for students and leading students to share in the design of learning that is both personally meaningful and connected to the curriculum. In this paper, we propose that an orientation to inquiry is a crucial ingredient for a shift toward ownership of learning, both in the teachers' experience and mental models and for students in the classroom. Teachers who "own their learning" engage in a continuous process of reflecting on their strengths as well as their needs to be able to identify their own personalized learning goals. In this spirit of inquiry, they pursue personally meaningful topics of investigation and share their discoveries in their own voice. The cycle of inquiry continues as they make meaningful choices about setting further learning goals. To facilitate this inquiry process, we provide a four-meeting platform, or scaffold, to support initial experiences with collaborative professional inquiry. Our model is a learning-oriented design situated within the field of school improvement and informed but not limited by action research

traditions. Focusing on professional inquiry and teachers owning their learning provides a fresh conceptualization of action research, a premise we develop more fully in a later section of this paper. Beyond the notion of social symmetry, a name that we have applied to a frequently mentioned phenomenon, our model is founded on three classic school improvement themes: a) creative tension (Lewin, as cited in Senge et al., 2000), b) single and double loop learning (Argyris & Schon, 1978), and c) the need for new beliefs to sustain new practices (Fullan, 2007).

Our Central Argument: Social Symmetry

Our central argument hinges on a common assumption in school improvement literature: *it is difficult for teachers to create, for their students, experiences and social conditions they have not experienced for themselves*. In the literature we reviewed for our studies of the development of professional learning communities, we encountered this phenomenon so frequently that we termed it social symmetry (Brown, 2004). Sarason (as cited in Mitchell & Sackney, 2009) described the phenomenon as a mirroring process in which teachers tend to view students the way administrators regard them, to anchor "traditional power dynamics across the system and perpetuate them in classrooms" (p. 150) and thus inhibit change. Mitchell and Sackney (2009) emphasized the notion as part of the reciprocity characteristic of living systems: "we return to one another the kinds of behavior that we receive" (p. 184). In our school improvement work and university teaching, the notion of social symmetry has helped us strive to create, for pre-service teachers and educators enrolled in master's programs in leadership, the kinds of experiences, relationships, and social conditions we hope they will create for their students. Our capacity-building purpose leads naturally to an emphasis on inquiry as a learning process that values the interests of learners and enables them to seek, synthesize and share meaningful information. Thus, the notion of social symmetry supports our interest in establishing inquiry as a characteristic of professional culture, both to energize educators for their own benefit and to build their capacity to create life-enhancing learning experiences for students.

More on Our Sustainable Professional Learning Community Framework

Our vision of ideal learning experiences and social conditions draws on Mitchell and Sackney's (2000, 2009) sustainable professional learning community research and theory. For these authors, interdependence, a key aspect of high-capacity schools, has grown from systems thinking (Senge, 2007) to an ecological model of life-enhancing schools that use "the power of meaning and purpose to align activities and to cohere practices" (Capra, as cited in Mitchell & Sackney, 2009, p. 178). As an ideal created from a composite of case studies, sustainable learning communities are filled with new life and energy as a result of a profound shift in thinking about learning. "Deep learning" (Mitchell & Sackney, 2009, p. 185) legitimizes knowledge through authentic, context-specific inquiry rather than through pre-determined standardization: prior knowledge of learners is respected and pathways to learning are not as controlled and limited, either by policy and top-down directives for educators or by provincial curriculums and teacher preferences for students. In an atmosphere of trust, both young and adult learners engage willingly in inquiries that address their own compelling questions and generate creative responses to real problems. Beyond this significant perspective of learning as authentic inquiry, the learning community framework has provided key words that capture the characteristics of a sustainable learning community: Wholeness, Awareness, Meaning, and Commitment. We have used these words to describe the phases of inquiry in our scaffolding model, thus enriching the traditional action research sequence of plan, do, reflect, and revise (Carr & Kemmis, 1986; Reason & Bradbury, 2008), with the understandings of change implementation and teacher/administrator learning we have drawn from school improvement research.

Origins of Our Professional Inquiry Platform

Our four-meeting inquiry model is a scaffold, or platform, to support teachers who are new to collaborative inquiry or to facilitating an inquiry process with colleagues. This model was developed in response to an authentic problem: teachers, administrators, and a researcher in an inner-city school in Saskatchewan (Brown, 2004) wanted to collaborate purposefully in a shared inquiry but needed a common language and clear process to support their journey toward learning community capacities. Since that time, we have applied and refined the model in collaborations with educators in the Yukon and in British Columbia, including: a) northern K-12,

post-secondary, and community educators seeking to erase racism in their practice, b) secondary teachers developing a scope and sequence to improve delivery of their mathematics curriculum, c) learning support teachers and their district leaders investigating the implications of a shift in their role from student pull-out to teacher support, and d) elementary and secondary principals inquiring as to how to lead for improved student literacy. Graduate students have also adapted the model to their own inquiries, as in Andrea Davy's study of the development of democratic discourse in a primary classroom (Davy & Brown, 2007) and in Jodie Baker's current collaboration with teachers for reflective implementation of a student inquiry platform.

We have facilitated a walk-through or simulation for our model at workshops for K-12 and post-secondary educators (Brown, 2007) and a recent version of the handout is available on a website that we have set up to support our research on multimodal literacy (Brown & Lapadat, n.d.). The handout posted on this site was designed to support school-based facilitators with guiding questions for each of the four phases of a collaborative inquiry as well as formats for five-minute journals (Philips, 1996) for participants to record observations between meetings. Supporting our definition of a learning platform as a document or template that scaffolds new instructional behaviours and helps develop the beliefs that will sustain those practices, we have termed this process, as supported by the handout as template, a professional inquiry *platform*.

Inspiring Literature

In addition to refinements to the process emerging from each project, we have developed our understanding of professional inquiry by synthesizing new reading with our existing framework, notably Timperley's (2005) analysis of effective forms of teacher learning, and Hattie's (2008) analysis of 205 studies of Enquiry-Based Learning (EBL), which established that student engagement in inquiry consistently produces transferable critical thinking skills, improved achievement, and improved attitude toward the subject. Hannon and Mackay (2010) have helped us link our work on student inquiry (Brown, Klein, & Lapadat, 2009) and *professional* inquiry, which may include any adult in the school, to principles of 21st century learning. To increase use of inquiry as an instructional strategy, Hannon and Mackay highlighted the following characteristics: inquiry is most effective when it is *purposeful*, or emerging from real community need; when it is *project-based*, when it is *publicly presented*, and most importantly to our platform approach, when it is scaffolded.

Recently, we have been inspired by the Learning Futures project, which has included over forty schools in England. In this school reform initiative, student inquiry is a key component: "how students learn is as important as what they learn, because learning is a skill they can carry with them for their entire lives" (Paul Hamlyn Foundation, Ideas page). "Students become 'expert learners' by learning through enquiry — formulating questions, researching, and experimenting" (Paul Hamlyn Foundation, Enquiry-Based Learning page), in contrast to transmissive learning, which develops a more narrow skill set based on listening, memorizing, and repeating. In a downloadable pamphlet that presents emerging findings on engagement, these researchers have proposed, as we do in this paper, that what schools need to do in order to increase authentic student engagement "is to become themselves more engaged — as learning communities, in learning outside school, in partnership with local communities and parents" (Paul Hamlyn Foundation, News page). We see the patterns of deep engagement that are emerging in the Learning Futures study, findings that deeply engaged learning is *placed, principled, purposeful*, and *prolonged* (Paul Hamlyn Foundation, About page), as contributing to a set of criteria by which we can consider deep engagement for educators, assessing and adjusting our professional learning platform design as well as self-regulating specific projects as they unfold.

Timperley's (2005) analysis of effective forms of teacher learning has suggested additional criteria for assessing the effectiveness of learning-oriented designs (Kaser & Halbert, 2009). Above all, Timperley has asserted that successful inquiry is evidence-based and focused on student outcomes, which we agree is the central purpose of schooling. Successful inquiry also serves a self-regulatory function for teachers and its theoretical understandings must have coherence with other initiatives, beliefs, practices, and values. Finally, successful inquiry results in subjective meanings or internal commitments that are derived from experiential evidence. To summarize Timperley's points, at the end of a successful inquiry, educators have made specific changes to practice that have demonstrated effectiveness for student outcomes and will be sustained through integrated skills, understandings, and values. We believe our professional inquiry platform has successfully met many of these requirements, with variation from project to project.

Professional Inquiry Platform Projects: Collaboration and Focus

Although the professional learning community (PLC) literature commonly refers to collaborative inquiry into student learning as a central process (Dufour & Eaker, 1998; Mitchell & Sackney, 2000), little is mentioned about precisely how to craft inquiry questions or structure meetings. A lack of focus and ineffective use of collaborative time is a common complaint when PLC implementation is not perceived to be effective. This platform may provide the support that is needed. We believe the process is best learned in an apprenticeship or workshop simulation, where participants in learning teams led by a skilled facilitator gain the experience to lead a learning team in their own workplace.

We encourage collaborative inquiry shared by teachers and administrators, if possible, acknowledging Robinson's (2008) finding that the single most effective instructional leadership behavior is participation in professional learning with teachers. Professional inquiry may be conducted by groups of teachers focused on problems or opportunities related to a specific grade or subject area, as in the secondary math inquiry, or questions spanning grades and subjects and even types of educational institutions, such as in the Yukon's *Erasing Racism* project. There are also times for independent inquiry. However, in the learning-oriented design of our inquiry platform, we aspire to make personal learning accessible to the group (Mitchell & Sackney, 2000) in order to build overall cultures of inquiry. Thus we encourage discussion of insights and findings with mentors or colleagues wherever possible.

To hold the attention of educators and to have lasting impact in practice, the focus of professional inquiry must be manageable within the context of busy lives and yet have meaning beyond the trivial. Our solution has been to draft a common umbrella question that unites the diverse interests of a group but allows each participant the latitude to focus on a specific, meaningful aspect of the inquiry. For instance, when principals in central British Columbia investigated literacy leadership, some chose to inquire into how to develop a school-wide sense of belonging to support learning and others moved directly to sharing reading comprehension strategies with teachers. The umbrella question gave the inquiry team a common purpose, making their discoveries relevant and their suggestions useful to each other.

An on-site facilitator may choose an inquiry topic, frame it as a question, and invite colleagues with similar interests to participate. Alternately, a learning team may

develop a common focus together. Groups may be any size but three to six members allows each member to participate actively and brings a variety of approaches that enriches learning from each other as well as from personal experimentation. In our largest groups, such as the learning support teacher project that we conducted at the school district level with more than twenty participants, shared sessions consisted of whole group planning interspersed with small group discussion, and most team members led a school-based inquiry cycle between meetings.

For an initial inquiry with an inexperienced team or facilitator, we recommend just four meetings of not more than ninety minutes, spaced evenly throughout a term to allow practice-based experimentation between meetings. For ongoing commitment to the process, it is important to avoid busy times such as start-up, reporting periods, and yearend. We have incorporated Sagor's (2000) advice on setting ground rules, inviting participants to make consistent attendance and participation a priority. However, in the interest of capacity-building, we have routinely allowed group membership to remain open, so that if the ongoing inquiry attracts the interest of new participants, they can be included from that point. We have also expanded a study beyond four meetings: experience with the process has made it evident that additional meetings at any phase could serve the unique interests and energies of a specific group.

The Professional Inquiry Platform

To make Mitchell and Sackney's (2000) learning community theory accessible to teachers, Brown (2004) designed a poster and a mural to present an image of a strong and interdependent learning community, a learning or *giving tree* (Silverstein, 1964), responsive to the shifting needs of students, families, and neighbourhoods. Rooted in principles of *wholeness, awareness, meaning, and commitment*, this image emphasized simultaneous learning at *personal, interpersonal*, and *organizational* levels, as symbolized in the leaves, the flowers and fruit, and the trunk and branches of a mature and productive tree capable of nourishing other life. As the collaboration unfolded, the four principles of a learning community, presented graphically in a circle around the tree figure, came to be used to describe the phases of inquiry that move learning teams toward learning community development, replacing and enriching the *plan, do, reflect*, and *revise* cycle common in action research. Here we outline the four phases of a professional learning platform, which are not intended to be rigidly sequential, and describe the guiding questions that help new

facilitators keep learning community principles alive in participants' developing beliefs and practices.

Wholeness

When an inquiry or learning team has formed and gathered for their first meeting, we invite participants to focus on a *catalyst* reading, presentation, or work-shop. This catalyst expands a whole team vision of what is possible and is the foundation of creative tension (Lewin, as cited in Senge et al., 2000), which energizes incremental steps toward the vision. We encourage team members to think of *wholeness* as a systems view in which all initiatives and responses are interconnected, so that change in one area may create unanticipated changes or tensions in others. In the Wholeness phase of inquiry, we have found it essential to create or review a collective vision of the ideal world the team wishes to create, through this and subsequent inquiries and other activities. A more practical next step is to generate, from the catalyst and from collective experience, a list of strategies that have potential to bring the vision to reality in classrooms and throughout the school.

An important aspect of the wholeness principle is uniting the group under a common *umbrella question* and valuing the contribution of each member, through the exploration of personal questions, to a holistic or gestalt-like group understanding. When common ground has been established, diversity of perspectives is appreciated as having potential to contribute to the learning of all participants. Freedom of choice within the overall topic allows participants to see their own inquiry as directly relevant to their work. As for student inquiry, choice appears to bring energy for learning and to energize the classroom or school-based experimentation that will contribute to the richness of reflection.

To summarize, a sense of purpose is established in this first phase of inquiry as creative tension, a clearly articulated difference between the real and the ideal, energizes the team to work toward a range of solutions for an immediate problem or to access a new opportunity. At this meeting, guiding questions build a sense of coherence between this inquiry and other initiatives, to combat the fragmentation that is a common enemy of school change (Fullan, 2007) and to build the coherence among innovations recommended by Timperley (2005).

Until the second meeting, participants are encouraged to make focused observations and record key words and phrases daily in a structured five-minute journal. The creative tension journal format helps build awareness of the difference

between current and desired practices and between current and desired student responses. We make it clear to participants that the small notebook we provide for their journal is their own property and will not be reviewed by anyone. The intended function of the journal is to jog participants' memories about strategies they have tried and specific student responses, to enrich dialogue with colleagues at the next inquiry meeting. However, we have also found that the physical presence of the journals reminds participants to find time most days to focus their thoughts on our collaborative project. When little or nothing has been written in the journal, as frequently happens, participants seem to have specific observations to contribute because of mental notes they have made with the intention of writing them later. Although we believe that short, frequent periods of written data collection are most effective, we appreciate all efforts and acknowledge that mental notes also contribute to collaborative reflection and to learning.

Awareness

Awareness is the focus of the second meeting, although developing keener awareness of the difference between the real and the ideal and data-informed awareness of the impact of actions are twin awareness themes that run through all phases of an inquiry. At this second meeting, facilitators invite participants to share insights from the creative tension journals they have been keeping, or intending to keep, since the last meeting. Regular references to the wholeness vision that was shared at the first meeting occurs as each participant identifies a specific strategy he or she will experiment with to try to bring the current situation closer to the ideal. Colleagues help each other to identify the precise classroom observations to be made or information to be gathered, in order to assess the effectiveness of the target strategy in terms of student response. Problems with implementation are anticipated and solutions brainstormed in advance, which becomes simpler when two or more participants choose to focus on a similar strategy.

The second session concludes with a review of how participants believe they are moving toward the overall wholeness vision or some aspect of it, to provide a sense of momentum or what Kotter and Cohen (2002) have called *short-term wins*. Until the next meeting, the *action step* journal format encourages participants to record the specific strategies they try and the student responses they observe, as well as subsequent adjustments to the strategy before the next round of observations. It is also made clear that participants are free to abandon and replace strategies when problems of implementation appear, for the time being, insurmountable or not currently worth the time and effort to redesign them. Although most participants

initially choose strategies that can be adapted over time to a specific group of students or teachers, alternate strategies are readily available as a result of discussing approaches chosen by other team members.

Meaning

The third meeting focuses on developing personal meaning from cycles of action, observation, and reflection. Inquiry team members begin to talk about how they have been integrating their experience-based beliefs with the perspectives expressed in the catalyst article and other readings, as well as with insights from colleagues. At this point, the classic notion of single and double loop learning (Argyris & Schon, 1978) comes into play, as valid single loop learning occurs when new skills and practices are developed, congruent with existing beliefs. For example, most of the participants in the Erasing Racism group did not change their belief in anti-racist education but they did come to a fuller understanding as to how discourse patterns in classrooms could be altered to help Aboriginal students experience less alienation. Less frequently, double loop learning occurs when core beliefs, assumptions, or mental models (Senge, 2007) are challenged by careful observation and discussion of student responses and beliefs begin to shift in a more transformative way. An example of double loop learning occurred in the secondary Math Scope and Sequence study, when teachers with only one or two courses in Math came to value collaboration as a culturally accepted way to access the experience of an entire department for the benefit of their students. Although the senior teachers and learning team leaders envisioned this orientation to collaboration as an outcome of inquiry, collaborative redesign of curriculum based on a shared understanding of student needs was a transformative experience for younger team members.

In the Meaning meeting, guiding questions alert the team to watch for surprises or anomalies in student responses. They are encouraged to reflect on beliefs that are not congruent with what they have seen and to consider alternate ways of thinking, which are often evident in a diverse group or can be suggested by the facilitator in light of readings. Participants are invited to begin to make value judgments about the strategies they have tried and the effects of these strategies, in preparation for commitments to all or parts of the new beliefs and practices. Until the final meeting, experimentation continues and the action step journals are used to note and reflect on reasons for *decision points*, the junctures at which strategies have been adjusted or replaced. Before the fourth and final meeting, participants think carefully about their developing convictions, the strong beliefs that integrate the research and professional literature with well-considered experience. They prepare to articulate commitments to practices that are more fully congruent with their convictions.

Commitments and Celebration of Learning

The fourth and final meeting is a time to articulate commitments to learning team members and to oneself, to articulate how each person believes his or her practice will be forever changed, even slightly, as a result of new beliefs and strategies developed in the inquiry. These authentic commitments may be written first but they are most likely to be sustained when they are read aloud with some ceremony, to cement them in memory and bring courage and conviction to ongoing practice. Inquiry team members can be witnesses to each other, affirming the growth that has occurred and planning to support one another to maintain commitments through obstacles. This is a phase that emphasizes celebration of learning rather than the reflective challenge that can be offered by critical friends. However, challenge occurs when inquiry team members identify remaining questions or newly discovered incongruities between beliefs and practices.

In the spirit of systems thinking as well as deepening spirals of inquiry, guiding questions bring participants back to the wholeness vision of the first meeting, asking how their sense of possibility may have expanded. Participants consider whether they are ready to invite others to join them in a new cycle of inquiry. The team celebrates together and makes plans to post the pages of the professional inquiry platform template, complete with notes summarizing conversations, to make the learning of this team accessible to colleagues and visitors.

Informed But Not Limited by Action Research Traditions

The rich scholarly tradition of *action research* informs our approach to professional inquiry. Reason and Bradbury (2008) described communities of inquiry "that engage in…systematic cycles of action and reflection: in action phases co-researchers test practices and gather evidence; in reflection stages they make sense together and plan further actions" (p. 1). However, we believe the term *professional inquiry* has more power to revive curiosity and establish a learning culture among educators. Our preferred term puts ownership of learning squarely within the realm of educators' professional activity and leaves a broader scope for investigating meaningful topics in meaningful ways. Tensions that complicate participatory action research, such as the insistence on full participation of co-researchers, the dual purpose of generating knowledge and improving the social condition (Greenwood & Levin, 2006), or emphasis on action before or after reflection, need not limit professional inquiry options. Although students may be participants in professional inquiry, it is not essential: unlike participative action research (Reason & Bradbury, 2008; Greenwood & Levin, 2006), empowerment of a community may focus on the

capacities of educators themselves, not necessarily on the group they will empower through improved strategies congruent with current and credible beliefs. Similarly, improvement of the social condition may occur when professional action and reflection improve the quality and equity of learning opportunities but a technical focus to improve instructional skills in alignment with expanding vision is also legitimate. Finally, professional inquiry may have a broader range of forms, including an action base, as outlined in our platform, or an analytical base, in which educators review and reflect on existing data to recommend a course of action. As described in Timperley's (2005) criteria, the key to professional inquiry is not in a narrow definition of the process but in the integration of practice, understanding, and values that constitutes learning about how to achieve desired results in classrooms.

Situating Professional Inquiry Within School Improvement

An environment of increasing anxiety around the ability of schools to prepare children for an unknown future, heightened with annual reports of international educational rankings (Fink, 2008), has been detailed in school improvement literature (Anderson, 2000; Harris & Chrispeels, 2006; Jacob, 2010; Ungerleider, 2003). Schools for the 21st Century are tasked with preparing children to become lifelong learners, creative and critical thinkers, collaborative team members, and inquisitive and democratic citizens (Canadian Council on Learning, 2010; Jacob, 2010; New London Group, 1996). Within this framework, teachers' roles have shifted significantly. Teachers are no longer seen as providers of static knowledge but as facilitators of information and resources for students' own inquiries through meaningful learning opportunities.

School improvement literature reinforces the importance of teacher learning to enhance student achievement (Timperley, 2005; Muijs & Harris, 2006). Increasingly, professional learning is becoming connected to concepts of teacher leadership (Muijs & Harris, 2006; Reeves, 2006). Similarly, teacher leadership is being seen as a foundation for successful school improvement (Lieberman & Miller, 2004; Muijs & Harris, 2006; Reeves, 2006). We argue that missing from the research is recognition of the importance of *social* symmetry—the opportunity for teachers to experience, for themselves, the inquiry opportunities they are expected to provide for students. A renewed emphasis on organizing schools as learning communities (Mitchell & Sackney, 2009; Crespo, 2008) provides a theoretical forum for placing teacher learning, particular learning through inquiry, at the core of school improvement initiatives.

In her work with the Innovation Unit out of the UK, Valerie Hannon highlights the need for school transformation based in practitioner-led innovations, particularly because of the historically slow rate of change through school improvement initiatives. She has argued that changes needed to develop a 21st century model of education to prepare children for the fast pace of change in a world of dwindling resources require a new way of thinking about school improvement. Rather than tinkering around the edges of existing school practices, Hannon suggested schools search for "next practice" through practitioner inquiry projects (2009, p. 24).

Unresolved Issues

In this section, we highlight a few of the unresolved issues that intrigue us. First, there is a tension between the self-renewing purpose of a learning community and our social symmetry argument, which may be seen as an instrumental purpose for professional learning, to improve student learning narrowly defined as improved test scores. Mitchell and Sackney's (2000, 2009) conception of learning communities is unique in that it acknowledges the intrinsic value of educators, beyond their role in improving student achievement. From this position, healthy social conditions in the professional workplace are valued as an end in itself, not merely as an end to a means. However, we do see student learning as the essential purpose of schools in a democracy and we wonder how we can hold this sense of organizational purpose in tandem with a non-instrumental respect for educators as human beings.

We see an irony in the tension between standards and standardization and paradox in the notion of ownership without financial control of scarce resources. Standards-based curricula have made it possible for educators to use benchmarks to assess student progress, as in use of the British Columbia Performance Standards, which fuels the evidence-based inquiries sponsored by the Network of Performance Based Schools. However, in our conception of ownership of learning, which we see as compatible with *deep engagement* as defined for Learning Futures schools, standardization is the enemy of engagement and curiosity. Finally, we question our own advocacy of ownership of learning: How can educators truly own their learning when professional development is funded by school districts and targeted to improve perceived system deficits? For each project, we wonder at what point organizational meaning and personal meaning will connect to create a healthy life and learning sustaining ecology? (Fullan, 2007; Mitchell & Sackney, 2009)

These are just a few of the tensions that remain, for us, unresolved, but with the potential to affect the design and delivery of future professional inquiry projects. We have tried to reduce ambiguity and confusion for those new to inquiry with a scaffolding process that is clear and purposeful. However, the story of trial and error in the development of our platform is largely untold. We urge readers not to assume that the process appeared effortlessly, without its own deepening spiral of experimentation, reflection, and revision that continued through several projects over a period of years.

Inquiry for Ownership: Personal Meaning in Professional Learning

The design of the professional inquiry platform provides a practical scaffold for the creative tension needed to shift schools toward Hannon's (2009) *next practice* and Mitchell and Sackney's (2009) *sustainable learning communities*. Both of these school improvement contributions assume that teachers need to move toward the mystery of learning themselves in order to create transformative changes in the students' educational experiences. We offer the inquiry platform as a supported opportunity for building skills to enact vision, as in valuable single loop learning; and to facilitate transformative, double loop learning occasionally when existing mental models are incongruent with research, theory, or student responses. Under the guidance of a skilled and knowledgeable facilitator, our professional inquiry platform has been shown to generate the creative tension necessary for bridging space between perceived reality and desired future possibilities, providing teachers and school leaders a way to engage meaningfully with the mystery of learning in their everyday professional lives.

We continue to challenge ourselves to engage more deeply with the phases of the inquiry platform, as we work with educators, pre-service teachers, and fellow scholars to refine our model. In writing this paper, we have discovered opportunity for further research in designing and applying assessment tools for the professional inquiry platform and for projects that follow this design. We plan to synthesize a set of criteria from the work of Timperley (2005) and others on effective teacher learning, with an eye to the patterns of deep engagement that are emerging in the Learning Futures study (Paul Hamlyn Foundation, About page).

A deep engagement in learning is required for shifting mindsets, beliefs, and practices—shifts that are necessary for achieving the student learning goals of 21st century education. As participants in our inquiry teams have engaged in the four phases of this inquiry platform, they have sharpened the skills that prevent grand visions from disintegrating into cynicism. With the help of inspiring authors and professional colleagues as critical friends, the shadows of hidden beliefs have come to light for conscious revision. Within developing cultures of inquiry, educators have come to identify incongruence between practice and beliefs as opportunities for cycles of action and reflection. As they continue to inquire with their colleagues in deepening spirals, we believe they will strengthen the integrity of their craft by aligning practice more closely with beliefs. This deep engagement in learning—the integration of practice, understanding, and values that constitutes learning about how to achieve desired results in classrooms—is at the heart of school transformation and is made meaningful for educators as they own their learning through professional inquiry.

References

Alberta Learning. (2004). *Focus on inquiry: A teacher's guide to implementing inquiry-based learning*. Retrieved January 12, 2011, from http://education.alberta.ca/media/313361/focusoninquiry.pdf

Anderson, K.D. (2000). School improvement and school reform in Canada…Whose perspective is it? *Ways Towards Quality in Education*. Conference Proceedings, Brdo pri Kranju, Slovenia, College of Management in Koper. Retrieved October 11, 2010 from http://www2.fmkp.si/zalozba/ISBN/961-6268-47-3/069-085.pdf

Argyris, C., & Schon, D. (1978). *Organizational learning: A theory of action perspective*. Boston: Addison-Wesley.

Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *PHI Delta Kappan* (1–12). Retrieved May 2, 2011, from http://www.easlinstitute.org/wp-content/uploads/Inside%20the%20black%20box.pdf

Brown, W. (2004). *Building a learning community through restitution: A case study*. Unpublished doctoral dissertation, University of Saskatchewan, Canada.

Brown, W. (2007). *ACT: Action circles for teaching*. Workshop presented at the annual meeting of the Society for Teaching and Learning in Higher Education (STLHE), Edmonton, Canada. June 15, 2007.

Brown, W., Klein, H., & Lapadat, J. (2008). Student reports in the digital age: An invitation to classroom inquiry on controlled research. *Networks Online Journal of Teacher Research 11*(9), 1–11.

Brown, W., & Lapadat, J. (n.d.). The Learners' Platform Network. Retrieved May 9, 2011, from www.learnersplatform.ca

Canadian Council on Learning. (2010). 2009–2010, *State of Learning in Canada: A year in review*. Executive summary. Retrieved October 11, 2010, from http://www.ccl-cca.ca/pdfs/SOLR/2010/SOLR-2010ExecSum-FINAL-E.pdf.

Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge and action research*. Philadelphia: Falmer Press.

Crespo, M. (2008). Leadership and conceptions of organization: Contours of the distributed perspective. *LEARNing Landscapes, 1*(2), 55–69.

Davy, A., & Brown. (2007). Turning show'n'tell into democratic dialogue. *Networks Online Journal of Teacher Research, 9*(1), 1–13.

Dufour, R., & Eaker, R. (1998). *Professional learning communities: Best practices for enhancing student achievement*. Bloomington, IN: Solution Tree.

Fink, D. (2008). Schools as centres of change not centres of blame: Constructing bridges between policy and practice. *LEARNing Landscapes, 1*(2), 99–111.

Fullan, M. (2007). *The new meaning of educational change (4th ed.)*. New York: Teachers College Press.

Greenwood, D., & Levin, M. (2006). *Introduction to action research: social research for social change (2nd ed.)*. Thousand Oaks, CA: Sage.

Hannon, V. (2009). The search for Next Practice: A UK approach to innovation in schools. Education Canada, *49*(4), 24–27.

Hannon, V., & Mackay, T. (2010, November). *Developing the BC learning agenda: Innovation and improvement*. Keynote address at the BC School Superintendents Annual Fall Conference: Personalized Learning in the 21st Century: From Vision to Action. Victoria, BC, Canada.

Harris, A., & Chrispeels, J.H. (Eds.). (2006). *Improving schools and educational systems: International perspectives*. London: Routledge.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.

Jacob, H. (Ed.). (2010). *Curriculum 21: Essential education for a changing world*. Alexandria, VA: Association for Supervision and Curriculum Development.

Kaser, L., & Halbert, J. (n.d.). Network of Performance Based Schools website. Retrieved May 9, 2011, from http://www.npbs.ca/

Kaser, L., & Halbert, J. (2009). *Leadership mindsets: Innovation and learning in the transformation of schools*. New York: Routledge.

Koehn, D. (2011). *A spiral of inquiry: Metacognitive reflection for all learners*. Paper presented at the International Congress for School Effectiveness and School Improvement (ICSEI), Limassol, Cyprus, January 4 – 7.

Kotter, J., & Cohen, D. (2002). *The heart of change: Real life stories of how people change their organizations*. Boston: Harvard Business Press.

Lieberman, A., & Miller, L. (2004). *Teacher leadership*. San Francisco: Wiley & Sons.

Mitchell, C., & Sackney, L. (2000). *Profound improvement: Building capacity for a learning community*. Lisse, The Netherlands: Swets & Zeitlinger.

Mitchell, C., & Sackney, L. (2009). *Sustainable improvement: Building learning communities that endure*. Rotterdam, The Netherlands: Sense.

Muijs, D., & Harris, A. (2006). Teacher led school improvement: Teacher leadership in the UK. *Teaching & Teacher Education: An International Journal of Research and Studies, 22*(8), 961–972.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66, 60–92.

Paul Hamlyn Foundation. (n.d.). *Learning futures: Engaging students, inspiring schools*. Retrieved May 2, 2011, from http://www.learningfutures.org/

Philips, G. (1996). *The school-classroom culture audit: Transformational instrument and process*. Issaquah, WA: National School Improvement, Inc.

Reason, P., & Bradbury, H. (Eds.). (2008). Introduction. *The Sage handbook of action research: Participative inquiry and practice* (pp. 1–10). United States: Sage.

Reeves, D. (2006). *The learning leader: How to focus school improvement for better results*. Alexandria, VA: Association for supervision and curriculum development.

Robinson, V. (2008). *The impact of leadership on student outcomes: Making sense of the evidence*. Melbourne: Australian Council for Educational Research. Retrieved January 12, 2011, from http://research.acer.edu.au/research_conference_2007/5/

Sagor, R. (2000). *Guiding school improvement with action research*. Alexandria, VA: ASCD.

Senge, P. (2007). *The fifth discipline: The art and practice of the learning organization (revised edition)*. Doubleday: New York.

Senge, P., Cambron-McCabe, N., Lucas, T., & Smith, B. (2000). *Schools that learn: A fifth discipline field book for educators, parents, and everyone who cares about education*. New York: Crown Business.

Silverstein, S. (1964). *Giving tree*. New York: Harper & Row.

Timperley, H. (2005). Distributed leadership: Developing theory from practice. *Journal of Curriculum Studies, 37*(4), 395–420.

Ungerleider, C. (2003). *Failing our kids: How we are ruining our public schools*. Toronto, ON: McClelland & Stewart.

Willow Brown, a classroom teacher for 16 years, received a master's from the University of Alaska Southeast and a doctorate in school improvement from the University of Saskatchewan. She now coordinates a master's program for school leaders at the University of Northern British Columbia. Her research interests include assessment and professional learning community development. Currently, she is interested in applying her experience with action research to develop new understandings of professional inquiry.

Sabre Cherkowski is an assistant professor in educational leadership at the University of British Columbia – Okanagan where she also serves as coordinator of the master's program in educational leadership. Her research interests include professional learning communities, teacher commitment, and teacher leadership. She is currently exploring the role of coaching as mentorship for increased professional learning in schools.

Stepping-Stone or Saving Story?

Trudy Cardinal, University of Alberta

ABSTRACT

Why does one enter graduate studies? What does it mean to do research on Indigenous education as an Aboriginal person? What is the significance of attaining a master's degree? In this paper I speak to how the experience of inquiring into the educational stories of five of my relatives, and into my own lived experiences, helped me understand the importance of stories and the impact of the autobiographical narrative inquiry on myself and my family.

Master's Research: Stepping-Stone or Saving Story?

Why does one enter graduate studies? What does it mean to do research on Indigenous education as an Aboriginal person? What is the significance of attaining a master's degree? These questions became important because in my graduate studies I experienced many tensions. Some tension revolved around choosing a research topic that would make a real difference in the lives of Aboriginal people. Other tensions revolved around my own feelings of belonging and identity. I doubted my ability to find the strength to carry the weight of stories I would be told as a researcher, and I wondered if I, a non-Cree speaker, distanced from the extended family and my mother's home community, was Indigenous enough to do Indigenous research. In the midst of my studies, while I pondered these questions and struggled to negotiate the tensions I felt around the questions, I was told that a master's degree was merely a stepping-stone to attaining a Ph.D. and not worth such soul-searching internal debates and especially not worthy of too much time out of my life. This "stepping-stone" phrase constantly bumped up against my lived experience, and I decided that if I was to feel confident engaging in Indigenous

research, then I needed to make sense of the tensions I was experiencing. Switching focus, I selected an autobiographical narrative inquiry as an appropriate avenue into my experiences as an Aboriginal student trying to become an Indigenous researcher. The process and product of the autobiographical narrative inquiry (Clandinin & Connelly, 2000), and the space created for the inquiry into my stories and into the educational stories of five of my relatives, helped me understand the importance of stories and the impact of the autobiographical narrative inquiry on myself and my family.

My research puzzle centered on my questions about the responsibilities of an Aboriginal graduate student choosing to engage in research with Aboriginal peoples in ethically responsible ways. The field text for the inquiry included two years of graduate studies writings: final papers, response journals, assignments, and life writings. As I moved from field text to research text, I identified tensions and bumping points I experienced in coming to understand Indigenous research. As I read, reread, and inquired into the field texts, I began to develop a deeper understanding of the impact of these moments on my identity, my stories to live by, as researcher in the making, and on my sense of belonging.

One of the field texts included writings about the final course in my graduate program, which required me to engage in a small research project with an Aboriginal community on the topic of Aboriginal education. The task was to seek out people's stories and determine common themes, to discover what issues in Aboriginal education existed for that particular community. As I pondered what this meant, I experienced the tension of imagining going to an Aboriginal community with which I had lost close ties and suddenly becoming interested because I had a need to fulfill a course requirement. Because of the short time frame, I knew I would not have time to reconnect and build relationships to the families who lived in the communities I imagined contacting. Building relationships was an essential piece of good research in both narrative inquiry[1] and Indigenous research.[2] These concerns pushed me to rethink the image of community that I held and to broaden the definition. I began to think of the little community of female relatives that I had constantly sought out in my studies to compare the university view of Aboriginal issues against the lived experiences of these trusted women. I returned to the core group of family members who had come along on my research journey. They were the ones who were always trusting and willing to give me their stories. They came because they wanted to help me and wanted to come to an understanding together. They also came in relationship. I returned to the women who had volunteered to join me every time I had a research assistantship that needed Aboriginal participants. They willingly

answered my questions and laughed with me at my initial awkwardness and my too-often repeated use of the word "right" when I was trying to remain a neutral, objective researcher. I realized that, as Aboriginal women living in an urban setting and connected through familial ties and a shared early landscape, we formed a community. We were not as close as we had been as children, and we were only getting to know each other now as adults. However, I felt the trust I had in the lived experiences and knowing of these women as well as the relationships we had formed were all necessary for me to engage in ethical and responsible research with Aboriginal people on Aboriginal topics.

In choosing these women as my community, I negotiated a way to feel less tension engaging in research that was personally so very close. As an Aboriginal woman, mother, aunt, teacher, and family member engaging in research on topics involving Aboriginal issues in education, I found the task to be complicated and tension filled. As I pondered statistics that predicted a "lifetime of poverty" for the disproportionately high number of Aboriginal youth who would not graduate, I saw the faces of loved ones and family members filling those categories (Mendelson, 2006, p. 24). I felt distress and panic. I was also uncomfortable feeling the responsibility held in the little flickers of hope and faith that I imagined existed in those who believed that through my research I would be able to answer these hard questions and bring understanding to our lived experiences as Aboriginal students. In narrative inquiry, relationships and coming alongside of participants is key (Clandinin, 2006, p. 48). As the trusted women became participants, they also became co-researchers. Together, we composed an understanding of lived experiences through the retelling, the narrative inquiry into the lived and told stories (Clandinin & Connelly, 2000). In the conversations between myself and my relatives on their education experiences as children, as adult students, and as mothers or aunties, we came to understandings that were more valid than inquiries into the experiences of people with whom I had no relationships. I came to better understand the process of narrative inquiry, a process that allowed time to inquire into each story alongside my participants. Most importantly, I felt less tension as an Indigenous researcher who felt disconnected from her Aboriginal roots when I worked alongside friends and family.

While narrative inquiry provided a way to work around some of my unease, I quickly realized how naive my understanding of the complexities of engaging in research with humans really was. I was reminded of how all research projects exist in the midst of lived lives (Clandinin & Connelly, 2000, p. 20) when life did intervene in the middle of my little research project. The day I finished interviewing the second of my planned five participants, family tragedy struck. A cousin unexpectedly died. I

abandoned the research for a week and headed home to join my loved ones. Together we rallied to cope with this latest loss. This gathering together in ceremony, remembering and honouring the life of a loved one, tightened the bonds that united us and brought us even closer as a family. I recall gathering at the community hall, surrounded by the family and friends from whom I had felt so disconnected the week before. I felt again the strong bond that still existed in their welcoming, open arms for all who gathered that day. My course work faded far into the background, and the lived experiences of the family who had lost a mother, a sister, a cousin, a friend, and a loved one made me stop and question again what it meant to be an Indigenous researcher and what impact research, even mine, would have on these humans for whom I cared so deeply.

I eventually completed the final three interviews. In the inquiry space created with the same family members touched by this recent death, relationships were key. The conclusions I reached and the paper I wrote attempted to honour the sacredness of the stories told. With care and tenderness, I wrote to understand and to respect the gift of stories I had been given. I wrote to give back to those who always, for the two years of graduate study and for much of my life, gave so willingly to me during processes of becoming graduate student, researcher, and Indigenous scholar. The seriousness of research and the necessity of ethical considerations became very clear as I sat alongside relatives while finishing interviews with the grief of our most recent loss fresh in our hearts (Kahakalau, 2004).

Loppie's (2007) words help me describe the process I engaged in with this final course project. I found it

> both intellectual and intuitive . . . based on my relationship with the women [and] evolving knowledge and understanding of [Indigenous education]. . . . This process was also emotionally, psychologically, and spiritually laborious, because it required the prolonged and intimate engagement of my consciousness regarding the challenges continuing to face Aboriginal women [who were an intimate part of my extended family]. According to Indigenous scholars (Battiste, 2002; Castellano et al., 2001; Smith, 2000), this engagement of multiple capacities is crucial to learning, particularly with respect to the historical and sociopolitical context of Aboriginal women's lives. (p. 277)

That paper I wrote represents some of the understanding I was beginning to develop when I finally allowed myself to be in relation as I sat across from a

research participant and asked her hard questions about her educational stories. Sometimes there were tears, sometimes there were difficult stories to hear and to tell, often there was laughter, and always there was caring. I inquired into this experience carefully because of the deep impact it had on my understanding of both narrative inquiry and Indigenous research and the impact it had on me as a person. The conclusion I reached in the paper represents some of the knowing I came to in two years of graduate studies. I had yet to engage in the autobiographical narrative inquiry process in my thesis study when I wrote that paper. But as I look back, I note how I attempted to take a moment of reflection within this final class project to try to articulate my emerging understandings. These initial comments, reflecting the thinking I engaged in during that time, were a part of what drew me further into the idea of an autobiographical narrative inquiry into my graduate studies experiences.

In this class project, I had a beginner's understanding of the methodology of narrative inquiry and of the methodological principles of Indigenous research. However, I tried in that short time to honour the elements that drew me to these methodologies, which are coherent and overlapping in ontological principles. I attempted to build relationships, to gather stories, and I searched for awareness of stories to live by within the inquiry process. Through my lived experience, my readings and the gathering of stories read, reread, and relived, I came to some deeper understanding. I sought out the impact of those grand narratives, always trying to see "big" and "small" (Greene, 1995). Above all, I tried to honour the "being" of the "other" while I read, reread, and revisited the stories co-composed in visits, as well as in the lifetime of our relationships (Stewart-Harawira, 2005, p. 156). I searched for common threads within the narrative, and I began to create research texts, always checking back to make sure that I continued to "honour the 'being' of the 'other'" (Stewart-Harawira, 2005, p. 156). While I was early in my understanding of what inquiring narratively entailed, and how similar in relational ontologies it was to Indigenous research, I wanted to emulate the kind of understanding that could be gained through narrative inquiry.

Wilson (2001) wrote,

As a researcher you are answering to *all your relations* when you are doing research … you should be fulfilling your relationships with the world around you. So your methodology has to ask different questions: rather than asking about validity or reliability, you are asking how am I fulfilling my role in this relationship? What are my obligations in this relationship? (p. 177)

I truly do imagine all my relations reading what I come to understand and come to write about. It is to them I go to most to seek approval. In this last class research project, I carefully considered who my community was and how I was going to ensure they too benefited from the research process. This felt coherent with the understandings I'd come to in the two-year graduate studies process. I chose my community thinking about Cajete's (1994) concept of community as "the place where the forming of the heart and face of the individual as one of the people is most fully expressed" (p. 164). My community of chosen go-to girls was a community in which I did feel "one of the people" (p. 164), and it was to these women that I was accountable in the writing of the paper. This close inquiry into this lived experience, this giving importance to my own story and honouring the stories of the women from my community, allowed me to begin to understand what kind of a researcher I needed to be and how important the relational aspect was. I began to see how narrative inquiry could be a way to negotiate the tensions I continued to feel with the label "Indigenous researcher" and my guilt at having drifted away from my traditional roots and my Aboriginal culture. I began to believe that I could still engage in research that would benefit the lives of Aboriginal people.

I tried to capture the spirit I strive to attain when engaging in research about Aboriginal education alongside Aboriginal people with the title of my thesis, "For All My Relations." Thinking about all my relations also helps me to work through the tensions and stay on a research landscape despite the dis/ease and discomfort I continue to experience. From this research experience, alongside five of my female relatives, and inquiring narratively into my experiences, I learned that I cannot speak for the family who stayed on the reserve. I cannot fully understand their stories in the same ways I can for those of us whose ties were weakened, who drifted away from the extended family and were set adrift in an urban setting. As an Aboriginal person, I learned that my community can and does include family who show up when they are needed: women who are my go-to girls, who are expert in the lives they live as Aboriginal people, and whom I bounce the university's ideas off of to test their validity. I learned that from my community's perspective, the issues in education extend far beyond the walls of the institution of school. These issues go deep inside to that shaky "wounded learner"[3] and far and wide to a society that initially learned about Aboriginal people as half naked on the shores, in awe of the big boat that was arriving to bring destruction and forever change their future. Addressing issues in Aboriginal education includes needing an authentic look at history, an accurate portrayal of where we, as Aboriginal peoples, are today—success stories, political structures, a living, breathing, evolving people—and continued hope for that future. The future as represented by those babies who laughed, cried, and snuggled as I

questioned their mamas about issues in Aboriginal education. In the midst of our loss, in the midst of my research, in the middle of our interviews, I saw again, looming large, those smallest members of my community. As I hugged their wee little bodies and I smooched their smooth chubby cheeks, I knew that the words I heard in my Indigenous research class, those words about benefiting the community, about respect and relationship, were so very true. I can't be an objective researcher for this topic. I can't present on it as if I don't live it and as if the "can't lose another generation of children"[4] isn't speaking about me and mine. From this research process I am trans- formed—by loss, by hope, by the love of a family who statistically represent all the crappy stuff we hear about—but also by a family I am very proud of, for their sheer strength, their beauty, their determination, and especially their love of their babies for whom we do research to try to change a statistically predetermined future.

My awareness of how much narrative inquiry methodology creates safe places for stories to exist and be told and inquired into, and how important these safe places are for Indigenous researchers and participants alike, has grown. I realize how much I need these safe places for the sharing of personal stories and for the support I need to care for them in the way they need to be cared for. Lopez (1990) wrote,

> Remember only this one thing. The stories people tell have a way of taking care of them. If stories come to you, care for them. And learn to give them away where they are needed. Sometimes a person needs a story more than food to stay alive. That is why we put these stories in each other's memory. This is how people care for themselves. (p. 48)

This caring of my participants and their stories was always important to me, but until I sat there in person, realizing the level of trust my participants had to share the sto- ries they did, I had not realized the truth of what Lopez spoke.

Narrative inquiry and Indigenous research, and the relational aspects that both methodologies hold dear, create an in-between place where together partici- pants and researchers can begin to see possibilities of how to negotiate tensions between who they have been in the past, who they are now, and who we are becom- ing while in the midst of research. I look to the words of Barton (2004), who wrote,

> I have discovered that narrative inquiry is about interpreting the threads of life woven in the fabric of our daily lives. Narrative inquiry is about eliciting from life stories the insight, essence, and resonance that accompany our philosophical and cultural expressions and our desire for them to be

recognized. As a methodology congruent with Aboriginal epistemology, narrative inquiry could be about witnessing an insurgent effort by Aboriginal people to reclaim confidence in their identities, regain a political voice, and heal from colonial injustices of the past. It is about a whole life. (p. 525)

Before engaging in autobiographical narrative inquiry, I felt daunted by the responsibility of engaging in Indigenous research and worried about my abilities to uphold the principles of ethical and caring research I was learning. I certainly did not feel that I had a valid voice, nor was I confident in my own identity as an Indigenous researcher or even as an Aboriginal person.

Through the process of narrative inquiry, keeping close the principles of Indigenous research methodologies, I articulated the understandings I was coming to and how engaging in narrative inquiry helped me to negotiate these tensions. Through narrative inquiry, I found a way to show "respect through cultural protocol" while still learning what this entails within my family (Archibald, 2008, p. x). As I reflect on the concept of "relationality" (Caine & Steeves, 2009) in a narrative inquiry methodology and in an Indigenous methodology (Wilson, 2001), I feel I am able to demonstrate "significance of and reverence for spirituality, honouring teacher and learner responsibilities, and practising a cyclical type of reciprocity" which are "important lessons . . . for those interested in First Nations/Indigenous methodology" (Archibald, 2008, p. x). I also feel more capable of upholding the principles that Kirkness and Barnhardt (1991) spoke to in "First Nations and Higher Education: The Four Rs— Respect, Relevance, Reciprocity, Responsibility." I saw possibilities when I imagined entering into relationship alongside people rather than beginning research on participants or on Aboriginal issues (Connelly & Clandinin, 2006). Stewart-Harawira (2005) explained it in the following way:

Reciprocity recognizes that nothing occurs without a corresponding action. Reciprocity means deeply acknowledging the gifts of the other and acting on this recognition in ways which deeply honour the other. At its deepest and most fundamental level, reciprocity requires that we acknowledge and honour the "being" of the other. (p. 156)

The principles of respect, relevance, reciprocity, and responsibility Kirkness and Barnhardt spoke of were an abstract ideal until I sat across from a relative with whom I had shared a history and who opened her heart and shared her stories. As I held people's stories in my hands, I realized what an honor and a deep responsibility I had now to care for them (Lopez, 1990).

I also feel a responsibility to try to share this knowing. Through discussions with my go-to girls and with other friends and family members, I have learned my story is not unique to me; others experience similar tensions. Narrative inquiry is coherent with the ethical responsibilities I feel for research with humans, especially when engaging in research with Indigenous communities. In Indigenous research methodologies, one has to consider "all [their] relations" (Wilson, 2001, p. 177) when completing the final research text. It also includes striving to "live the good life" as Cajete (1994, p. 46) described it. I imagine that I am getting closer to becoming mindful of all who will be impacted by my thesis, by this research text, by this autobiographical narrative inquiry, by my stories. From the inquiry process, I am more able to see possibilities of engaging in Indigenous research, never arrogant with confidence and self-assurance but with a quiet determination that as long as I strive for this good life and am mindful of respect, responsibility, and reciprocity, I will more likely "do no harm," and I can imagine engaging in further research. Holding me accountable is the relational ontology, the research inquiry space, and the writing for and the keeping in mind of the need to benefit "all my relations" (Wilson, 2001, p. 177).

Today, over a year since I last sat across from my relatives asking them to trust me with their stories, I am still deeply impacted by what I learned in that space, in those conversations, and in the months that followed. The more I speak with other family members and fellow graduate students, the more I realize how closely interwoven all of our lives really are and how my stories impact the web that connects us all. As noted by Setterfield (2006),

> Human lives are not pieces of string that can be separated out from a knot of others and laid out straight. Families [all our relations] are webs. Impossible to touch one part of it without seeing the rest vibrating. Impossible to understand one part without having a sense of the whole. (p. 59)

The importance of stories shared and safe spaces created to do this sharing is evidenced when my own personal lived experiences resonate with the stories I hear, in the relief of the listener as I describe my unease, and in the pleas of others for me to tell more so they too can feel a validation of their own story. These experiences remind me, in my moments of doubt, that our stories do indeed vibrate across the web and impact in ways that I will never be able to comprehend.

My master's degree was much more than the stepping-stone that many see it to be, much more than only a moment in the grand prize of a higher degree. For me,

through the inquiry processes of reliving and retelling of my lived experiences, I have been able to come to a deeper understanding of the importance of stories in Indigenous research. I have come to see how my relational way of being, my narrative inquiry, the temporal nature of my chosen methodology, and the way I understand the world through stories is absolutely coherent with Indigenous research and with an Aboriginal worldview. The reflection on my graduate studies experience has allowed me to see how my intellectual knowing of Aboriginal culture continues to emerge; however, my embodied knowing has always been there, and only now can I see it and understand what it is that I live.

Through these moments of sharing stories between cousins, distanced by time and now reunited, I have come to believe that the story itself should be the teacher (Archibald, 2008). There were stories told to me in those interviews with my cousins that brought me back to our youth and a life that held hardships and tears, stories that would break hearts, but they also reminded me of the strength of the women we have become. They reminded me of the love that sustains a family through those kinds of moments and the gift of laughter and humour that is also characteristic of our family. As each one of us shared hard stories, we did so from a place where we either were planning or were already in the midst of our own educational journey as adults. I found hope and inspiration inside the stories of women who statistically were not supposed to survive the educational system that created such tensions but who instead were now role models for their own children and who continued to brave the sometimes uneasy landscape of school. As we shared our stories, finding more similarities than differences, I saw our strength, as a circle of women, grow. I felt the power each story held and the importance of sharing this knowing we held, even if we had not yet finished our own educational journeys. I found a community in which I belonged, and together we found inspiration in each other's stories and validation of our own.

I started my master's degree uneasy at the image of returning to my community as a researcher, intending to take stories from them to benefit my own educational journey. Through narrative inquiry I found not only a way of negotiating entry back into the communities I had drifted away from and into relationships I had thought lost forever, but also a space where I could feel safe enough to become the Indigenous researcher I imagine I want to become. I am still, and likely always will be, in the process of becoming this Indigenous researcher I imagine, but as I strive to become her, I keep in mind Wilson's (2001) words: "As a researcher you are answering to *all your relations* when you are doing research . . . you should be fulfilling your relationships with the world around you" (p. 177). Sharing the knowing from my

autobiographical narrative inquiry is my way of sharing the importance of narrative inquiry, Indigenous research, and relational ways of engaging in research alongside humans while honouring the knowing they bring in the form of stories. It is my way of not just taking stories but sharing what I have been privileged to learn. I do this from my firm belief that for me and my relations, the stories we told and the stories I retell are indeed "saving stories": stories we can tell "to [ourselves], to [our] friends, sometimes to strangers. Because they make [us] laugh. Because they are a particular kind of story. Saving stories, if you will. Stories that help keep [us] alive" (King, 2003, p. 119).

Notes

1. "We negotiate relationships, research purposes, transitions, as well as how we are going to be useful in those relationships" (Clandinin, 2006, p. 48).

2. "Right or wrong; validity; statistically significant; worthy or unworthy: value judgements lose their meaning. What is more important and meaningful is fulfilling a role and obligations in the research relationship—that is, being accountable to your relations" (Wilson, 2008, p. 77).

3. Wounded learner—as explained in Lange and Chovanec's (2010) unpublished paper: "Wojecki (2007) also identified learners with internalized feelings of failure and negative dispositions to learning, as individuals who have experienced 'wounding learning practices.' He declines to use the term 'wounded learner,' suggesting it implies an internalized perspective and individual 261 deficits. However, we are using the term to express the structural dynamics that create learning conditions in which some are deliberately wounded within a system where failure is necessary. Rather than believing they are losers who do not deserve better, do not have any academic abilities, and are solely to blame for their own failures, they can see the symbolic violence of a system that victimizes and pathologizes them, within a system where education is used to jostle for social positioning" (Goldstein, 2005, p. 5).

4. "The bottom line is the education of students is suffering and we can't risk losing a generation of young people" (Alberta's Educational Minister Dave Hancock, quoted in "Education Minister Fires School Board," 2010). The minister is referring to a decision to dismiss the entire Northland's School Division School Board and the resulting media coverage of the event. His statement storied Aboriginal people, and especially their children, as "lost."

References

Archibald, J. A. (2008). *Indigenous storywork: Educating the heart, mind, body, and spirit*. Vancouver, BC, Canada: UBC Press.

Barton, S. S. (2004). Narrative inquiry: Locating aboriginal epistemology in a relational methodology. *Journal of Advanced Nursing, 45*(5), 519–526.

Caine, V., & Steeves, P. (2009). Imagining and playfulness in narrative inquiry. *International Journal of Education & the Arts, 10*(25). Retrieved April 19, 2011, from http://www.ijea.org/v10n25/

Cajete, G. (1994). *Look to the mountain: An ecology of indigenous education*. Durango, CO: Kivakï Press.

Clandinin, D. J. (2006). Narrative inquiry: A methodology for studying lived experience. *Research Studies in Music Education, 27*(1), 44–54.

Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research*. San Francisco: Jossey-Bass.

Connelly, F. M., & Clandinin, D. J. (2006). Narrative inquiry. In J. Green, G. Camilli, & P. Elmore (Eds.), *Handbook of complementary methods in education research* (pp. 375–385). Mahwah, NJ: Erlbaum.

Education minister fires school board to address poor student performance. (2010, January 21). Retrieved April 19, 2011, from http://edmonton.ctv.ca/servlet/an/local/CTVNews/20100121/edm_school_100121/20100121/?hub=EdmontonHome

Greene, M. (1995). *Releasing the imagination: Essays on education, the arts, and social change*. San Francisco: Jossey-Bass.

Hancock. D. (2010). *Education minister fires school board to address poor student performance* (CTV.ca article). Retrieved April 19, 2011, from http://edmonton.ctv.ca/servlet/an/local/CTVNews/20100121/edm_school_100121/20100121/?hub=EdmontonHome

Kahakalau, K. (2004). Indigenous heuristic action research: Bridging western and indigenous research methodologies. *Hülili: Multidisciplinary Research on Hawaiian Well-Being, 1*(1), 19–33.

King, T. (2003). *The truth about stories: A native narrative*. Toronto, ON, Canada: House of Anansi Press.

Kirkness, V. J., & Barnhardt, R. (1991, May). First nations and higher education: The four R's—respect, relevance, reciprocity, responsibility. *Journal of American Indian Education, 30*(3), 1–15.

Lange, E., & Chovanec, D. (2010, June). *Wounded learners: Symbolic violence and dreamkeeping among marginalized adults*. Paper presented at the Canadian Society for the Study of Education Conference, Montreal, QC, Canada.

Lopez, B. (1990). *Crow and weasel*. San Francisco: North Point Press.

Loppie, C. (2007). Learning from the grandmothers: Incorporating indigenous principles into qualitative research. *Qualitative Health Research, 17*(2), 276–284.

Mendelson, M. (2006). *Aboriginal peoples and postsecondary education in Canada*. Ottawa, ON, Canada: Caledon Institute of Social Policy.

Setterfield, D. (2006). *The thirteenth tale*. New York: Washington Square Press.

Stewart-Harawira, M. (2005). Cultural studies, indigenous knowledge and pedagogies of hope. *Policy Futures in Education, 3*(2), 153–163.

Wilson, S. (2001). What is an indigenous research methodology? *Canadian Journal of Native Education, 25*(2), 175–179.

Wilson, S. (2008). *Research is ceremony: Indigenous research methods*. Halifax, NS, Canada: Fernwood.

Trudy Cardinal is a PhD student at the University of Alberta in the Elementary Education Curriculum studies program. A Cree/Metis woman, she originated from rural communities in northern Alberta and currently teaches part-time while engaging in research in the area of Aboriginal education. She obtained her M Ed degree in Indigenous People's Education at the University of Alberta in September of 2010.

The Languages of Inquiry: An English-French Lexicon of Inquiry Terminology in Education

Tanya Chichekian, Annie Savard & Bruce M. Shore,
McGill University

ABSTRACT

Contemporary curricular reform efforts are underway in many countries toward adopting and implementing inquiry-based approaches to teaching and learning on a provincial and national level. Buzzwords associated with inquiry-based pedagogy have been used to express similar ideas in bilingual educational communities, but rarely with a direct one-to-one correspondence. We present and explain the meaning of 10 initial key terms from inquiry in education, in English and French. They represent the beginning steps to guide teachers and curriculum developers who are exposed to both the French and English inquiry traditions to translate ideas and curriculum consistently.

early every major curriculum reform initiative since the 1980s, in many subjects and different countries, has had inquiry-based learning at its core (e.g., Alberta Learning, 2004; Boyer Commission, 1998; European Commission, 2007; National Council of Teachers of Mathematics, 2000; National Council for the Social Studies, 1994; National Research Council, 1996; Ontario Ministry of Education, 1999, 2004, 2005). Among these is the Quebec Education Program (Ministère de l'Éducation, du Loisir et du Sport, 2001, 2004). However, Quebec educators face several barriers to effectively implementing inquiry in their students' learning experiences. For example, implementing inquiry is too often presented without context, and pedagogical decisions are based on teachers' systematic, inter-woven knowledge of child development, subject matter, psychology of learning, and

philosophy and goals, all of which are enriched by personal experiences. In addition, despite the common origins, the English- and French-language educational communities (especially relevant to teaching in Quebec) have come to know about inquiry and to understand it from different literatures. This explains in part why the language of the Quebec Education Program, in its original French and as translated into English, for example, is somewhat different from the language of inquiry encountered in most of the English-language literature on inquiry in education. As a result, the separate development of inquiry traditions in English and French has generated somewhat different terminology. To benefit from both traditions, both English- and French-speaking educators can be assisted by a lexicon of key inquiry terminology that they might read or hear.

The first goal of this paper is, therefore, to summarize the background and reasons for including inquiry as a core goal in our teaching at all levels (Shore, Aulls, & Delcourt, 2008, called inquiry a "curricular imperative," and provided examples of overcoming barriers). Our second goal is to outline the separate paths taken in anglophone and francophone communities and, thirdly, to present 10 initial key terms from inquiry in education, in English and French, with an explanation of the meaning of each term.

Common Roots of Inquiry

First, inquiry-based learning begins with the inquirer's interest in or curiosity about a topic or focus that the inquirer decides to investigate. Western cultural traditions of questioning can be traced back to the classical Greek philosopher Socrates 2500 years ago. Socrates cultivated a dialectic method of inquiry, a form of debate between individuals taking on opposing viewpoints, based on asking and answering questions to encourage rational thinking and the expression of newly formed ideas. Skeptical questioning and independent thinking led students to develop the critical thinking skills required to evaluate the evidence of their claims, and being able to answer the question, "How do you know that?"

Coming to a focus can be a challenge for learners because it involves more than narrowing the topic. It involves defining an authentic question, a personal perspective, or a compelling thesis statement. Inquirers may need to spend considerable time exploring, discussing, and thinking about information they find, deciding what kinds of evidence can support their anticipated conclusions, and generating a plan to

collect that evidence. At this stage of the inquiry process, which is perhaps the most important, inquirers often experience a sense of excitement or optimism about the tasks ahead. This stage explicitly addresses both content and motivation in the learning process.

A second and related common element, alluded to in the reference to authenticity, dialectic, and personal perspective in the choice of topics, is that inquiry-based learning experiences are supposed to enhance meaningful learning. One of the 20th century's most influential thinkers in education, John Dewey (1938), believed that children learn through activity, real-world experiences, and discussion with others that we now refer to as "learning in activity." To be grounded in real experience, education needs to be driven by students' interests and desire to connect with what is most meaningful in their situations. He is widely reported as having stated that, "If you have doubts about how learning happens, engage in sustained inquiry: study, ponder, consider alternative possibilities and arrive at your belief grounded in evidence" (Educational Broadcasting Corporation, 2004, website). He closely linked inquiry and reflection and the weighing of evidence to support one's knowledge and beliefs (Dewey, 1933). Although Dewey's writing is probably more familiar to English than French readers, his works were translated into French as early as 1913 (Boydston, 1979), therefore we have presented this point among the common roots. Dewey's insight that children construct meaning for themselves as a result of the activities in which they systematically engage has a direct parallel in the French literature, also known in English—the work of Jean Piaget. Piaget (1951) also proposed that learners *construct* meaning or reality for themselves in relation to their previous experience, hence the label "constructivism." Learners do not just memorize facts and procedures. Rather, they construct meaning for themselves. They build new understanding shaped by their existing knowledge (including the misconceptions that fascinated Piaget) and that helps reshape their previous understandings.

Jerome Bruner occupies a pivotal place in the story of inquiry. He co-chaired and summarized an important 1959 symposium of 35 prominent scientists, educators, and psychologists, to chart a future vision of US education, including a special focus on science education following the Soviet Union's launch of Sputnik. The National Academy of Sciences and the National Science Foundation sponsored the meeting, held in Woods Hole, Massachusetts. His co-chair was Jerrold Zacharias, an experimental physicist at the Massachusetts Institute of Technology who directed the Physical Sciences Study Committee team whose physics curriculum was published at the same time. Zacharias was a graduate student of the 1944 Nobel Laureate in physics, Isadore Isaac Rabi at Columbia University. Rabi was asked by *Parents* magazine why he became a scientist:

> My mother made me a scientist without ever intending to. Every other Jewish mother in Brooklyn would ask her child after school: So? Did you learn anything today? But not my mother. 'Izzy,' she would say, 'did you ask a good *question* today?' That difference--asking good questions--made me become a scientist. (Schulman, 1993, p. 100)

Asking good questions such as "why . . . ?" and "what if . . . ?" helps make all kinds of inquirers. Asking questions, however, is only part of inquiry.

All the Woods Hole participants were American, with one notable exception: Bärbel Inhelder, Jean Piaget's best-known collaborator in Geneva (this explains why the Woods Hole meeting is part of the common roots of inquiry in the English and French educational communities). The symposium generated a highly influential book, *The Process of Education* (Bruner, 1960), from which came the notion of a spiral curriculum that brings key topics back to children's attention in new forms as their understanding and intellectual skills grow. Also came a key proposal built upon Dewey's ideas: Students learn subject matter best, not when presented with the well-organized conclusions of a discipline, but, rather, when they approach it in the same manner as an expert in the field, someone who creates new knowledge in the field. The symposium made several daring assertions; for example:

> Intellectual activity anywhere is the same, whether at the frontier of knowledge or in a third-grade classroom. What a scientist does at his desk or in his laboratory, what a literary critic does in reading a poem, are of the same order as what anybody else does when he is engaged in like activities—if he is to achieve understanding. The difference is in degree, not in kind. The schoolboy learning physics is a physicist, and it is easier for him to learn physics behaving like a physicist than doing something else. The "something else" usually involves the task of mastering what came to be called at Woods Hole a "middle language"—classroom discussions and textbooks that talk about the conclusions in a field of intellectual inquiry rather than centering upon the inquiry itself. Approached in that way, high school physics often looks very little like physics, social studies are removed from the issues of life and society as usually discussed, and school mathematics too often has lost contact with what is at the heart of the subject, the idea of order…. Ideally, interest in the material to be learned is the best stimulus to learning, rather than such external goals as grades or later competitive advantage. While it is unrealistic to assume that the pressures of competition can be effectively eliminated or that it is wise to seek their elimination, it is nonetheless worth

considering how interest in learning per se can be stimulated. (Bruner, 1960, pp. 14–15)

Bruner (1971) later commented about expectations of students in traditional curricula:

Their motivation was taken for granted. It also accepted the tacit assumption that everybody who came to these curricula in the schools had already been the beneficiary of the middle-class hidden curricula that taught them analytical skills and launched them in the intellectual use of mind. (Bruner, 1971, p. 19)

Children from less favored environments were therefore disadvantaged by traditional curricula, and not given full opportunity to develop their potential.

The third common root that we want to briefly highlight is the role of science and the scientific community in leading the movement to initiate inquiry-based schooling. Given Sputnik, Bruner's (1960) example of a young student-physicist was not accidental. Curriculum change was based on the notion that learning is an active, social process in which students formulate hypotheses, construct new ideas, and generate, evaluate, and select information that is integrated into existing knowledge and experience. One of the challenges remains to discuss inquiry in language beyond that of science, specifically, to extend the language to knowledge, skills, and dispositions that cut across disciplinary boundaries.

The fourth common thread began in Europe as a means to provide educational continuity for the children of diplomats and others posted and moved overseas. The International Baccalaureate (IB) includes explicit requirements for an extended collaborative undertaking (the teacher-guided "exhibition") for 10- to 12-year-olds at the end of the elementary program or a personal inquiry project concluding the secondary and college levels (International Baccalaureate Organization, 2005-2011a, b). Inquiry is not extensively articulated in publicly available documentation, and only broadly in training materials, but there is consistency across languages and the IB is a very popular curricular enhancement in Quebec. There is a common expectation that students will have repeated experiences producing in-depth products of their explorations of topics of personal interest. Our observations of these projects, especially at the secondary level, is that they have tended to be conducted by individual students rather than collaborative groups, and evaluated by the teachers, but this may not be a universal experience.

From 1960 forward, the English and French literatures on inquiry in education took separate paths for nearly a half century, but the common roots can be readily sensed, including fostering and building upon student interest and curiosity, promoting question-asking and learner dialogue, enabling authentic and meaningful learning, actively engaging students from a wide range of backgrounds and abilities, and the influential but not exclusive role of science in initiating inquiry-based curricular change.

English Literature Branch

A major influence was the translation from Russian to English of Lev Vygotsky's book, *Mind in Society* (1978). Vygotsky was born in 1896, the same year as Piaget, but died in 1934 (Piaget in 1980). He was also a constructivist, but added an important dimension widely incorporated into curricular models. Vygotsky proposed that meaning is constructed by learners through dialogue, and that there were critical and moving boundaries between what a learner could already do unassisted, with the assistance of a more knowledgeable person (peer, teacher, parent, etcetera), and not do at all. That middle zone is the now familiar "Zone of Proximal Development" (ZPD). Meaning is not constructed in individual isolation but in social interaction when the learner needs and can benefit from it. Teachers' professional judgment can be critical in helping learners recognize when they are in a ZPD. This extension of constructivism, known as social constructivism, as well as the idea of communities of learners, became the basis for group activities becoming central to inquiry pedagogy.

Keegan (1993) helped sharpen the language that defines this contrast between individual and collaborative work. He noted important differences among the types of teacher-student verbal interactions (see Table 1). Teacher-student roles, whose exchange is fundamental to inquiry, vary along a continuum of classroom discourse. From top to bottom in the table, students are more autonomous. They take more responsibility for generating and answering questions and learning about subject matter through dialogue or discourse, and the teacher moves from direct instruction to a less visible but critical role as the creator of learning situations. This provides an interesting lens through which to examine a learning situation. Keegan categorized discovery learning as most autonomous and distinguished it on the basis of how active the student is in exercising his or her imagination. Shore, Aulls, and Delcourt (2008) acknowledged that discovery learning may be *maximally* autonomous, but it places a large burden on the learner: From a social constructivist perspective, inquiry is *optimally* autonomous.

Table 1:

Keegan's Representation of Teacher-Student Interaction and Responsibility for Learning

INSTRUCTIONAL DISCOURSE PATTERN	WHO IS RESPONSIBLE FOR THE QUESTIONS?	WHO IS RESPONSIBLE FOR THE RESPONSES?	INSTRUCTIONAL EXAMPLE
Didactic	Teacher	Teacher	Lecture, text, film
Socratic	Teacher	Student	Recitation, discussion, oral quiz
Inquiry	Student	Student and Teacher	Library research, guided lab or project
Discovery	Student	Student	Lab, fieldwork, survey interview

Among the most influential documents in English are reports from United States associations in science, the social sciences, and mathematics. The introduction to the National Research Council's (1996) science-education standards listed historical precedents reaching back to the 1980s, and specifically cited the National Council of Teachers of Mathematics (1989) as the first to espouse the contemporary inquiry approach and to influence developments in other subject areas. Inquiry-based social sciences standards were the next to appear (National Council for the Social Studies, 1994). The formal compilation of the science standards appeared in 1996 and was followed by recommendations for research-based teaching in higher education (Boyer Commission, 1998) and *Inquiry and the National Science Education Standards: A Guide for Teaching and Learning* (National Research Council, 2000).

An early contributor was a 1984 working group convened by the National Research Council in which Jerome Bruner participated. The report was written by learning psychologist Lauren Resnick (1987). Although the word "inquiry" did not appear in the entire volume and the focus was totally on the individual learner, it anticipated documents to follow: "Various subject matters in the school program should be taught with an eye to developing the powerful thinking methods used by experts in those disciplines" (p. 48), and

> Effective reading, writing, and mathematics learning depend on elaboration, explication, and various forms of meaning construction. Reorienting basic instruction in these curricula to focus on intentional, self-managed learning and strategies for meaning construction, rather than on routinized performances, will result in more effective basic skill instruction while providing a strong base for higher order skills development in other disciplines. (p. 49)

Within inquiry instruction we now find these emphases on developing high-level intellectual skills and knowledge of experts (e.g., creating as well as absorbing knowledge), as well as cross-disciplinary abilities, and self-regulated learning. Added to these are collaboration and co-construction of curricular components by students with other students and teachers, arising from the convergence with social constructivism.

French Literature Branch

Decisions regarding the reform of science education were initiated by scientists. During a visit to the United States in the mid-1990s, Georges Charpak (1992 Nobel Laureate in physics) was inspired by the *Hands On* approach developed in Chicago by Leon Max Lederman (also co-winner of the Nobel prize in physics, in 1988). Lederman completed his PhD at Columbia University in 1951, and credited Isadore Isaac Rabi, mentioned earlier, as a key mentor (Hoddeson, Kolb, & Westfall, 2008). Lederman remained a Columbia physics professor for 30 years, envisioned and then became the director of the Fermi National Accelerator Laboratory in Illinois, and later a professor at the University of Chicago; this is why the meeting with Charpak took place in Chicago. The *Hands On* approach was originally tailored to address active learning needs of students from lower socioeconomic backgrounds. It was designed to engage students in clearly defined experimental steps and direct experience to develop scientific understanding of physical phenomena. The broader appeal to all students was rapidly recognized.

Motivated by *Hands On*, Georges Charpak, Pierre Léna, and Yves Quéré proposed the development of *La Main à la pâte* (2010) (LAMAP; literally "hands in the dough," equivalent to "hands-on" or, idiomatically, "do it on your own"). The French Academy of Sciences supported this proposal and in 1996 implemented LAMAP in several primary schools. By 2002, primary schools in Switzerland implemented *Penser

avec les mains ("Thinking with the hands") (n.d.), a project adapted from LAMAP. This instructional approach eventually spread to other countries, such as China, Brazil, and Quebec in Canada in 2003. Although the initial curricular emphasis was in science, the approach spread to mathematics and other subjects. It is known as the *approche* or *démarche d'investigation raisonnée* (literally "approach by reasoned or thoughtful investigation") that is usually expressed in English as "inquiry-based instruction" or just "inquiry."

More recently, Europe-based agencies have also published reports in multiple languages proposing inquiry-based pedagogy (e.g., European Commission, 2007). UNESCO (2008), based in Paris, captured the essence of inquiry-based schools:

Skills such as problem solving, communication, collaboration, experimentation, critical thinking, and creative expression become curricular goals in themselves and these are the objects of new assessment methods. Perhaps the most significant goal is for students to be able to determine their own learning goals and plans—the ability to establish what they already know, assess their strengths and weaknesses, design a learning plan, stay on task, track their own progress, and build on successes and adjust to failures; skills that can be used throughout a lifetime to participate in a learning society. (p. 8)

These reports do not, however, appear yet to have experienced wide professional recognition. There is also less direct emphasis in *La main à la pâte* on collaborative learning. In the Quebec Education Program, however, the North American emphasis on learning to work in groups is explicit as Competency 8—To Cooperate With Others:

All the programs of study lend themselves to the creation of learning situations in which students are required to work together. Such situations give them an opportunity to learn to plan and carry out an activity with others, to participate in group discussion and to work with others to achieve a common goal, adapting to the situation, recognizing the contributions of others, developing a sense of organization and sharing. (Ministère de l'Éducation, du Loisir et du Sport, 2001, p. 34)

Tanya Chichekian, Annie Savard & Bruce M. Shore

Shared Foliage: English-French Lexicon of Inquiry Terminology in Education

As our bilingual research team explored the French and English inquiry literatures, we found many different words used to express similar ideas. There is rarely a direct one-to-one correspondence. We therefore used the research team of some 20 professors and students (including many teachers and teacher-educators) as an expert panel to generate a list of key terminology, starting with a list of inquiry competencies (Shore, Birlean, Walker, Ritchie, LaBanca, & Aulls, 2009). We narrowed these to 10 key terms. They represent the beginning steps to guide educators who have the advantage of access to both the French and English inquiry traditions to translate ideas and curriculum consistently. For readers who are so far familiar with just one of these literatures, we hope it will open new opportunities to use the language and ideas of inquiry in their classrooms. If this first attempt at a lexicon proves useful, we can foresee adding more terminology and additional languages.

Table 2:

English-French Lexicon of Inquiry in Education—10 Key Concepts

ENGLISH	WHAT THE TERM IMPLIES IN EDUCATION	FRENCH
Inquiry [*or* inquiry instruction]	Learning and teaching in which students individually or in groups develop initiative, disciplinary and cross-disciplinary expertise, intellectual and creative skills, through thoughtful investigations of authentic questions on topics of student interest. Teachers collaboratively create inquiry experiences with students and help them develop autonomy. Students plan, generate, and evaluate evidence for their investigations, and construct meaning through hands-on activities and sharing and comparing ideas and plans through dialogue. [The English term might be too open and excessively focused on the question-asking part of inquiry; the French term is less vague but risks seeming tied uniquely to science.]	Approche [*or* Démarche] par investigation raisonnée *or* Démarche d'investigation

The Languages of Inquiry: An English-French Lexicon of Inquiry Terminology in Education

ENGLISH	WHAT THE TERM IMPLIES IN EDUCATION	FRENCH
Inquirer	A person--student, teacher, or any other person--who values inquiry as a way to learn, is engaged acquiring competences of inquiry and the ability to communicate these, and who completes one or more inquiry projects; an inquirer has knowledge, skills, dispositions, and experience that support inquiry. [The term most commonly used in French is focused on the learner.]	Élève-chercheur
Role exchanges between and among teachers and students	In inquiry students undertake some roles formerly the exclusive purview of teachers, such as asking questions, choosing topics of study, specifying evidence or argument, and evaluating progress and final performance. Teachers undertake some roles sometimes reserved for learners, such as helping to figure out how to answer questions, and learning new content resulting from student inquiry. [The English term places extra emphasis on the role exchange versus the role differences.]	Rôle de l'élève et de l'enseignant
Interest- or curiosity-motivated learning	A learning situation whose objective, essential in inquiry, is built at least partly around students' interests or curiosity.	Apprentissage basé sur curiosité et engagement des élèves

ENGLISH	WHAT THE TERM IMPLIES IN EDUCATION	FRENCH
Dialogue	Dialogue is goal-directed and collaborative, as is inquiry. Participants go beyond making their own contributions as in discussion or conversation. [The French term usefully draws attention to the mindset or thought process that distinguishes dialogue.]	Pensée dialogique
Problem finding	Defining the problem to be solved by the individual or group, for example, the topic of the investigation conducted as part of inquiry. [The French term avoids the ambiguity of "finding"; problems are formulated generated, recognized, found, etcetera]	Problématiser
Questioning	Questioning is at the heart of inquiry, but, in class, it is more than asking questions. It refers to a questioning frame of mind or spirit, including shaping hypotheses, seeing issues or problems in different ways or from other people's perspectives. It includes developing students' responsibility and opportunities for originating and shaping questions, putting things into question (remise en question) or being skeptical--in relation to critical thinking, and extends far beyond teachers quizzing student knowledge.	Questionnement

ENGLISH	WHAT THE TERM IMPLIES IN EDUCATION	FRENCH
Be comfortable with ambiguity (ill-defined or open-ended problems)	An important inquiry disposition is to learn to feel at ease undertaking investigations of questions that may begin with questions that require making assumptions to fill gaps or that do not have known answers, or whose answers are incomplete and lead only to new questions. [In French these are also called *black boxes.*]	Être confortable avec des problèmes ouverts et complexes [on appelle aussi ce type de problème des *boîtes noires*]
Evaluating evidence	At the heart of inquiry is the systematic investigation of a question or topic leading to a decision. These decisions require consideration of the quality of evidence supporting or refuting different conclusions. [The English terminology stresses the quality of the external evidence; the French terminology stresses the critical thinking processes needed to evaluate evidence. Both emphases are essential in inquiry.]	Pensée critique
Co-constructing knowledge	Meaningful learning occurs most successfully when students and teachers create new understanding through dialogue, especially helping each other to do what they cannot do alone but can with each others' assistance. In inquiry, this includes sharing ideas for goals, procedures, evidence, and conclusions during the process, not only at the end.	Co-construction des connaissances

Conclusion

Since the early 1900s, educational reforms have sought to decrease the rates of attrition among science students (European Commission, 2007; National Council of Teachers of Mathematics, 2000; National Research Council, 1996) by increasing the quality of science education. Although inquiry has served as the primary means to learn to do science, its advocacy should not be limited to this domain. This paper provided reasons for including inquiry as a core goal in our teaching at all levels and although the nature of the subject matter does play an influential role, the inquiry process has already been successfully transferred in social studies and language arts. However, one can expect the steps involved in using a historical or linguistic method to differ from the cognitive actions of a scientific thought. Nevertheless, making historical inquiry a part of the social studies and history curriculum can add a unique element to the repertoire of inquiry skills, that of social criticism (Shore, Aulls, & Delcourt, 2008). In this context, human interaction, discussion and the proper use of literacy are required on the part of teachers and students.

Curricular realities in Quebec include the vast percentage of anglophone students receiving a substantial part of their education in a combination of French and English instruction, the newly proposed creation of intensive English experiences for francophone students, the existence of schools in which English and French programs share a building, administration, teaching personnel, or curricular resources, and the Quebec Education Program. Comparable situations exist in many parts of Canada and beyond. At the same time, the language of inquiry-based instruction has developed along partially different paths in the two languages and their national and international communities. Building bridges across these differences will provide greater unity of purpose and expression to the educational communities, facilitate opportunities for jointly participating in professional development experiences, and communicating with families about the goals of 21st-century education.

References

Alberta Learning. (2004). *Focus on inquiry: A teacher's guide to implementing inquiry-based learning*. Edmonton, AB, Canada: Author. Retrieved March 25, 2011, from http://education.alberta.ca/media/313361/focusoninquiry.pdf

Boydston, J. A. (Ed.). (1979). *John Dewey: The middle works, 1899-1924*, vol. 7, 1912-1914. Carbondale: Southern Illinois University Press.

Boyer Commission on Educating Undergraduates in the Research University. (1998). *Reinventing undergraduate education: A blueprint for America's research universities*. Retrieved June 9, 2010, from http://naples.cc.sunysb.edu/Pres/boyer.nsf/

Bruner, J. S. (1960). *The process of education*. Cambridge, MA: Harvard University Press.

Bruner, J. S. (1971). "The process of education" revisited. *Phi Delta Kappan, 53*, 19.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process.* Boston: Heath.

Dewey, J. (1938). *Experience and education*. New York: Simon & Schuster.

Educational Broadcasting Corporation. (2004). What is the history of constructivism, and how has it changed over time? In *Concept to classroom: What is the history of constructivism and how has it changed over time?* Web-based seminar retrieved March 25, 2011, from http://www.thirteen.org/edonline/concept2class/constructivism/index_sub4.html

European Commission, Directorate-General for Research, Directorate L - Science, Economy and Society. (2007). *Science education now: A renewed pedagogy for the future of Europe.* Retrieved March 25, 2011, from http://ec.europa.eu/research/science-society/document_library/pdf_06/report-rocard-on-science-education_en.pdf

Hoddeson, L., Kolb, A. W., & Westfall, C. (2008). Fermilab: Physics, the frontier and megascience. Chicago: University of Chicago Press.

International Baccalaureate Organization. (2005-2011a). Diploma programme curriculum—core requirements: Extended essay. Retrieved March 25, 2011, from http://www.ibo.org/diploma/curriculum/core/essay/

International Baccalaureate Organization. (2005-2011b). Middle years programme curriculum: Personal project. Retrieved March 25, 2011, from http://www.ibo.org/myp/curriculum/project/

Keegan, M. (1993). Optimizing the instructional moment: A guide to using Socratic, didactic, inquiry, and discovery methods. *Educational Technology, 33*(4), 17–22.

La main à la pâte. (2010). *La main à la pâte--Qui sommes-nous?* [Who are we?]. Retrieved December 21, 2010, from http://www.lamap.fr/?Page_Id=50

Ministère de l'Éducation, du Loisir et du Sport. (2001). Quebec education program: Preschool education, elementary learning [*Programme de formation de l'école québécoise: Éducation préscolaire, enseignement primaire*, 1999]. Quebec, QC: Author. Retrieved March 25, 2011, from http://www.mels.gouv.qc.ca/DGFJ/dp/programme_de_formation/primaire/educprg2001h.htm

Ministère de l'Éducation, du Loisir et du Sport. (2004). *Québec education program: Secondary school education, cycle one*. Quebec, QC: Author. Retrieved March 25, 2011, from http://www.mels.gouv.qc.ca/DGFJ/dp/programme_de_formation/secondaire/pdf/qep2004/qepsecfirstcycle.pdf

National Council for the Social Studies. (1994). *Expectations of excellence: Curriculum standards for social studies*. Alexandria, VA: Author.

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics.* Reston, VA: Author.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school. mathematics*. Reston, VA: Author.

National Research Council. (1996). *National science education standards (7th ed.)*. Washington, DC: National Academy Press.

National Research Council. (2000). *Inquiry and the national science education standards: A guide for teaching and learning*. Washington, DC: National Academy Press.

Ontario Ministry of Education. (1999). *Mathematics--grades 9 to 10: The Ontario curriculum*. Toronto, ON: Author. Retrieved March 25, 2011, from http://www.edu.gov.on.ca/eng/curriculum/secondary/math.html

Ontario Ministry of Education. (2004). *Social studies--grades 1 to 6, History and geography--grades 7 and 8: The Ontario curriculum*. Toronto, ON: Author. Retrieved March 25, 2011, from http://www.edu.gov.on.ca/eng/curriculum/elementary/sstudies.html

Ontario Ministry of Education. (2005). *Mathematics--grades 1 to 8: The Ontario curriculum*. Toronto, ON: Author. Retrieved March 25, 2011, from http://www.edu.gov.on.ca/eng/curriculum/elementary/math.html

Penser avec les mains. (n.d.). *Penser avec les mains--Thinking with the hands*. Retrieved December 21, 2010, from http://www.form-it.eu/goodpractice/projects/hands.shtml

Piaget, J. (1951). *The psychology of intelligence*. London: Routledge & Kegan Paul. [Later published as *La psychologie de l'intélligence*. Paris: Colin, 1967.]

Resnick, L. B. (1987). *Education and learning to think*. Washington, DC: National Research Council (Committee on Research in Mathematics, Science, and Technology Education, and Commission on Behavioral and Social Sciences and Education).

Schulman, M. (1993). Great minds start with questions: Practical ways to enhance your child's natural ability to think and create. *Parents [magazine] 68*(9), 99–102. Retrieved March 25, 2011, from http://proquest.umi.com/pqdlink?index=45&sid=1&srchmode=3&vinst=PROD&fmt=6&startpage=1&clientid=10843&vname=PQD&RQT=309&did=5001740&scaling=FULL&ts=1293572316&vtype=PQD&aid=1&rqt=309&TS=1293572432&clientId=10843

Shore, B. M., Aulls, M. W., & Delcourt, M. A. B. (Eds.). (2008). *Inquiry in education (vol. II): Overcoming barriers to successful implementation*. New York: Routledge.

Shore, B. M., Birlean C., Walker, C. L., Ritchie, K. C., LaBanca, F., & Aulls, M. W. (2009). Inquiry literacy: A proposal for a neologism. *LEARNing Landscapes, 3*(1), 138–155.

UNESCO. (2008). *ICT competency standards for teachers: Competency standards modules*. Paris: United Nations Educational, Scientific and Cultural Organization. Retrieved March 25, 2011, from http://unesdoc.unesco.org/images/0015/001562/156207e.pdf

Vygotsky, L. S. (1978). *Mind in society*. (Trans. M. Cole). Cambridge, MA: Harvard University Press.

Tanya Chichekian holds a BEd from McGill University and was a secondary mathematics teacher in Montreal. She is on leave from her position as Co-Coordinator of Academic Advising at Dawson College in Montreal. She is completing her MA in Educational Psychology with a specialization in the Learning Sciences in the Department of Educational and Counselling Psychology and, in the fall of 2011, will begin her PhD. Her research interests include mathematics and science education, inquiry-based teaching and learning in general and in the International Baccalaureate, and the development of learners' and teachers' identity, knowledge, skills, and motivation as inquirers in general and in learning and teaching.

Annie Savard is an assistant professor in mathematics education in the Department of Integrated Studies in Education at McGill University. She taught in elementary school for 12 years and worked for the Quebec Ministry of Education, Recreation and Sports as consultant and trainer. She earned a master's degree in science education and a PhD in mathematics education from Laval University. Her research focuses on professional development with elementary school teachers using inquiry-based learning in science and mathematics classes, on the development of probabilistic reasoning among students, and how mathematics can enhance citizenship competencies.

Bruce M. Shore is Professor Emeritus of Educational Psychology in the Department of Educational and Counselling Psychology of the Faculty of Education at McGill University in Montreal. He has a BSc in Mathematics and Chemistry plus Psychology, an MA in Education, and a Teaching Diploma in Secondary Mathematics and Science from McGill University, and a PhD in Educational Psychology from the University of Calgary. His research addresses the ways in which gifted students think and learn differently from other students, how the development of giftedness parallels that of expertise, and understanding and evaluating learning outcomes in inquiry-based environments.

LINK TO:

www.mcgill.ca/inquiry

Inquiry Revisited: The Role of Puzzlement in Today's Classroom

Pat Cordeiro, Rhode Island College

ABSTRACT

Inquiry in today's classrooms has been reduced to a formula for learning the scientific method with any given topic, most often in science in elementary school. While there is value in acquiring a method for approaching a query, students are deprived of the opportunity to construct their own queries, to pursue their natural puzzlement over personal and real-world dilemmas. Questions arise about the value of this procedure in assisting students to develop facility with the genres of the disciplines.

The children come in from an outdoor expedition. These second graders have been exploring a science concept as part of a required lesson. This time they are exploring the effect of wind on objects, part of a larger unit on the concept of air, taken from a district-prescribed science text. Each child has designed and built a paper airplane from sturdy oaktag. Today they have had the chance to try out their designs in a real environment—the playground on a windy day. When they are back inside, they will complete a worksheet on what worked in their design and what they will do to improve the design of the plane next time—even though there will be no next time, at least in this classroom, since the curriculum of the science text moves on to other topics.

All goes well out on the playground. Some planes flew well, some crashed, some designs were successful, some needed more work. One plane, caught by the wind, flew up onto the school roof and stayed there—a great success.

The class moved slowly back inside the building until they were all inside the door. At that point, a little girl screamed, several children shouted and there was a general push of bodies toward the front of the line. There was a call for order, no one listened, and, and for a moment, chaos seemed inevitable. A large garden spider had taken up residence in a corner near the door.

As order was gradually restored and the line moved forward, the hubbub continued with children pushing and shoving. One child shouted, "Kill it!" And another responded, "That's nature."

The spider was put back outside and the children moved on. Back inside the room, the children took up the task of completing textbook prompts on how the wind affected paper airplane designs, "why my wing design worked/didn't work," and "wind makes things fly because…" The large garden spider and the children's divergent responses to it were forgotten, and class turned its attention to completing the worksheets, according to standard, attempting to learn elements of the scientific method, as presented in textbook-driven exercises in today's classrooms.

So, what are we to learn from this anecdote? A form of inquiry is alive and well in this classroom. Inquiry is present in the teaching of the scientific method within the constraints of textbook-driven science curricula—students are investigating scientific concepts appropriate to the specific science curriculum and to the learning of elements of the scientific method.

However, this is a limited form of inquiry, beginning with a teacher-driven query and proceeding through a structured, textbook-driven mode of investigation. I argue that inquiry must go much further and that interpretations of how inquiry is delivered and implemented develop very different modes of language and thinking in learners (Wells, 1999). In the science curriculum in the anecdote above, students are asked to develop a responsive form of inquiry, what I call a "structured" or "controlled" inquiry: "…the scientific method, as the artifact of school science culture, provides an initial way to guide the classroom activity but that its oversimplified approach actively subverts more authentic and model-grounded ways of thinking about inquiry" (Windschitl & Thompson, 2006, p. 825). This form of inquiry answers the textbook- and teacher-developed question, "what happens when…" and allows students to begin to explore causal reasoning, a cause-and-effect approach to phenomena, to develop one aspect of what is commonly taught to students as "the scientific method" as a heuristic for solving queries. Bruner (1986) refers to this as a paradigmatic mode of thinking (p. 13). He writes:

One mode, the paradigmatic or logico-scientific one, attempts to fulfill the ideal of a formal, mathematical system of description and explanation....deals in general causes, and in their establishment, and makes use of procedures to assure verifiable reference and to test for empirical truth. (pp. 12–13)

Wells (1999) refers to paradigmatic thinking as "…this powerful discursive tool [that] has, not surprisingly, been appropriated by other fields of inquiry, and, in different forms, has come to play a major role in the written genres of exposition and argument in almost all the disciplines" (p. 145).

But inquiry must go deeper; it must include what I am here calling "puzzlement." This is an inquiry that captures learner's own puzzling questions, with stories behind them, and asks students to consider divergent possibilities, to think critically, to answer the question, "Yes, that, but what about this?" It is a form of thinking that captures the confusion and search for clues that accompanies human learning about the world and living in it; it is about being puzzled and having no ready answer for resolution and satisfaction. Dewey (1910) says that critical thinking begins when a learner confronts "the forked road" (p. 11), "…the origin of thinking is some perplexity, confusion, or doubt. Thinking is not a case of spontaneous combustion. There is something specific which occasions and evokes it…the next step is…some tentative plan" (p. 12).

While that element of evoked thinking may or may not have been in the exercise of building paper airplanes to collect data, we do see that "forked road" query in two children's divergent response to a large spider—"Kill it" versus "That's nature"—an inquiry ripe with puzzlement. Bruner (1986) would place this inquiry closer to his second mode of thinking, the narrative mode. He writes: "The imaginative application of the narrative mode leads instead to good stories…It deals in human or human-like intention and action and the vicissitudes and consequences that mark their course" (p. 13). It is "the landscape of consciousness: what those involved in the action know, think, or feel, or do not know, think, or feel" (p. 14).

Wells (1999) writes of these two modes: "The narrative mode is primary, and…underlies children's early experience of conversation. It is the discourse of doings and happenings, of actions and intentions: Agents act in the light of prevailing circumstances to achieve their goals" (p. 144). The other mode, the paradigmatic, recodes,

almost every aspect of experiences…a way of symbolically managing the complexity and variability of experience, allowing it to be reconstrued in 'scientific' concepts, which can be systematically related to taxonomies; instances can then be counted, and made amenable to operations of mathematics and logic. (p. 145)

Teaching for and about structured and limited inquiry does not always capture the element of puzzlement that is experienced by all learners of all ages as they seek to understand the world around them. Nor does teaching for structured inquiry necessarily translate into learners' ability to use that structure or that discourse to investigate a new query. The fundamental question for current education, I think, is, does inquiry as taught in its limited, formalized, and structured form as "scientific method" prepare thinkers to confront the second, and deeper aspect of inquiry—"How do I know what to think?"—"What evidence helps me to make a decision?" "What do I do at a crossroads?" "What am I supposed to make of this?" This is puzzlement. Although there was an element of divergency in designing and testing the paper airplanes, the unexpected spider presented a much more distinct and divergent situation. Are young students and their teachers being prepared to appropriate the inquiry tools they are given in order to explore personal, and perhaps more pressing inquiry problems?

The existence of inquiries is not a matter of doubt. They enter into every area of life and into every aspect of every area. In everyday living, men examine: they turn things over intellectually; they infer and judge as 'naturally' as they reap and sow, produce and exchange commodities. (Dewey, 1938, p. 102)

The question for teacher education may well be, how do we best prepare our students for success in today's educational "culture of evidence" (Knapp, Copland, & Swinnerton, 2007) without losing sight of our larger goals to prepare our students and the children they teach to be critical and creative thinkers, to seek and solve knowledge about the world around them, and to be "guided by shared beliefs about the purposes of schooling in democratic societies and about the roles teachers and teacher educators can play in social change" (Cochran-Smith & the Boston Evidence Team, 2009, p. 458).

We will never know whether children's interests were captured by trying to fold the paper into airplanes that would fly, nor will we ever know how an inquiry would have proceeded as to why there are spiders in the world. But we can ponder whether children are being equipped through current inquiry-based instruction to

cope with and solve the worldly problems, the future "forked roads," that they will face.

> For many years, the science education community has advocated the development of inquiry skills as an essential outcome of science instruction and for an equal number of years science educators have met with frustration and disappointment. In spite of new curricula, better trained teachers, and improved facilities and equipment, the optimistic expectations for students becoming inquirers have seldom been fulfilled. (Welch, Klopfer, Aikenhead, & Robinson, 1981, p. 33)

On the overhead projector in a 2nd grade classroom I find evidence of pursuit of inquiry in a formulaic assignment. Students are to list their learnings under three categories: "I learned, I know, and I wonder." Below this is a chart to be copied and filled in by these young learners: "My Claims & The Evidence."

This formula for learning the scientific method comes from a popular, elementary school science series. "For most preservice teachers, the 'scientific method' remains the dominant procedural framework for thinking about inquiry—to the exclusion of considering theoretical models as the basis for fruitful questions and for conceptual refinements after investigations" (Windschitl & Thompson, 2006, p. 829). While the procedures begin to follow Dewey's (1910) injunction to "extend the problem to whatever…perplexes and challenges the mind…" (p. 9), they fail to provoke a "forked-road situation which is ambiguous and presents a dilemma with alternatives" (p. 11). The activity does contain elements of what we commonly call "the scientific method," a process taught for investigating an inquiry in any field. "Essential to thinking, for Dewey, was the importance of doubt and systematic inquiry through reflection. However, Dewey felt very strongly that thinking needed to be trained in order to move beyond basic instincts" (Sevey, 2010, p. 24).

In 1910, when he wrote *How We Think*, Dewey called for formal, trained inquiry as an extension of the "forked road situation." He specified that thinking involved a five-part process which he called "steps": "(i) a felt difficulty; (ii) its location and definition; (iii) suggestion of possible solution: (iv) development by reasoning of the bearings of the suggestion; (v) further observation and experiment leading to its acceptance or rejection" (p. 78). Kliebard (2004) writes:

> Although Dewey was articulating a version of how thinking in general takes place, the act of thought he formulated ultimately became transformed into

a series of five more or less invariant steps constituting *the* scientific methods for high schools students… (p. 231, italics in original)

Kliebard notes that in revising *How We Think* twenty years later, Dewey attempted to unseat this rigid interpretation by including a section that specified that the "phases" were not "steps" nor were they "fixed" (p. 231). Kliebard writes:

His efforts at reconstructing his version of reflective thinking and correcting some confusion was[sic], as seemed to be Dewey's fate by and large, ignored. The controversial belief that there existed a series of sequential steps comprising *the* scientific method has persisted to the present as a staple of the teaching of science. (p. 232, italics in original)

And so inquiry learning inherited a rigid, five-step process that has come to be known as "the scientific method." In curriculum and pedagogy, it is too easy for inquiry to be reduced to its formulaic state, with only correct answers being sought from students, rather than allowance being made for pure puzzlement to be the source for investigation. Such a reduced form of inquiry, or inquiry-as-formula, fails to allow for the essential role of puzzled engagement, reducing inquiry to a five-part thinking process. Although a learner may experience interest in a prescribed lesson with a built-in problem, the learner's own puzzlement is not guaranteed, expected, or provided for. With a prescribed and built-in problem and inquiry, it is far too easy for the teacher and the learner simply to follow the formulaic path and not puzzle at all. In studying the impact of teacher-driven inquiry in mathematics instruction, Jaworski (2004) found that, in spite of teachers' best intentions and strong training, there were times when student-directed inquiry simply could not occur: "While some episodes provided clear evidence of challenge, there were others in which challenge was lacking, in which the teacher answered her own questions and offered her own explanations in response to students' apparent inabilities to do so" (p. 18).

In textbook-driven inquiry lessons, as we see in the following anecdote, learners may experience a situation that is only confusing and puzzling as they try to make the prescribed experiment work, thus further confounding the development of useful inquiry strategies. A fourth grade classroom works on a prescribed textbook lesson on electromagnetism. The creation of a circuit should eventually allow a wire-wrapped nail attached to a D-battery to pick up a metal washer. The lesson doesn't quite go as planned, washers aren't moving and children are frustrated.

There is plenty of confusion and puzzlement in this lesson—children and teacher are all involved with worried frowns, trying to make this experiment work. But this is merely "frustration puzzling"—it does not result in Dewey's "forked road" decision-making or a plan for finding information and resolution, nor is it resulting for some in teaching of "the scientific method" as a method for query investigation, or even as a heuristic being taught for answering a question. Rather it results in curricular frustration and abandonment of the experiment. Some children simply drop out and put their heads down; a few children become seriously engaged in making this work by trying to solve the problem; many look around and talk about other things; some play with the washers. This is not the self-generated puzzlement that will eventually lead to more genuine and personal inquiry; this is frustration that leads to a learning dead end, regardless of the teacher's helpful intervention. In their critique of the scientific method as it is taught in today's classrooms, Windschitl and Thompson (2006) write:

> …even though [the scientific method] encourages naïve empiricism and often dispenses with the need for deep content knowledge to inform the inquiry process, it provides the only structure within which many teachers feel comfortable engaging their students in hands-on work. Teachers relying on this heuristic are often successful in getting their student to ask inquiry-appropriate questions, to work with the materials of science, and to talk about data. (p. 825)

In this anecdote, inquiry is used as it is taught in elementary schooling—a vehicle for investigation and training learners in the scientific method and conveying some testable results. "Puzzlement" is a much more specific and focused term and I am using it to characterize those real world encounters and moments when dichotomies and contradictions arise and are confronted. In today's classroom, curriculum and its implementation are subject to many factors: time is always of the essence, testing and school stress are real, and the "daily grind" often compounds distracting factors. In reviewing an earlier study done by a colleague and herself, Jaworski (2004) notes:

> However, later, under the stress of a Friday afternoon lesson, students' unwillingness or inability to offer explanations, and time factors in finishing an activity, this same teacher entered a funnelling process in which she herself explained the concepts she wanted students to address. She was aware of the conflict between her aims and actions, but she needed a closure to current activity and, in the moment, no other actions were obvious. In

reflecting on the activity later, she explained that what she would have done, ideally, did not fit with time factors and the mood and behaviour of students. (p. 5)

In sharp contrast, Duckworth (2006) writes of a particular curriculum she observed in action:

Instead of expecting teachers and children to do only what was specified in the booklets, it was the intention of the program that children and teachers would have so many unanticipated ideas of their own about the materials that they would never even use the booklets. (p. 8)

We note here that inquiry and the role of puzzlement do not only exist in science education and curriculum. All of our examples have been situated in the discipline of science, a natural context for inquiry, particularly with the teaching of the scientific method. However, both inquiry and puzzlement, given time and opportunity, reside in all disciplines, and in all areas of daily life, and in the world around us. Wells (1999) lays out the role of language-as-inquiry, dialogue in action, in the various disciplines and summarizes:

In each of these cases…the activities…are different, and so are the discourse genres through which these activities are enacted….the different discourse genres perform complementary and interdependent functions, together with constituting, in large part, what it is to 'do' science, history, or literature. (p. 140)

In the classrooms of English language arts and social studies, we often approach inquiry through structured debates and position papers. While working with a stance on a topic is valuable in teaching children how to investigate and defend a position, and how to present that position to a critical forum, this debate format only begins to prepare learners to confront the complex form of inquiry that requires a weighing and evaluation of contradictory and divergent ideas—such as we might find in children's discussion of their reactions to the garden spider in the first anecdote, or in citizens' evaluation of a political debate, or in legal debates around a legislative or Constitutional issue. Literature in its many languages fosters the contemplation of moral ambiguity, promoting much puzzlement in readers. The teaching of social studies provides rich fodder for endless questioning by historians and social scientists who are often engaged in moral puzzlement over "forked roads." Jaworski (2004) writes: "Two factors, however, were always clear to me: (1) the power

of inquiry in processes of learning; (2) the importance of dialogue in coming to know" (p. 28).

Back in the day, when I had time and liberty, I experienced an extended pursuit of mathematical puzzlement that was undertaken by my sixth graders and me. As a child, I was taught very formal math, purely algorithmic, no inquiry allowed, and my students were well on the way to also having this same limited form of mathematical inquiry. But my delight was in exploring with my sixth graders some of the higher ideas in math, some of the theories that reside behind the algorithms that plagued my high school years. I wrote about it in Cordeiro (1994) and characterized our pursuit this way:

> In an effort to promote concept formation in pre-adolescents, to develop powers of thinking, to sow seeds of curiosity, to 'get behind' the computational surface of traditional instruction, I have engaged students in thinking about some 'big ideas' in mathematics. (p. 266)

Big ideas are characterized in three ways, they extend into a variety of contexts, they begin with the intention to develop conceptual thinking, and they are ideas that continue to intrigue the experts (p. 266). This last requisite satisfies the definition of puzzlement—big ideas continue to puzzle even the experts.

We set out to explore group theory (Cordeiro, 1994). I had assembled materials and learned as much as I could about this big idea, and throughout the month of this free-flowing inquiry, I managed to stay ahead of the students as we explored this query. What I had not predicted or prepared for was the students' puzzlement. They kept up just fine with the mathematical explorations I led, but they voiced continuous puzzlement at how people had thought of this. I wrote:

> I had narrowly seen the study as an opportunity to explore the world of mathematics. I had not…expected us to focus finally on the power of the human mind and its manifestation in mathematics. Nor had I seen an exploration of group theory as an opportunity to expand our notion of patterning in the world around us. I had underestimated the minds of children. (p. 290)

This extended inquiry into the world of group theory followed up on a study done with an earlier sixth grade class the year before, studying the big idea of infinity. I wrote:

Whether or not any child becomes a world-class mathematician, we have nonetheless fulfilled the first requirement: we have made the introduction to the concept…a playful and exploratory experience, which has optimized the chance for independent thinking. Further, each child in that class comes away feeling that what they thought…was important, not wrong and a new direction. (Cordeiro, 1988, p. 564)

Elements of playfulness and exploration in pedagogy appear as key to allowing for the introduction of puzzlement as an earmark of learning and inquiry. But playfulness and exploration are scarce commodities in today's hectic classrooms, even though they are essential to fostering students' pursuit of their puzzlements. Jaworski (2004) writes of inquiry in mathematics education:

[This] just start[s] to sketch the kinds of complexity I see in trying to develop teaching. They include dealing with in-the-moment decisions involving cognitive and sociosystemic factors relating to the diverse needs of pupils in class and beyond: time factors, syllabus demand, mathematical or didactical beliefs, emotions of teachers and pupils and more. Teachers tried to balance challenge and sensitivity within a management of learning that was both inclusive of students (sensitive to their thinking and needs) and focused on deep consideration and development of mathematical concepts. (p. 22)

Passmore (1980) posits that we teach capacities and he outlines two kinds of capacities that are taught: open and closed. He distinguishes between them in this way: "A 'closed' capacity is distinguishable from an 'open' capacity in virtue of the fact that it allows of total mastery" (p. 40). Closed capacities can be "converted into routines" (p. 41). "Open" capacities, on the other hand, allow that,

the pupil can take steps which he has not been taught to take…the teacher has not taught his pupil to take precisely that step and his taking it does not necessarily follow as an application of a principle in which the teacher has instructed him. (p. 42)

The teacher can "prepare the way" (p. 44) and may teach closed capacities first to lay the groundwork for learning an open capacity. Passmore specifically addresses the case of science instruction: "In the school science course, the child was to acquire established techniques; later it was supposed, he might blossom out into being an imaginative scientist" (pp. 47–48). But Passmore warns against then assuming that closed capacities must be taught first, because children may become "so

wearied by the endless preliminaries…of any attempt to think for themselves, that they were completely bored by their school life…and certainly not attracted by the prospect of becoming scientists…" (p. 48).

In our anecdotes, we see the potential for "curriculum weariness" in children, their inability to go beyond the preparatory work in learning closed capacities as we try to move them into higher thinking, into the open capacities that allow for higher level problem solving and inquiries into their puzzlements. Unless curriculum and curricular practice quickly move learners into realms of investigation, passing over the tedium of learning strategies and methods, we risk losing learners' interest. Passmore writes: "A school system has to make up its mind what level of capacity it is going to take as its objective. There is a minimum below which it has failed to teach the open capacity at all" (p. 43). Berlak and Berlak (1981) characterize this issue as a "knowledge as given versus knowledge as problematical" (p. 147) dilemma of schooling. They write: "This dilemma focuses our attention on the pull toward treating knowledge as truth 'out there', and the alternative pull towards treating knowledge as constructed, provisional, tentative, subject to political, cultural, and social influences" (p. 148). When curriculum and pedagogy treat knowledge as problematical, a puzzlement, this results in activities designed to develop children's thinking, "an assumption that persons are capable of creative and critical examination of the world that they take for granted" (p. 148).

Here is the heart of the problem, what has been lost in today's classroom interpretation of inquiry. Without a firm grasp of inquiry in our philosophy of education, we are at risk of losing the opportunity for children to learn diverse ways of thinking and expression. "…an inquiry-oriented approach to curriculum creates opportunities for students to engage in many modes of discourse, both spoken and written" (Wells, 1999, p. 161). Creating a diversified and personalized curriculum for children is our only hope for developing in each child the widest possible range of cognitive and discursive opportunities for achievement.

Certainly the material world is too diverse and too complex for a child to become familiar with it…the best one can do is to make such knowledge, such familiarity, seem interesting and accessible to the child…to catch their interest, to let them raise and answer their own questions, to let them realize that their ideas are significant so that they have the interest, the ability, and the self-confidence to go on by themselves. (Duckworth, 2006, p. 8)

This requires a view of the classroom that goes beyond curriculum and practice and sees everyone who is in that space—students and teachers alike—as being engaged in a shared process of learning and dialoguing, so that,

> …the emphasis is on the learner and the conditions that enable him or her to master the means for full participation in the activity of inquiry, both alone and in collaboration with others…a community of inquiry, in which learners share with the teacher the responsibility for deciding on the topics and on the means for their investigation… (Wells, 1999, p. 164)

By 1938, Dewey had allowed for inquiry to go beyond simply teaching a structure such as he wrote about in 1910. By 1938, he allowed that when approaching a forked road situation, inquirers would seek "warranted assertions" (p. 9) based on external and structural factors. In 1938 he wrote, "…every inquiry grows out of a background of culture and takes effect in greater or less modification of the condition out of which it arises" (p. 20) and he warned against teaching for short cuts in inquiry, which "begins in doubt" (p. 7), and may end prematurely, the result of too much structure, if the "problem is taken to be closed and inquiry ceases" (p. 118).

Wells (1999) reminds us that, in the end, learning how to know is all about learning how to think and communicate within a genre, about learning how to inquire and discourse about it. Teaching about inquiry, and teaching in general, is an elegant and informed process of preparing people how to reason and articulate their reasoning within different genres for many different types of inquiries. We as teachers are charged with schooling children into "…the various functions that language performs in the different activities that we might expect students to engage in in the classroom…as an apprenticeship into the various modes of knowing…on which the curriculum is based" (p. 140).

Writing about inquiry and education, Wells sees the goals of education as twofold, "…to ensure that the young are socialized into the values, knowledge, and practices of the culture…and to nurture the originality and creativity of the individual…to fulfill his or her unique potential" (p. 157). He sees goal one as creating "responsible and productive citizens," but should not goal two also do the same? Jaworski notes, "In my view, inquiry is both a *tool* and a *way of being*. In constructivist terms, it can be seen to stimulate accommodation of meanings central to individual growth. In sociocultural terms it is a way of acting together that is inclusive of the distributed ways of knowing in a community" (p. 26). This is how we prepare an educated citizenry to think, discourse, and act.

Duckworth (2006) proposes the heart of education as "the having of wonderful ideas." I certainly agree and find that wonderful ideas often start from a learner's puzzlement over a dilemma, the learner's discovery in a rich and personal context, and the learner's discursive advancement of that idea and its implications. Without that allowance for meaningful engagement, a school's pursuit of the teaching of inquiry becomes merely a formula for problem solving and not the rich tool for addressing a learner's unique and puzzling query and for developing a learner's discourse repertoire.

References

Berlak, A., & Berlak, H. (1981). *Dilemmas of schooling: Teaching and social change*. London: Methuen.

Bruner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard.

Cochran-Smith, & The Boston Evidence Team. (2009). "Reculturing" teacher education: Inquiry, evidence, and action. *Journal of Teacher Education, 60*(5), 458–468.

Cordeiro, P. (1988). "Playing with infinity in the sixth grade." *Language Arts, 65*(6), 557–566.

Cordeiro, P. (1994). "Vygotsky in the classroom: An interactionist literacy framework in mathematics." In V. John-Steiner, C. Panofsky, & L. Smith, (Eds). *Sociocultural approaches to languages and literacy*. Cambridge, UK: Cambridge.

Dewey, J. (1910). *How we think*. Boston: D.C. Heath.

Dewey, J. (1938). *Logic — the theory of inquiry*. New York: Holt.

Duckworth, E. (2006). "*The having of wonderful ideas" and other essays on teaching and learning*, 3rd edition. New York: Teachers College.

Jaworski, B. (2004). Grappling with complexity: Co-learning in inquiry communities in mathematics teaching development. Proceedings of the 28th Conference of the International Group for the Psychology of Mathematics Education, v. I, 17–36.

Kliebard, H. (2004). *The struggle for the American curriculum, 3rd ed*. New York: RoutledgeFalmer.

Knapp, M., Copland, M., & Swinnerton, J. (2007). Understanding the promise and dynamics of data-informed leadership. In P. Moss (Ed.), *Evidence and decision making, the 106th yearbook of the National Society for the Study of Education* (Pt. I, pp. 74–104). Chicago: National Society for the Study of Education.

Passmore, J. (1980). *The philosophy of teaching*. Cambridge, MA: Harvard.

Sevey, L. (2010). The role of pedagogical documentation in developing young children's thinking processes. Unpublished dissertation, Rhode Island College, Providence, RI.

Welch, W., Klopfer, L., Aikenhead, G., & Robinson, J. (1981). The role of inquiry in science education: Analysis and recommendations. *Science Education, 65*(1), 33–50.

Wells, G. (1999). *Dialogic inquiry: Towards a sociocultural practice and theory of education*. Port Chester, NY: Cambridge University Press.

Windschitl, M., & Thompson, J. (2006). Transcending simple forms of school science investigation: The impact of preservice instruction on teachers' understandings of model-based inquiry. *American Educational Research Journal, 43*(4), 783–835.

Pat Cordeiro is Professor and department chair in elementary education at Rhode Island College in Providence, Rhode Island. Her research interests and publications are in language and literacy, with a focus on children's writing. Her 25 years of teaching elementary school coupled with her more recent 21 years in teacher education have left her with more questions than answers about trends in today's schooling.

Teacher Inquiry for Educational Change

Danielle Couture, Judith McBride, Sujata Saha, Denise Schellhase & Kelly Von Eschen, Heritage Regional High School

ABSTRACT

The inquiries of professionals involved in the development of a centre for inquiry into educational practice in a secondary school are fostered through professional conversation among teachers, support and professional staff undertaking research on practice. A framework for the development of the work done in the centre is briefly reviewed. Snapshots of various experiences and products illustrate evolving understandings of inquiry and evidence of ways in which it supports student learning and developing teaching practices in light of local curricular reforms.[1]

Teacher Inquiry for Educational Change

Within the context of curricular reforms (QEP, 2004), education in Quebec has been reconceptualized to reflect societal demands for a support system for teachers and learners with a focus on success for all students achieved through cooperation, problem solving and partnership (Smith, Foster, & Donahue, 1999). However, systemic transformation is rarely without confusion or conflict, and one means to approach such change is to anticipate, confront, and problematize it, using systematic processes such as those of the practitioner researcher. The purpose of this paper is to present a local illustration of the context and application of the inquiry process. Snapshots of various inquiries highlighting problems and progress follow brief summaries of theories framing the work. Finally, a possible next step is put forward.

Danielle Couture, Judith McBride, Sujata Saha, Denise Schellhase & Kelly Von Eschen

The Inquiry Context

Heritage Regional High School (HRHS) is a suburban secondary school located outside of Montreal, Quebec, serving the needs of 1800 mixed-ability and culturally diverse students in an array of programs. These include the prescribed provincial curriculum; enriched English, French and Mathematics courses; extended Secondary I, and work-oriented pathways; Fine Arts Focus, International Baccalaureate, and Sports Excellence options. A team of six administrators, 105 teachers, 28 support and professional staff deliver programs. Ours is a large, busy, and extremely complex community, with a mission to provide a "warm and caring environment, which…encourages excellence and celebrates, with pride, the efforts of those who teach and learn" (HRHS, 2009). However, like any school, HRHS is not without its problems.

The HRHS *Centre for Inquiry Into Professional Practice* (CIPP) grew from weekly meetings begun in 2008. The purpose is to support the endeavors of staff conducting research on practice. Participants have included administrators, teachers, professional, support and secretarial staff. Our professional conversations focus on various problems, possible solutions, as well as a variety of inquiry processes.

A framework for building the CIPP. Various theoretical perspectives frame the CIPP project. Professional conversation supports our developing inquiry community, and provides a context for critical discussion of the school's academic and social issues, research methods, and progress of individual inquiries. Guidelines for various projects are found in the narrative inquiry, self-study, and action research traditions. This paper will focus on the latter.

Conversation as a medium for reflection and change. As a generic term, conversation may be applied to varying language activities in which one's experience is recounted to an other. In a research context, conversation has been used as an alternative or complement to the interview tradition, allowing equal participation in the consideration of assumptions, questions, and ideas. Van Manen (1992) understands conversation as a relational triad. One speaker engages with another, and together they engage with an object, idea, experience, or topic, through question and answer, expression and interpretation of commentary. Thus, conversation may be understood as a collaborative and collective endeavor, fostering reflection and providing an opportunity for shared understanding of experiences, ideas, or phenomena.

Professional conversation fosters the establishment of a discourse community (Rath, 2002), characterized by flexible relationships, and an atmosphere of mutual

respect and trust, each member contributing to the form and topic of the conversation (Clandinin & Connelly, 1998; Rust, 2002). In the case of the CIPP, professionals on equal footing explore and reflect upon the fundamentals of their work as educators and researchers, leading through action to the construction of theoretical and practical knowledge (Connelly & Clandinin, 1999; Rath, 2002; Rust, 2002; Whitehead & McNiff, 2006).

Action research. Action research is generally conceived of as a systematic, cyclical process of reflection on, and change to, professional practice (Arhar, Holly, & Kasten, 2001; Drummond & Themessl-Huber, 2007; Heydenrych, 2001; Mills, 2003; Stringer, Christensen, & Baldwin, 2010; Whitehead & McNiff, 2006). With experience, the inquiry process becomes embedded in the professional's repertoire (Clarke & Erickson, 2003). Outcomes include not simply isolated improvements to teaching and learning. As inquirers construct practical and theoretical professional knowledge, they move to a position where they may make a contribution beyond the local to the broader educational research context.

For our purpose in the CIPP, action research is defined as systematic investigation involving reflection and the gathering of information on teaching and learning in academic and social contexts. The goal is to identify and solve problems, initiate positive change in specific practices and the school environment in general, and to publicly validate findings. Whitehead and McNiff (2006) suggest a series of questions to guide the inquiry process.

- What is my concern?
- Why am I concerned?
- What experiences can I describe to show why I am concerned?
- What can I do about my concern?
- What kind of data will I gather to show the situation as it unfolds?
- How will I explain my educational influences in learning? (p. 89)

These have loosely guided our various inquiries.

Snapshots of Inquiry on Practice

Professional conversation supports our developing inquiry community, and provides a context for critical discussion of demands made by recent curricular initiatives, the school's academic and social challenges, methods supporting inquiry into problems of practice, and progress of individual inquiries. The following snapshots

serve to illustrate a sampling of CIPP action research projects. The first is of Danielle, an early career science teacher exploring inquiry-based learning. Denise, investigating classroom discourse, teaches history. Kelly and Sujata are math teachers developing an inquiry framework to support curricular demands of the reform.

Danielle Couture on inquiry in the Science class. For the last four years I had the opportunity to teach the same students from grade 7 to 10. My teaching style matured as the students had, yet I constantly feared that the mistakes from my rookie year would return to haunt me. This year would be different. It is my fifth year teaching, and the first time I received an entirely new batch of students. Needless to say I was nervous. Nervousness and fear have always compelled me to modify and better my practice. It seemed like a test. Would I be able to adapt to these new students? Would I be able to approach Science in the same manner I had in previous years?

The ominous bell marking the beginning of the school year rang and I stood by the door anticipating new faces. They filed into class slowly, eyeing me suspiciously with a pre-glazed expression of students expecting a bombardment of facts, one question imprinted on the back of their minds, "But why are we learning this? We will never use it again." Through my readings on gender differences, multiple intelligences and learning styles, along with experience, I have developed a student-centered approach to learning. This "but why" attitude was not new to me, and I believed that there was only one person who could answer that question—the student.

The following is an account of different activities, and methods that I am using with my students to foster inner motivation and responsibility, and to answer the elusive "but why" question that often stifles curiosity, through inquiry-based learning. Looking back now, I have to admit that it was difficult at times, but I would not change a thing. The lessons learned for my students and myself were astonishing.

Problematic and selection of the question. Whether or not it was due to familiarity with my teaching style or to the expectation of fact-driven science instruction, I found my students lacking inner motivation, independence, and responsibility for their learning. They could not remember dates of quizzes or exams. They forgot to bring materials for projects and class, and they seemed unable to organize their time. The lack of these essentials seemed problematic. I am teaching grade 9 and 10, my students are quickly approaching final graduation requirements, and the less structured learning environment of CEGEP. I feared that if they were unable to develop their time management skills and responsibility for learning, they would very shortly encounter an incredible wall.

Fig. 1: Danielle engages with students in her student-centered inquiry Science class

Was the lack of responsibility for learning due to disinterest in the course, or maybe a dissonance between my teaching and their learning styles? These questions led me to join the Action Research Group, people with whom I can talk, and refer to, who are also seeking to better their teaching. After trying to pinpoint exactly what my intent in action research was, I came up with my question: "How can we create an environment in which students will develop their independence for learning through inner motivation?" The question, like my teaching, is forever in a tumultuous dance. It changes with new situations. It is molded by individuals I encounter, leaving an impression as they pass. The only thing that I know for sure is that it definitely should be "How can we create?" instead of "How can I create?" The choice of pronoun is essential, for the "we" refers to my students and me. I can question my practices as much as I like, change minor things, for example, give them schedules or build web-sites—both of which were tried with little success. If the students will not use the tools how can they be effective? I realized that the students must come up with the tools, must find the everyday relevance of science. I must provide them with the platform and guidance when needed.

Solution adopted and information gathering. Seeing as I hoped to help develop fully functional, independent citizens and individuals, I decided to put learning into their hands for certain inquiry-based projects in an attempt to foster responsibility for learning. I found it easier to interest the students in this type of project by

discussing major events covered extensively by the media, such as the toy recall in 2009-2010 and the British Petroleum (BP) oil spill.

Obviously, independence, motivation and responsibility for learning are not elements that can be easily quantified. Students do not have small meters showing their development. In order to verify the level of responsibility being developed, I observed their organizational skills, their use of resources, and innovations. I noted when materials were brought in. I considered the amount of idle time spent during periods assigned to projects.

Project 1: The Safe Toy Company 2009-2010. The first project was done in the context of an entrepreneurship contest run by the Quebec government. The students had recently heard about various toy recalls that plagued 2008-2009. This concern inspired a discussion on toy safety and those made of natural materials, such as wood. The class came up with an idea. Each group would become a toy company and would design a wooden toy, giving its specifications and detailed instructions for its construction.

Chessboards and tic-tac-toe games were created, but to my surprise, many students went above and beyond my expectations, designing and creating pinball machines, marble labyrinths and foosball tables. Students were highly interested in the creation and fabrication of their games, not to mention that they also wanted to play with them. They were intrigued by the lengthy process of toy manufacturing, and enjoyed working with wood. Through the Safe Toy Company, the students took the first steps to become responsible for their learning. They chose the toy, came up with specifications, and built products within a limited time frame. They organized their time, materials and roles within groups. I began to note that tardiness had declined, students brought materials, and they were ready to work.

Project 2: Re-creating BP. It was very difficult not to talk about the BP oil spill in the first few days of class. Everyone had heard about it, every student had an opinion, yet no one really knew the extent of the damage or about the clean-up trials taking place. This seemed like an opportunity to re-create a miniature oil spill in the class—in this case vegetable oil.

Students were asked to bring in materials that they believed would help contain and clean up the watery mess. What surprised me was the independent research the students performed. They wanted to select the best possible materials— hairbrushes, sponges, cotton balls and other sanitary products. It was amazing to see

how the different materials reacted with the oil, and to see the difficulty in containing it. What was particularly interesting was that many of the materials worked, yet the students still remarked that there was an oily gleam covering the surface of the aquarium. Through the clean-up efforts, the students understood issues surrounding the spill, and aspects of the scientific method as well.

Project 3: Full-fledged inquiry – end-of-year project. The preliminary results of the Safe Toy Company and the BP Oil Spill encouraged me to take a further step, relinquishing more of my job as teacher, and adopting the role of facilitator. In full-fledged inquiry, students were allowed to select their topic and the type of project, whether it was research-based, experimental, or involving technical design. Within the six classes that were blocked off for the project, students were encouraged to establish their own time lines and take on the responsibility for making arrangements with the lab technicians or librarians as needed.

Students brought in a vast array of poster presentations, experiments, and a Rube Goldberg Machine that could only enter the school through the merchandise delivery door. Students became researchers, scientists, builders and even psychologists using the class as their test subjects. One of the more memorable groups was the Hockey Stick Boys. No matter what I asked to support them in their development as inquirers—What is the purpose of the project? What are you trying to accomplish? What is your question?—They stated, matter of factly, "Hockey sticks." Yet even this group understood, toward the end, the complexity of the research required to reproduce the manufacturing process of hockey sticks. The group actually required additional time to complete the project, and carefully scheduled moments with the technician, while balancing the demands of the science class. Responsibility, motivation, and organization were instilled in the group. At the end of the year, they presented their research, experiment, or construction to their peers, administrators and other teachers involved in action research. For the first time, I had no problem finding volunteers. They all wanted to present first, to show their handiwork, their research, and their results.

Final results and outcomes. Inquiry-based learning was beyond anything that I could have imagined. Not only did the students take up the challenge that I placed before them, but also they had a greater gift at the end—pride. I had never seen students so anxious and proud of their accomplishments. They were hoping that the vice-principals would visit the class, a rare wish for grade 9 students! They created wonderful projects, every one finished, and reflecting students' inner sense of responsibility.

I realized that I could, from time to time, give up my position as the textbook teacher, and the students would still learn, and the lessons learned might be, at times, more beneficial and definitely more memorable to my students and myself. In an attempt to extend my experiment, I debated how to introduce full-fledged inquiry as a permanent element in my classroom. I worried too much. Within the first few weeks of this school year, one of my grade ten students, a friend of a former student asked, "Miss, can I do my inquiry project on go-karts?" The idea spread by itself through the class. I was speechless. Not only were students looking forward to tackling the project with zeal, but the word had also spread to new students who had not experienced my inquiry classroom. Since then, they have all come to my class with ideas, expectations and motivation.

Denise Schellhase on classroom discourse in the History and Citizenship class. I am originally from British Columbia where I earned my Bachelor's degree in History and Anthropology, and a teaching certificate at Simon Fraser University. I am in my 12th year of teaching, and teach Canadian history to grade nine and ten students. At present, I am working on a Master's Degree in Education at McGill University. Year one. One area of my teaching practice I have always found problematic is my use of class discussion. Often, when there was a topic to be discussed at length in class, I asked a general question to the whole class and let various students share their opinions. Other students would respond to these opinions (and so would I), but I frequently found that students' opinions tended to be unfounded. Certain students monopolized our discussions, there was a general lack of respect or reflection on ideas that were "different." In the end, discussions often turned into debates, where students were constantly trying to "one up" each other. In short, there wasn't a whole lot of learning taking place.

When I joined the Action Research Group, therefore, I chose to focus my research on class discussions and how I could implement a more meaningful, discussion-based curriculum in my classroom. I researched various strategies on how to teach discussion techniques and how to structure discussions so that they could be opportunities for students to encounter, engage with, and build new knowledge.

First steps. I started my inquiry by placing all the chairs in a circle and facilitating a discussion with my students on a topic which I figured they would have some opinions about already—at the time, it was the 2008, United States presidential election. I videotaped this discussion. I had no real plan in mind. I simply wanted to observe how we were discussing ideas as a class, and I wanted to see whether changing the physical space of the classroom would have an effect upon the way we

Fig. 2: Denise leads her students in discussion in History and Citizenship class

discussed. Videotaping the discussion definitely changed the nature of the discussion in that students were, overall, more respectful and self-conscious. More importantly, I showed the videotape to the action research group for feedback, and for the students to get their feedback and observations. During our action research group analysis, I asked my colleagues to write what they saw in the video. While my students were watching the video, however, I asked them to track who spoke, the order in which they spoke, and whether their comments were related to what another student had said. The comments I received were very interesting. The teachers noticed details which had eluded me, such as students' body language, while the students were very critical of how they presented themselves publicly and how little some students in the class spoke or responded to what others had said.

In order to see what was transpiring during our class discussions, I invited a colleague's leadership class to observe my students during a discussion. My hope was that his students could offer critical feedback to my students on how best to interact during a discussion. I also wanted them to tell us what they saw going on. Once again, the activity proved to be extraordinarily fruitful. My colleague's class made an outside ring around my discussion group, and in this fishbowl configuration my students discussed the topic of democracy and whether Canadian society was truly democratic. The feedback we received was extremely useful. Though some of the comments made by the leadership students seemed a little harsh at the time, they were honest,

and I felt that my students appreciated getting critical feedback from older peers instead of from me. I also felt that the critiques encouraged them to reflect on their interactions during discussions and to consider how they might modify or change their way of responding to others or sharing their opinions.

Using the data I collected from the videotapes, my journaling after discussions, and the feedback from the leadership class, my students and I sat down together to draw up a list of criteria with which I would evaluate them. In the QEP one of the competencies which I am expected to assess is Citizenship, and I had been struggling both to define what this meant, and to come up with meaningful activities which gave students the opportunity to practice it. Discussions, I concluded, could be a perfect vehicle for putting citizenship education into action. If I define citizenship according to the parameters set by Crick and Joldersma (2007), then the practice of citizenship must be embedded within social interaction.

Once I had my list of criteria from the students, I came up with descriptors and placed them on a grid (see Figure 3 below).

CRITERIA	1	2	3	4	5
Quality of Comments (c1)	Student does not contribute to the discussion.	Student's discussion points simply echo what has already been said. Little understanding of the topic is demonstrated.	Student shares good thoughts and ideas with the group which help to keep the discussion flowing. His/her comments prompt others to clarify their positions/points.	Student's comments are thoughtful and provocative. They demonstrate a sound knowledge of the topic. Student challenges the thoughts of those who have spoken previously.	Student's comments show depth of thought and understanding of the topic. He/she has added new and constructive points to the discussion. Student probes others' positions through thoughtful questioning.
Listening Skills (c3)	Student's body language does not demonstrate an interest in the discussion.	Student's body language suggests that student is not actively following the conversation at all times.	Student's body language demonstrates active listening skills.	Student's body language demonstrates active listening skills. His/her comments reflect consideration of other points of view.	Student's body language demonstrates active listening skills. Through his/her comments, it is evident that he/she has been following the conversation very closely as comments build upon what others have said.

CRITERIA	1	2	3	4	5
Respect (c3)	Student often interrupts others while they are speaking.	Student does not always wait his/her turn before speaking.	Student always waits his/her turn before speaking and never interrupts others by adding unnecessary comments.	Student waits his/her turn before speaking. Even when disagreeing with what others have said, he/she remains respectful of different points of view.	Student waits his/her turn before speaking. He/she gives others a chance to speak who may not have already spoken. Even when passionately disagreeing with what others have said, he/she remains respectful of other points of view.

Fig. 3: Appendix—History and Citizenship discussion criteria

I decided that I would use one grid per student throughout the term. This way, students who did not find a particular topic especially engaging would not feel compelled to speak just because I was evaluating them. The grids would be used to assess general participation and quality of participation over a period of months. I also asked students to do written reflections about our discussions for homework. This way, even if they hadn't contributed to a discussion, I knew they had been carefully listening to, and assessing different arguments. This, I felt, was important for reaching a fair evaluation of student learning.

After reviewing the videotapes, teacher comments, student comments, and my own reflections I understood that in order to engage the students in fruitful discussions, they would first have to be confident in their knowledge of the topics being discussed and take an interest in the topics themselves. After having them reflect upon some of our first discussions, the comment I frequently heard was that they didn't know enough about a topic, or connect to the topic being discussed. Instead of using discussions as a way to discuss more abstract ideas, such as democracy and justice, I decided to base our discussions on concrete material we had learned, and which encouraged the students to take a stand or make important decisions about a certain issue.

Year two.

Initial research. After having laid the groundwork for my inquiry into class discussions, I spent much of the second year exploring different methods for organizing class discussion. Mercer and Littleton (2007) suggest structuring the classroom so

students begin their discussion as a whole class, break into small groups, then return to the whole group with the results of their small group talk. Parker (2006), on the other hand, distinguishes between seminar discussions, which are more exploratory in nature, revealing the world, and deliberations, through which students have to assess arguments presented and draw their own conclusions. All discourse theorists involve educators in the process in very different ways, and it is up to the individual pedagogue to select the best method.

Generally, techniques a teacher chooses should reflect the discussion's end goal. For example, if the main goal of the discussion is to hear as many opinions on a given topic as possible, one might decide to use Cazden's technique of handing off (2001). This consists of asking the last person who spoke to choose the next person to speak based on a specific set of criteria. If the teacher would like a more gender-balanced discussion, she might ask every other person who hands off the discussion to choose a female. Or, if the same individuals tend to dominate the discussion, she might request that the discussion be handed off to people who haven't yet contributed. If it is required that every group member contribute one idea to the discussion, a talking stick can be passed around. In this way, teacher involvement in the discussion's basic structural components can create a more equitable learning environment.

Students need to be taught how to disagree, take criticism, and how to respond and listen to the spoken thoughts of others. There are a variety of ways to achieve this. Johnson and Johnson's model of Constructive Controversy (2009) is a brilliant way of encouraging students to engage with multiple perspectives on a topic—first by researching and arguing one point of view, then switching sides and preparing an argument for the opposite point of view. Finally, students must seek to take both perspectives into account by attempting to reach a consensus on a single view point.

Through my initial research, I also discovered that there are multiple ways to track students' reflections. I might choose, for example, to introduce students to the notion of triple-entry notebooks (Kooy & Kanevsky, 1996) in which they can do pre-writing, a post-discussion reflection, and exchange thoughts with me in the final column. This method allows teachers to keep one finger on the pulse of emergent student knowledge as well as possible impediments to discussion which an individual student might be experiencing.

Continued experimentation. I am experimenting with many different methods, trying to find the ones which would work best for my students. I also put the criteria grid which I had developed with my students in the previous year to good use! Because I was fortunate enough to teach my Canadian history students for two years in a row, I felt that my students were on an exploratory journey with me. Moreover, they were excited each time I told them that we were going to have a class discussion, and they suggested the development of new discussion protocol—having a student moderator who would take note of whose turn it was to talk next and regulate the discussion. These acted as gatekeepers or facilitators, regulating the tempo, pace, and direction of our conversations. I began to feel that my students were not only taking ownership of the discussion process, but were also actively creating banks of knowledge and meaning from the topics I placed on the table.

Towards the end of the year, I felt I could separate myself from the discussions, and I began to note who spoke and what they said. I felt that I could begin to enjoy some of the fruits of my labour. The topics I selected for discussion were motivating and interesting for the students, relevant to our curriculum, and had been well researched by the students ahead of time. I was beginning to develop a systematic means of evaluating the students for their citizenship competency—with a tool they had helped develop! There were still many hurdles to overcome, however. I sometimes felt that our discussions lacked spontaneity; while the discussions were mostly respectful and well controlled by the students themselves, because they had to take turns while discussing, the discussions sometimes lacked the energizing, spirited dynamic which critical conversations often have. Furthermore, certain students still tend to participate more than others.

Once again, I am researching different ways of dealing with some of these issues. The more I discuss these problems with my colleagues, however, the more I realize that my action research project will never actually end! As a result of my research into class discussions and citizenship education, I have decided to write my Master's thesis on classroom discourse, a topic which naturally emerged from my inquiry. And, in spite of my present action research project, I am starting to see new areas of my practice I would like to improve upon and research further.

Sujata Saha and Kelly Von Eschen on inquiry learning in senior Mathematics classes. I, Sujata, am in my eighteenth year of teaching. This year I only teach grade 11 mathematics. I am also currently doing a Master's in Teaching Mathematics at Concordia University. My colleague, Kelly, has been a mathematics teacher for 13 years. She recently completed her Master's in Teaching Mathematics from

Danielle Couture, Judith McBride, Sujata Saha, Denise Schellhase & Kelly Von Eschen

Concordia University, and became interested in action research as a way to link and assess what she was learning at Concordia with what she was doing in her practice, wanting to be more of a participant in the ideas she was reading about. We are two teachers with a total of thirty-two years of classroom teaching experience between us.

What are our concerns? Besides teaching together, we have collaborated on many professional projects and have learned to trust and respect each other's approach to senior secondary mathematics teaching, in particular, and to education in general. We consider ourselves traditional math teachers, delivering a content-heavy curriculum with traditional notes, examples and assignments. We have always conscientiously read the government-issued curriculum documents, and have taught the full content of our courses. So, in 2009, when we knew that reform was imminent, we took our characteristic initiative and read the sections of the MELS documents that concerned us. We discovered that we were about to face a new and unusual pedagogical challenge. According to the program content documents, secondary V mathematics teachers were required to facilitate a 10-15 hour independent assignment (IA). This IA would take the form of investigations and would account for 10% of the allotted class time for the courses. This was not something we felt we could ignore.

Neither of us had done this type of assignment in our classes before. We were accustomed to very traditional teaching practices. The courses we teach are very content-driven and our approach has been effective for both of us. Our initial shock wore off, and our next step was to dive in and get as much information as possible so that we would be able to prepare ourselves for the coming school year. Our shock was to be more jaw dropping when we discovered that there were no resources to help us in this endeavor. We were being asked to implement a substantial curricular change, but we were given virtually no resources to do so, save for one page in the MELS documents.

The time allowance for this project was another of our concerns. We have always felt that in the senior math courses time is a precious commodity, and the last thing we wanted was to squander it in pursuit of a project that, initially, seemed to have very little value. That the reform documents contained inadequate guidance really did not surprise us, but it certainly vexed us. If this IA had to happen, who was going to provide us with the guidance we needed?

Why are we concerned? Indeed, the question of who was going to guide and support teachers in this regard was at the forefront of our concern. We were willing

to do what MELS prescribed but we were wary of trusting the ministry to provide the necessary scaffolding for the IA. As the reform had made its way through Secondary grade levels, we had attended MELS implementation sessions for the new mathematics courses and had come away disappointed. At the sessions there was confusion, contradiction, resignation, frustration—and this from the presenters, not the participants! MELS had lost credibility as far as we were concerned and we immediately felt that the only way to prepare ourselves adequately for 2010 was to take the initiative to create some support of our own.

What experiences can we describe to show why we are concerned? As mentioned, adequate time to deliver the program has always been a principal concern. Since we had no experience with this type of unstructured project, we were scared. We were out of our element. We are used to very structured lessons and homework. What little the MELS documents did provide with regard to implementing the IA sounded completely counter to our usual style of teaching. Experience told us that many senior math teachers feel this way, and many teach the way that we do. We needed some clear, step-by-step procedural guidelines and there were none. What could we do? Were we able to create some support materials for ourselves and for others? Clearly we needed to take action.

We set about trying to clarify the purpose of the IA and through that exercise we would see a plan emerge. We discussed our problem with the Action Research Group. It was suggested that we consider having the students use the inquiry model for research, and we were provided with a copy of an existing inquiry lab developed by a group of teachers several years ago. As soon as we saw the design, we knew that this would be the building block for our own inquiry framework. We customized it to fit the particular needs of our math students. Because we were still very new to this type of instruction and learning, it was decided that we needed to pilot it with a group of students as soon as possible. In the winter of 2009 we began the process of framing our research question, testing our research tool and collecting data to assess the validity of our inquiry framework with a select group of Secondary 5 students. The action research process had begun.

What kind of data will we gather to show the situation as it unfolds? Because we were developing and piloting simultaneously, we were able to collect data that provided us with feedback to make immediate improvements to the framework. Data came in the form of anecdotal student feedback following working sessions, written student surveys, our personal journals of the process, students' final products, and valuable feedback from colleagues. It was this data that allowed us to determine

whether the goals of the IA, as directed by the MELS, were attainable using the framework. Now in the second phase of the action research process, we are using the framework with regular Secondary 5 classes throughout the school and continue to gather data for the purpose of further developing the framework. This data includes feedback from colleagues, our observations, and a larger pool of final products.

Fig. 4: Sujata (right) and Kelly evaluate student inquiry products at the Mathematics Fair

What evidence is there that we have made a difference? Not only did we do the project and bring our HRHS colleagues on board, but other teachers in various school boards have also used our tool to implement the IA component of the program. We have been in contact with teachers by email who have asked for more information or who have offered suggestions for improvement, based on their experiences with the tool that we created. We have given workshops that have been well received throughout the mathematics teaching community in Quebec. These contacts continue to re-energize our efforts to improve. Not only do we feel that our students have learned, but so have our colleagues. One teacher, in particular, came to one of our workshops quite skeptical that the project could be done or that it had any value, but by the end of our two-hour session he was not only convinced that it could, but also wanted to begin right away. The math teachers at our school felt that the tool kept the students on task and was instrumental in leading the students to a final product. They have taken the initiative to contribute to even more improvements for next year. The AR process is never over.

Conclusion

In 1999, as reform initiatives were becoming the hot topic in school staffrooms, then Minister of Education, François Legault, called upon teachers to become the architects of the reform (MEQ, 1999). I believe that it can safely be said that the architects were left to their work without adequate understanding of blueprints or design tools. For some, action research has become a solution, but it is not the only tool available to professionals determined to understand the reform, tackle problems of practice and make change. In our developing CIPP, other activities include a Narrative Inquiry Group working at the intersection of story and self-study. As well, a group of teachers and support staff are working with students on social and physical problems in the school's environment using *Action Research for Community Problem Solving* (Poudrier, 1993). Still others are tackling issues faced by early career teachers, the need for differentiated instruction, problems of classroom management, and student motivation, through individual consultation. The common thread is that staff members are taking the initiative, and the risk, to seek problems and develop solutions. It is clear that this embedded professional development results in learning, and an understanding of that learning is becoming a new direction in work done in the CIPP in order that we better understand inquiry processes and practices, and resultant changing perspectives on teaching and learning.

Notes

1. This work has been funded in part by a *Professional Development and Innovation Grant* from MELS Québec.

References

Arhar, J., Holly, M., & Kasten, W. (2001). *Action research for teachers: Travelling the yellow brick road*. Upper Saddle River, NJ: Merrill Prentice Hall.

Cazden, C.B. (2001). *Classroom discourse: The language of teaching and learning*. (2nd ed.). Portsmouth, NH: Heinemann.

Clandinin, J., & Connelly, M. (1998). Personal experience methods. In N. Denzin & Y. Lincoln (Eds.), *Collecting and interpreting qualitative materials*. Thousand Oaks, CA: Sage, 150–178.

Clarke, A., & Erickson, G. (Eds.). (2003). *Teacher inquiry: Living the research in everyday practice*. London: Routledge Falmer.

Connelly, M., & Clandinin, J. (Eds.). (1999). *Shaping a professional identity: Stories of educational practice*. London, ON: Althouse.

Crick, R.D., & Joldersma, C.W. (2007). Habermas, lifelong learning, and citizenship education. *Studies in Philosophy and Education, 26*(2), 77–95.

Denzin, N., & Lincoln, Y. (1998). (Eds.), *Collecting and interpreting qualitative materials*. Thousand Oaks, CA: Sage.

Drummond, J., & Themessl-Huber, M. (2007). The cyclical process of action research: The contribution of Gilles Deleuze. *Action Research, 5*(4), 430–448.

Gouvernement du Québec. (2004). *Quebec education program* (MEQ Publication No. 03-00691). Quebec, CA: Author.

Heritage Regional High School. (2009). *Educational project*. Quebec, CA: Author.

Heydenrych, J. (2001). Improving educational practice: Action research as an appropriate methodology. *progressio, 23*(2), Retrieved September 23, 2009, from http://www.unisa.ac.za.

Johnson, D.W., & Johnson, R.T. (2009). Energizing learning: The instructional power of conflict, *Educational Researcher, 38*(1), 37–51.

Kooy, M., & Kanevsky, L. (1996). Searching for meaning in assigned readings: Using a triple-entry notebook, *Teaching Education, 8*, 45–54.

Lyons, N., & Kubler LaBoskey, V. (Eds.). (2002), *Narrative inquiry in practice: Advancing the knowledge of teaching*. New York: Teachers College Press.

MEQ. (1999). *Schoolscapes: The education reform newsletter, 1*(3).

Mercer, N., & Littleton, K. (2007). *Dialogue and the development of children's thinking: A socio-cultural approach*. Oxford: Routledge.

Mills, G. (2003). *Action research: A guide for the teacher researcher*. Upper Saddle River, NJ: Merrill Prentice Hall.

Parker, W. (2006). Public discourses in schools: Purposes, problems, possibilities. *Educational Researcher, 35*(8), 11–18.

Poudrier, C. (1993). *Action research for community problem solving*. Trois-Rivières, QC: Author

Rath, A. (2002). Action research as border crossing: Stories from the classroom. In N. Lyons & V. Kubler LaBoskey (Eds.), *Narrative inquiry in practice: Advancing the knowledge of teaching*. New York: Teachers College Press, 146–159.

Rust, F. (2002). Professional conversations: New teachers explore teaching through conversation, story, and narrative. In N. Lyons & V. Kubler LaBoskey (Eds.). *Narrative inquiry in practice: Advancing the knowledge of teaching*. New York: Teachers College Press, 173–188.

Smith, W., Foster, W., & Donahue, H. (1999). *The contemporary scene in Québec: A handbook for policy makers, administrators and educators*. Montreal, QC: OREP.

Stringer, E., Christensen, L., & Baldwin, S. (2010). *Integrating teaching, learning, and action research: Enhancing instruction in the K-12 classroom*. Thousand Oaks, CA: Sage.

Van Manen, M. (1992). *Researching lived experience*. London, ON: Althouse.

Whitehead, J., & McNiff, J. (2006). *Action research living theory*. Thousand Oaks, CA: Sage.

Danielle Couture graduated from McGill University in 2006 and is currently in her fifth year of teaching at Heritage Regional High School. Her passion for learning can be seen through her hobbies: dance, music, 3D rendering and film-making. When not in the classroom, you will most likely find her in the gymnasium coaching competitive cheerleading. She joined the action research group to better her practicum and learn more about the inquiry process. It is a wonderful fit as it coincides with her view of what a teacher really is: an avid learner who desires to share her passion.

Judith McBride, PhD is a retired special education teacher. She currently serves as research coordinator at Heritage Regional High School of the Riverside School Board in Saint Hubert, Quebec. Her research interests include action research, instructional design, narrative inquiry, and teacher learning.

Sujata Saha taught senior high school mathematics for over 18 years on the South Shore of Montreal and is currently a vice principal at a high school in the same board. She has also been involved with the International Baccalaureate Middle Years Programme as a teacher, coordinator and work-shop leader. Five years ago Sujata returned to pursue formal studies and recently completed a Master's in Teaching Mathematics. Education is her passion and she feels it is a jour-ney where all involved must continuously look at best prac-tices to keep up with the needs of the quickly evolving world.

Denise Schellhase teaches Canadian History at Heritage Regional High School and is in her 13th year of the profession. She has a B.A. in Anthropology from the University of British Columbia and a teaching certificate from Simon Fraser University. Denise is currently completing her M.A. at McGill University and the topic of her thesis is classroom discourse and its role in identity development and critical thought. The inspiration for Denise's graduate work evolved from her action research project.

Kelly Von Eschen is a teacher of senior mathematics at Heritage Regional High School in St. Hubert. She has been teaching for 15 years and in 2009 she completed her Master's in Teaching Mathematics from Concordia University. She finds that the collaboration and collegiality inherent in action research is the balance she is looking for between academic research and the practice of her profession.

Tools for Inquiry: Improving Questioning in the Classroom

Marcia. A. B. Delcourt, Western Connecticut State University
Jason McKinnon, Ridgefield Public Schools

ABSTRACT

The ability to ask questions is the foundation of inquiry learning. While national research standards promote the use of inquiry skills such as questioning, many programs for pre-service teachers do not include training in the development of these skills, leaving teachers and children lacking in this area. A four-step plan is described for assessing inquiry skills by monitoring types of questions employed in the classroom and implementing changes in classroom practices. Results not only reveal that teachers and their students learn to ask more questions, but also that the number of higher order thinking questions actually increases using these methods.

Inquiry is fundamentally about asking questions and being curious. Inquiry means to discover, show interest, be motivated, problem-find, problem-solve, think, and create meaning. "The idea of producing knowledge that is meaningful to yourself and others, and using knowledge to accomplish purposes that include those you set yourself or that you believe in, is central to inquiry" (Aulls & Shore, 2007, p. 23). If a purpose of education is to assist students to become independent learners and thinkers, then inquiry deserves a place in every classroom, beginning with how to formulate a question.

We take for granted that people know how to ask a question. It is assumed that if a child uses the word "why" then he or she has learned how to ask an appropriate question. While this behavior may be developmentally accurate for a two-year-old, once children enter school they do not necessarily learn about "nuances" in

questioning because inquiry is not typically stressed in teacher preparation pro-grams (Zembal-Saul, Blumenfeld, & Krajcik, 2000), and many teachers have difficulties employing inquiry-based instruction (Oliveira, 2010, p. 422).

While organizations such as the National Research Council (NRC) promote the use of questioning skills (NRC, 2000), most teachers do not provide their students with direct training in question asking until a student is given instruction in scientific thinking through conducting a science experiment, or taking a research-related course such as statistics or psychology. In fact, when the key words "inquiry in educa-tion" were used to review available databases in education for peer-reviewed sources published from 2000 to 2011, the search revealed a total of 62, 43, and 46 references pertaining to the elementary, middle, and secondary school levels, respectively. Between 74% and 93% of these references related to the field of science. Few other subject areas were specifically named in the titles, key terms, or abstracts. (For research about inquiry instruction across content areas, refer to Aulls & Shore, 2007; Shore, Aulls, & Delcourt, 2007). Although reports of using inquiry in schools occur pre-dominantly in science classrooms, science educators maintain that there is "little evi-dence" that inquiry-based instruction is being used in these classes (Hermann & Miranda, 2010, p. 27), despite numerous models available in the literature (Harris & Burke, 2008; Hendrickson, 2006; Jansen, 2011).

Not only do many students lack the training to formulate questions, but they also often have low self-confidence when presenting their ideas, problems, or projects (Shore, Aulls, & Delcourt, 2007). Because they worry about what others will think of them, students become reluctant, uncomfortable, or even fearful about ask-ing questions (Oliveira, 2010; Starko, 2007). At some point, these students may have felt that their questions were not supported due to inappropriate feedback (Salon, 2008). Another deterrent to asking questions is a lack of instructional time (Ramsey, Gabbard, Clawson, Lee, & Henson, 1990). There can be so many demands on a teacher to include a specified amount of content in a limited amount of time that he or she uses most of a classroom period to check for basic understanding, thereby con-sciously or unconsciously reducing the number of higher order thinking skills ques-tions that require lengthier, more in-depth responses.

If the numbers and types of questions being asked by teachers and students in a classroom are not given a high priority, most questions are asked by the teacher, and a majority of these can be classified at the knowledge/comprehension (K/C) level of thinking (Delcourt & Carkner, 1996). It should be no surprise that if teachers are ask-ing all or most of the questions, then students do not have the opportunity to ask

them. Furthermore, if teachers ask questions that only require basic knowledge, such as "Who was the antagonist in this story?" or "What are the ingredients needed for this experiment?," then many students will not have practice responding to or formulating questions, especially those representing complex levels of thinking.

How Can Questioning in the Classroom Be Improved?

An Example of Improving Questioning Skills

The first way to improve questioning is to assess what is happening. The second step is to develop a plan for improvement. Thirdly, the situation should be reassessed. Finally, new targets should be set. The following guidelines were developed for a course project in *Learning, Cognition, and Teaching* as part of an EdD in the Instructional Leadership program at Western Connecticut State University in Danbury, CT.

Purpose. The purpose of this activity is to influence student learning by improving the use of Higher Order Thinking (HOT) questions in a school environment. Ideally, both students and teachers should be using HOT skills on a regular basis through both questions and statements made during the school day. This activity provides data about the numbers and types of questions being used, as well as strategies to improve HOT questions in the classroom.

Directions. One way to monitor improvement is to take a baseline, develop a plan for change, and assess the results. In order to record HOT skills, data need to be gathered about the types of questions and comments being made in a classroom. The Classroom Practices Record (CPR) (Westberg, Archambault, Dobyns, & Salvin, 1993) is an instrument that can be used to analyze activities during a class session. While the CPR was originally used by researchers for the National Research Center on the Gifted and Talented to target participation of specific children in classroom activities, it can also be used to observe selected students or an entire class. The observer records the types of activities such as whole group, individual seat-work, small group, learning center, etcetera. The classroom conversations are then scripted and coded. It is also a good idea to record wait time, the amount of time between asking a question and soliciting a response. Refer to the report by Westberg et al. for complete directions for using the CPR.

An educator can reflect on his or her own teaching using an audio or video taping system or being observed by a colleague. Using either technique, conversations can be scripted directly onto the CPR.

Procedures.

1. **Step One: Assess Numbers and Types of Questions Using the Classroom Practices Record**
   a. Become familiar with the CPR. Review the self-test at the end of the manual.
   b. Record 1-3 or more baseline observations of teaching. Strategies could include monitoring the same class or different classes of the same teacher throughout the day.
   c. During each session or while watching or listening to the tape, script the lesson to capture what is occurring.
   d. After each data collection session, record narrative observations in field notes.
   e. Using the CPR, count the number of HOT questions and comments made by the teacher and the students; count the number of knowledge/comprehension questions and comments made.

2. **Step Two: Develop and Implement an Improvement Plan**
   a. Analyze the data from Step One.
   b. Set goals for improvement.
   c. Investigate possible strategies.

3. **Step Three: Reassess**
   a. Collect new data as in Step One above.
   b. Calculate the results. Use a chi-square analysis.

4. **Step Four: Reflect and Develop Future Plans**
   c. Provide a summary and conclusions.
   d. State next steps.

Step One: Assess Numbers and Types of Questions Using the Classroom Practices Record. A sample of verbal interactions is recorded in Table 1. These represent an initial fifth-grade reading lesson about the book, *Number the Stars,* by Lois Lowry. The school Principal was the observer and an EdD candidate. Therefore, these data were collected for a course project rather than for a teaching evaluation. For this

observation, students and the teacher asked 10 (K/C) questions compared to four HOT questions. Specifically, teachers asked five K/C and three HOT questions, while students asked five K/C questions and one HOT question.

Table 1:
Classroom Practices Record (CPR): An Example of Verbal Interactions

WHO AND TO WHOM CODES:	WHAT CODES:	WAIT TIME:
(T) Teaching adult	(KC) Knowledge/ comprehension question	✔ Minimum wait time (3 seconds)
(S#1) Target Student #1	(HOTS) Higher-order thinking skills question	
(S#2) Target Student #2		
(S) Any Student	(RC) Request or command	
(AL) Students at large	(R) Response	

WHO	TO WHOM	WHAT	WAIT TIME	NOTES
T	AL	K/C	✔	"What do you think this chapter will be about based on the title?"
S	T	R		"Maybe like when the Nazis came to the house."
T	AL	K/C	✔	"What happened at the end of the chapter 4 to support your answer?"
S	T	R		"…the Nazis identified the 'dark haired girl' as Ellen."
T	AL	K/C	✔	"Can someone please summarize what happened in this part of the story?"
S	AL	R		Examples given…
T	AL	K/C	✔	"How is Annemarie acting?"
S	T	R		"She's acting like it's another day."
S	AL	K/C	✔	"If the Nazis come, will they figure out that Ellen is a Jew?"
S	S	K/C	✔	"Why is Ellen acting like she is the dark queen?"
S	S	R		"Because she played this part in the play once."

WHO	TO WHOM	WHAT	WAIT TIME	NOTES
T	S	HOTS	✔	"What type of person is Annemarie based on evidence in the story?"
S	AL	R		"I think she is very high spirited because she never lets the Nazis get her down."
S	AL	K/C	✔	"How old was Kristie at the time her sister died?"
S	S	R		(Response to the question.)
S	S	HOTS	✔	"Why didn't the author tell us the story of what happened to Lise when she died?"
T	AL	HOTS	✔	"What do you notice that the author is doing during this part of the chapter?"
T	AL	KC	✔	"In chapter 4, Annemarie makes a bold statement to show that she is caring, what is that statement?"
S	S	R		(Response to the question.)
S	AL	K/C	✔	"Did the family know who hit Lise?"
S	S	R		(Response to the question.)
S	AL	K/C	✔	"Would Eliza's wedding dress ever be worn?"
S	S	R		(Response to the question.)
T	AL	HOTS	✔	"Why is Annemarie's stuff in the blue chest? Why is it important?"
S	Various Students	R		Various responses.

Step Two: Develop and Implement an Improvement Plan. Following the first observation, the principal shared his data with the classroom teacher. Despite preparing questions in advance and posing numerous HOT questions, this teacher was somewhat disappointed with the results. She wanted more student engagement and greater evidence of higher order thinking. The next aspect of the plan was to develop a way to achieve these goals. The observer and teacher discussed different types of questions based on Bloom's Taxonomy (Bloom, 1956) and decided that students needed training in how to identify and write different types of questions.

The improvement plan had three distinct components: First, KC questions and HOT questions were reviewed with students; Second, students were asked to develop and recognize different types of questions; Third, students formulated their own questions, which were then both self-scored and scored by the teacher. The resulting information was used to develop a set of exemplars for question types. The guidelines for this strategy are listed in Table 2.

Table 2:
Definitions and Examples of Questions

TYPE OF QUESTION	QUESTION EXAMPLES		RUBRIC SCORE
Knowledge/ Comprehension *(i.e., describe, sequence, list, infer, compare, contrast, what, where, when, how)*	**Knowledge** • Who is the main character? • What do you think the chapter will be about based on the title? • Where does the story take place?	**Comprehension** • What was the problem in this book and how was it solved? • List five major events in this story in sequence • What was the author's purpose for writing this story/chapter/book?	1 point
HOTS (Higher-order thinking) *(i.e., evaluate, rate, support, draw conclusions, why, apply, analyze, criticize, arrange, plan, judge, select, evaluate)*	**HOT Questions** • What was the relationship between (name a character) and (name of other character)? • How is the problem in this story comparable to a problem you've read before? • Did the author do a good job in making the setting believable? • If you were in this situation, what would you have done? • Did the author make any mistakes in telling this story?		3 points

TYPE OF QUESTION	QUESTION EXAMPLES	RUBRIC SCORE
	• Pretend you are one of the characters in the book. Write a diary about the happenings in your life for two consecutive days. • Write a different ending to the book. Tell why you changed it. • Find one word that describes a character in your book very well. Give five reasons for your choice of words. • The climax of any book or story is the exciting or interesting part. Tell what you think is the climax of the book and why. • Identify one problem in the book and give an alternate solution, one not given by the author. • Whom do you think the author intended to read this book and why? • If you could only save one character from the book in the event of a disaster, which one would it be and why? • Which character in the book would you choose for a friend? Why?	

Step Three: Reassess. The data collected during the initial and final observations can be placed into a chart to view any differences in the frequencies for asking questions (Table 3).

Table 3:

Frequencies of Knowledge/Comprehension Questions and Higher Order Thinking Questions in a Grade Five Reading Class

	TYPE OF QUESTION	
DATA COLLECTION PERIOD	**K/C**	**HOT**
Pre		
Teacher	5	3
Student	5	1
Total	10	4
Post		
Teacher	0	4
Student	3	9
Total	3	13

This information shows that there was a decrease in the number of K/C questions and an increase in the number of HOT questions, but does not indicate if this difference is significant. A chi-square can be used to calculate statistical changes in frequency-level data. The data gathered prior to the program implementation can be considered the "expected" or pre values, if nothing changes and the number of questions obtained after the program implementation can be the "observed" or post values. To interpret a significant chi-square, a standardized residual (R) is calculated for each of the categories as indicated in Table 4. Categories that have R values of ± 2 are "major contributors" (Hinkle, Wiersma, & Jurs, 2003, p. 552) to a significant chi-square.

As a result of the fifth-grade classroom study, a final observation revealed that there was a significant change in the numbers and types of questions being asked in the classroom ($X^2 = 70.13$, $p < .05$). Furthermore, the most important contributors to the significant chi-square were the facts that teachers asked fewer questions at the knowledge/comprehension level during the post observation as compared to the initial data collection period and students formulated a greater number of HOT questions after participating in the question recognition and writing activities. The latter follow-up information is indicated by the R values in Table 4, which meet or exceed the absolute value of 2.

Table 4:

A Comparison of Knowledge/Comprehension Questions and Higher Order Thinking Questions in a Grade Five Reading Class

SUBJECT	TYPE OF QUESTION	PRE (EXPECTED)	POST (OBSERVED)	O-E	$(O-E)^2$	$(O-E)^2/E$	R
Teacher	K/C	5.00	0.00	-5.00	25.00	5.00	-2.24
	HOT	3.00	4.00	1.00	1.00	0.33	0.58
Student	K/C	5.00	3.00	-2.00	4.00	0.80	-0.89
	HOT	1.00	9.00	8.00	64.00	64.00	8.00
Chi-square						70.13	

Step Four: Reflect and Develop Future Plans. These data support the argument that focused and explicit instruction can have a powerful impact on critical thinking skills. Additionally, teachers can benefit from having a colleague who serves as a "Critical Friend," providing feedback used for formative assessment. Focused mini-lessons provide students and teachers with opportunities to target specific areas of teaching in order to improve a "best practice." Clearly, this four-step process supports the notion that teachers can quickly and effectively improve practice through explicit instruction in the area of critical thinking, which can be part of a larger plan to improve student achievement.

Additional Examples of Improving Questioning Skills

Improvement plans. Using this four-step model, teachers have designed a variety of plans to improve the use of questions in their classrooms. Their efforts have usually been related to increasing the number of HOT questions asked by both themselves and their students. They have found that directly teaching students how to recognize and compose different types of questions has produced considerable changes in their ability and willingness to formulate questions of different types. These questions have been based on several different schemas, such as the six-category Bloom's taxonomy (1956) (knowledge, comprehension, application, analysis, synthesis, and evaluation) or the revised hierarchy (remembering, understanding, applying, analyzing, evaluating, creating) (Anderson & Krathwohl, 2001). Other

sequences related to cognition include questions related to recall, processing, and information generation (Landrum, 1990; Shrable & Minnis, 1969), or questions related to declarative, procedural, and conditional information (Driscoll, 2005). Teachers certainly find it valuable to construct their questions as part of lesson preparation, and have found that when students are encouraged to write their questions in advance, they are better prepared to participate in classroom discussions.

Teachers have also developed specific plans to enforce a three-second waiting period between asking a question and calling on a specific student. They have used strategies such as tapping out the seconds, counting silently, or even placing a poster in the classroom to remind everyone of the value of pausing prior to expecting a response.

Additional Results of Assessing Questioning

Table 5 is an example where all R values support a significant change in the total numbers and types of questions being asked in a grade two reading class ($X^2 =$ 42.2, p < .01). This teacher particularly focused on limiting the number of K/C questions being asked and increased the number of HOT questions. She modeled HOT questions and required each student to produce at least one higher order question.

Table 5:
A Comparison of the Number of Knowledge/Comprehension and Higher Order Thinking Skills Questions by Teachers and Students in a Grade Two Reading Class

SUBJECT	TYPE OF QUESTION	PRE (EXPECTED)	POST (OBSERVED)	O-E	$(O-E)^2$	$(O-E)^2/E$	R
Teacher	K/C	25.00	3.00	-22.00	484.00	19.40	-4.40
	HOTS	21.00	36.00	15.00	225.00	10.70	3.30
Student	K/C	22.00	8.00	-14.00	196.00	8.90	-3.00
	HOTS	21.00	31.00	10.00	100.00	3.20	2.20
Chi-square						42.20	

The chi-square statistic can also be used to analyze results across classrooms from different teachers. In a study of 11 science teachers, the frequencies of questions are averaged. There was a significant change in the mean number of questions asked (X^2 = 89.69, p < .01). The greatest contributor to this result was the number of HOT questions asked by students (Refer to Table 6). Overall, teachers did reduce their total use of questions during a typical lesson by 17%. In addition, the total use of HOT questions posed by students and teachers increased by 14.7%. While this example shows that teacher use of HOT questions was not a major contributor to the significant chi-square, more class time and opportunities were established for students to pose better questions.

Table 6:

A Comparison of the Mean Number of Knowledge/Comprehension and Higher Order Thinking Skills Questions by Teachers and Students Across Eleven Science Classrooms

SUBJECT	TYPE OF QUESTION	PRE: MEAN QUESTIONS ASKED (EXPECTED)	PRE: MEAN QUESTIONS ASKED (OBSERVED)	O-E	$(O-E)^2$	$(O-E)^2/E$	R
Teacher	K/C	7.00	6.64	-0.36	0.13	0.02	-0.14
	HOTS	5.18	5.82	0.64	0.41	0.08	0.28
Student	K/C	5.36	6.63	1.27	1.6	0.30	0.55
	HOTS	0.27	5.18	4.91	24.11	89.29	9.45
Chi-square						89.69	

Conclusions and Implications

Teachers and students can increase their use of higher order questions in the classroom. Teachers who paid particular attention to the reactions of their students once an improvement plan was in place noticed that when some students began to model asking questions, more of them became involved in asking questions. One school principal not only observed the entire class, but also followed two students over time, and watched and recorded the increase in their participation. Another teacher observed that as a result of participating in the implementation plan, " … many students were interested in understanding their own cognitive

processes, were aware of instructional preferences, and were able to monitor and assess personal levels of engagement during a learning activity" (B. Boller, personal communication, December 20, 2006). One important finding was that while the HOT questions increased on the part of students, the need for the teacher to explain and restate information in the lesson decreased.

These results indicate that over time, these teachers designed more opportunities for students to ask advanced questions. They added inquiry opportunities into their classes by creating inquiry-oriented activities and environments. Developing a plan to improve questioning skills is indeed a key variable in student involvement in inquiry (Shore, Aulls, & Delcourt, 2007), resulting in a greater number of HOT questions being asked by both teachers and students. Through keeping the development of higher order questions at the forefront of teaching, critical thinking and inquiry strategies will be kept at the heart of educational improvement.

References

Anderson, L., & Krathwohl, D. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing*. New York: Pearson.

Aulls, M. W., & Shore, B. M. (2007). *Inquiry in education: the conceptual foundations for research as a curricular imperative*. New York: Erlbaum.

Bloom, B. S. (1956) *Taxonomy of educational objectives, handbook 1: Cognitive domain*. New York: Longman, Inc.

Delcourt, M. A. B., & Carkner, P. (1996, June). *Teachers' and students' participation in an inquiry-oriented curriculum: The types of questions they ask and their perceptions of learning*. Presentation at the Canadian Society for the Study of Education, St. Catherines, Ontario.

Driscoll, M. P. (2005). *Psychology of learning and instruction*. (3rd edition) Boston: Allyn & Bacon.

Harris, R., & Burke, K. (2008, September). Developing the essential features of inquiry. *Science Scope*, 40–46.

Hendrickson, S. (2006, January). Backward approach to inquiry. *Science Scope*, 30–33.

Hermann, R. S., & Miranda, R. J. (2010). A template for open inquiry. *The Science Teacher*, November, 26–30.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (2003). *Applied statistics in the behavioral sciences*. Boston: Houghton Mifflin.

Jansen, B. A. (2011, March/April). Inquiry unpacked: An introduction to inquiry-based learning. *Library Media Connection*, 10–12.

Landrum, M. S. (1990). *The effects of peer coaching as follow-up to inservice training on application of training to classroom practice*. (Unpublished doctoral dissertation). The University of Virginia, Charlottesville.

National Research Council (NRC). (2000). *Inquiry and the National Science Education Standards*. Washington, DC: National Academy Press.

Oliveira, A. W. (2010). Improving teacher questioning in science inquiry discussions through professional development. *Journal of Research in Science Teaching, 47*(4), 422–453.

Ramsey, I, Gabbard, C., Clawson, K., Lee, L., & Henson, K. T. (1990). Questioning: An effective teaching method. *The Clearinghouse, 63*(9), 420–422.

Salon, C. (2008). *Student Perceptions of Mathematical Self-Efficacy in the Context of the Instructional Setting and Problem Solving Activities* (Unpublished doctoral dissertation). Western Connecticut State University, Danbury, CT.

Shore, B. M., Aulls, M. W., & Delcourt, M. A. B. (Eds.). (2007). *Inquiry in education: Overcoming barriers to successful implementation*. New York: Erlbaum.

Shrable, K., & Minnis, D.L. (1969). Cognitive levels analysis interaction model (CLAIM). In A. Simon & G. Boyer (Eds.), *Mirrors for behavior III: An anthology of observation instruments*. Wyncote, PA: Communications Materials Center.

Starko, A. J. (2007). Teaching problem finding to elementary students: Views from the trenches. In B. M. Shore, M. W. Aulls, & M. A. B. Delcourt (Eds.), *Inquiry in education volume II: Overcoming barriers to successful implementation*. Mahwah, NJ: Erlbaum.

Westberg, K. L., Archambault, Jr., Dobyns, S. M., & Salvin, T. J. (1993). *An observational study of instructional and curricular practices used with gifted and talented students in regular classrooms*. Storrs, CT: The National Research Center on the Gifted and Talented.

Zembal-Saul, C., Blumenfeld, P.C., & Krajcik, J. S. (2000). The influence of guided cycles of planning, teaching and reflection on prospective elementary teachers' content representations. *Journal of Research in Science Teaching, 37*(4), 318–339.

Marcia A. B. Delcourt is a Professor at Western Connecticut State University, Danbury, CT where she coordinates the Doctor of Education in Instructional Leadership Program. She has been active in education for over 20 years as a teacher, program coordinator, curriculum consultant, and researcher. She has also been a principal investigator or evaluator for over 25 state or federal grants. Her present research interests include assisting school personnel to design and refine techniques for identifying their gifted and talented children, developing inquiry skills in teachers and students, and encouraging teachers as researchers. She is presently working with educators and researchers through the government of India to identify and mentor children who have high ability in mathematics and science.

Jason McKinnon is Principal of the Branchville Elementary School in Ridgefield, CT. He has a Masters degree in education from Flinders University in Australia and is currently a doctoral candidate in Instructional Leadership at Western Connecticut State University. Earlier experience as a literacy specialist prompted Jason's interest in the importance of asking higher order thinking (HOT) questions to engage students in deeper learning. Jason learned that when students formulated HOT questions themselves, they interacted with their peers in a more meaningful way. His dissertation topic will explore HOT questions and the effects they have on students' critical thinking skills and reader self-efficacy.

Spotting the Occasion for Poetry: An Invigorating Process of Finding Out by Finding In

Margaret Louise Dobson, McGill University

ABSTRACT

This essay illustrates how the spotting of a poem in a prose con/text can reveal essential lessons for research, teaching and learning. In describing the process of my inquiry, I demonstrate how writing a found poem unearths an otherwise hidden—or possibly forgotten—connection between finding poems and educating youth. To allow artful, heartfelt insights to emerge, we have only to learn how to "spot the occasion for poetry" (Sullivan, 2007).

My experimentation with the writing of poetry in the recent past has shown me that poems have a way of finding me rather than of me finding them. More often than not, a poem will appear as if by accident. More likely than not, a poem will shy away from intent. As a former school principal fresh from the fields of teaching and educational leadership, I am a newcomer to the writing of poetry and to the doctoral program in Integrated Studies in Education. After spending several recent years in school administration and in the writing of success plans, grants for funding, and letters to various constituents on behalf of other people, I wondered if I had an original thought left to call my own. To find out, I enrolled in a creative writing course at McGill University. Part way into the course, instead of the usual prose I was expecting, out popped little poems like newly sprouted wild violets in the summer's grass. Imbued with a reticent hue, the newly-born-shy outcrop persistently insisted their way out of the blue and onto the pages of my weekly assignments. I loved them as only a mother can love. Shortly thereafter, on a quest of a similar nature, but with a different purpose, I enrolled as a doctoral student looking to find the hidden meaning of education within its purpose-driven

mission. I came to talk back to the system. I wanted to find "somewhere / these children / (& i) / so very need / to go" (Prendergast, 2008). I came to question the imbalances of the dominantly utilitarian-instrumental worldview of education. I wanted to look beyond the prosaic facts of the matter and get to the poetic heart of the matter. What I am finding is a serendipitous coming together, a happy reunion, of poetry and education. Through the new-found perspective of poetic inquiry, I am discovering essential lessons for research, teaching and learning. I am beginning to find the answers I am looking for, and those answers are not where you would expect to find them. Finding out is an invigorating process of finding in.

It was in the spring term of the first year of my program that I first took Lynn Butler-Kisber's (2010a) course in Interpretive Inquiry. I had realized by now that the research I was interested in "doing" was not going to fall easily and neatly into conventional modes of academic research methodology. Poetic Inquiry was introduced in the course as only one of several possible arts-informed perspectives. I felt an immediate personal connection with the potential I sensed for letting new insights and new meanings emerge. For the course assignment, we were asked to work with the material in our course packs, and to write a found poem to demonstrate our newly acquired knowledge of poetic inquiry. As I began to think about my approach to the assignment, I decided to write a found poem from interview data that I had previously kept on hand for just such an exercise. As you will see shortly, I had a compelling "occasion" to change my mind on that decision. One of the crucial lessons to be learned by researchers working in the realm of poetic inquiry for the first time is not to expect preconceived plans to pan out.

While re-reading Anne Sullivan's essay, *On Poetic Occasion in Inquiry: Concreteness, Voice, Ambiguity, Tension, and Associative Logic* (Sullivan, 2007), I was struck once again by the poetic phenomenon I describe in my introduction. What I didn't expect was my strong emotional response to the content of the essay I was reading ostensibly to "learn about" poetic inquiry. The author was writing about "occasions for poetry," but I kept seeing, hearing and feeling "occasions for *living*"! Reading words in the essay such as "intuition," "embodiment," "voice," "emotion," "ambiguity," "associative logic," "open-endedness," "complexity," "mystery," "non-linearity," and "the circuitous and unresolved" IN A UNIVERSITY COURSE PACK was like gulping deep breaths of fresh air that I thought were long-gone from most public (and private) institutions. Like watching the negative of a photograph come to life in the developing solution of the dark room, I began to see the outlines and possibilities of a poetic re-presentation. It was the strong emotion evoked by the essay, and the intriguing parallels for education that I intuited that compelled me to work with

this material, and no other. In short, I recognized an occasion for poetry. Finding and writing the poem became in and of itself an "act of inquiry that aims at making meaning of the world" (Brizuela, Stewart, Carrillo, & Berger, 2000, p. xi).

Being in and Doing the Work

After my first reading of Sullivan's essay, I almost cried out loud. I felt that what was being reflected by the words "poetry" and "poems" was the very essence of life itself. Schools, in their ever-positivistic linear march towards progress, were squeezing out the very poetry from our lives, I thought. In sad, angry pen strokes of protest, I quickly jotted down my uncensored feelings and thoughts: "They (schools) have tried to take this from me, from you/Choked up by the Program, we have forgotten how to breathe." At the same time, I felt energized by the strong resonance I found in the work. Having inadvertently discovered an educational ally in Sullivan, my resolve to do something about it was renewed and strengthened. This sad/mad/glad cocktail was the powerfully intoxicating beginning of my process.

Thus began my inquiry, my "way of being in and doing the work from its inception to its conclusion" (Butler-Kisber, 2010b, p. 3). My aim was not only to understand how poetic inquiry could enhance qualitative research in general, but also to explore the intuitive connection I felt between finding occasions for poetry and research, teaching and learning. I was intrigued by the idea that in qualitative inquiry a found poem is discerned and written by the researcher, yes; but unlike generating my own poetry, in writing a found poem, I would have to allow another person's thinking, not my own, to "write" the poem. I acknowledged that I could reorganize the author's thought patterns into what I hoped would be poetry; but I could not touch or change a single word or the *meaning* of her words. I found myself required by unwritten "found poetic law" to remain true to the inherent voice of the author, and to convey that voice. Isn't that the real role of the educator? To listen for the student's "voice," discern the student's meaning, and draw that meaning forth? The parallel I found between writing found poetry and educating youth was exciting to me. In particular, I became interested (*inter esse*, Latin "to be inside") in finding out how the writing of a poem found in the con/text of Sullivan's essay might possibly contribute to the reinvigoration of an educational system that I perceive to be dying from a lack of oxygen. I resolved to go inside, find out how, and do something about it, with the renewed vigour propelled by my initial fiery etchings.

I reread the essay, noting carefully the nuances of the words and lines that I had highlighted during my first reading. I trusted my initial impulses. Once again I delighted in the beauty of the found treasures. I turned them over and over in my mind and heart's eye. I contemplated their symbolic implications. Next, very tentatively at first, I started grouping the words and phrases according to their order in the essay. I listened closely for coherence. Once a rough idea of groupings or stanzas was sketched out in my notebook, I began the final look to "find" the whole poem. This meant more listening. This meant changing the sequence. I trusted my poetic instincts. I noticed how enjoyable and peaceful a process it was compared to some other churned-out academic exercises I had known in the past. Intuitive examination meant reading and refining, and again chipping away everything that didn't belong until I could begin to see the shape and hear the poem's human voice. I looked for the beautiful in the occasion because, as a researcher, I must confess, I came to the process with the absolute conviction that Beauty stands on her own merit, and needs no justification of purpose or utility. Sometimes just changing the position of a single line in a single stanza released an overall tone that was on its way to becoming beautiful. This was my unique way of finding out by finding in. "There is no template or prescribed approach for creating found poetry" (Butler-Kisber, 2010b, p. 85).

The following poem was written entirely from the text of Anne Sullivan's essay, as described above. No words or phrases have been changed, only the order of the words and phrases have been reconfigured according to the inner "dictates" of the found poem. It is my wishful thinking that the poem may come even close to conveying the essential, life-affirming lessons about research, teaching and learning that I found in Sullivan's essay.

An Occasion for Poetry

Learning to spot the occasion for poetry
Is learning to see the sculpture
That is already in the stone
Then chipping away everything
That is not David

Poems hide.
What we have to do
Is live in a way that lets us find them
I am not going to get straight to the point

Spotting the Occasion for Poetry: An Invigorating Process of Finding Out by Finding In

I want to examine the intuitive
Without reasoning towards it

Occasions for poetry
Must be concrete, straightforward
The everyday sensory stuff
Getting the poem into the body
Renders the "lived experience"
Of wheat fields, flocks and sheep

Resonant with powerful feelings
Recollected in tranquility
Bearing sensory information
Charged with emotion
Highlighted in the colours of idiosyncrasy
The human voice
May be the true occasion for their existence

Possibility wide open
No meaning trapped, enclosed, contained
The everyday and unresolved
Circuitous thoughts of you and me
Rife with complexity and mystery
May be found occasions for poetry

Word connecting with word
Line with line
As with the spider web
Touch it at any part
And the whole structure responds
In associated logic

A nexus of tensions
Integral and essential
Avoiding the habit of conclusion
I would have to unlearn tidy linearity
I would need to make leaps
As the mind leaps
As impulses fire across synapses

Margaret Louise Dobson

With unexpected turns
And surprising connections

The doors and windows are open
You decide

Reflections on the Process

How differently we might approach research, teaching and learning if we were to seriously consider the premise that education is the sacred act of looking for the "David" within every student. My poetic inquiry, through the perspective of found poetry, has reminded me of the wealth of poetic occasions lying dormant (but still alive, amazingly enough!) under the hardened surface of any prosaic undertaking such as schooling. Once the source of energy and interest is found, or, as in my experience, once the poem finds me, the well is primed. The rest of the procedure flows easily, relatively speaking, because the creative process is at the source, not just my limited intellect all on its own. For example, at the very moment when my intuition was allowed to become engaged in the process of inquiry because I didn't dismiss outright the vision of a found poem emerging from the essay and not from the formerly intended interview data, I discovered that poetry was in the making. From the experience of poetic inquiry, I see an undeniable connection between poetry and education. Education (*e-duco, e-ducare*, Latin, to draw forth *from within*), not schooling (training from the outside in), is in the offing! As educators newly oriented to finding the David within, we would no longer be required to assume schooling's arduous and unreasonable task of making some/*thing* of ourselves and of our students. We would have only to develop and/or strengthen the necessary "perceptivity" (Barone & Eisner, 1997). To look behind appearances, and to discern beneath surfaces, we would need to relearn how to perceive interior landscapes in a way that would allow ourselves and others to emerge as the some/one we, and they, really are. Like a found David emerging from the surrounding stone, there I am; there you are!

"An Occasion for Poetry" has taught me that we must make room for unexpected outcomes if we are truly to "make meaning of our world" (*op. cit.)*. The unlearning of the habits of tidy, predictable linear thinking, so well ingrained through schooling, will be the biggest challenge faced by arts-informed educators as we move away from the prosaic "mould-by-concepts," "paint-by-numbers" approach to schooling and begin to lean towards the artistic "emergent" approach of education. The integral

combination of the poem's content and process of an arts-informed inquiry has arrived at the same open-ended conclusion. This fact is a significant find in and of itself.

Emerging Possibilities

No doubt there will be a strong backlash to a more artistic orientation in education. Too much of our current worldview is deeply invested in the manufacturing of a socio-political identity dependent upon, and addicted to, the assumption of outer concepts, and the consumption of outer resources for there to be an easy transition. There is sure to be a fight. Poetic inquiry through found poetry has been an invaluable perspective for putting me in touch with my own intuition in a way that is unmistakably real. More than just putting me in touch theoretically with a concept *about* intuition, the inquiry has actually dared me to find, respect and follow my intuition as a valued partner of my intellect. I learned, in practice, to trust my intuition, and by so doing, to let the creative process unfold to where the poem "wanted" to go, not to where my intellect "planned" to take it. Transformation of any real magnitude is unpredictable. It comes out of the blue. It has its own agenda and time frame. Just as in poetic inquiry, you don't know where you're going until you get there. Ultimately, this particular inquiry led me to an original poem, created through an original experience, and based on a deep resonance and appreciation of a colleague's original essay. Novice researchers such as me who are experimenting with arts-informed methodologies for the first time are finding not just found poems, but a sound footing in an arts-informed practice. We may be amateur artists; but we will not be easy pushovers in the struggle for a legitimate say in the education of our youth!

References

Barone, T., & Eisner, E. (1997). *Arts-based educational research. Complementary methods for research in education*, 2nd edition. R. Jaeger, ed. Washington, DC: AERA.

Brizuela, J. P., Stewart, R. G., Carrillo, R.G., & Berger, J. G. (2000). (Eds.) Introduction. *Acts of inquiry in qualitative research*. Harvard Educational Review, Reprint Series no. 34, xi–xxii.

Butler-Kisber, L. (2010a). EDEC 707-001 *Interpretive Inquiry*, McGill University. Montreal, QC: COPIBEC (HBSP).

Butler-Kisber, L. (2010b). *Qualitative inquiry: Thematic, narrative and arts-informed perspectives*. London: SAGE.

Prendergast, M. (2008). UNESCO world conference on arts education: A poetic review. *LEARNing Landscapes, 2*(1), 39.

Sullivan, A. (2007). *On poetic occasion in inquiry: Concreteness, voice, ambiguity, tension, and associative logic (This essay was originally delivered as a talk at the 1st Symposium on Poetic Inquiry, UBC, Vancouver, October 2007).*

Margaret Louise Dobson is a PhD student in the Faculty of Education of McGill University. Prior to entering the doctoral program, she taught high-school French and English in Ontario and Quebec. Most recently she assumed leadership responsibilities in both elementary and secondary schools of the English Montreal School Board. Her doctoral studies focus on the role of *thinking* (as distinct from *knowing*) in the reinvigoration of education. She has published in the forthcoming anthology, *The Heart of Wisdom: Life Writing as Empathetic Inquiry*.

Multi-Modal Responses to Literature: A Teacher Educator's Classroom Inquiry

Susan E. Elliott-Johns, Nipissing University

ABSTRACT

Approaches to the effective integration of technology in learning and teaching continue to develop at lightning speed. This ongoing inquiry explores multi-modal literature response as a relevant component of teacher education. Illustrative examples of four multi-modal literature responses created by teacher candidates are embedded as hyperlinks. The author's work highlights multi-modal expression as an innovative approach to literature response in contemporary classrooms; one way of "bridging" print and digital literacies; and as professional learning for both pre-service and practicing teachers in the "new literacies."

> *For the reader, the literary work is a particular and personal event: the electric current of his mind and personality lighting up the patterns of symbols on the printed page. Or perhaps we should say that the symbols take meaning from the intellectual and emotional context the reader provides. (Rosenblatt, 2005, p. 63)*

Introduction

The essentials of response theory have become well known (Rosenblatt, 1978, 1994, 2005) and, over time, have contributed to changes in the way we ask students to respond to their reading in school. A central focus of Rosenblatt's reader response theory was that the readers' active participation in any reading event was equally as important as the text itself, and her work has direct relevance to the topic of multi-modal response: "While many theories of literature have

come and gone, Rosenblatt's has endured even in the presence of emerging forms of text associated with technology" (Smith, 2008).

Literature response strategies offer ways to enable students to express their understanding and interpretations of different texts (both print and digital) in a multitude of ways, and enable teachers to assess students' demonstrations of learning and understanding. Kress and Van Leeuwen, (2001) define multimodality as, "the use of several semiotic modes in the design of a semiotic product or event, together with the particular way in which these modes are combined" (p. 20).

The approach to extending literature response strategies described and discussed in this paper involves the "multi-modal" communication of meaning constructed in response to a self-selected piece of literature. Using a wide range of multimedia, teacher candidates represented their understandings of, and connections to, themes/"big ideas" and personal interpretations of the text and expressed their responses through images, movement, text, music, and film.

Multi-modal information sources and opportunities for the construction of meaning "multi-modally" are increasingly available to students in contemporary classrooms but do require the acquisition of "new" literacies for the 21st century by both students and their teachers.

Context and Background of the Inquiry

Prior to taking up my current position as a professor of literacy teacher education in 2006, I was a middle years teacher and school principal (K-8) for almost twenty years. My experiences as a teacher of adolescents continue to influence my inquiries into effective literacy teaching practices and, specifically, ways in which to diversify instructional repertoires of teacher candidates. The work described reports a practitioner inquiry into a teaching assignment conducted alongside teacher candidates at Nipissing University, the small university in the "Near North" of Ontario where I currently teach. The context was the one-year Consecutive B.Ed program that presently offers 60 hours of Language Arts coursework throughout the year for individuals preparing to teach at the Junior Intermediate (J/I) grade levels (Grades 4-10 in Ontario). The philosophy at the heart of the education program in the Schulich School of Education at Nipissing contends that education graduates must be computer literate in order to be competent, professional teachers today and in the future.

This philosophy is actualized through the iTeach Laptop Learning Program for teacher candidates, and faculty strive to consistently demonstrate effective integration of educational technology for teaching and learning. Therefore, "Creating a can-do culture" has become a mainstay of both the Consecutive and Concurrent education programs.

An initial catalyst for my inquiry was the design of an assignment that required a multi-modal literature response to be completed by all J/I teacher candidates in my language arts and literacy courses. This assignment sought a) to broaden their conceptualization of "literature response" (as potential teachers of language arts), and b) to actively promote the integration of effective uses of educational technology for teaching and learning into a major assignment completed as part of the course. On completion of the assignment and after final grading, teacher candidates were invited to participate further by allowing samples of their work to be included in written papers on the topic. All teacher candidates who voluntarily agreed to contribute signed an informed consent.

Many teachers and students utilize reader response journals and learning logs (Atwell, 1990; Kooy & Wells, 1996; Parsons, 1990), talk, write, and draw about making text-to-text-, text-to-self and text-to-world connections (Freebody & Luke, 2003), and some teachers and their students are also beginning to explore a broader range of responses and the construction of personal meaning through multi-modal responses. My intent in conducting an inquiry around the assignment described was to further explore the potential for "bridging" print and digital literacies in the experiential learning of my teacher candidates. Subsequently, this also enabled further examination of a specific aspect of integrating technology into their developing pedagogy for language arts teaching. In light of the need, as I see it, to increasingly (and meaningfully) "bridge" print and digital literacies in contemporary classrooms, I perceived the teacher candidates' participation in this assignment as also having an impact on broader audiences—i.e., the students they would eventually teach in J/I classrooms. As Anstey and Bull (2006) remind us:

> The world continues to change in technological, social, and economic ways. As a result, the texts we use continue to change, the ways we use literacy will change as purposes and contexts change, and literacy knowledge, skills and processes will continue to change….Therefore, the ways we teach and learn literacy will need to change. (p. 1)

Kress and van Leeuwen's (2001), exploration and discussion of some common principles behind multi-modal communication helped to explain the shift that has taken place (in Western society, at least), from a seeming preference for "monomodality" to crossing boundaries inspired by twentieth century semiotics, thus resulting in increased expressions of meaning across a variety of semiotic modes. Kress and van Leeuwen described "production" as "the communicative use of *media*, of *material resources*" (p. 66) and emphasized that interpretation of "production" "is never a matter of passive reception" (p. 67). In the context of this inquiry and the completion of the multi-modal assignment, it was helpful to integrate Kress and van Leeuwen's work with teacher candidates' increased understandings of processes related to the construction and articulation of meaning and interpretative responses to literature.

While writing still frequently appears as the expected and dominant mode for completion of responses in J/I classrooms, Kress and van Leeuwen (1996) present a convincing case for including, "The semiotic landscape: language and visual communication" (p. 16) and for multiple modes to be as much a part of student's *in-school* experiences as they are in their literacy lives beyond the school:

> Outside school, however, images play an ever-increasing role, and not just in texts for children. Whether in the print or electronic media, whether in newspapers, magazines, CD-ROMS or websites, whether as public relations materials, advertisements or as informational materials of all kinds, most texts now involve a complex interplay of written text, images, and other graphic or sound elements, designed as coherent (often at the first level visual rather than verbal) entities by means of layout. But the skill of producing multi-modal texts of this kind, however central its role in contemporary society, is not taught in schools…We want to treat forms of communication employing images as seriously as linguistic forms have been. (Kress & van Leeuwen, 1996, pp. 16–17)

In this paper, descriptions of the multi-modal literature responses completed by teacher candidates in classes last year (2009-2010) are illustrated by examples of work and enhanced with selected comments in teacher candidates' own "voices." Collectively, work completed for this assignment clearly demonstrated growth over time in terms of their knowledge of literature and various approaches to literature response for J/I classrooms, thus highlighting observed benefits of being asked to construct and share multi-modal texts as part of their teacher education experience.

Purpose and Process of the Multi-Modal Assignment

Building a Repertoire of Teaching/Learning Strategies

Teachers at all grade levels need to acquire and employ an extensive repertoire of literacy teaching and learning strategies for use in language arts classes and across other areas of the curriculum. I believe, therefore, an essential aspect of preparing individuals to teach at J/I levels is to assist them in building confidence, and "knowledge in practice" as a result of direct experience with research-based skills, strategies, and carefully selected resources relevant to contemporary and future classrooms.

Building Knowledge of Literature Selections for J/I Teaching/Learning

Teacher candidates were asked to first identify a literature selection suitable for use in either Junior (Grades 4-6) or Intermediate (Grades 7-10) classrooms. They were also given the opportunity to select a curriculum area of their choice—for example, history or physical education—in order to underscore the importance of seeing cross-curricular connections when planning for language arts. The positive response to the assignment was palpable, and I observed a great deal of interest and enthusiasm for the assignment as soon as details were shared in class. Many began combing through different novels, picture books, non-fiction selections, and a range of other "literature," broadly defined, including poetry, song lyrics, newspaper articles, graphic texts and other electronic sources in search of a selection. They each considered a number of different genres, titles, and purposes for making their final choice— as opposed to gravitating to the first selection that came to hand (which, unfortunately, had often been my experience previously when assigning work related to literature response that called for *written* responses only). Teacher candidates frequently discussed with me and with each other the wide range of potential selections they were discovering, bringing various selections in to class that they were considering, and overtly expressing excitement about the opportunity to generate a multi-modal response. These discussions continued before, during, and after completion of the multi-modal responses, and I do think asking the teacher candidates to *read/sample*, *think about*, and *discuss* a wide range of literature selections relevant to teaching and learning in J/I grades (i.e., to actively build on their knowledge and experience) was undoubtedly accomplished. Three comments shared by participants in the course further illustrate the sense of their increased abilities to "think like a teacher" about selecting appropriate literature for teaching and learning in their J/I classrooms:

Knowing more about a wide range of texts I can present to my J/I students is beneficial to me as a teacher and, I believe, will only have positive impacts on student learning…

Incorporating technology into language arts is going to be very important for me as a teacher—and very important for the next generation of learners in my classrooms. But I also want to continue learning much more about "what's out there" for them in terms of literature to actually read and respond to…

As a teacher candidate, it is one thing that my ideology and knowledge has grown where J/I Language Arts is concerned. But I have also seen enormous growth in my knowledge of literature and related strategies to take into my developing classroom practice…

The Creation of a Multi-Modal Response

After briefly discussing the assignment when the course outline was distributed at the beginning of the year (September), additional details were discussed further as the time approached to prepare and submit the multi-modal responses (February). The central task was first to identify an appropriate selection of literature, and then to create a response, as follows:

Identify a literature selection suitable for use in either a Junior or Intermediate curriculum area *of your choice*. Using your MAC computer, you are to construct a computer generated multi-modal response to your literature selection. For example, your selection might be a picture book, a novel, or even a non-fiction selection. The selection identified will provide the focus for your development of this multi-modal response. Using multimedia of your own choice, plan a literature-based response that represents your understandings and the connections made to "big ideas"/themes/ interpretations presented in the text. Your response may involve text, images, movement, music and/or any other modes you find relevant to effectively communicating your response….

(Excerpt from Course Outline EDUC 4214: Assignment # 3, 2009-2010 - SEJ)

Individuals with specific questions/concerns/ideas readily took time to come and chat with me before or after classes, and/or came to see me during office hours. Again, I found the sheer amount of interest and engagement in this particular

assignment unprecedented. I consistently emphasized that the result of their work was *not* intended to be their version of a response that a Grade 4 or a Grade 7 student in their classes might create. Rather, it was to reflect their personal response as an adult learner. That said, they were also assured the final product might well be something that they might use as an exemplar in future classes when assigning similar work to their school-age students.

Submission of a Written Rationale

The written component of the assignment required the composition of a short written paper, giving the reasons for their choice of selected literature and demonstrating their developing understanding of the purposes/uses of quality literature for instruction and learning in J/I classrooms. The "rationale" was to reflect a broad definition of literacy, as shared throughout the year in interactive class activities, discussions and assigned readings. Using examples from the literature selection chosen to support points made in the rationale was both suggested and encouraged. This written paper was to be prepared electronically and handed in on the same USB key/DVD as the multi-modal response.

Outcomes

First and foremost, despite some last-minute challenges of a technological nature, all teacher candidates had a completed multi-modal response ready to hand in on/before the due date, and the overall quality and attention to detail was impressive. Of particular interest was the significant teacher learning that became evident: not one of the 120 individuals in my three classes appeared to complete their piece of work, "just to hand in an assignment." This, in itself, went a long way to convincing me that the exercise represented an authentic, relevant, and enjoyable assignment to be completed as part of the course.

As the instructor, thoughtful planning about the submission process was vital. Submission processes were also negotiated with all teacher candidates prior to the due date. For example, some elected to hand in a USB key or DVD with a compilation of two or three different responses and it was agreed that this was fine as long as the electronic files were all clearly marked and organized. Carefully thinking

through logistics of this phase of the assignment was essential in terms of the management, assessment, and safe return of 100+ USB keys and DVDs. The USB keys were all placed in a sealed envelope and clearly labeled when submitted for return to their owner after final placement, six weeks later. DVDs had to be submitted in a protective case and were also clearly labeled with the owner's name and section. Furthermore, the due date for this assignment was purposely planned to fall prior to the final school placement (in February-March), thus giving me ample time to review all of the work completed. The multi-modal responses averaged 5-7 minutes each in terms of viewing time, but completed responses varied in length from 2 to 35 minutes. This was the final assignment in the course; and some were able to utilize their work when out in a classroom on final practicum. Class time was also allocated for sharing and discussing their work with colleagues when they returned in April to share and discuss completed responses with colleagues in small groups. At this time I gathered additional samples of feedback from individuals in the course about the learning they felt had taken place as a result of their experience with this assignment:

> The multi-modal response was truly the most unique (assignment) since it took so many various ways of responding to literature and put them all together in one presentation. This is definitely something I see using in future classroom applications since it asks students to do more than simply "write" a response. The biggest influence on me was realizing that so many different learning styles would benefit from this approach to responding to literature. So many factors went into my response to "The Giver"—text, music, images, and video, all presented on a PowerPoint—it's really inclusive, and caters to all learning styles.

> First and foremost, the multi-modal response screams "cross-curricular"!

Four links to actual examples of the pre-service teachers' work will be shared and briefly discussed. Excerpts from the written rationale papers submitted have also been included in order to provide further context and background in the pre-service teachers' own voices. The illustrative links provide examples of the kinds of multi-modal literature responses created. Unfortunately, the soundtracks embedded in all four of the multi-modal examples had to be removed from the links, as publishing them here would constitute copyright infringement. A fifth example could not be shared as a link as it also contained a copyrighted image. Instead, a brief description of the multi-modal response to *A Rose is a rose* was retained and presented in the students' own voices.

All five examples clearly illustrate the wide range of multi-modal literature responses that were created in response to five very different text selections, as follows: *The North Star* (an inspirational picture book by Peter Reynolds); *Three Wishes: Palestinian and Israeli Children Speak* (an anthology of children's voices by Deborah Ellis); *Spirit of the Land* (song lyrics, author unknown); *Brian's Winter* (a novel by Gary Paulsen), and *A Rose is a rose is a rose* (from the poem, "Sacred Emily" by Gertrude Stein). A short introduction will provide some background on each of the texts selected and also give details of the soundtracks that accompanied the visuals.

The North Star

The North Star (Reynolds, 2009) is a text that has grown into a website, a classroom guide, a musical, online activities/resources, and an online version of the story that is available without cost. On the website at www.peterhreynolds.com/phr_thenorthstar.html Peter Reynolds explains, "*The North Star* is my tribute to "off-the-path" thinking—and to those who encourage it. Self-determination, creativity, hope, and vision are the cornerstones of this allegory." Jade's work provided a really interesting example of a multi-modal response from the perspective of a pre-service teacher. In her written rationale Jade wrote,

> My multi-modal is split into two parts, my own response and my models for student responses. I did this to represent how teacher learning can shape student development. There are also various types of media included that I feel represent the necessity to appeal to various types of learners while selecting texts.
>
> The themes in this text are universal and relevant to J/I learners, and the theme of possibilities and dreams appealed to me as a future guidance counselor… The biggest message for me is that along any path one must stay true to oneself, help others along the way, and enjoy the walk. I look forward to taking the first steps down the trail of teaching and helping others take their first steps towards a lifetime of loving literature.

http://www.nipissingu.ca/faculty/susanej/videos/thenorthstar.mov

Three Wishes: Palestinian and Israeli Children Speak

Three Wishes is a small but powerful text that documents conversations between author Deborah Ellis and Palestinian and Israeli children when Ellis spent time in 2002 conducting interviews in both Israel and the Palestinian territories. In her Introduction, Ellis (2004) writes,

The months preceding my visit had seen a number of suicide bombings by Palestinians, and the Israelis had responded by sending their army into Palestinian villages and refugee camps and placing virtually all Palestinians under house arrest or curfew… I asked the children I met to tell me about their lives, what made them happy, what made them afraid and angry, and how the war had affected them… (p. 8)

Jessica discussed the considerable impact this text had on her when she read it, and its relevance to her growth and development as a teacher. Her written rationale also clearly reflected her understanding of a broad definition of "literacy," and the need to welcome and acknowledge her students' interests in constructing and conveying meaning through a variety of modes. Jessica wrote,

> *I see a literate individual as someone who is able to derive and convey meaning from various sources while using their knowledge and experiences to make valuable connections. In my view, there can be no set definition of what constitutes literacy, as the definition itself is a dynamic one that is and always will continue to develop and evolve along with our society…. As J/I educators, it is exceedingly important we not only provide our students with quality literature but also make ourselves aware of the many different approaches to instruction and learning that a selection of quality literature promotes…I want my students to absorb ideas, to question, and to make meaning, and to carry these skills and attitudes with them for the rest of their lives…. Three Wishes is comprised of Israeli and Palestinian children's stories, conceptions, and beliefs about the war they are living through every day. This book would not only educate my students on world issues but would also provide them with opportunities to make personal connections and provoke further questions….*

http://www.nipissingu.ca/faculty/susanej/videos/threewishes.mov

Spirit of the Land

Ashley and Fay created a response to the song, *Spirit of the Land* (Unknown), explaining in their written rationale that quality literature in a J/I classroom can be in the form of a novel, a textbook, song lyrics, fiction, non-fiction, poetry, magazines, speeches, read aloud, video, and more. They chose this text for their response, as, they explained, the song resonates with so many different aspects of Canadian life. Different individual responses stimulate different connections to the audio text of the lyrics images, thoughts, and feelings as represented visually here: http://www.nipissingu.ca/faculty/susanej/videos/spiritoftheland.mov

In their written rationale, Ashley and Fay expressed how they might use their work as an exemplar for students at the grade six level and literacy across the curriculum (e.g., geography, history, art, language arts, music and drama):

> *Our literature response addresses the curriculum expectation 1.1—"identify a range of purposes for listening in a variety of situations, formal and informal, and set goals related to specific listening tasks (e.g,. describe stated and implied ideas in the lyrics of a song)." Students will read, listen to, and discuss the lyrics and then respond by creating their own multi-modal projects about what the song means to them and images the song conjures up for them…*

Brian's Winter

The final example of a multi-modal literature response evokes sound and imagery based on the novel *Brian's Winter* (1996) by Gary Paulsen. Steve and Jessica responded via their personal interests in "the great outdoors" and utilized their own photographs and videography, along with narration, to construct their response to the text selected:

> *We chose Brian's Winter (the sequel to Hatchet), as it is appropriate to the present season. We listened to an audio version of the novel and used the print version for review…. Our response had to include something in the great outdoors.*
>
> *After reading the novel, it makes one want to move into the wild and just observe! We chose to go winter camping and use digital photography to capture the sights. We took pictures of images we connected with in the story, such as beautiful winter scenes, animal tracks, and the campfire…. Our multi-modal response includes several forms of text: photography, video, and spoken word and these elements were pieced together into a mini movie. Our response also includes the physical act of getting outside and paying careful attention to the natural world, something we both hope to encourage our students to do….*

http://www.nipissingu.ca/faculty/susanej/videos/brianswinter.mov

A Rose is a rose is a rose… (Stein, 1913/1998, p. 387)

Two teacher candidates, Andrew and Kendra, chose to work together on their multi-modal response and selected a line from a Gertrude Stein poem, "Sacred Emily," as their text. Their multi-modal response conveyed interpretations of the

poem expressed through images of all kinds of roses and accompanied by a piano solo. They wrote:

> We closely examined the poem entitled "Sacred Emily" and selected one sentence in particular that we would have students focus attention on. The sentence "Rose is a rose" was chosen because it was often interpreted, read and understood in many different ways depending on the audience. Gertrude initially meant for the first "Rose" to represent the name of a person. However, she later altered this version to include **"A"** Rose is a rose et al. By adding just one letter the meaning of this sentence changed dramatically and was subsequently interpreted as "things are what they are"—a statement of law and identity….

> … In order to portray the sentence, as it was known for its later meaning, we chose to show various types of roses via a movie montage created in iMovie and accompanied by Comptine d'un autre été l'après-midi, composed by Yann Tierson. Our interpretation enables viewers to see how a rose really is just a rose. However, a rose can be seen to symbolize different characters or personalities, it can be different colours, shapes, dead or alive, and in a multitude of locations around the planet. Ultimately, a rose is a flower that signifies love and relationships and different colours represent different variations of love and emotion…

Discussion

As previously noted, the creation of these multi-modal literature responses generated considerable interest and enthusiasm in classes, and pre-service teachers were rapidly engaged in thinking about how to approach and complete this work. A great deal of learning about literature selections relevant to J/I classrooms for language arts and many other areas of the curriculum was accomplished over time, as well as some impressive demonstrations of the effective integration of technology for teaching and learning. As the samples of work included illustrate, multi-modal responses were constructed using digital images, text, collage, art forms, music, movement, drama, narration, movie clips, and a wide range of software applications were incorporated into the process including Quick Time, Key Note, Pages, i-movie, i-tunes, and even the creation of related websites.

The extensive range of genres in the texts they selected represented picture story-books, poetry, art combined with poetry, novels, song lyrics, and samples of

non-fiction (e.g., text books, articles, biography, anthologies of students' voices). The responses generated reflected thoughts, feelings, complex connections with the text, "big ideas," and themes inferred and interpreted from the various texts. The pre-service teachers commented over and again on how much the opportunity to create a multi-modal response "made sense" to them—and how much they looked forward to trying it out with school-age students in their own classrooms. The freedom from "lesson plans" and the opportunity to think creatively and "multi-modally" also appeared to be a further catalyst for original, highly thought-provoking "thinking like a teacher," and the critical responses that resulted.

Initial teacher education programs, while often criticized for being constrained in terms of time available, are best regarded as a beginning and not an end in themselves. Expert teachers are not the result of one-year teacher education programs. Calderhead and Shorrock (1997) describe the complexities involved in the *ongoing* nature of what I tend to refer to as the teacher education continuum, i.e., pre-service teacher education *and* ongoing professional learning:

> It is clear that learning to teach involves more than the mastery of a limited set of competencies. It is a complex process. It is also a lengthy process, extending, for most teachers, well after their initial training. The multi-dimensional nature of learning to teach has often not been fully recognized in the design of initial teacher education courses, which are often tightly constrained in terms of both time and human resources. (p. 194)

The experience of completing the multi-modal response assignment appeared to enable pre-service teachers to enact what Loughran (2006) refers to as "Articulating a knowledge of practice" (p. 66). As a teacher educator, I believe an important component of initial teacher education is the design and completion of thoughtful, rigorous, authentic, and meaningful assignments. Assigned work should require thoughtful application, and articulation of learning. By making the very best possible use of time available, initial teacher education programs must seek to offer candidates a range of authentic experiences that clearly demonstrate ways in which practice informs theory, theory informs practice, and the relevance of ongoing professional development.

The successful integration of technology *in* practice is a foundational component in all teacher education programs at Nipissing and the context of the iTeach program and its expectations for graduates, undoubtedly, was a significant enabler in the creation of these multi-modal responses to literature. As one teacher candidate commented:

By having the emphasis on technology (in the iTeach program and in our courses generally), I feel I have a much better handle on linking technology with literacy, allowing me to better integrate multi-modal responses into my class lessons—and across the curriculum!

Possibilities and Future Directions for Inquiry

Dynamic whole class and small group discussions, as well as numerous conversations with individuals, were facilitated, enhanced and observed during this inquiry and the work completed by teacher candidates. Enthusiasm for, and engagement in, the task of responding to an authentic assignment (another "way in" perhaps for those who did not particularly relish teaching/learning about language arts?) were all clearly evident throughout the process—before, during, and after creation of the multi-modal responses. Once again, perhaps the voices of teacher candidates who contributed to this paper say it best themselves:

After the first reflection paper and class discussion I had decided for sure that language was not my thing… but after the break and into the "home stretch" LA was beginning to win me over. The multi-modal assignment was something I really threw myself into… it not only got us to think about how we would teach critical literacy but it also gave us a chance to go through the process we'd ask our students to go through.

It used to be that the thought of teaching language arts terrified me! Writing, spelling have never been my strong suits…but I have come to see LA as truly "cross-curricular" and … the multi-modal response allowed us the freedom to choose how to approach this assignment and produce work using skills we were strong in.

Throughout the year, this course presented some very interesting (and useful) assignments… The multi-modal response was truly the most unique since it fostered so many different ways of thinking and responding in one presentation. This is something I'll definitely use in future classrooms since it gets students to do much more than simply write to respond to literature.

Increasing awareness of developing and enacting a pedagogy of teacher education (Loughran, 2006; Russell & Loughran, 2007) and ongoing study of my own

efficacy as a teacher educator were central to this initial inquiry. The outcomes expanded my own "learning about teaching teachers" and, more specifically, a focus on multi-modal literature response as literacy teacher education. I have already noted some indicators for "fine-tuning" of the assignment itself, such as ensuring references and acknowledgements are included where appropriate in "credits" at the end of the responses. Some responses conveyed these very well, others not at all. Steve and Jessica's work on *Brian's Winter* demonstrates one of the best in terms of clearly acknowledging "credits" for (their own) photography as well as the book's title and date of publication, and audio-book recording. This is one I would share in future classes to draw attention to the need to credit images, audio clips, movie clips and so on as I found such sources were frequently not acknowledged in the multi-modal responses submitted. In the age of Internet research, I believe citations are as essential to work of this nature as they would be to, for example, more traditionally "written" responses, and must be included. Therefore, this is a teaching point that needs to be considerably emphasized next time, with the sharing of examples of work that include appropriate "credits" as exemplars.

Professional learning about integrating educational technology as part of my own classroom practice is constantly enriched as a direct result of the iTeach program. Ongoing learning and experiences include the many different programs, software, and the invaluable "mentoring" available that I, as a "digital immigrant" (Prensky, 2001) benefit from, as a result of working alongside my students most of whom would qualify as "digital natives." As an instructor, I continue to learn so much from my teacher candidates as a result of our work together—as digital natives and immigrants.

More research is needed and recommended in order to better understand ways to successfully bridge print and digital literacies in teacher education and school classrooms and to avoid perpetuating "traditional only" approaches to language and literacy. For example, pre-service teachers in this group also commented on 1) how interested their Associate Teachers had been in both viewing and (subsequently) experimenting with the multi-modal responses in their classrooms during final placement and 2) the benefits of the opportunity to share responses completed with colleagues in class. One pre-service teacher reflected as follows,

> *Sharing in class also gave me the opportunity to consider the wide variety of points of view of my colleagues. At no other time was it clearer to me that we all bring our own unique worldview to the same text, and thus interpret that text in very different ways. This kind of reflective practice, coupled with a collegial*

sharing of opinions, is exactly the type of atmosphere I want to build and support in my own classroom…

Whether an experienced teacher or one who is just graduating, we can capitalize on the many opportunities for "learning from each other" as we *all* continue to learn about teaching our "clientele" in schools who are "growing up digital" and creating digital futures (Tapscott, 1998, 2009). Continuous professional learning not only promotes growth and development in our own knowledge and practice as individuals, but also offers new ideas and opportunities for sharing that learning with the colleagues and students with whom we work. A genuine sense of confidence, trust, and support in collegial environments are critical contributing factors to success when trying anything new.

Teaching and learning through multi-modal literature response is but one way to approach the "bridging" of print and digital literacies. This innovative approach should not be regarded as a "replacement" for other interactive oral and written responses to literature, but rather as an extension of these as relevant to contemporary classrooms. However, based on my experience to date with the completion of this multi-modal assignment by teacher candidates, and my ongoing inquiry into the related processes, multi-modal literature responses provide powerful learning experiences. It is my hope that the five examples of responses and "students' voices" in this paper will provide starting points for explorations of multi-modal literature responses by others interested in literacy teacher education and the development of innovative assignments.

To conclude, as a researcher/practitioner, the exploratory inquiry reported here served to pique my own interest in the whole topic of multi-modal literature response and teacher education. Most recently, it has become evident that further investigation of technical details beyond the ability to merely craft a multi-modal response through images, text, music, movement, etcetera need further attention. Specifically, legalities related to potential copyright infringement continue to inform the work of the pre-service teachers and my own inquiry. As a result, the assignment is continually being improved and enhanced by the "fine-tuning" of expectations and advice given to those completing the multi-modal responses. (For example, something we will be discussing in classes next year is the selection of music already in the "public domain" and/or available through Creative Commons without disrupting the creative process. In this regard publishing and sharing complete examples in their entirety [i.e., including all "modes"] may be greatly facilitated).

I plan to conduct further research in this area to acquire greater understanding and insights about the knowledge and experience gained by teacher candidates as a result of their participation in coursework of this nature. The kinds of questions to which I believe we need more answers include: 1) What important outcomes of pre-service literacy teacher education can be identified as a result of the kind of coursework described here? 2) What are the implications of experiential learning in this area for the developing practice of J/I teachers?; 3) What are some of the specific challenges and complexities involved in innovative work of this nature? and how do we effectively manage these complexities? and 4) What are some different ways to continue providing support for teachers who attempt to effectively "bridge" print and digital literacies in contemporary J/I classrooms?

References

Anstey, M., & Bull, G. (2006). *Teaching and learning multiliteracies: Changing times, changing literacies*. Newark, DE: International Reading Association.

Atwell, N. (Ed.). (1990). *Coming to know: Writing to learn in the intermediate grades*. Portsmouth, NH: Heinemann.

Calderhead, J., & Shorrock, S. B. (1997). *Understanding teacher education: Case studies in the professional development of beginning teachers*. London: Falmer Press.

Ellis, D. (2004). *Three wishes: Palestinian & Israeli children speak*. Toronto, ON: Groundwood Books.

Freebody, P., & Luke, A. (2003). Literacy as engaging with new forms of life: The "four roles" model. In G. Bull & M. Anstey (Eds.), *The literacy lexicon*. (2nd ed.). Frenchs Forest, NSW: Pearson Education Australia.

Kooy, M., & Wells, J. (1996). *Reading response logs: inviting students to explore novels, short stories, plays, poetry and more*. Markham, ON: Pembroke Publishers.

Kress, G., & van Leeuwen, T. (1996). *Reading images: The grammar of visual design* (2nd ed.). New York: Routledge.

Kress, G., & van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. New York: Hodder Arnold.

Loughran, J. (2006). *Developing a pedagogy of teacher education: Understanding teaching and learning about teaching*. New York: Routledge.

Parsons, L. (1990). *Response journals*. Markham, ON: Pembroke Publishers.

Paulsen, G. (1996). *Brian's winter*. New York: Delacorte Press.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–6.

Reynolds, P. (2009). *The North star*. Somerville, MA: Candlewick Press.

Rosenblatt, L. (1978). *The reader, the text, the poem: The transactional theory of the literary work*. Carbondale and Edwardsville: Southern Illinois University Press.

Rosenblatt, L. (1994). The transactional theory of reading and writing. In R. B. Ruddell, M. R. Ruddell & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 1057–1092). Newark, DE: International Reading Association.

Rosenblatt, L. (2005). *Making meaning with texts: Selected essays*. Portsmouth, NH: Heinemann.

Russell, T., & Loughran, J. (Eds.). (2007). *Enacting a pedagogy of teacher education: Values, relationships and practices*. New York: Routledge.

Smith, K. (2008). Louise Rosenblatt: An enduring legacy in the teaching of literature. *English Quarterly, 38*(2–3).

Stein, G. (1913/1998). *Gertrude Stein: Writings, 1903 to 1932, vol. 1*. The Library of America.

Tapscott, D. (1998). *Growing up digital: The rise of the net generation*. New York: McGraw Hill.

Tapscott, D. (2009). *Grown up digital: How the net generation is changing your world*. New York: McGraw Hill.

Unknown. *Spirit of the Land.* (Words and Music).

Susan E. Elliott-Johns is currently a tenured Assistant Professor at Nipissing University where she teaches courses in both the pre-service and graduate programs in Language Arts and Literacy. Prior to joining the faculty at Nipissing, Susan enjoyed a long and successful career in public education as a teacher (K-8), literacy consultant, teacher educator, and elementary school administrator. She has provided leadership in numerous workshops, conference presentations, additional qualifications courses, and publications for teachers, administrators, and other teacher educators in Canada, Europe, the United States and Australia.

LINK TO:

www.nipissingu.ca/faculty/susanej

It's Like Telling People You Have Rats and Forgetting to Qualify Them as Pets: A Poet's Journey

Daniela Elza

ABSTRACT

How do I take my place as a learner, parent, educator in the fractal, multifaceted, kalei-doscopic process of being and becoming? How to negotiate the forces that pull us and push us in different directions? Or, how I discovered I am a poet, and survived to tell of it.

*I*t all started with a four-line verse. Innocuous, while crossing a stretch of grass on the way home from the university. Instead of taking the asphalt path when I got off the bus, I walked *through* the grass. The same four lines every time, the same feeling as my high heels sank into the soft dirt. Almost tiptoeing through the exhale of summer. Between the busy bus street and the supermarket—this grassy interlude. Quite the unremarkable stretch, except for the soft breeze, the smell of evening grasses and trees, the welcomed end of the day. The moment came when I feared: *if I forget the lines I lose the moment*; this twilight space carving itself into words. So, I wrote it down. The year was 1989.

~

When I read Margaret Atwood's account a few years ago (in *Negotiating With the Dead*, 2002) the similarity was arresting. It happened to her while crossing a foot-ball field on the way home from school. It was not the poem, it was, as she put it, *the electricity*, "and after that writing was the only thing I wanted to do" (p. 14).

~

In my excitement I showed the poem to my dad. It was titled: *You Ask When?!*:

When I feel the soft earth beneath my feet
and the summer flowers' scent caress me
when the breeze is caught and tangled in my hair
that's when I want you to be there.

Followed by two more stanzas of growing intimacy. My dad was sitting on my sister's bed, across from my desk. He read it. My room lit only by my desk lamp. My breath stilled. He looked up. There was a concerned look on his face. He asked: *What made you write this?* I deflated. I don't know *what* I was thinking.

For a long time after I would feel his discontent. This feeling that poetry was a waste of time. That poetry does not pay. It *did* pay, only, in a different way. It made me pay attention. An attention that put things together, made them make sense, made them whole. I could not explain that to my dad then.

~

Poetry is more than putting words on paper, or fitting them in a certain form. It is that *electricity* that becomes the conduit for a first translation between world and word. Robert Bringhurst (2008) reminds us it is a texture of thought. It is a way of being in the world, and it was here long before we were. He says: "The reason for writing poetry is that *poetry knows more than any of us who write it*. Poetry is what I start to hear when I concede the world's ability to manage and to understand itself" (p. 145). Annie Dillard (1989) also makes the connection between writing and knowing:

> The writing has changed, in your hands, and in a twinkling, from an expression of your notions to an epistemological tool. The new place interests you because it is not clear. You attend, in your humility, you lay down the words carefully, watch all the angles. (p. 3)

This kind of inquiry is like looking for a needle in a haystack without knowing what a needle looks like.

~

Reading for exams was intense in those days. We did not study much during the semester. That was the student culture. I did most of my reading in the last few days before an exam. So, I was likely staying up the night before to read through all my notes. I had no time to mess around with poems. Still, at 2 a.m. the flowers in the vase stirred with presences. If I refused the poem, I did not make much progress with

my reading. To fight it was wasting time. I would read and re-read the same paragraph without much luck. I realized when this *feeling* came (*the arriving of a poem* feeling) I *had* to listen. Even if it was just for efficiency's sake. What is more: I *wanted* to listen.

When I think of them now, they were not *good* poems, but they were *my* poems. They were *first* poems. In time I realized it is pointless to ignore a poem. It is futile to shut the door in the face of an emerging poem.

~

I don't know if one really chooses to be a writer. We choose to pursue it, to develop the discipline. Today, I can say I *am* a writer, but for the past twenty years I would have checked *not sure* if it was an option on a form. It was what I *wanted*, it also seemed *unlikely*, *unserious*, *unreal*. My parents thought this was no way to make a living. They are *still* right about *that*.

~

Over time, I noticed the look others gave me when I said *I write*. It is a bit like telling people you have rats, and forgetting to qualify them as *pets*. They give you that look, which seems to say: *I am sorry*. Perhaps, wondering if it's contagious, or if there is a cure. That writing was a way into questions, whose answers were beyond my grasp, escaped people. Few would light up and say: *Rats make good pets. I had them once*. Or: *I have one or two myself. They are very smart*. Mostly, it is that look. I do not know what poetry, or poets have done to deserve it. This silence that does not know what to do with itself. Or the silence will come after the question: *Oh, have you published anything?* And if I said: *No*. Well, there was that silence.

~

I remember the comment a teacher made once. Teacher had underlined the last line of my poem. It read: *The Truth that are so many*. Next to it, in red, was written: *grammar*. I thought that was my *wow* line. My little epiphany at that moment in my young life was considered a grammar mistake? I was so flustrated. (I thought I just made this word up for the occasion, but I see it is already on its way into existence.)

Even my knowledge of English was now suspect. Being between languages did not help. At times I was regarded as an ESL student, even though English *is* my academic language. I *knew* it was a grammar mistake. What was *more* exciting: it was a *deliberate* and a *profound* grammar mistake. I felt trapped.

Was I to forgive teacher? Feel sorry for teacher? Or feel sorry for myself? I was not strong enough then to feel sorry for my teacher. I was *flustrated* for not being seen, not being understood. Here again, the computer underlined the word (in red) the instant I hit the space bar. The instant I cut the umbilical cord, let the word loose

into the world. Or did I let the world loose into my word? Such immediate feedback. I could have spent *some* time revelling in what, I thought, I had just created. Now I do not even need teacher to tell me this word is misspelled, that it might not even exist.

~

In 1993, while doing my Masters in Linguistics at Ohio University, I met the person who later became my husband. In the tentative months of getting to know each other he handed me Natalie Goldberg's *Writing Down the Bones*. I promised I would return it. It turned out I never had to. We got married.

Before Natalie's book, writing was sporadic, unpredictable. After reading it, writing became a discipline. It put the *rite* in *writing*. I could show up everyday, invite it. It took years to implement, to be precise, about ten. And a crisis moment to open space for redirecting, for change. Life happened in between. Anne Lamott (1995) observes: "To participate requires self-discipline and trust and courage, because this business of becoming conscious, of being a writer, is ultimately about asking yourself, as my friend Dale puts it, How alive am I willing to be?" (p. 236).

Staying with the writing every day for a few years also brought another revelation. That I was learning from my practice. As I was writing my poems, my poems were writing me. I found a mentor who helped me write more like me. Who, over the course of a few years, opened my eyes to what I was doing. It is hard to find such teachers who will let you, guide *you* toward being more *you*, and help you bring it out into your words.

~

In 2006, while doing my doctorate in Philosophy of Education, I was invited to publish a number of poems in a philosophy journal. I had been publishing in literary journals, but this was going to be the first peer-review of my poetry, my newly rediscovered voice. The journal did not have a tradition of publishing poetry. In fact, I later found out that my piece was the first one to appear in a section added to the journal called *philosophical fragments*. I submitted my poems knowing *that* is what I *had* to do. I was coming to the realization that poetry and philosophy are twin sisters separated at birth.

I sent the work to the editor. Then the thought hit me: *I will be hearing back from two peers*. I was petrified. Not because the work could get rejected—I was used to that by now. I feared the evaluation. What it could do to my voice, the joy in writing. I had not thought through *those* consequences. What could happen to that sheer delight of writing, which by now I had built into my day, my life, enjoyed its numerous rewards.

Days dragged their feet across the beige carpet of my house. How to brace myself? I began to feel I should not have been so enthusiastic, so daring. *Doubts* flooded in. They don't need inviting. They sit there. Waiting. Moments when we were rejected, misunderstood, unacknowledged. They crouch on the periphery of this territory I have to jealously guard. A place I not only practice my craft, but, more importantly, my freedom. Could it go in a blink? Would it? The moment these doubts smell fear, they move in, take over. Could this be the end of a fragile experiment, this different way of walking along, of getting to know the shore*line* of my mind and from there the world? The word *line* so misleading in describing the infinite complexity, the fractal kaleidoscopic nature of thought.

The review came back positive, even encouraging. Ok, these words are not adequate to convey what I felt. I printed it out. I carried it with me. At the slightest doubt that it was real, I re-read it. To myself, to others. Even while waiting at the crosswalk for the light to change. Especially that line that said: "…*the author exemplifies the possibilities of poetry as a way to engage in philosophical discourse with skill, courage and heart*" (Anonymous reviewer, written communication, October 2006).

That is what I hoped I was doing, and the only way at that point in my life I could do it. I could not write another academic paper. To be able to think on paper the way my mind thinks when it is full of questions and wonder, was very exciting. When big ideas buzz around my head and start taking their own *unique-to-me-and-my-life-and-my-image-world* shape. Ruth Behar (2008) says: "You will reach a point, as I did, where there is no choice but to work from your poetic self" (p. 67). I had reached that point.

Then there was the line that said, the poems were: *carefully crafted, subtly sophisticated, inimitably imaginative, lyrically logical, and philosophically playful/purposeful* (Anonymous reviewer, written communication, October 2006). The person, who had with such heart-felt enthusiasm responded to my work, is not only a peer in academia, but also a poet, a congenial soul.

The comments on the *form* were insightful. In my teen years I avoided form because it meant little to me. Now, I was witness to my form taking shape. I had a need for a more organic form, to pull the words away from each other for a number of reasons. The reviewer nailed a few of them.

As the day progressed I could almost recite the review: on the playground, while waiting for my kids, while cooking, on the phone with my sister, to my husband,

over coffee with a friend. That night I could not go to sleep. If I closed my eyes I might wake up to find it never happened.

At 2 a.m. lines were still running through my head. Who else could I share this news with? Who else would understand? Without thinking I am boasting, over-reacting, or un-humble? It had to be someone who knew what it takes—the work, dedication each day, how much editing, how many submissions, how much waiting.

A more pending question now was: who would be awake at this time of the night? It was day on the other side of the world. Of course, my parents. I snuck out of bed, went to the kitchen and dialed Sofia. A few windows still lit here and there in the high-rises. The co-op—dark. The ringing of the phone—unusually loud in the night. My voice could not be quiet enough. I read them the review. I read them the seven poems. I read them the review again.

I don't think my parents really believed in this whole poetry expedition. They kept hoping it was *a phase*. It has been the longest phase of all. The one thing that has stayed with me regardless of what country, school, job, language, or culture I was in. Looking back, poetry has always been there for me, even if I was not always there for poetry. When I was doing my degrees, writing academic papers on reading educa-tion, linguistics, semantics, pedagogy, or philosophy, poetry lay dormant. Except for the infrequent poem that gushed out. As if the mind has to be tuned in differently to invite poetry. Over-saturated with reading articles, textbooks, there was no room for anything else. All was defined by arguments, points, summary bullets. Institut-ionalized. It takes letting go, emptying, a certain kind of presence to allow poetry to flow through me. Egoless, I had to step out of myself as I knew myself. I had to be *beside* myself, to address something much larger. Robert Bringhurst (2008) says: "We are born questions. Culture is the thin but sometimes lovely web of answers we keep spinning for ourselves" (p. 50). I had to turn into a question, embrace *wonder* as my methodology. From there, listen to the world.

My parents regretted I abandoned my Ph.D. in Education when my daugh-ter was born. It did not help when I kept sending them stacks of poems. Their pres-ence in those years was a silence. I had completed all my coursework, had one more exam to sit for, and write a dissertation, when my first child was born. I thought hard: Baby? Dissertation? It is not that I had to choose one, or that one could not be with-out the other. But both would demand a big chunk, if not the whole, of me. If I dedi-cated myself to writing my dissertation, I was betraying my principles as a parent/teacher (that children come first). My daughter will never be one, or two,

again. I could always go back to finish the degree. The situation was exacerbated by my visa status, which required me to be in school full-time to be *legal* in the States. This left its nightmarish marks on my life. A story to be told another time.

I dedicated those initial years (fully and completely) to my daughter, and later my son; to being the teacher and mother I have been writing about. No regrets. No one has taught me more about myself than my kids. I took my apprenticeship seriously. I came to see those first few years in a child's life as crucial. You give them that, you have given them a gift for life. I do not have to chase after them to do their homework. I do not have to *tell* them what to be interested in. I just need to guide and support them as they discover their voices, launch on their own journeys. All these thoughts unsaid between me and my parents. Yet, something shifted that night. I felt acceptance, even admiration. That is all I cared to feel. We have had enough stressful arguments on *what* makes one happy, *what* is important in life. Here it was the poems, the praising words of a reviewer.

By 3 a.m. I had committed enough to memory. I went to sleep thinking how not only were my first poetic steps in the academy met with acceptance, but I was also acknowledged by my own family. Soon after, my poems appeared in *Paideusis*. My parents have cheered me on since.

One has to write, to hope and trust, and it takes a lot of it.

~

The peer review was blind, but it opened *my* eyes. Had the review been condemning, however, where, how, and who would I be today? These concerns remain as I move toward the publication of my first full-length poetry book. These concerns remain for me as an educator. How everyday we can negate a care, a curiosity, a passion children come to school with. I am astonished at some of the stories coming home with my children of how petty teachers can get to feel they are in control.

The critic, the reviewer, is very much like a teacher, in that their words can effect transformation. I cannot personally thank this man or woman who took the time and the heart to review my work. But, there is always the story. If it gets written, there is a chance it will get read. These are a teacher's quiet and rare gifts. They are almost never immediate.

~

Today (with over 160 poems released into the world in over 50 publications, two books on the way) I am left wondering: How can this be? As if all my life I have been working toward this moment. In a world of growing uncertainty, how can we know what we are preparing ourselves for? Or our children? It is a most curious puzzle.

References

Atwood, M. (2002). *Negotiating with the dead: A writer on writing*. Cambridge: Cambridge University Press.

Behar, R. (2008). Between poetry and anthropology: Searching for languages of home. In M. Cahnmann-Taylor & R. Siegesmund (Eds.), *Arts-based research in education: Foundations for practice* (pp. 55–71). New York: Routledge.

Bringhurst, R. (2008). *The tree of meaning: Language, mind and ecology*. Berkeley, CA: Counterpoint.

Dillard, A. (1989). *The writing life*. New York: HarperCollins Publishers.

Lamott, A. (1995). *Some instructions on writing and life*. New York: Anchor Books.

Daniela Elza just completed her doctoral thesis in Philosophy of Education (Simon Fraser University). Her interests lie in the gaps, rubs, and bridges between poetry, language, and philosophy. She dwells in the spaces that call us to attention, to an embodied awareness of the poetry that is our lives. In this process she not only finds that boundaries between philosophy and poetry blur, but writing also becomes a way of being, a vehicle for transforming consciousness, where we loosen our grip on the world to invite a more intimate connection with it. Daniela's work has appeared in over 50 literary and peer-reviewed publications.

LINK TO:

http://strangeplaces.livingcode.org/

Teacher Explorations of Science and Science Learning Generate Insights Into Inquiry and Teaching

Fiona J. Hughes-McDonnell, Emmanuel College
David R. Burgess, Rivier College

ABSTRACT

Education and science faculty describe explorations introduced into a multi-year professional development program to promote teachers' abilities to create environments for the elementary and middle school students they teach which elicit learners' exploratory behavior and sustain them in authentic scientific inquiry. Experiences, which were informed by the teaching-learning research pedagogy of critical exploration (Duckworth, 2006a), involved teachers as co-collaborators and explorers of scientific phenomena and students' science learning.[1]

We are faculty members in the divisions of education and science at two small colleges in New England. For the last few years we have been collaborating on the design and development of a professional development program to support k-8 teachers in their efforts to teach science through inquiry. On this Saturday morning in late November we will meet with a group of sixteen k-8 teachers to explore students' science learning through sharing artifacts generated by their classroom teaching. In other sessions we engaged the teachers in exploring materials and phenomena that we presented to them. Involving teachers as explorers of scientific phenomena and students' science learning are two explorations which we have found generate the knowledge and insights needed to engender understanding of scientific concepts through engaging students in authentic scientific inquiry. This approach also reflects our deep trust in classroom teachers as

decision-makers and diagnosticians of student learning, as well as our recognition of k-12 teachers as co-collaborators in researching teaching, learning and inquiry.

None of these teachers hold degrees in science. Upon entering this program, the majority self-identified as "science avoiders" and expressed a fear and uneasiness with teaching science, especially the idea of engaging students in inquiry as a means to support their understanding of scientific concepts. Moreover, no teachers in our program had any prior experiences with authentic scientific inquiry. All teachers reported using and relying upon district-mandated reading materials and science texts.

On this Saturday morning, to further our understanding of children's science learning, two teachers will share classroom videotape that shows two groups of second-grade students exploring an assortment of rocks and minerals that they selected to launch students into making their own explorations of rocks and minerals. The teachers have also brought a set of the students' science journals which contain drawings the students made, as well as the descriptions, questions and wonderings that occurred to them, as, through making close observations, they noticed and developed an increasing curiosity in the colors and textures exhibited by the various specimens. A teacher from a neighboring school district will share videotape excerpts that show the fifth-grade students she teaches using ideas they have put together about electrical circuits to construct a device of their choosing that contains a light bulb and a switch. In previous meetings, one teacher shared classroom videotape which documented the investigations that her fifth-grade students designed to understand the various factors that affect the motion of objects that they have launched. Another teacher shared videotape of the second grade students she teaches observing, describing, and drawing an assortment of leaves they have collected as part of a leaf study. She too shared journal entries the students made as part of their leaf explorations. One teacher team presented videotape that shows the fifth-grade students they teach making close observations of an assortment of flowers they had selected to stimulate thinking about structure, form, and function. One teacher team, motivated by contemporary events, shared videotape that showed the different investigations their students had planned and conducted to understand the biological and physical impacts of an oil spill on the environment. Another team shared videotape that showed two groups of second-grade students using materials they had gathered up from their homes (turkey syringes, hair dryers, tubing, sand, water, etcetera) to investigate questions they had about wind, wind speed and its effects on the environment. These teachers moved their teaching from the classroom into the gymnasium. In another session, a teacher who teaches science in the state's

only alternative middle school, a school for "at risk" students, showed videotape of students observing, analyzing, and raising questions about soil samples collected from different locations around the city. Finally, a teacher new to the teaching profession from a long career in business, shared videotape of his seventh-grade students engaged in explorations which grew out of their observations of a burning candle flame. The idea resulted from his own reading of Michael Faraday's 1860 Christmas lectures for children (1993). As teachers prepare to depart this final Saturday meeting, two teacher teams announce that they have plans to extend their students' science experiences by initiating after-school science programming at their respective schools; one teacher team describes their plan to set up areas specifically designed to not only "nurture and prompt children's wonderings," but to also help children "pursue their wonderings." The teachers hope that their colleagues will notice these centers and become inspired to introduce exploratory learning into their classrooms. Two second grade teachers announce that they have plans to develop a series of workshops to give their colleagues experiences with learning science through exploration. One of these teachers, who upon enrollment in the program declared her fear of teaching science, reports that she has agreed to the request of her building supervisor to serve as a science mentor.

In this paper we describe two explorations that we introduced into a multiyear professional development program which the teachers report gave them insights into the nature of inquiry and students' science learning. Insights gained motivated teachers to create settings that suggest "wonderful ideas" (Duckworth, 2006b) to students, and to sustain students' autonomous learning by giving students opportunities to pursue ideas and questions they had about the various subject matters that engaged them. Teaching, learning and research became fused, approaching the pedagogy of critical exploration (Duckworth, 2006a), as the students of these teachers explored subject matter that their teachers presented to them, and teachers—assuming the role of teaching-researcher—explored the different ways that students were taking in and making sense of their new experiences.

Context

Teaching Science Through Scientific Inquiry: A Call to Action

It has been more than a decade since concern about students' lack of interest in science careers and their apparent lack of achievement in science, prompted the National Research Council [NRC] to put out the clarion call to make "inquiry into

authentic questions generated by student experience the central strategy for teaching science" (National Research Council, 1996, p. 31). Yet, the call to make inquiry a central strategy for teaching science, and concern about students' lack of interest in science, is not unique to the United States. Education reform documents in Canada (see, for example, Foundation for the Atlantic Canada Science Curriculum, 1998) also put scientific inquiry, alongside the three traditionally recognized domains of science study (life science, physical science and earth-space science), as a fourth content area to be included in the k-12 science curriculum. The emphasis on inquiry-based teaching reflects the commitment of policy makers to promote student interest in science, and subsequent enrollment in science fields, as well as their knowledge of scientific concepts, by having k-12 students experience the science curriculum in a way that is reflective of and consistent with what scientists do and how students learn. The description of scientific inquiry presented below, while taken from US education reform documents, is consistent with descriptions of inquiry outlined in various documents available from the Canadian government:

> Inquiry is a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. (NRC, 1996, p. 23)

The call to implement scientific inquiry into the experiences of k-12 students has been taken up by the National Science Teachers Association [NSTA], which has chapters in Manitoba, Ontario, and Saskatchewan. A position statement released by this national organization urges teachers to make scientific inquiry "the centerpiece of the science classroom" (NSTA, 2004). Curriculum guidelines in the US and in Canada operationalize scientific inquiry as a set of discrete behaviors and skills, typically called science process skills.

Assessing scientific inquiry. In the United States, federal legislation (i.e., the No Child Left Behind Act of 2001) requires each state to conduct an annual assessment of k-12 student learning in mathematics and English language arts. Assessment of students' science learning, which is typically restricted to science content knowledge, is optional. A number of states choosing to conduct assessments in science have begun to introduce Science Performance Tasks as a mechanism to gather data on students' abilities to perform scientific inquiry. The nature of the science performance task varies by grade span. Tasks administered to students in early grades target

students' abilities to make observations and generate questions. Students in the middle grades are required to plan and conduct small collaborative investigations using materials provided to them. Students in the secondary grade levels are required to interpret, analyze and evaluate data gathered through experiment.

The Challenge of Implementing Scientific Inquiry

Teaching science content through inquiry does not come without its challenges. Some teachers believe, as Bruce Robertson (2006) notes, that they have to make a choice between utilizing inquiry or teaching science content. Others may feel, as Marguerite Comley (2009) notes, that inquiry teaching compromises the science content learned. Comley notes that "questions and doubts may make it challenging for a teacher to feel confident implementing inquiry-based laboratories in their classroom" (p. 162). Developing the confidence to utilize inquiry to support students' science learning presents a challenge to all science teachers, including those who hold degrees in science. Comley cites research by Abd-El-Khalick et al. (2004) who assert:

> Most science teachers have never directly experienced authentic scientific inquiry during their education in the sciences or within teacher education programs …Teachers need to be well versed in scientific inquiry as a teaching approach, a set of process skills, and a content area. (Comley, 2009, p. 163)

Understanding scientific inquiry as a teaching approach presents a special challenge for teachers, who, like those in our program, do not have formal training in science and lack experiences learning science through inquiry. Providing this teacher population with experiences that promote their knowledge of scientific inquiry, as well as their appreciation for the central role of inquiry in supporting students' science learning is of critical importance. As early as 1991, Canadian researcher Ruth Fawcett warned:

> The fact that teachers of the lower grades need have little specific science training brings a danger that many children will lose interest in the subject at a young age … many of these [teachers] themselves have rejected science and may communicate their dislike and fear of the subject to their students. (Science Education section, para. 4)

The Inquiry Learning Cycle: A Lesson Planning Model for Teachers

The call for inquiry-based science teaching has provided a new market for publishers and curriculum developers. Across the country, k-12 teachers, teacher educators, and college science faculty are inundated with texts which utilize a lesson planning model referred to as the inquiry learning cycle. The model, developed by Myron Atkin and Robert Karplus (1962), draws on findings concerning the cognitive structure of children's learning reported by child psychologist Jean Piaget (1896-1980). The model is presented as having anywhere from three to six phases. The original model, as proposed by Karplus and Atkin, had three phases: discovery, invention and concept development. While this lesson-planning model can and does provide a useful framework for teachers in thinking about lesson design, curricula that follow solely from a model or template for lesson development rather than from observations, ideas and thoughts of the learner is sure to fall short, for students and their teachers. Something more is needed. What students need is to have access to teachers who follow and attend to their growth and development; what teachers need is to be acknowledged as researchers and diagnosticians of children's development and learning.

Theoretical Framework

As collaborating Education and Science faculty, our aim was to use our expertise to create experiences out of which the teachers might notice the environments, settings, and teaching behaviors which prove helpful to learners in pursuing their own learning. We sought to design a program which engaged teachers as classroom researchers of students' science learning such that they might gain the knowledge and insights they need to teach in ways that cohere with how students learn. Our challenge, we recognized, was to interact with these teachers in the same way that we hoped teachers would interact with the students they teach. We rejected using our authority to tell these teachers what they should know about scientific phenomena or how students learn. The challenge that we undertook was to use our individual expertise to collaborate on the design of situations which we hoped would allow the teachers to put these ideas together for themselves.

Teaching, Learning and Research

Eleanor Duckworth is a former student and translator of Jean Piaget (1896-1980). "Critical exploration in the classroom" (Duckworth, 2006a) extends into the

classroom setting the clinical interview methodology that Jean Piaget and his colleague Bärbel Inhelder developed to research the origins and development of children's understanding within various domains. Duckworth reports that it was when she was field-testing curriculum materials with students in classrooms, seeking the different ways that students were taking in and making sense of the situations that she presented to them, that she noticed a possible inter-connection among teaching, learning and research. Duckworth noticed that her efforts to understand the thinking of the students proved useful to the students in taking their own ideas seriously. Exploration of student understanding became an act of teaching in the sense that it supported the students in coming to a deeper understanding of the materials and phenomena with which they were engaged (For Duckworth's own account see Duckworth, 2006b.) Teachers who utilize critical exploration in the classroom create situations in which children are "called upon to think, and to talk about what they think" (2006a, p. 159). It requires both student and teacher to become involved in exploration: "Exploration of the subject matter by the child (the subject or learner), and also exploration of the child's thinking by the adult (the researcher or the teacher)" (p. 159).

Teachers who create environments which are responsive to and supportive of the exploratory behavior of the learner are functioning as the kind of teacher scientist-philosopher David Hawkins (1913-2002) envisioned when he wrote,

> The function of the teacher is to respond diagnostically and helpfully to a child's behavior, to make what he considers to be an appropriate response which the child needs to complete the process in which he's engaged in at a given moment. (1969/2002, p. 56)

The idea that a teacher's genuine interest in understanding the thoughts of learners (whether the learners be k-12 students or adults), as expressed through the teacher's active role in exploring the different ideas that learners have about the phenomena that engage them, proves useful to those same learners in taking their thoughts further, is a notion that informs our work with these teachers. (For examples of introducing critical exploration into the preparation of pre-service teachers, see Hughes-McDonnell, 2009; Cavicchi & Hughes-McDonnell, 2001).

The Teacher Explorations

Teachers Explore Scientific Phenomena

In one set of experiences we engage the teachers in active exploration of materials, phenomena and tasks that we present to them. We might, for example, present a carefully chosen assortment of materials (magnets of varying sizes and shapes or an assortment of spherical objects of different sizes and masses along with ramps of different lengths and materials) and challenge the teachers to see what they can discover about the materials and/or phenomenon in question. Oftentimes, we present teachers with a question, prediction, or challenge that we hope is sufficiently rich to take them inside the subject matter such that they might encounter the structure and complexity of that subject matter. In addition to exploring what the teachers are thinking at the outset of an exploration, we typically ask the teachers to consider how the students they teach might apprehend (Schneier, 2001) and respond to the particular situation presented. We ask the teachers to consider the full range of responses that students might give and to find or "give reason" for each prediction (Duckworth, 2006c, p. 83). We find that this approach helps to alleviate teacher anxiety, while deepening teachers' appreciation for the student perspective and providing a context for exploring different ways of thinking about and explaining events. We continue this approach throughout the teachers' explorations. We invite the teachers to share their initial observations and wonderings so that these observations, questions, and wonderings might become the basis of subsequent explorations. Teachers share their new explorations with the group and reflect together on their learning and understanding.

Teachers Explore Students' Science Learning

In a concurrent set of explorations we involve the teachers in exploring the science learning of the students they and their colleagues are teaching. We encourage the teachers to use their own experiences as science learners to create exploratory settings for the students they teach. We emphasize the active basis of learning research, and communicate that, as teaching-researchers, their actions should parallel the exploratory behavior they hope to observe in students. We encourage the teachers to be genuinely curious about what students are thinking and doing: to create situations and pose questions which open up and uncover student thinking; to make note of what students say and do, to gather up the student work products generated by their teaching (student journals, posters, drawings, models, etcetera), and to document with videotape episodes of teaching and learning as it is happening. It is these artifacts which we examine at the Saturday sessions to

further our individual and collective understanding of the indicators of inquiry and of actions that support and sustain inquiry. That is, teachers do not share artifacts as exemplars of teaching and learning but as contexts through which to further our understanding of how students learn and teaching behaviors that support students in pursuing their own inquiries. It is essential that we maintain an individual and collective stance of inquiry. To this end we have adopted and subsequently modified an inquiry-based looking at student work protocol developed by Steve Seidel at Project Zero, Harvard University (Blythe, Allen, & Powell, 1999).

Overview of the Professional Development Program

The experiences that we describe in this paper are taken from our third and final year of a multi-year professional development program, which has been made possible by funding received through the federal Mathematics-Science Partnership program. Each year of programming built on previous experiences. In 2006, we engaged 25 teachers in open inquiry experiences using as a context science content identified in state curriculum frameworks. We engaged teachers in conducting and developing Science Performance Tasks. The following fall and spring the teachers met for two hours each month to share student work products that were generated by small inquiry experiences that they were providing for their students. For the most part, the inquiry experiences that teachers were providing for students were taken from mandated curriculum materials issued to them by the school district. The following year (at the request of one district administrator) we included a mentoring component. We adopted a mentoring model that supported ideas that we had been developing about inquiry teaching (Zubrowski, Troen, & Pasquale, 2007). We subsequently replaced the terms mentor and mentee with the concept of collaborating partners. The teachers visited the classroom of their collaborating partner for the specific purpose of gathering data related to questions about teaching and learning that were of interest to the host teacher. Teachers presented their teacher research projects at the spring 2009 meeting of New Hampshire Science Teachers Association. In this, our third and final year of working with this group of teachers, the teachers met for five days in the summer of 2010 to design and produce inquiry-based curriculum units which enact ideas and insights gained through their involvement in explorations associated with the program. It is artifacts generated by the enactment of these curricula that the teachers gather and share at the Saturday meetings.

Involving classroom teachers as co-collaborators in conducting research into students' science learning is a form of professional development that is supported by leadership within the National Science Teachers Association. A position statement released by the NSTA board in September 2010, reads: "the Association 'encourages ALL participants in science education, including k-12 teachers of science . . . to assume active roles in research practices'" [caps in original].

The Teachers

The teachers in the current group are drawn from 10 elementary and middle schools across six public school districts in New Hampshire. Seven of the 16 teachers in the current and final group have participated since the project's inception in summer 2008; five teachers joined the program in the fall of 2008; we accepted an additional two teachers in the summer of the final year of the program. Seven reported three or less years of teaching experience upon entering the project. Six teachers reported between four and six years of classroom experience. Two teachers reported between seven and 10 years classroom experience. One person in the group reported more than 20 years teaching experience. At the time of their participation, nine of the 16 teachers were teaching in grades four and five; five participants were teaching in the second grade; and two participants were assigned to the eighth grade. The group consisted of 13 women and three men.

Teacher attrition. Five of the 16 teachers in the current group have participated in all phases of the programming we have developed. A number of teachers joined the group in Years Two and Three of the programming while others have been lost. A mentor teacher component introduced in Year Two of the project resulted in substantial teacher loss. Further attrition resulted when, as result of sensitivity to district needs, we moved from a weekday to a Saturday meeting schedule.

Teacher Reflections

In this section, we present *some* of what the teachers have shared with us and with project evaluators about the nature of their experiences and insights gained. The reports speak to teachers' growing trust in themselves as curriculum-makers, decision-makers, and diagnosticians of learning, as well as their respect for students as explorers and sense-makers. The reports illuminate teachers' deepening appreciation for the exploratory roots of authentic teaching and learning, and the

power of real-world subject matter to elicit exploratory behavior. The reports reveal teachers' insights into practices that sustain exploratory behavior, such as observing, noticing, and documenting the diverse ways that students apprehend and interact with subject matters presented, and listening attentively to how students describe and explain those actions. Most importantly, the reports illuminate teachers' new appreciation for students' observations, questions, and wonderings as "material to work with." Finally, the accounts indicate the potential of documentation and collaboration to produce individual and systemic change.

The teacher accounts are taken from a number of sources, including teacher surveys, written reflections (both formal and informal), field notes that we made during the professional development sessions, and transcriptions of the teacher meetings that we videotaped in the fall of 2010. Unless otherwise noted, teacher comments are taken from a Saturday morning session held November 20, 2010.

"I was a ten-year-old scientist"

Several teachers noted the value of exploring scientific phenomena in what they now appreciate as important elements in engaging learners in scientific inquiry. One teacher with less than five years teaching experience reported, "[My] experience designing ramps and 'playing' with things that rolled moved my understanding from science inquiry being just 'hands-on' to exploring and developing further questions to investigate…" [Underline in original] (Anonymous, program evaluation, November 2010).

A teacher with three years experience commented, "I wasn't a teacher in training … I was a ten year old scientist, thinking about my own experiences in a garden, looking at the moon on the horizon, and realizing that crickets eat cornmeal" (Cummings, 2010).

A fourth-grade teacher with three years teaching experience reported,

I like how we learned and discovered through our own experience. This is how we should be teaching our students-through experience.…. I now find myself thinking about the questions, my own and the students'… I allow my students time to develop their own questions about the subject matter and give them time and opportunity to find the answer to their own questions. (Anonymous, program evaluation, November 2010)

A second-grade teacher with five years teaching experience, reported,

> I used to be anxious and not comfortable with science and the inquiry process. My content knowledge and comfort has grown year after year. I'm [now] more comfortable with teaching science. I'm excited about and enjoy teaching science. I've increased my science content knowledge. I now have more ideas about what to say and what to do to support students in making their own inquiries. I am more comfortable learning what kinds of questions to ask. (Anonymous, program evaluation, November 2010)

"I have become a student of learning"

The teachers expressed awareness that exploring and documenting students' science learning was especially useful in helping them to create settings which are effective in promoting children's exploratory behavior. As one teacher, Rebecca Cummings, put it, "I feel like I have taken a journey with Piaget." This research and the understandings generated, transitioned teachers from classroom teacher to teacher-leader. A fifth-grade teacher with nine years teaching experience wrote,

> "I have gone from giving the answer to following the learning I see happening in front of me. I have become a student of learning" (Anonymous, program evaluation, November 2010).

A middle school teacher with eight years teaching experience commented,

> My greatest personal growth has occurred from observing how students learn, through reflections, observations and videotaping, students and myself in action. My ability to ask questions to probe student learning has greatly improved. The ability to observe children actually interacting in the learning process gave a concrete presence to our notions about how learning takes place. (Underline in original)

Another teacher stated that researching students' learning has helped her to "Put the focus on the child ... it helps me to see how a particular child is reaching their understanding" (Anonymous, program evaluation, November 2010). Moreover, through documenting students' science inquiries, this group of teachers began to notice teaching behaviors that are essential for involving and supporting children in making their own authentic scientific inquiries. Another teacher reported, "Last week at a parent-teacher conference I could tell a mother, 'he had a brilliant question

the other day,' and I could remember the process he went through to get there"
(Anonymous, program evaluation, November 2010).

Learners' Ideas as "material to work with" and "songs to build on"

If limited to one insight that the teachers happened upon, which we believe
proved essential to their new understanding of what it means to teach, we would
argue for teachers' new awareness, appreciation, and respect for the role and value of
children's ideas for teaching. Today, these teachers seek out students' ideas, questions
and wonderings with the same energy and drive that they seek out new materials for
the supply table. No longer do these teachers perceive children's questions and ideas
as thoughts to be avoided, corrected, or covered up. Today these teachers value the
ideas and questions that learners bring as "material to work with" and "songs"
(Cummings, 2010) to build on. At our last fall meeting, one teacher exclaimed,

> I used to be so afraid of what my students would say. I never, never would
> have given up control; I would have wanted to tell them what to think. Now
> I think, *let's let them go there*. I wonder, now, how far will they take this? I look
> forward to seeing what material they will give me that I can work with.

One teacher, in an anonymous program evaluation, shared the revolution
that has taken place in the way she thinks about teaching.

> There's been a sort of revolution in my teaching. . . Now, students make
> observations first, come up with questions, and then try to dive into the
> answers on their own. I am there to guide, not to tell. Afterwards, we discuss
> what we all noticed and the students take their own notes. There is a new
> sense of pride within the classroom.

Another teacher also used the program evaluation to report,

> … this project has given me the tools to not only have more fun while teach-
> ing science, but to teach it in a meaningful way that involves the children in
> observation, exploration and experimentation. The children are more
> involved and responsible for their learning as the subject and discussion is
> directed by them, their interests and their questions.

To "hear their voices in their work"

Teachers have transitioned from perceiving teaching as telling and providing answers to seeing teaching as involving listening to the ideas and explanations that students have about events (Duckworth, 2001). One teacher reported that her new capacity for listening to what each student is trying to express, through looking closely at the things they produce and the words they use in conveying their ideas, has brought her closer to her students and helped her to know them as individuals beyond the label "student." Fifth-grade teacher Rebecca Cummings (2010) wrote,

> Just as these students have learned to develop their skills through patient observations I feel that I have developed my ability to listen without trying to manipulate their ideas to fit an objective. . .Fostering their experiences instead of capitalizing on their learning has now become my goal. Reading their written words and watching as they draw what they see allows me to hear their voices in their work. . . . I can pinpoint their [my students'] understanding. I can draw on it. I actually see their learning. (p. 5)

"I was . . . king of the castle. . . I have given up the throne"

Teachers' genuine curiosity, what Freire (1970/2006) might refer to as "epistemological curiosity," in knowing and understanding what their students are seeing, thinking and wondering for the purpose of supporting their developing ideas has had a dramatic impact on the nature of the questions they pose to students and in how they think about the purpose of the activities that they plan for their students. An eighth-grade science teacher, who entered teaching from a career in business, reflected

> I [used to think] that science teaching was to be done out of a book—or out of a kit, step by step. I was the point of knowledge—'king of the castle'—I have [now] given up the throne and now have shifted that power to the kids. They are responsible for their learning. I am a guide. . . I used to worry about the clarity of the explanations that I gave to students. Now I do a lot more listening to my students. I find myself genuinely interested in hearing what my kids have to say.

"Initially I was skeptical": Having Confidence in Student's Wonderings and Questions

Of some significance is that these teachers trust that students' explorations

will uncover the science content that they are required to teach. A second grade teacher with five years teaching experience reported, "Initially I was skeptical that kids could and would have questions that would lead to uncovering the content that I was responsible to cover. I'm confident now that they can and will become more invested learners."

Making inquiries into scientific phenomena and following students' science learning has deepened teachers' appreciation for the social origins and context of individual and group learning. The teachers now recognize group discussion, in which learners are called upon to share their diverse observations and ideas about situations experienced, whether the observations concern the motion of an object along a plane or the thinking of a student, as a valued activity and an intellectual necessity to their own learning. In a written reflection, fifth-grade teacher, Rebecca Cummings (2010) wrote,

> All I had to do was prompt them with materials, questions, give them a venue for their ideas to be valued. Most importantly, I had to listen. . . . As their teacher I should always be listening and my own talk is limited to help-ing them decipher their own thoughts, develop their questions, and give meaning to their vocabulary. (p. 5)

"I can be the facilitator [of learning] and present the material in a real way."

Teachers who began the project fearful of science have now assumed lead-ership positions within their district and many have begun to provide students with additional exploratory science experiences through initiating after-school science programming. Teachers' facility for teaching science through inquiry is paralleled by their students' increased interest in science. One fourth-grade teacher reported that before her participation in the program, her students "were bored reading the text-book and answering assessment questions." Since her participation in the program, she has "noticed a difference in students' attitudes [toward] science. They cheer when we transition into science, and if science isn't in our schedule for the day, they ask if we can fit it in somewhere before going home." Whereas these teachers used to adhere to a scripted curriculum, they now create their own curriculum in response to the ideas and interests that their students express. One teacher shared how, in one recent experience, she searched her home for "junk" materials that her students might use to build devices to explore wind and its effects, taking her students into the gymnasium where they would have more space for their explorations. "This is

something I can't imagine myself ever having the courage to do this before [my involvement with this project]." A second-grade teacher reported that before her involvement with the project, "I really never taught any science. The material I have is dated and uninteresting. This project took the intimidation factor away and I have realized that I can be the facilitator and present the material in a real way."

Challenges

In the schools where our participants teach there continues to be a strong focus and emphasis on literacy and mathematics, which does not leave much time for science instruction of any kind. In many cases students are expected to learn science through reading stories or articles that have a reference to science, or that are about science; and reading about science rather than doing science, continues to be considered as valid science instruction. Some of the schools, mostly those in larger districts, have implemented scripted curricula in which every aspect of teaching is written out for the teachers. In science they may purchase a curriculum using kits where the students do some hands-on activities, but it is still scripted; questions and inquiries are provided to students and there is little opportunity for students to experience phenomena and to design investigations around questions they have. Some of our teachers have experienced resistance from colleagues who are not willing to change what they are doing and so trying to introduce inquiry to them is very difficult. Some participants have experienced indifference from administrators who ascribe to the view of inquiry articulated in purchased curriculum. Yet, despite these challenges, the teachers in our program are forging ahead with their work, doing what they can do to introduce the students they teach to authentic inquiry, and thereby improve their students' science learning, as well as their images of and experiences with science.

Closing Comment

As this project comes to a close, not only are the teachers who participated in our program making time to teach science, but they are also teaching science through inquiry. A number of teachers are taking ideas they have gained about the nature of learning into their teaching of other subjects. And, despite some resistance, these teachers are seeking out opportunities and avenues to introduce inquiry to their colleagues. We feel the enormous trust and confidence that these teachers have in themselves and in each other, both as teachers, learners and researchers. These teachers document student learning with the understanding that the artifacts that

they gather and share are vital to furthering the knowledge base on teaching and learning. As one teacher said, "We know that the group is not there to judge us but to help us record our kids' learning. Judging and evaluation has gone by the wayside." We notice the confidence with which these teachers point to the actions, thoughts, gestures, etcetera, which they consider to be either evidence of learning or teaching actions supportive of exploration. The teachers are eager to see what others will bring to the table and listen with curiosity and attentiveness as teachers share their thoughts and observations about the artifact in question. These teachers appreciate that knowledge and understanding of teaching comes from making extended inquiries into student learning.

Finally, Hamos et al. (2009) highlight the use of professional learning communities (PLCs) in supporting teacher learning. Professional learning communities, they write,

> …open the classroom door wide so that teachers can discover ways to improve their craft through group effort, discuss with others ways to improve the education of all students, and generally create a culture of mutual support within school walls. (p. 23)

We did not set out with the idea to form a PLC, yet, the development of community is a natural outcome of this work. It is our shared commitment to exploring the nature of development and learning which brings us together on this Saturday morning.

Notes

1. This research was supported in part by grants from the New Hampshire Department of Education and U.S. Department of Education from the Mathematics Science Partnership program NH080107, NH080104, NH080101.

References

Abd-El-Khalick F., BouJaoude, S., Duschl, R., Lederman, N., Mamlok-Naaman, R., Hofstein, A., et al. (2004). Inquiry in science education: International perspectives. *Science Education, 88*, 397–419.

Atkin, J. M., & Karplus, R. (1962). Discovery or invention? *Science Teacher 29*(5): 45.

Blythe, T., Allen, P., & Powell, B. (1999). Two ways of looking at student work. In *Looking at student work* (pp. 26–37). New York: Teachers College Press.

Cavicchi, E., & Hughes-McDonnell, F. (2001). Introducing inquiry into the experiences of new teachers of science. *Proceedings of the Annual Meeting of the History of Science Society*, Denver: CO. Retrieved November 14, 2010 from http://www.eric.ed.gov/PDFS/ED470928.pdf.

Comley, M. (2009). The inquiry-based science pedagogy debate. *LEARNing Landscapes 2*(2), 153–164. Retrieved November 10, 2010, from http://www.learnquebec.ca/export/sites/learn/en/content/learninglandscapes/documents/LL-no4-spring2009.pdf.

Cummings, R. (2010). *My revised teaching style: Why I listen to my students*. Unpublished manuscript, Rivier College, NH.

Duckworth, E. (2001). *"Tell me more": Listening to learners explain*. New York: Teachers College Press.

Duckworth, E. (2006a). Critical exploration in the classroom. In E. Duckworth, *"The having of wonderful ideas" and other essays on teaching and learning* (3rd ed.) (pp. 157–172). New York: Teachers College Press (Original essay published in 2005, *The New Educator, 1*, 257-272).

Duckworth, E. (2006b). The having of wonderful ideas. In E. Duckworth, *"The having of wonderful ideas" and other essays on teaching and learning* (3rd ed.) (pp. 1–14). New York: Teachers College Press.

Duckworth, E. (2006c). Understanding children's understanding. In E. Duckworth, *"The having of wonderful ideas" and other essays on teaching and learning* (3rd ed.) (pp. 83–97). New York: Teachers College Press.

Duckworth, E. (2010). The soul purpose. *LEARNing Landscapes, 3*(2), 21–28. Retrieved November 14, 2010, from http://www.learnquebec.ca/export/sites/learn/en/content/learninglandscapes/documents/LL-no6-june2010-low-res.pdf.

Faraday, M. (1993). *The chemical history of a candle*. Marietta, GA: Cherokee Publishing. (Original work published in 1861).

Fawcett, R. (1991). Science education in Canada. Depository Service Program, Government of Canada. Retrieved March 23, 2011, from http://dsp-psd.pwgsc.gc.ca/Collection-R/LoPBdP/BP/bp265-e.htm.

Foundation for the Atlantic Canada Science Curriculum (1998). *Science: Foundations*. Retrieved March 23, 2011, from http://www.ednet.ns.ca/pdfdocs/curriculum/camet/foundations-science.pdf.

Freire, P. (2006). *Pedagogy of the oppressed*. New York: Continuum International Publishing Group (original work published in 1970).

Hamos, J. E., Bergin, K.B., Maki, D.P., Perez, L.C., Prival, J.T., Rainey, D.Y., et al. (2009). Opening the classroom door: Professional learning communities in the Math and Science Partnership Program. *Science Education, 18*(2), 14–24.

Hawkins, D. (2002). I, Thou and It. In D. Hawkins (Ed.), *The informed vision: Essays on learning and human nature* (2nd ed., pp. 51–64). New York: Algora Publishing. (Original essay published in 1969).

Hughes-McDonnell, F. (2009). "I wonder how this little seed can have so much potential?" Critical exploration supports pre-service teachers' development as science researchers and teachers. *The New Educator 5*(3), 205–228. Retrieved October 10, 2010, from http://www1.ccny.cuny.edu/prospective/education/theneweducator/volume5_3.cfm.

National Research Council (1996). *National science education standards*. Washington, DC: National Academy Press.

National Science Teachers Association (2004). *NSTA Position Statement: Scientific inquiry*. Arlington, VA: NSTA Board of Directors.

Retrieved December 3, 2010, from http://www.nsta.org/about/positions/research.aspx.

National Science Teachers Association (2010). *NSTA Position Statement: The role of research on science teaching and learning*. Arlington, VA: NSTA Board of Directors. Retrieved November 22, 2010, from http://www.nsta.org/about/positions/research.aspx.

Robertson, B. (2006). Getting past "inquiry versus content." *Educational Leadership* (2006-07 Dec-Jan).

Schneier, L. (2001). Apprehending poetry. In E. Duckworth (Ed.) "Tell me more:" Listening to learners explain (pp. 42–78). New York: Teachers College Press.

Zubrowski, B., Troen, V., & Pasquale, M. (2007). *Making science mentors: a 10 session guide for middle grades*. Arlington, VA: NSTA Press.

Fiona Hughes-McDonnell is associate professor of science education at Emmanuel College, Boston, where she is also the director for the Center for Science Education. A former high school science teacher, she has partnered with her colleague David Burgess for five years on developing in-service opportunities for teachers. She completed her doctoral degree at Harvard University in the field of Teaching, Curriculum, and Learning Environments where she studied under Eleanor Duckworth and from whom she learned the methodology of critical exploration.

David Burgess is a professor at Rivier College in Nashua, New Hampshire. He received his Ph.D. from Iowa State University in Physical Chemistry and has been teaching chemistry, physics and physical science for 30 years. In addition he has collaborated with several faculty in the education department at Rivier College, doing online and face-to-face professional development, writing and editing a series of Discovery Books, and most recently investigating teaching and learning in elementary and middle school classrooms.

Democracies in Action: A Changing Learning Community Landscape

Carol A. Mullen, The University of North Carolina at Greensboro

ABSTRACT

Learning alongside others to effect transformation of community and self is a process of inquiry that guides theory and practice. My purpose as an author is to portray a balanced, realistic portrait of the promises and pitfalls of engaging in professional learning communities (PLCs). Herein I present the results of a democratic project that united 42 scholars and practitioners who made discoveries as collaborators within evolving communities of practice geared toward desirable change. I also draw upon the relevant literature to describe this trend and identify possibilities for renewal, reflection, and inquiry that arise out of PLCs.

In this essay, I advance the idea and practice of learning community as democracy in action. My purpose as an author is to portray a balanced, realistic portrait of the promises and pitfalls of engaging in professional learning communities (PLCs). To undertake this task, I build on the relevant literature, including synthesized results from my collaborative, multi-site case study described in *The Handbook of Leadership and Professional Learning Communities* (Mullen, 2009). The 2009 project drew together 42 scholars and practitioners from schools, universities, and institutes across the United States to analyze their work in communities of practice geared toward desirable change. After exploring this multifaceted learning innovation from different perspectives and at numerous sites, it was confirmed for us that learning community is indeed a promising democratic reform deserving further study. The scholars and practitioners who contributed to this project wrote from organizational, cultural, technological, and mentoring perspectives that incorporate cultural considerations. My intended audience is education practitioners in particular as well as

scholars for whom learning as a school community is essential and for whom important ideas are translated here into strategies.

My perspective about PLCs as democratic learning communities is consistent with a view of democracy as a change process committed to principles of freedom and responsibility that people use to shape their work (Giroux, 1992). Democratic community building enables members to collectively change who they are, fully participate in their work lives, socially negotiate meaning in expansive ways (Wenger, 1998), and operationalize their individual and collective rights (Jenlink & Jenlink, 2008). Committed leaders persevere as agents of change and renewal, no matter how encumbered mandated reforms might make them feel.

Based on my experiences with learning communities over the years, I believe that the PLC is, at least ideally, a type of democracy in action. An established approach for organizing the professional development of educators, the PLC is a popular form of practice-based research (Birchak et al., 1998; Donahoo & Hunter, 2007). While collaborative professional learning is not new, the social justice bent on learning community and the practicality of developing communities that are democratic, authentic, and sustained remains challenging. Educators can benefit from learning about the inner workings of PLCs and making concrete contributions to them. Through such work, we can re-imagine our learning landscapes and role in forging collective action that strengthens, even transforms, our relationships and communities.

Learning Community Landscapes and Frameworks

PLCs integrate two traditionally distinct concepts—professional learning and community. In this model, the professional's expert knowledge and focus on student learning and needs are combined with the community's shared interests, core values, and mutual responsibility, but the PLC can be defined in different ways (Mullen, 2009). For example, the PLC can be viewed as a model of school organization designed to foster collaboration and continuous learning among educators for facilitating school improvement. Further, the PLC model has become a popular means for promoting organizational, cultural, and relational change through shared purposes (Birchak et al., 1998; Bullough & Baugh, 2008; DuFour, 2004; Mullen & Schunk, 2010).

Principles that inform and guide the work of successful PLCs include commitment to change; shared vision and common goals; belief that all participants can effectively collaborate and contribute; encouragement of risk taking and sharing of ideas; use of research-based (leading, learning, and teaching) strategies; and design of assessments that reflect goals. Mullen and Schunk's (2010) meta-analysis of the learning communities research reveals that PLCs have leadership, organizational, and cultural goals and functions, and that the extent of the impact on teaching and learning in classrooms is only gradually emerging (Whitford & Wood, 2010). Thus, a pitfall of PLCs is that benefits for student learning and success are often implicit or indirect.

Also deserving more attention is the potency of PLCs as a culture-changing process, not only as a strategy for school improvement. From this perspective, activist-oriented PLCs grapple with school inequities that Watts and Erevelles (2004) argue oppress many diverse children and youth, ranging from poverty to alienation, scapegoating, and bullying, for which they call for empowering alternatives. The PLC initiative is one such alternative through which whole-school change can occur. Such groups may establish counter-normative goals (e.g., culturally responsive learning) and members may be facilitated to deliberate in ways that productively surface biases and emotions (Cooper, 2009). Decisions generated out of consensus-building dialogue can produce unifying actions. These include school campaigns and mottos (e.g., United for Change), policy creation, teacher modeling, customized courses (focused, e.g., on social skills), and assessment of (hostile and aggressive) behaviors. As a model of democracy in action, PLCs can foster cultural awareness for targeted education groups, such as students who alienate or hurt students they consider "different," as well as demographically changing schools.

PLCs are changing the learning landscape of schools, districts, and universities. Based on widespread and multifarious policies, implementations, and examples across North America, the PLC has potency as a strategy for educational change. Educators and policymakers concerned about school improvement have an invested interest in it as a staff development model. Stakeholder groups include teachers, teacher leaders, principals, often professors, and sometimes community members, state department personnel, intermediate service agency staff, district and campus administrators, superintendents, parents, and higher education administrators. Learning communities are in vogue as a vehicle for school-wide change and improvement (Dufour, 2004) and for student learning and engagement (Mullen & Hutinger, 2008; Zhao & Kuh, 2004). Perhaps the PLC initiative has reached the stature of being an educational movement, "sticking" as an idea that has staying power (Gladwell, 2002).

The tipping point means something unusual or rare, such as Internet use or population patterns, has suddenly become the norm. A comparable vision for PLC models is for them to generate excitement and endure within the schooling culture in which they are initiated, having a lasting impact. Change happens slowly yet rapid change can emerge from seemingly slow progress. Applied to PLC networks, desirable outcomes with respect to practitioner collaboration, student learning, and organizational performance can suddenly spark, fundamentally changing a school. Shared leadership, partnership buy-in, synergy, reinforcement, and recognition are catalysts for changing negative cultures into democracies in action.

Conduits for creating PLCs are school-university partnerships, professional development schools, virtual learning communities (VLCs), and racially inclusive PLCs (Mullen, 2009). The 2009 project contributors engaged in a group learning process whereby they reflected on their own practice with a critical eye. The teacher groups they studied identified student learning needs and took action to meet those needs. PLCs can fruitfully undertake such potentially transformative practices as distributed leadership, collaborative inquiry, reflection, self-study, mentoring, coaching, and problem solving. All levels of leadership commit to improving student learning, enhancing faculty development, and enacting organizational change through supportive guidance, shared leadership, core values, collective learning, conducive conditions, and collaborative practice. PLCs, as self-study discourse communities, are the means and supporting structure for organizations to be continuously improved.

In the 2009 project, we collectively expressed a view of the PLC as a promising approach to educational change subsequent to having weighed the pros and cons of our various initiatives. Upon analyzing what we had together created, I appreciated more fully that PLC efforts range in the importance of the work attempted and accomplished within them, and in their degree of functionality and effectiveness, capacity for outreach, and circumference of inclusion. They also vary in the synergy generated and fulfillment of their promises. The belief that learning, teaching, and leading are inherently not only social but also democratic undergirds the PLC initiatives we described; moreover, our work is political, experimental, and unfinished.

Upon reflection, I also became convinced that the learning community literature, generally speaking, does not challenge the status quo in a significant way. The theoretical foundations upon which much of the research is based is presented as having functional value rather than a critical or an interpretive one. The literature includes populist writers, some of whom have been criticized for quick-fix, instrumental approaches and pre-packaged notions of "best practices" for developing and

sustaining learning communities. In contrast, English (2008) invites practitioners to develop knowledge that is dynamic, collaborative, and creative, not standardized, and to develop their own promising practices. Next, I briefly describe four overriding perspectives (i.e., organizational, cultural, technological, and mentoring) that had relevance for the 2009 project contributors' work within democratically oriented PLCs.

Organizational Perspective on Learning Community

The organizational perspective of leadership and PLCs can be variable, dynamic, and diverse, just as it should be. In the 2009 project, we called for critical attention to this movement, attempting to rise to the occasion ourselves. Critique of school improvement reforms, including the PLC, was captured by such images as that of the zealot who "hops on" what is working organically in schools and reduces their potency by mandating reform through policy initiatives and other means. PLC development does not happen in a vacuum—instead, it is supported through a shared vision, purposeful agenda, and collective understanding of the change process. Researchers and practitioners alike have been cautioned to vigilantly monitor the bandwagon mentality encompassing the learning community innovation and the evangelical attitude toward it (Johnson & Kruse, 2009). Ironically, those who are most directly involved in developing, implementing, and assessing PLCs are nonetheless affirming of PLC development as worthy. However, this initiative must be thoughtfully undertaken and must satisfy certain conditions.

Notably, organizationally minded change agents believe that the PLC initiative should be aligned with democratic aims and agendas that promote equity, inclusion, and success (Bullough & Baugh, 2008, 2009). In addition, they know from firsthand experience that this intervention must yield organizational capacity and human capital for schools, districts, and universities. They also know that the ins and outs of a PLC developed organically feature a decentralized structure, partnership alliances, and teacher leadership focused on collaborative problem solving.

Cultural Perspective on Learning Community

Cultural writers encourage PLC members to democratize their community arrangements and group processes from the outset. Critical democratic groups are not just introspective—they are self-interrogating; they proactively adopt social justice stances, understand the dynamics of change, and recognize that learning communities are not automatically self-sustaining—instead, they require hard work, ongoing support, and personal commitment. As mentioned, culturally relevant

education within demographically changing schools is an example of this practice in action (Cooper, 2009). Another manifestation focuses on aligning democratically practiced places of learning with the processes, resources, and activities necessary for transforming a school's social spaces (Jenlink & Jenlink, 2008). Change agents must grapple with cultural diversity, difference, and inequality if they are to prepare teachers, students, and others to interface with a pluralistic constituency (English, 2008).

Institutions do not naturally awaken to the need for change, so activists must jump-start the process and propel it. Change agents bring integrity to the inner world of the self and the outer world in which they live as they create communities for learning and support (Clandinin, 2010). They re-imagine teaching and learning as a cooperative social and political practice enabled by active partnerships with constituents. In the 2009 project, while we reported cases and examples of partnership development within and across schools, universities, and institutes, we described a larger view of PLC development as environmental, cultural, and social. PLCs that transform outdated cultures renew education relative to their own buildings and the profession.

Technological Perspective on Learning Community

The technological perspective advances cultural ideas to inform thinking about new kinds of communities of practice. Geographically dispersed professionals participate in virtual learning as a community, endeavoring to foster their own development, establish shared purposes, and pursue new knowledge or skills through online communications (Lewis & Allan, 2005). Educators use VLCs, often originated through conferences, courses, and workshops, to simulate real-life learning. Digital technology supports active learning, critical reflection, and collaborative inquiry (Mullen, 2009). Because it allows for online interaction and collaboration, some VLCs use Elluminate (http://www.elluminate.com). Pros and cons associated with this platform have been documented by a PLC group of leaders that renewed their professional organization and increased overall productivity by co-leading and co-learning within a computer-supported governance structure (Mullen, 2011). Pros included accelerated progress towards mutual goals and meeting convenience, and cons included a learning curve and technology glitches such as inaudible voice levels. Facilitators of VLCs use Web, audio, and/or video for engaging a community of learners in which members simultaneously talk and write questions and comments. Wenger's (1988) requirements of successful communities of practice, which are mutual engagement, joint enterprise, and shared repertoire, have been shown in numerous case experiments to have credibility (e.g., Lewis & Allan, 2005; Mullen, 2011; Rogers, 2000).

Systems thinkers create system-wide collaborative cultures among schools, universities, and outside agencies. PLCs are entities that are intrinsically linked from the classroom to the school and beyond. To this end, digital communication systems (e.g., high-speed digital networks) mobilize social, cross-institutional, and global networking (Mullen, 2011). VLCs are a widely disseminated example of how digital learning contexts can productively generate insight and action. Embedded within a social justice framework, this emergent practice encourages critical thought, human connection, open, honest dialogue, conflict resolution, and respect for difference (Cernohous, Wolsey, & Grisham, 2010; Mullen, 2009).

Highly influential thinkers' (e.g., Jean Clandinin, John Dewey, Paulo Freire, Michael Fullan, John Goodlad, Nel Noddings, Thomas Sergiovanni) transformative ideas about education can be adapted to virtual and online learning. As frameworks undergirding goals, ideas from the education literature span such important concepts as community learning, grassroots activism, learning by doing, professional renewal, and teachers' professional knowledge. In the 2009 project, we discussed the frameworks that had guided our individual PLC initiatives. We expressed our belief that practitioners are social creatures whose cultivation of creative intelligence, selfhood, self-actualization, and activism depends on engagement in co-learning and co-leading that is not left to chance. We also talked about how technology is not value-free, as technology communications shape knowledge, power relations, and how we see the world and ourselves in it. Further, we used technology in the development of our PLCs—whether to augment face-to-face (f2f) sessions or to outright foster VLCs. Moreover, we used a blended approach to create the 2009 project, meeting f2f and online, and presenting at conferences.

Mentoring Perspective on Learning Community

Contributors to the 2009 project addressed collegial mentoring issues relevant to preservice teachers, beginning teachers, and inservice teachers. We approached activist mentoring in leadership and learning teams and as a peer-based community innovation. Intergenerational and cross-cultural relationships within PLC networks occur among teachers and administrators of different leadership styles, ages, generations, backgrounds, and ethnicities. A noteworthy benefit, mentoring-oriented PLCs foster cross-cultural and intergenerational understanding partly by including historically underrepresented groups (Davis, 2008). These provide a forum for teachers to influence school cultures through their own experiences of inquiry that generate peer-led communities, tight school-community linkages, deepened cultural awareness, and self-reflective citizens (McKenzie et al., 2008; Shields & Mohan, 2008).

Of additional benefit, the learning community arrangement provides opportunities for teacher leadership and participation through collaborating, coaching, and induction (Fives, Buehl, & Myers, 2008). Mentoring cultures depend on such activities to turn places of work into flourishing learning communities. Formal induction programs can foster mentoring-based social networks for beginning teachers through which support, growth, and success are rewards. The 2009 project contributors explored underlying epistemological models of leadership (e.g., transactional, transformational, critical) and philosophies of education (action learning, culturally relevant knowledge, shared governance) that influence practitioners' work. They also described the catalytic role of administrators (e.g., principals) and teacher leaders (e.g., curriculum leaders) in team- and culture-building efforts.

Challenges to Community Building and Breakthroughs

Regrettably, many professionals work alone (Putnam, 2000). And yet, PLCs offer an invaluable source of social capital that leaders turn to when "build[ing] a coalition of support or sustain[ing] a position in times of conflict" (English, 2008, p. 27). A major goal of a democratic leadership is to develop and sustain networks that are relational, interactive, and mutually constructed and have egalitarian and humanistic aims (Cernohous et al., 2010; English, 2008; Wenger, 1998). Synergistic networks that support professional communities of collaboration yield benefits with respect to informational flow, reciprocal learning and bonding, collection action, and identity formation and solidarity.

The group mentality and identity within the PLC groups described by the project contributors (Mullen, 2009) worked in similar and different ways and within wide-ranging contexts. As differences, initiating agents were from schools, districts, universities, and institutes and the PLC networks reflected younger and more mature phases of development; the focus, engagement, and outcomes of them also varied significantly. As common themes, all the PLC group members included stakeholders from outside the school; they developed shared purposes connected to student learning and they studied their own learning processes.

For example, included in the 2009 project is a hallmark PLC group that teacher educator pioneer John Goodlad founded in 1986. The National Network for

Educational Renewal is composed of over 20 school-university partnerships. Focused on renewal, not reform, of teacher education and schooling, the partners of these highly organized collaboratives have forged learning communities rooted in what is known as the Agenda for Education in a Democracy. Agenda developers of this multifaceted initiative, explicitly guided by Goodlad's philosophies, include the Institute for Educational Inquiry in Washington.

Researchers of this complex PLC model, a professor and superintendent (Bullough & Baugh, 2009), describe the PLC networks' commitment to democratic schooling as a process of renewal through such means as internally self-initiated and experientially based work. One of these learning communities, the Brigham Young University (BYU)–Public School Partnership, organized in 1984, encompassed a school of education and five school districts totaling over 7,000 teachers, in addition to PLC subgroups (e.g., Associates Program, Principals' Academy, Leadership Preparation Program). Organized by this Partnership was a Goodlad-steeped curriculum that provided study, conversation, reflection, and inquiry on the shared purpose of democratic schooling and renewal. Groups of approximately 20 school and college educators met throughout the academic year to talk about research-based practices (they read over 20 books each year), and to participate in projects and activities.

More specifically, in the BYU Partnership's Alpine Associates program, 360 school practitioners (teachers and principals), including multidisciplinary university professors, deans, superintendents, and school board members, met up to six times yearly. They participated in daylong retreats and an annual conference to experience collaboration across educational roles, discuss salient issues anchored in readings, and decide future directions for their work. Surveys conducted within the groups revealed the need for teacher leadership and explicit connections to student learning through analysis of diverse data, in addition to the fostering of school cultures.

The PLC members experienced, over time, collective synergy, trust, competence, and interdependence and they were guided to use research results to improve their practice. The BYU Partnership also grappled with issues of power and authority, such as the struggle to widely distribute leadership in an effort to renew school and districts. Differences of viewpoints within the various PLCs were sometimes confounded by a lack of understanding of the shared purposes governing the work, so members responded by educating from within while expanding the membership of targeted stakeholders. Another tension involved the classroom responsibilities of teachers who felt awkward about missing time for instruction. Consensus was sought by creatively accommodating schedules, making compromises, addressing

misunderstandings, expressing appreciation for differences in roles and viewpoints, and engaging in open, honest dialogue (also see Bullough & Baugh, 2008).

At the other extreme end of this highly organized model, as captured by the 2009 project, is the Professional Development High School that had met for one academic year in North Carolina to develop its vision. The goals for the PLC network, established in 2007, included creating a school-university PLC collaborative focused on practitioners' professional development and collaboration to improve student learning (Lashley, Cooper, McCall, Yeager, & Ricci, 2009). For this initiative, university faculty members, a school principal, and curriculum facilitator brought together approximately 65 teachers (representing 10 departments) and 8 cross-campus university faculty (I was one of them) in a newly built high-tech school for which no student population or culture yet existed. All committed in that empty but impressive building to professional learning as a new community of practice that was research based.

A team consisting of practitioners and university faculty created the agenda that embedded the goals of this PLC that had a "blank slate" for planning from the outset. The configuration of the group included preservice teachers whom the PLC teachers and university faculty members wanted to intentionally mentor through group discussion followed by modeling in such forms as supportive co-teaching practices in different content areas. An interview study involving some of the participants surfaced the value placed on building positive school community where all members feel valued and value others through promising practices that include teacher coaching. Recognizing the challenges faced by preservice teachers from the university, beginning teachers in the school, and especially the adolescents who would be entering the school from different backgrounds, motivated the PLC group to create their own school culture. Talking together in a media room, they agreed to build a democratic community for the diverse population of students that signals "a strong sense of purpose and community and high academic expectations" (p. 67). They also agreed that it was important to meet as a group to make visible their commitment to school-university collaboration and peer-led learning.

Such work and commitments make good sense, given that social isolation has reached an epidemic proportion (Putnam, 2000). As communities and teams lost potency in the United States, educators hunkered down, taking to private corners. Because schools and universities show signs of psychological insulation, it is more of a feat than it should be to build organizational capacity through connections and partnerships. Professional isolation is daunting for beginning teachers, especially. In

isolated rooms, guidance from colleagues is critical. Educators' ability to make a difference grows exponentially when we function as a dynamic social network that values support, engagement, interaction, and transformation (Sergiovanni, 2007; Wenger, 1998).

Arguably, the experience of community has disintegrated over time, and yet practitioners and scholars have reinvigorated the value of community learning through their good work. Structural frames of reference must be bolstered by human frames of reference to avoid isolating people and their work. The metaphor of learning community—or learning landscape—underscores value for social progress through networking, interacting, and bonding. Sergiovanni (1992) encouraged this "paradigm" shift, arguing that "community" (not "organization") is a better way to be thinking about the democratic spaces in which we educate. Thus, it is incumbent upon us to revisit how we think about education; how we interact as leaders and learners; and the models and strategies we create for this purpose. In the 2009 project, we put a human face on the places and spaces where educators collaborate, portraying how at the center of democratic practice are people, relationships, and community, facilitators of which are structures, policies, and agreements that forge a democracy in action (Sergiovanni, 2007).

Working to create social practices supported by vibrant communities, educators enact Sergiovanni's (2007) idea of a "smart school." "Smart learners" teach each other, thereby compounding what they know and are able to do, making "smart schools" a promising practice of change. Where organizational learning of this nature is evident, PLCs have been identified as "smart" cultures (Leithwood, Aitken, & Jantzi, 2006) within which the social practices of bonding, bridging, and linking occur for school people (Mulford, 2007). As project contributors, we described the "smart" ways that organizations have moved "knowledge into practice" (Schweitzer, Howard, & Doran, 2008, p. 50), extending the reach of democracies.

Unfortunately, school leaders are often so inundated with survival (in such pressing forms as high-stakes testing, teacher attrition, and daily responsibilities) that they see community and team building as a luxury. Obviously, being transfixed in a survival mode is not a "smart" leadership orientation. Democratic leaders free themselves of the survivalist mindset—they establish the conditions for transforming their workplaces into vital communities of learning wherein members feel motivated to make a difference. They consciously work with others to develop structures that promote synergy and partnership, and sustain the momentum for change in their buildings. How do democratic leaders view their success with developing learning

communities? Many ironically describe it in measurement terms but nonetheless see it as an indicator of transformational learning through which the social capacity of organizations is increased (English, 2008; Mullen, 2009).

In the 2009 project, we engaged in an educational conversation about community building among different professional groups and within highly varied contexts replete with competing worldviews. Some of us adopted advocacy stances relative to the learning community initiative, others critical, cautionary, and balanced stances, and collectively we addressed organizational, democratic, and leadership issues related to this theme. Together, we presented alternatives to the status quo that makes isolation, as well as individualism and competition feel "natural" and inevitable. We endeavored to help mend the fragmented, dysfunctional state of public schools and rewrite the script of resource-poor, struggling school-communities (Kincheloe, 1999). Although school renewal is in its infancy, we have added to the canon of narrative knowing, living examples of democracy in action (e.g., Clandinin, 2010).

Practical Ideas and Future Directions

Based on my analysis of the 2009 project and relevant literature, I offer practical ideas and tips for promoting learning community work (see Table 1).

Table 1:
Practical Ideas for Creating Professional Learning Communities

Embrace human services	Features of human service organizations include decentralized structure, diverse, multiple, ambiguous goals, and value-infused lenses. When planning change, consider these and other organizational features. Also, identify your individual and collective assumptions and mindsets; address principles of democracy and learning community and their fit with the vision, mission, and direction of the organization; assess the change and its effect on teaching and the environment; and examine how the proposed change might affect workloads

Be action oriented	Develop an action plan that includes such elements as who or what will be included in the development of the PLC, what resources are needed for the community initiative (e.g., staff assistance), what professional development supports teacher involvement, and how effectiveness will be assessed
Model social practice	Collaboratively craft your mission and goals; use various types of data to promote, document, and assess student learning, and identify leadership practices that foster teacher collaboration and collective action. Enact democratic decision making to ground the learning of your community in open and respectful dialogue, consensus building, and shared leadership
Adapt good ideas	Learn about theories of leadership, community, and change, and philosophies of education, relevant to your learning community, in addition to documented practices of educational change. Adapt what is useful to your context, not as a template but as an informational source
Encourage new learning	Develop participants as co-leaders and co-learners to reinforce advancements in the culture of teaching. Community-oriented professional development fosters collective identity and a sense of belonging
Forge partnerships	Collaborate with university faculty and school personnel to discuss shared purposes, plan programs, and identify guiding questions. Carry out research focused on school improvement and culturally responsive agendas
Recruit diverse members	Reach inside and outside the organization, including parents, families, students, and teacher candidates/interns. Be mindful of exclusionary practices and cultural expectations. Fully embrace persons of color, community members, and others
Adopt a mentoring stance	Treat differences in age, generation, gender, leadership style, etcetera as a strength and resource for mentors and learners. Avoid relying solely on mentoring programs to foster professional learning—support professionals' individual and varying needs to maximize outcomes

Communicate electronically	Digital systems and VLCs can advance one's vision, mission, and goals. These allow for experimentation with the more traditional form of PLCs and, at their best, promote the creation of new democratic spaces, increased political participation, synergistic (reciprocal and collegial) interactions, and group identity development
Make activities challenging	With participants (via workshops, courses, other), identify barriers that people encounter and action steps for generating solutions. Do activities that move participants outside their comfort zones (e.g., simulations, debates) focused on goals (e.g., making schools culturally engaging places to work)

The collective learning of schools depends on the willingness and expertise of their faculties to adopt expanded definitions of learning community, leadership, and governance. Educators who support democratic practices of community and who dialogue across cultural differences help meet organizational goals in previously unrealized ways. Leaders who work effectively together are reciprocal partners who support school/district/state initiatives through goal setting, collaborative problem solving, and inquiry projects and through such outcomes as content creation, program development, and student success. PLC members who purposefully set in motion positive change engage new ways of being within their learning community landscapes. They build social capacity, develop social identity, and impact their communities.

Future directions for creating learning communities and researching them can address many challenging areas of professional life. These include micropolitics, external factors and pressures, toxic culture, and consensus building. A recent study that addresses these educational issues is Whitford and Wood's (2010) 6-year examination of seven school districts. Information from teachers who belonged to PLCs in Florida, New Jersey, New Mexico, Pennsylvania, and Washington was analyzed. The PLC founders, serving as the research team, addressed both pros and cons of this complex work. As a pro, like the PLC contributors to the 2009 Mullen project, the 2010 PLC teachers shared that positive collaboration and meaningful conversation among stakeholders was a major benefit. As a con, Whitford and Wood also found that PLCs introduced difficult problems that took time away from teaching; however, practitioners liked having the opportunity to identify their own issues and seek solutions as a team.

Readers may find the wide-ranging PLC portrait I have presented useful for forging ahead with their own democratically oriented communities. As part of this portrait, I have compiled practical ideas from my own readings and experiences that provide orientations and steps for creating PLCs (see Table 1). It takes time and patience to do PLC work for which synergistic learning communities become the process and product of change. More and more PLCs are translating research results into promising practices, creating policies through consensus, and integrating digital communications. In our work lives, many of us see democracy in action. However modest the signs may seem, synergy builds synergy and cultures change.

References

Birchak, B., Connor, C., Crawford, K. M., Kahn, L. H., Kaser, S., Turner, S., et al. (1998). *Teacher study groups: Building community through dialogue and reflection*. Urbana, IL: National Council of Teachers of English.

Bullough, R. V., & Baugh, S. C. (2008). Building professional learning communities within a university–public school partnership. *Theory Into Practice, 47*(4), 286–293.

Bullough, R. V., & Baugh, S. C. (2009). Developing professional learning communities in a university-public school partnership. In C. A. Mullen (Ed.), *The handbook of leadership and professional learning communities* (pp. 39–49). New York: Palgrave Macmillan.

Cernohous, S., Wolsey, T. D., & Grisham, D. L. (2010). Contemporary technological innovations in teaching and learning and teacher education. *Teacher Education Quarterly, 38*(1). Retrieved July 25, 2010, from http://teqjournal.org/editors.html

Clandinin, D. J. (2010). Narrative understandings of lives lived in and out of schools. *LEARNing Landscapes, 3*(2), 15–20.

Cooper, C. W. (2009). Performing cultural work in demographically changing schools: Implications for expanding transformative leadership frameworks. *Educational Administration Quarterly, 45*(5), 694–724.

Davis, D. J. (2008). Mentorship of a sharecropper's daughter: Being young, gifted, and Black in academe. In C. A. Mullen (Ed.), *The handbook of formal mentoring in higher education: A case study approach* (pp. 73–83). Norwood, MA: Christopher-Gordon.

Donahoo, S., & Hunter, R. C. (Eds.). (2007). *Teaching leaders to lead teachers: Educational administration in the era of constant crisis, vol. 10*. Oxford, UK: Elsevier Science.

DuFour, R. (2004). Schools as learning communities. *Educational Leadership, 61*(8), 6–11.

English, F. W. (2008). *The art of educational leadership: Balancing performance and accountability*. Thousand Oaks, CA: SAGE.

Fives, H., Buehl, M. M., & Myers, S. D. (2008). The cultivation of a professional association-based new faculty mentoring program. In C. A. Mullen (Ed.), *The handbook of formal mentoring in higher education: A case study approach* (pp. 165–190). Norwood, MA: Christopher-Gordon.

Giroux, H. A. (1992). Educational leadership and the crisis of democratic government. *Educational Researcher, 21*(4), 4–11.

Gladwell, M. (2002). *The tipping point: How little things can make a big difference*. New York: Little, Brown, and Company.

Jenlink, P. M., & Jenlink, K. E. (2008). Creating democratic learning communities: Transformative work as spatial practice. *Theory Into Practice, 47*(4), 311–317.

Johnson, B. L., & Kruse, S. (2009). *Decision making for educational leaders: Under-examined dimensions and issues*. New York: SUNY.

Kincheloe, J. L. (1999). *How do we tell the workers? The socioeconomic foundations of work and vocational education*. Boulder, CO: Westview.

Lashley, C., Cooper, J., McCall, J., Yeager, J., & Ricci, C. (2009). Teacher education is everybody's business: Northern Guilford High School— a professional development community. In C. A. Mullen (Ed.), *The handbook of leadership and professional learning communities* (pp. 59–71). New York: Palgrave Macmillan.

Leithwood, K. A., Aitken, R., & Jantzi, D. (2006). *Making schools smarter: A system for monitoring school and district progress* (3rd ed.). Thousand Oaks, CA: Corwin.

Lewis, D., & Allan, B. (2005). *Virtual learning communities: A guide for practitioners*. England, UK: Open University Press.

McKenzie, K. B., Cambron-McCabe, N., Capper, C. A., Christman, D. E., Dantey, M., Gonzalez, M. L., et al. (2008). From the field: A proposal for educating leaders for social justice. *Educational Administration Quarterly, 44*(1), 111–138.

Mulford, B. (2007). Building social capital in professional learning communities: Importance, challenges and a way forward. In L. Stoll & K. Seashore Louis (Eds.), *Professional learning communities: Divergence, depth and dilemmas* (pp. 166–180). London: Open University Press.

Mullen, C. A. (Ed.). (2009). *The handbook of leadership and professional learning communities*. New York: Palgrave Macmillan.

Mullen, C. A. (2011). Renewing professional organizations and action learning. *Action Learning: Research and Practice*, *8*(2), 149–157.

Mullen, C. A., & Hutinger, J. L. (2008). The principal's role in fostering collaborative learning communities through faculty study group development. *Theory Into Practice, 47*(4), 276–285.

Mullen, C. A., & Schunk, D. H. (2010). A view of professional learning communities through three frames: Leadership, organization, and culture. *McGill Journal of Education, 45*(2), 185–203. Retrieved March 6, 2011, from http://mje.mcgill.ca

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.

Rogers, J. (2000). Communities of practice: A framework for fostering coherence in virtual learning communities. *Educational Technology & Society, 3*(3), 384–392.

Schweitzer, L., Howard, E. J., & Doran, I. (2008). Planners learning and creating power: A community of practice approach. *Journal of Planning Education and Research, 28*(1), 50–60.

Sergiovanni, T. J. (1992). *Moral leadership: Getting to the heart of school improvement*. San Francisco: Jossey-Bass.

Sergiovanni, T. J. (2007). *Rethinking leadership: A collection of articles* (2nd ed.). Thousand Oaks: Corwin.

Shields, C. M., & Mohan, E. J. (2008). High-quality education for all students: Putting social justice at its heart. *Teacher Development, 12*(4), 289–300.

Watts, I. E., & Erevelles, N. (2004). These deadly times: Reconceptualizing school violence by using critical race theory and disability studies. *American Educational Research Journal, 41*(2), 271–299.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, UK: Cambridge University Press.

Whitford, B. L., & Wood, D. R. (Eds.). (2010). *Teachers learning in community: Realities and possibilities*. New York: SUNY.

Zhao, C-M, & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education, 45*(2), 115–138.

Carol A. Mullen, PhD, is Professor and Chair, Educational Leadership and Cultural Foundations Department, The University of North Carolina at Greensboro. She specializes in social justice approaches to leadership mentoring in education. She is long-time, former editor of the *Mentoring & Tutoring* journal (Routledge). She has published 15 books and also edited *The Handbook of Leadership and Professional Learning Communities* (2009, Palgrave Macmillan).

LINK TO:

www.uncg.edu/~camullen

(En)Gendering Difference:
A For(u)m for Possibilities

Pam Patterson, Ontario Institute for Studies in Education,
Centre for Women's Studies

ABSTRACT

This inquiry observes how cultural collaborations can create for(u)ms—forms repre-
senting narrative activity; for-"ums" for reflective pauses; and forums for discussion—
to critically address and provide spaces for playing in and with differences in ability,
race, gender, and ethnicity. Using the project *gender/TROUBLING* as template, it theo-
rizes a performative model for learning to explore the possibilities for engendering
diversity and for building responsive, creative, and inclusive teaching/learning prac-
tices.

> Discovery consists of looking at the same thing as everyone else
> does and thinking something different.
>
> Albert Szent-Gyorgyi (date unknown)

This inquiry, "(En)Gendering Difference: A For(u)m for Possibilities," as
reflection, examines the perspectives I and other participants acquired,
the processes we developed, and possibilities we explored in critically
addressing and providing a space for playing with, and negotiating through, differ-
ences in ability, gender, ethnicity, and culture through our engagement in a particu-
lar arts collaboration and event. As research, it reflects on how such collaborations,
actively pausing and playing, can frame a processual learning for(u)m for partici-
pants. Here for(u)m is used to mark complexity and multiple processes in arts learn-
ing: as form made by artist and then used by onlookers in/for interpretation; for "um,"

the pauses (often reflective) in activity (Patterson, 2006); and the forum, as an active and acknowledged site for discussion and knowledge making. My intention in fragmenting this word is to disrupt reader preconceptions and assumptions, open theoretical spaces for new configurations of difference and to name, as author, an active site for the performance of meaning.

I focus this discussion around *gender/TROUBLING*, a creative program I initiated as Director of *WIAprojects*, a feminist interdisciplinary educational, exhibition, performance, and arts-informed research program housed at the Centre for Women's Studies in Education, Ontario Institute for Studies in Education of the University of Toronto.

gender/TROUBLING was both the title for the project and for the resulting exhibition, performance, film screening, and discussions that were held at XPACE Cultural Center, Toronto. Participants were from *WIAprojects*, XPACE, York University, the Ontario College of Art and Design University, the Art Gallery of Ontario Youth Council, and other community curators and artists.

My own creative work, as autobiographical, stories a woman gendered as older, queer, and disabled. Often my installations and performances are ghettoized in queer, women's or disabled exhibitions, or if shown or performed in mainstream galleries, bodily appearance and sexuality are downplayed or sometimes exoticized by viewers and interpreters. Stories of similar troubling or reductive experiences by various cultural workers were sent to me via mail or email, through blog posts, or told to me in person. These individuals were invited to join the project and if time and personal commitments allowed, they became active participants. What we had in common was that each of us had been asked at one time or another to simplify our complex autobiographies and define ourselves and our work into one category for exhibition and discussion. Gender definition was limited to straight, gay or maybe queer; and rarely were the complexities of race, class, ability or age, for example, included with/in gender. Many times we were asked to make work or to speak publicly in such a way that did not acknowledge our complex gendered selves at all.

Our intention was to explore how we could collaborate and produce work that could represent and perform these complexities.

Revealing Perspective and Initiating Process Through Story

The stories we told each other or shared through writing went beyond simply naming exhibition frustrations. Personal and schooling experiences also were articulated. Many of these stories served in analysis as open forms, as musings. I choose the word "muse" intentionally to note a rich resonance that comes from attending to individual presence in story. Stories can provide opportunities for conversations and connection, and stimulate personal insight. They can offer a beginning place for an exploration of the process of self-identity and sometimes better reveal the complexities of gender. As others, such as the Personal Narratives Group (1989), have commented, such a venture will probably not settle the argument concerning the location of the self: whether it is there to be discovered (or uncovered) and relatively stable, or whether it is a construction of the mind and continually shifting. However it will provide an entry point for examining the interaction between the individual and society in the construction of gender. If we understand each of our stories as a recording of our gender status, then gender will never be taken for granted and our stories will become evidence of historical activity that illuminates both the effects of systemic constraints and the potential impact of individual agency. These narratives can allow us to see our lives as simultaneously individual and social creations, and to see ourselves as individuals who are simultaneously the changers and the changed.

gender/TROUBLING stories were counter-narratives and spoke to the power of individual agency and to the understanding that participants had of collective interdisciplinary work. The project took place in a gallery space, which while funded by an educational institution, was not so policed. Participants also came from many different sites—institutional and non-institutional—which also served to destabilize a fixed discourse. The project developed from a shared passion for gender difference and fluidity, for powerful stories, and from our desire to understand and interpret such "stories of difference" for ourselves and for others.

From our early meetings questions emerged:
What are the challenges we have within our communities?
How do we, and those we work with, understand "gender"?
How limiting can that term be?
How might we unpack it?
What are some of the strategies that we could use, as educators, curators, and artists,

to create spaces to celebrate, activate, and engage our diverse community(ies)? How can we rethink what we do as pedagogy and use it to animate action?

We explored how to aesthetically activate and integrate complex gender issues in exhibition. The description of "how" this occurred articulated the project's learning. Project learning was multilayered. Foregrounded here in this writing are the understandings I reached around my own facilitation of, and curatorial strategies used for responding to, and developing and animating, project questions. It also includes, in part, participants' learning around how story could build performance and new media representations, how they might integrate and make use of reinter-pretations of their work, and how they might animate, inform and respond to view-ers' readings. It also discusses the learnings acquired by our viewers and discussion participants. In many instances these roles—as did our gender designations—over-lapped and become fluid: the curator worked as an installation artist; artists became interpreters; and visitors assisted in facilitation. Learning was both individual and col-lective, a complex enactment and engagement. In reporting on this, while I include others' viewpoints, my writing is biased as I speak about how I viewed and inter-preted project learning.

Engaging Possibilities in "Play"

gender/TROUBLING
Gender bend, gender blend—Oh ! Have we got trouble! The fun, sexxy, hot, meets "voguing"—What a "drag"! Get rid of those binaries! Engage with life-sized on the wall grls/gys and video and film by native-tranny-poly-queer-gimp-homo-gender-b(l)enders. "Perform" (or critique) a new persona at the gallery site, see a performance and a portable gender-abled potty, and workshop, in conversation, with the artists on site. Play with where you stand (or pass?)… anything is dizzyingly possible.

This was the exhibition invitation text as written by our collective. The lan-guage was intentionally chosen to provoke discussion and to defuse the power derogatory words can have when hurled against us.

gender/TROUBLING was a presentation-in-process. Our research drew from Judith Butler's (1988) early work on performative acts and gender constitution. Butler does not consider the performance of gender, sex, and sexuality to be a voluntary

choice. She locates the construction of the gendered, sexed, desiring subject within what she calls "regulative discourses." These discourses, also called "disciplinary regimes," decide in advance the socially permitted possibilities of sex, gender, and sexuality. The discourse itself naturalizes the construction of binary gender and heterosexuality—in other words heterosexuality in the West appears "natural."

She writes,

Gender reality is performative which means, quite simply, that it is real only to the extent that it is performed. It seems fair to say that certain kinds of acts are usually interpreted as expressive of an expected gender core or identity, and that these acts either conform to an expected gender identity or contest that expectation in some way. (1988, p. 527)

Butler claims that, without an adequate critique of sex/gender, race, ability, age, etcetera, subversive performances will be seen as nothing more than futile acts.

In summarizing how such a critique might be activated, performance scholar and practitioner Richard Schechner (2006) writes, in referencing various theories of performativity, that a performance "act" has three branches—it has its physical attributes (to "do"), its social aspects (to "act"), and its theatrical aspects (to "perform"). "Any action consciously performed refers to itself. Its 'origin' is its repetition. Every consciously performed action is an instance of restored behavior. Restored behavior enacted in real life is what poststructuralists [such as Butler] call a performative…. all social identities are performatives" (p. 167). Of interest here in Schechner's argument is the relationship between performativity, the performative, and the performance proper: an "act" accomplished in everyday life becomes connected with "to act" something enacted for the stage—as art. When one is reflexive about one's acting, one becomes conscious of how such acting is constructed.

There is an "as if" of performativity analogous to the "as if" of theater. In theater, the "as ifs" consist of characters, places, actions, and narratives – all of which exist as they are performed. In performativity, the "as ifs" consist of constructed social realities – gender, race… – all of which are provisional. (p. 168)

While theatrical approaches dispense "information to spectators through closed narrative conventions" (Garoian, 1999, p. 49), those which employ performance do so through intervention. It invites a different way of perceiving. If a differently

gendered, raced, disabled etcetera performative can be re-imagined "as if" and re-created in a "live" setting or formalized as a performance, might we perhaps raise the possibility that it might be "real" after all? Schechner notes, "It is possible… to progress from pretending to acting to performing to simulating… Phenomenologically, the distinction between real and feigned" might then potentially disappear (2006, p. 134).

Our intention, as an activist/artist collective, was to engage with this discussion as we built, contextualized, and presented our work. Our desire was to expand the field bodily through creatively constructed subversive performances of various kinds. Our strategy was one of play.

Maria Lugones (1990) notes,

The shift from being one person to being another person is what I call travel… Those of us who are "world" travelers have the distinct experience of being different in different "worlds"… The attitude that carries us through is [a] playful [one]… We are not worried about competence. We are not wedded to a particular way of doing things. We are there creatively. (p. 396)

We worked towards opening a for(u)m where new meanings could assemble and shift, creating fluid narratives of change, using a construction which acknowledged the power of diverse art practices, the embedding of memory and story in image, and the productive use of fantasy. As artists, curators, and writers, we were implicated in the production of the interpretation enacted by the visual frame. Our production was transparent—the context and content evident in location, producer, place, and intent, enacted in discussion, and marked in publication. We strategically played together among our worlds, and in doing so, refused to stabilize gender.

How? We told and shared our stories and made these stories content for our art. As artists and researchers, we acknowledged our shared and different conditions and explored the complex interpretive practices that were at play. We admitted our complicity, and modeled and critiqued the roles we played in mediating, betraying, and building alliances among our diverse selves and communities. Rather than presenting easily recognizable images of the gendered body, we searched for ways to connect differently with our viewers. In engaging in such practices, we attempted in our art to be inextricably (and publicly) engaged in the conditions, context, positionality, and performativity of our gendered lives.

Some artists came to the project with completed work from other contexts and used our for(u)m to share their stories and recontextualize their work; some used feedback from weekly meetings and story sharing to go back into the studio and build their work; some brought raw footage to me and the group and we assisted in choosing which work to show and made suggestions on how best to show it. The final decision as to what to show or how it was to be shown was mine, but negotiation was critical. All were able to identify and realize their own work in relationship to the project intention and the exhibit as it was conceptualized.

Curation as Pedagogy

All of the works the artists developed addressed, in various ways, Butler's notion of performativity through the use of photo-based images, video, new media, performance, and sculpture. My intention, as curator, was to design an installation with the group that would articulate our collective work together in forms which would enact a more inclusive and complex performance of gender. I wanted viewers to become aware of, and perceive differently, gender variability and to understand the unique subjectivity of each artist and the particularity of each artist's story.

While I could understand how performance might activate the gendered body in space, I questioned how photo-image and sculpture might work. This hesitation influenced my choice to approach artists who mostly worked with less static forms—moving images, video and performance. However, regardless of whether the completed works were to be static or moving, live-sized or referencing the body as sculpture, I needed to look at how others could imagine themselves in the stories and move through the exhibition.

Cultural theorist Herta Wolff (2007) provided some context for affirming the potential of a static image to replicate performance intent for the viewer:

> [I]n a photograph, what is viewed through and replicated by the lens is not only represented but also made present again….This notion of photograph as a self-imprint of nature and the world endows each photograph regardless of the theoretical grounding of its viewer with an eminent link to the subjective, to experience. (p. 69)

While as an interpretive educator, I do not doubt an image's connection to experience, I am interested in how we can best predict certain viewings as researchers/artists when we use different media to "perform" our own and other's experiences.

Through a performative reflexive inquiry—reflection within the context of the social and political for action—I facilitated discussions with the group on how their representations might work as explications of race, culture, disability, as well as of pain, confusion, and joy. How might this provide a learning experience and affect change for me, as curator/researcher, for them as artists/participants, and for our viewers? I then noted how each of these groups facilitated with varying results, these shifts in learning through a complex balancing and "performing" of various factors: research data, personal experience, aesthetics, art making process, and viewing practices.

Performance has been framed as pedagogy (Garoian, 1999) and used specifically to expose and address, for example, medical, disability, and race and gender challenges (Gray et al., 2000; Kuppers, 2003, 2007; Paget, 1990; Piper, 1996). Performance proposes that both artists and viewers become aware of the layering of action and image. It asks for a direct involvement of spectator with performer, transforming the role of spectator to one of participant (Garoian, 1999). As a form which is interventionist, it is useful in challenging how various normative narratives might work.

gender/TROUBLING, as a video, sculpture and photo-based exhibit, mostly lacked what most performance works have, the actual body in performance. "Merleau-Ponty's conception of 'having a body is that it is a spatial act'" (in Kuppers, 2007, p. 9); for Kuppers this is activated in performative work through the spatial performance of embodiment. Simultaneously, in performance the body exists as image, the body itself, and the ground or context. These positions are mobile. This mobility causes a shift in looking and meaning making, a suspension, a tension, a destabilizing. Theatre director Eugenio Barba[1] makes use of this technique in his practice. Suspension as physical/mental act is a moment of tension and destabilization and, in holding this moment, both performer and/or audience consider choice and action.

Performance encourages a metaphoric viewing of events, activities, emotions, and ideas—a viewing similar to that required for conceptual or idea-based, art. Petra Kuppers (2007) looks to the performative as a way to play with/in storying and to intermingle object and subject, voice and word. Digital new media and video, video installation, sculpture and photo-based work were then reconfigured in a

dialogic performative "mash" as exhibition. Multiple voices were raised. The audience entered.

gender/TROUBLING: Activating the For(u)m

The following acts as a somewhat oblique tour of the exhibition, in which I, as curator/viewer, employ looking, invite musing, recall story, and engage in interpretive analysis. My intention here is to connect the performance of the work with viewer response and explicate some of my own and others' learning.

Fig. 1: Gender bend, Gender blend: Oh! Have we got trouble! Questioning gender constraints cannot only cause trouble for us as cultural producers, but also trouble you, the viewer.[2]

At the exhibition entrance, a window displays the exhibition title and a tissue paper clothing pattern hung on a metal hanger. This hanging fragment speaks to me of the socially constructed or "patterned" nature of gender—a concept critical to our analysis. A wall panel just inside the door lists the collective participants. I am named as facilitator/curator, assisted by Leena Raudvee and Serena Lee. Cultural producers are video, film, and new media artists Loree Erickson, Spy Dénommé-Welch, Jo SiMalaya Alcampo, and Alexandra Hazisavvas; sculptor Frances Mahon; performance artist Claudia Wittmann; and the activist/artist collective ShiftChange from the AGO Youth Council.

Fig. 2: Gender Super Nova, a life-sized "voguing" or "trying on" of gender by Art Gallery of Ontario Youth Council & Dan Bergeron, 2008.

ShiftChange's "Gender Super Nova" spreads out along the long wall to the left. The group, gathered together by Syrus Ware, Art Gallery of Ontario Education, explored with visiting artist Dan Bergeron the vagaries experienced in the putting on and taking off of gender as/in a continuum. The life-sized paper photo-based black and white images depict a young person dressed as male transiting through clothing changes to female. The work is both playful and confrontational. The intent is to invite a curious viewing. While an image of someone donning two different costumes does

not necessarily encourage a complex understanding of gender fluidity, it does, through the use of scale and multiples, open up the potential for performative viewing. It allows viewers, just as does voguing, opportunities for imagining new possibilities. The life-sized photo-based installation becomes the ground wherein the viewers can and did insert themselves.

Fig. 3: "Everything is OK Now" is ready for action. The personal (disabled or transgendered) and political (issues of safety and inclusivity) merge in this work.

Frances Mahon's portable do-it-yourself (DIY) fabric-constructed-gender-neutral-accessible washroom-as-sculpture titled "Everything is OK Now" is bundled and ready for action. Patterns are pinned to the wall and can be provided on request. She has moved her DIY potty onto college and university campuses lacking such facilities, as protest. The bundled nature of the sculpture makes the washroom form difficult to read. But just as this might be seen as problematic, so too is a "normative" view which does not take into account the issues of transgendered and disabled safety and access. Providing such facilities is sometimes seen as an unnecessary expense for so few and yet how many have used these facilities or taken their children into "disabled" washrooms? But now, suggests Mahon, knowing how useful such a facility is, you can make and tote your own!

Fig. 4: Blurred and shifting black and white images in Alexandra Hazisavvas' split-screened video installation reference the confluence of gender, race and ethnicity.

Alexandra Hazisavvas' split-screened video projection simultaneously shows, in close-up, a woman swallowing and regurgitating a string of black pearls and a young tutu-clothed woman, alternately blacked and whited out, compressing herself through a pinhole. The juxtaposition of the two video images was critical for the explication of complex meaning. Alexandra had made many non-linear video "stories" and over a period of weeks we looked together at how different juxtapositions and contexts might provide different readings. We felt that this final work would best speak to an internalized mixed-race young woman's struggle. For many viewers, this video installation proved to be one of the most theoretically complex and emotionally compelling pieces.

Fig. 5: In XBASE, Alexandra Hazisavvas' video of the "original sin" of gender construction.

This tension was played out even more dramatically in Alex's video installation in XBASE, XPACE's basement gallery. A video, shown on a monitor placed on an apple-covered plinth, depicts an ambiguously gendered figure who stands in a shower eating an apple. The water turns blood red as it pours over the naked hair-streaked body. The apples, placed on the plinth top in front of the monitor, thematically repeat in "flesh" this painful "eating." As a viewer, I felt drawn to bite into an apple; to enter the work another way. Others drew different, but viscerally similar, interpretive connections to their own "embodied" conflicts.
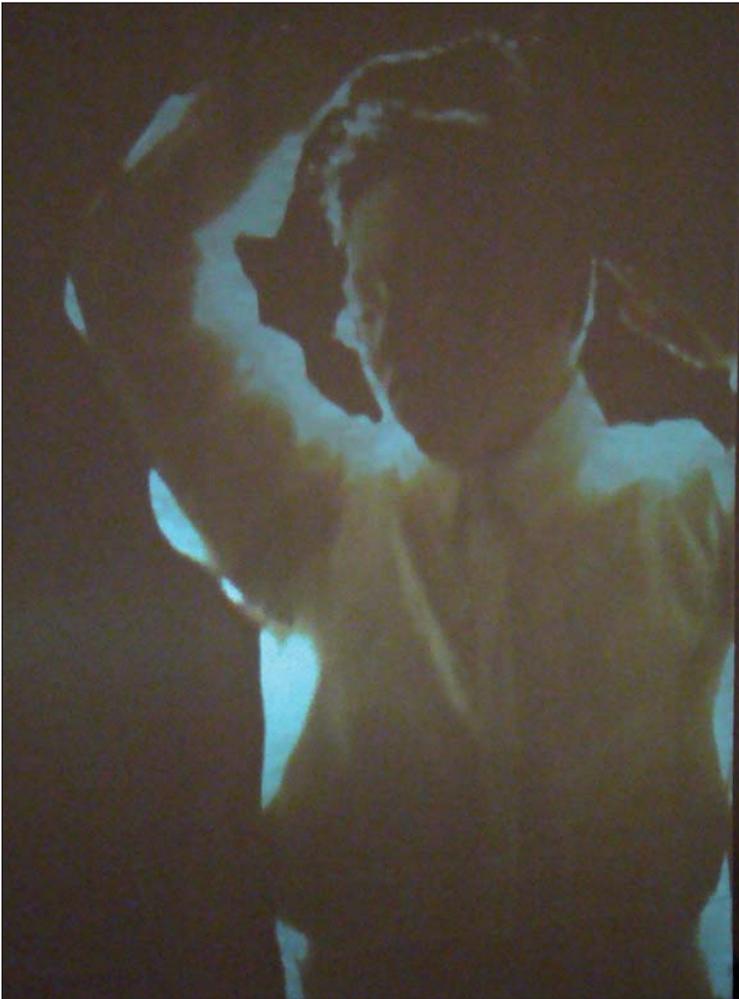
Fig. 6: Jo SiMalaya Alcampo self-projected as fe/male Elvis impersonator—a "cultural" shift.

Jo SiMalaya Alcampo, self-projected in video onto a translucent fabric surface hanging in the gallery, is dressed in her father's barong, a man's traditional Filipino shirt. She alternately plays with male posturing by crossing her arms in a defiant pose, and with Elvis impersonation as she slicks back her hair with a small black comb. These two images alternate with, and fold into, each other. They operate as indistinct forms, barely visible. Jo had spoken to the group earlier about her ideas around the visibility and strictures of gender, how it is so labeled and delineated in the west, where transgressions from traditional binary expectations can be treated with severity. In The Philippines, just as Jo's images float and shift, barely visible in the gallery, so does gender glide beneath society's regulatory radar. It is understood as more fluid, and hence invites, rather than restricts, play.

Both Loree Erickson and Spy Dénommé-Welch introduce further gender complexity in their autobiographical films: Loree as a self-declared femmegimp porn star, and Spy as two-spirited or transgendered aboriginal. Advertised as an evening presentation, discussion, and reception, five videos (two of Loree's and three of Spy's) are screened. Loree's videos "Sexxy" and "Want" play with gender, disability, and sexuality. Images and story invite us to share in the intimacies of a personal care team, the pleasure of a sexual encounter, and the sexiness of wheelchairs, as well as how Loree negotiates a harsh, uncomprehending and unaccommodating world. The work is both sensitive and provocative.

Fig. 7: Self-declared femmegimp porn star, Loree Erickson wants it all and finds it in life, love and the "sexiness" of wheelchairs.

Spy's "The Making of a Hybrid Male" is a humorous and poignant coming-out story of a young Trans "man." Spy, his life companion Catherine, and their two dogs drive from a large urban centre through a changing landscape to the north. Over the journey, conversations with Catherine and emerging fantasies and inner dialogue anticipate the impending meeting with Spy's elders. The video speaks to transiting cultures, spaces, and bodies. His two animated video shorts, "Naming/Claiming: A Brief Journey through Memory Space" and "Contact/Border: A Brief Lesson in History," expose the erasure of aboriginal people, land, and culture: forests and people are scribbled into oblivion, a city landscape erupts and despoils the forest, lights blanket and mark, as disease, the earth. In showing the animated works juxtaposed with "Hybrid Male," Spy generates new questions at the confluence of gender, culture, and history.

While many of Spy's and Loree's videos operated, as did much of the work in the exhibition, as more evocative than narrative, both "The Making of a Hybrid Male" and "Want" are told in story form and provided easier access for the audience to the artists' challenges, needs, and desires. Shown at the opening of the exhibit, they served to initiate discussion and provided a useful context with which the audience could make critical connections for entering other works.

Fig. 8: Claudia Wittmann "performs," à la Grotowski, her own gender research in "conversation" with Jo SiMalay Alcampo's work.

Performance artist Claudia Wittmann, after improvising alone each night during the exhibition week with all the works in the gallery, presents a performance on the final Sunday in response to Jo Alcampo's video installation. Claudia questions whether one can actually get to a place physically and psychically beyond or before gender. Trained in the sciences as a researcher, and in performance as a Butoh performer and Grotowski actor, she brings an honesty and intensity—in gesture and emotion—to her performance.

This presentation was followed, as has been much of our work together and with our audiences, with a discussion.

The Discussions: Learning as Pedagogy

Fig. 9: Following the screening of the videos at the "gender/TROUBLING" opening was our first public discussion (author/curator is in the wheelchair at left).

The public response was overwhelming and positive. The space created by the exhibition accommodated and welcomed the programmed receptions, screenings, and discussions and encouraged informal meetings, talks, and visits by school groups. Our audience was eclectic and included: Ontario College of Art and Design University students and faculty, members of downtown Toronto art, social, and academic communities, teens from the Art Gallery of Ontario Youth Council and Toronto School of Art, students from alternative secondary schools, and family and friends. In each performative moment reflection was a crucial complement. Discussion was key. One school group, from a Toronto alternative school, came to see the show responding to one student's urgent need to challenge our use of derogatory works in the exhibition advertising. Serena, Jo and I met with the group and the discussion centered on words, the power of words, how we can reclaim words and re-perform them in new contexts to empower ourselves. We agreed that such words act as performative "utterances" … wherein the power of the theatrical makes the imaginative "flesh" (Schechner, 2006, p. 124).

The discussions both within the group and with the public were significant not only for their content and process (i.e., instrumental in contextualizing the work, in building collective understandings and empathy, and in generating and receiving public reaction and response), but also by how they were defined. It was refreshing for many to be able to talk in a space so characterized by diversity, inclusion, and gender complexity.

Most of the discussions were videotaped or informally recorded in journal writings, emails, blog and Facebook posts by me, project participants and by those who attended the public sessions. Further dissemination, discussion and reframing of this "data" still continue through various sites and projects both private and public.

Our stories were what initially engaged us. The intent eventually became to find a way to interconnect these and use them to "draw" visual maps representative of the complexity of our lives. A curious questioning framed our project sessions and this, as learning practice, became transposed onto the public talks. The project discussions provided a fertile ground for developing content, form, and inspiration, and the public talks for further questioning, critique, and idea expansion. Claudia's performance gave physical form to the nature of these exchanges.

Fig. 10: A Friday afternoon public discussion with Alexandra Hazisavvas (centre). To Alex's left is Catherine Magowan from "An Ind(i)en Rights Reserve," a multi-arts production company.

Discussion issues raised were varied. For example, Loree spoke about how her films tended to be screened in either disability festivals or queer festivals. In the former, the explicit sexual scenes were seen as problematic, and in the latter, disability became invisible. Neither venue was especially comfortable with the presentation of a complex gender fluidity.

Perhaps one might assume that the content of this exhibition and its surrounding events and discussions were overly reliant on the odd, the exotic, or impaired, but in fact this was not the case. The exhibit created an atmosphere of heady inclusivity. It invited all—hetero, white, brown, bi, male, able-bodied and disabled—to shift paradigms.

This shift suggests a viewing different from one so defined and constrained by the "normal" Western binary. Viewers were asked to accept a more complex and diverse understanding of gender for individuals and communities. Inclusion then is not predicated on making room for the different or marginalized, but rather on rethinking a society in which environment, personal attitudes and perceptions, and

institutional organization are flexible and welcoming. We become raced, gendered and disabled not because of individual difference, but rather a result of social construction and designation.

This paradigm shift was for me and many participants the key learning in this work. In letting go of categories and definition—the tyranny of labeling—I felt myself enter into a queasy unfamiliar space. The experience was much like being in a foreign country where one does not speak the language. Julia Kristeva (1991) writes in "Strangers to Ourselves," "Being alienated from myself, as painful as that may be, provides me with that exquisite distance within which perverse pleasure begins, as well as the possibility of my imagining and thinking, the impetus of my culture" (pp. 13–14).

Audience learning varied. One might expect that not many would be willing to give up the conventions of normalcy, especially if they had been serving them well. But as a former student of mine asked on preparing an exhibit and talk, "The Violence of Gender Norms," "Does labeling, in the long run, really do anyone any good?" The younger crowd, especially the art students, was generally very open, willing to be playful and curious. While the impact was not as so profound for all, we were told we created a safe, enjoyable, challenging, and inclusive space in the gallery.

Fig. 11: A public discussion on the final day with the project group. Some participants are perplexed while others experience a heady joy. (Jo SiMalaya Alcampo is seated on the left).

Good learning invites many interpretations. It is open and evolving. When we return day after day to our learning, we receive differing interpretations and understandings of what we do and what we know over time. These shifts keep us moving, ever active, ever questioning. This invites a way of being in learning which is open to ambiguity and to change.

This perception provided the rationale for inviting *gender/TROUBLING* participants and viewers to live in the uncomfortable place of unpredictability. It reminded us of the fact that often there is no one answer. It encouraged us to risk shaping various forms. The for"ums" became pauses, breaths, changes—forms to observe, moments to hear, opportunities to reflect—which allowed us to generate various texts to mark and give meaning to our progress.

In making art of our bodies, we intentionally placed our bodies in the world. In doing so, we energized a site between meaning and creation, audience and artist. Using body-as-template, we created complex images of gender, race, and disability in public space and in so doing affirmed the importance of such images, practices and ideas in rendering the suppressed visible. We were heartened to see, as does feminist cultural theorist, Janet Wolff (2003), that some leakage into the culture in general from occasions such as these were possible.

Closing

gender/TROUBLING has spawned further projects which I have shared in as viewer and/or as sounding board. Project artists Claudia Wittmann and Jo SiMalaya Alcampo continue to work with these ideas: Claudia performs, facilitates workshops, and presents on gender construction, and Jo empowers herself and others using story to elucidate her cultural heritage and ongoing formation in her new media installations. In closing, I share a recent writing sent to me by Jo as she prepared to mount a new exhibition:

> This past year I visited the Philippines to conduct research and visit my family. Some of the best times were when we would gather at the same dining table, my father and his siblings had gathered around as children and I would listen to our family stories unfold. My Ninang (Godmother) said that she could hear the voices of her mother and father at those times because those who have passed on are present when we include them in the telling.

I believe that we can inherit the emotions of these stories across genera-
tions. While these reconnections across time bring me the joy of a deeper
understanding of the story of my family and homeland, they also bring an
unresolved sadness and a longing to make meaning from traumatic history.
(Alcampo, personal communication, May 6, 2010)

Perhaps we can engage with different stories, playing and learning collec-
tively, drawing connections across generations and cultures. Lita Fontaine (2009), an
aboriginal feminist artist and activist from Winnipeg, spoke in conversation to this
process. She suggested that we should not force parallels but use them, build bridges
rather than define further separation. Do we need to reeducate each other in entirely
new vocabularies and problems? Let us work collectively in the spaces between and
activate our different contexts, narratives, and relationships to comprehend and illu-
minate. Let us employ multiple strategies to analyze how our stories operate to reveal
conscious experiences and reflect social landscapes, and use them creatively in our
art. While these analyses exist in relationship, sometimes in tension with one another,
taken collectively, they suggest different ways of thinking of, and being with, our
complex, ever-learning, selves.

Notes

1. I had the opportunity to train with Odin Theatre Director Eugenio Barba when
    was he was in Toronto in the early 1980s. We continued to correspond for years
    after, discussing direction and drama theory. His books such as "The Floating
    Islands" (1986, New York: PAJ) also record his training theory, and performances.
    This comment is excerpted from my notes on my training with him.

2. Photography credits: Figures 1-6, 8-11: John Oughton with thanks to the artists
    and XPACE Cultural Centre. Figure 7: Provided by, and thanks to, Loree Erickson.

References

Butler, J. (1988). Performative acts and gender constitution: An essay in phenomenology and feminist theory, *Theatre Journal, 40*(4), 519–531.

Fontaine, L. (2009). Adapted from a conversation we had at Plug In Institute for Contemporary Art Residency, Summer 2009.

Garoian, C. (1999). *Performing pedagogy: Toward an art of politics*. Albany: State University of New York.

Gray, R, Sinding, C., Ivonoffski, V., Fitch, M., Hampson, A., & Greenberg, M. (2000). The use of research-based theatre in a project related to metastatic breast cancer. *Health Expectations*, 3, 137–144.

Kristeva, J. (1991). Toccata and fugue for the foreigner. In J. Kristeva, *Strangers to ourselves* (pp. 1–40). New York: Columbia University Press.

Kuppers, P. (2003). *Disability and contemporary performance: Bodies on edge*. New York: Routledge.

Kuppers, P. (2007). *The Scar of visibility: Medical performances and contemporary art*. Minneapolis: University of Minnesota Press.

Lugones, M. (1990). Playfulness, "world" - travelling, and loving perception. In Gloria Anzaldua (ed.) *Making face, making soul: Hacienda caras* (pp. 390–402). San Francisco: Ann Lute Books.

Paget, M. (1990). Performing the text. *Journal of Contemporary Ethnography, 19*(1), 136–155.

Patterson, P. (2006). *Pause and play: Is this the "um" in Curriculum? A performance artist acts out in the academy* (keynote), Collisions 2006, University of Victoria.

Personal Narratives Group (1989). (Ed.). *Interpreting women's lives: Feminist theory and personal narratives*. Bloomington: Indiana University.

Piper, A. (1996). *Out of order, Out of sight. Volume 1: Selected writings in meta-art, 1968-1992*. Cambridge, MA: MIT Press.

Schechner, R. (2006). *Performance studies: An introduction 2nd edition*. New York: Routledge.

Szent-Gyorgyi, A. (date unknown). FamousQuotes.com. Retrieved May 2, 2011, from http://www.famousquotes.com/author/albert-szent-gyorgyi/

Wolff, H. (2007). (Trans. Nicholas Grindell). The Tears of photography, *Grey Room, 29 Fall*, 66–89, Massachusetts Institute of Technology.

Wolff, J. (2003). Reinstating corporeality: Feminism and body politics. In A. Jones (Ed.), *The Feminism and Culture Reader* (pp. 414–425). London: Routledge.

Pam Patterson's (PhD) research, performance and teaching have focused on disability and gender, performativity, and trans-praxis as process. She is an Associate Scholar and Director for the interdisciplinary arts program *WIA projects* for the CWSE, OISE/UT, and teaches at the Ontario College of Art and Design University. As a performance and visual artist she was a founding member of FADO Performance and ARTIFACTS and has exhibited and performed internationally.

LINK TO:

www.wiaprojects.com

http://pampatterson-performanceartist.blogspot.com/

Image-Based Educational Research: Childlike Perspectives

Jon Prosser & Catherine Burke

ABSTRACT

A new approach to researching childhood experience has become established whereby researchers are seeking out ways of giving voice to children and young people by "close listening" and engaging them in the research process. In this way, researchers can choose to adopt a childlike perspective, to recognize and pay due attention to children's multiple ways of "seeing" childhood in particular and the world in general. Visual research is well placed to access, interpret, and give voice to children's worlds. This is achieved by adopting child-sensitive research methods and by recognizing that children's experience and agency are important and worthy of study.

This chapter empathizes with children's visual culture in two ways. The first is a matter of empowerment: Words are the domain of adult researchers and therefore can be disempowering to the young. Images and their mode of production, on the other hand, are central to children's culture from a very early age and are therefore empowering. Put simply, children often feel more confident in creating drawings, photographs, and videos than words. Second, children's visual culture is central to any study of childhood. Children's everyday creative enthusiasms and aesthetic capacity for visualizing, space sharing, mobile technology, doodling, graffiti, sketching, dreaming, blogging, video, and photography are all expressions and representations of childhood. They are pivotal to understanding children's meaning making in their taken-for-granted lives. Striving to engage in children's lives by combining participatory research with children's visual culture is a worthy endeavor.

Methodological Background

Observation of children has always played a pivotal role in researchers' endeavors to understand their physical, cognitive, and social worlds. Sociologists at the turn of the 20th century used photographs to record and document observations of children's working and living conditions (e.g., Hine 1932; Riis, 1971). This body of work can now be viewed as lacking academic rigor and integrity. It was regarded by some as merely using images for political ends and therefore "muck-raking" (Stasz, 1979, p. 134). However, the status of image-based research across the disciplines was significantly enhanced following the publication of Bateson and Mead's (1942) anthropological study *Balinese Character*. They made more than 25,000 photographs of Balinese culture, some of which critically documented children's lives, and organized them under emergent categories, such as "parents and children," "siblings," "stages of children's development" and "rites of passage." The next significant phase of development followed the publication of Collier's classic 1967 methodological text *Visual Anthropology: Photography as a Research Method* (updated and revised 1986) and Wagner's sociologically orientated Images of Information (1979). Currently, a gamut of texts, for example, Prosser (1998), Banks (2001), Rose (2001), Van Leeuwen and Jewitt (2001), and Pink (2004) provide insightful, varied, and rigorous discussion of contemporary visual methods, which can legitimately be applied to working with children. Child-focused researchers have adopted, adapted, and further developed these approaches for their own needs in child-centric visual studies, such as *Seeing Kid's Worlds* (Wagner, 1999), *Seeing Beyond Violence: Children as Researchers* (Egg, Schratz-Hadwich, Trubwasser, & Walker, 2004), and *The School I'd Like* (Burke & Grosvenor, 2003).

In the past, adults and children were seen as passive objects of research. Researchers' thinking has changed to encompass the general view that the subject of study has "the right as well as the ability to enter into discourse about the construction of their lives" (Banks, 2001, p. 9). Coupled with these philosophical changes are shifts in theory within the discipline of sociology of childhood. The long-held position that children should be viewed as being in a stage of transition to adulthood and therefore lacking worthwhile cognitive skills is no longer tenable. The current view is that children are active participants in their own social worlds and, given the means, are able to articulate and construct their own unique perspectives. This democratic and empowering model, which is personified as research "on, for and with" (Cameron, Frazer, Harvey, Rampton, & Richardson, 1992, p. 22), recognizes children as dynamic members of the community with their own agendas. Hence, methodological

advances in themselves are insufficient to understand children's increasingly complex lives. There is a requirement that researchers embrace an "on, for, and with children" mentality.

For social scientists an image-based approach is a pivotal element in understanding children's visual culture—its production, consumption, and meaning. Visual researchers have evolved methods and techniques that are collaborative, participatory, and insightful. Particular advances have been made, even involving very young children, in design-based visualization and planning. In sum, image-based research methods offer a powerful tool for realizing children's ways of seeing the designed present and imagining the designed future, capturing the visual culture of schools and other formal or informal edu-care environments in which children are placed, communicating to a wider audience the creative capacities of children in informing from their own experience, and shifting dominant paradigms of practice from research *with* children toward research *by* and *for* children.

Visual Methods

Accessing children's visual culture inevitably means understanding their perspectives. Children develop visual skills early in life, and visual methods draw on this strength. Children from as young as 2 years of age can explore feelings about their worlds, assisted by an adult photo-ethnographer. Older children can make their own photo-essays designed to explore and communicate their own experiences of, for example, the built school environment. Photo-collage techniques can be conducive to evaluative participation among those for whom lack of language or literacy is an impediment to communication. Children's views can be sought via diaries, drawings, modeling, and still and video camera work. The Internet can allow children to communicate visually about their lives from all continents, creating new visualizations and challenging assumptions by means of the photo-voice. All these possibilities have been achieved in practice by projects designed to recognize the implications of new ways of seeing children and childhood as a consequence of legal, theoretical, and social changes in the decades following the United Nations Convention on the Rights of the Child in 1990.

Jon Prosser & Catherine Burke

Photo-Elicitation With Children

A common data gathering technique is *photo-elicitation*. Here photographs (or film, video, drawings, or objects) are introduced as part of an interview. The aim is to explore the significance or meaning of the images or objects with the respondent. The images can be created by the researcher specifically for the purposes of photo-elicitation; they can be drawn from archives, magazines, or newspapers; or they can belong to the interviewee. Photo-elicitation has been used by visual anthropologists since the 1950s and is extensively used by a wide range of contemporary visual researchers (see Harper, 2002, for examples). However, it has no agreed protocol, and few studies have been undertaken to establish its validity as a research method. Nonetheless, the feeling is that "if it works, use it," and it is a technique that if used appropriately with children is capable of producing insightful data.

Researchers choose to use images or objects during initial discussions with young people because they are useful "icebreakers" and help to break down the power differential. Of course building bridges is important since potentially it leads to cooperation and engagement, but using visuals merely as a quick "way in" is to underplay the potential of the technique. Stand in a playground and point to objects or places, and bold children, generous with their time and knowledge, enthusiastically shower you with their insights—pleased you are taking an interest in what they do. Moreover, they are visually astute and enjoy talking about images they or others have constructed, and photo-elicitation builds on this enthusiasm.

Photo-elicitation protocol in its simplest and most common form entails inserting a photograph into a research interview with the aim of drawing out the viewer's response. Interviewing children is a key method for data gathering, and interviewing with images or objects aids this approach in a number of ways. Banks (2001), for example, points to photographs acting as a neutral third party facilitating a more relaxed atmosphere for interviewing since eye-to-eye contact need not be maintained. This role for imagery is particularly worthwhile where children are interviewees and adults the interviewers since there are inescapable differences in status and power. The potential tension generated by face-to-face contact is lessened by mutual gazing at a photograph or the act of exploring an object together.

Children's willingness to pass comment on images depends on the image's content, their relationship to the content, and the context of viewing. It makes sense to young people and they feel more comfortable in sharing their insights if they are

depicted since the image acts as an aide-mémoire, and they can more readily appreciate the researcher's need to gain their insights since they are visibly central actors. The timing, territory, membership, and nature of a photo-interview session are also important if children are to feel sufficiently confident and comfortable to pass on their ideas and beliefs.

Accessing a child's perceptions through image-elicitation may work by taking an indirect route. For example, rather than exploring a child's feelings about family relationships by looking through their family album, there is potential in using comics, magazines, or paintings depicting family relationships as a starting point, thereby allowing the child to dictate the pace and direction the interview takes. Children may feel less pressured if they don't speak directly to a researcher about a sensitive topic and may prefer working through a toy or doll. This approach, commonly used to build rapport or for diagnostic reasons, is a "projective technique" and requires careful, sometimes specialist handling (see Wakefield & Underwager, 1998).

Video-elicitation was not popular in the past because it required cumbersome and nonportable equipment. Photo-elicitation was more popular since photographs are easily picked up, dropped, and rearranged in another sequence. However, portable DVD players are now the norm and widely accepted as part of a visual researcher's toolkit. This makes viewing of moving imagery more practical for empirical work, and one would expect to see an increase in the use of video-elicitation. There are many different but valid ways of conducting visual-elicitation. Whatever approach is taken, the media and topic should be part of children's everyday culture.

Giving Children Still Cameras

During the late 1960s experimental participatory visual studies were carried out by Worth and Adair (1972). They provided inner city teenagers, students, and representatives of the Navajo with movie cameras and film in an attempt to circumnavigate the problems caused by "outsiders" determining the form, content, and cultural context of filmmaking. In short, Worth and Adair attempted to shift away from the orthodox researcher-researched relationship by getting participants to act as the critical agents of data collection and interpretation. This approach was taken up by still photographers in the 1980s who emphasized the empowerment aspect of giving cameras to children. Jim Hubbard,[1] a professional photographer, gave cameras to homeless children, children at risk, and American Indian children through a project

called "Shooting Back." Ewald (2001), a photographer/educator[2] working around the same time, gave children cameras to aid self-expression and language development. In the 1990s numerous studies adapted Worth and Adair's (1972) approach and provided children and young adults with movie cameras or a combination of movie and still cameras (see Rollins, 1995).

Giving cameras to children and inviting them to photograph aspects of their lives gives children the freedom to create their own agenda in two ways: If the images are used later for photo-elicitation, it is their priorities that are the focus, and as narrative and a vehicle for personal expression (as, for example, in Caroline Wang's, n.d., work). The research community generally underestimates children's media abilities. Children of the 21st century are familiar and adept with the technology of image production to such an extent that they are capable of being significant image makers themselves.

Sharples, Davison, Thomas, and Rudman (2003), in their systematic study of children as photographers, aged 7, 11, and 15 from five European countries, provide an insight into children's photographic interests and capacities. The study found that children across the age groups showed an increasing ability to distinguish the properties of images from the world they represent. This suggests that children should not necessarily be viewed as apprentice adult photographers since they exhibit their own distinctive intentions and products. Since children display critical capacities through their photography and are able to access physical and mental territory not available to adults, there is a case for perceiving them as fellow researchers. Given a particular focus and scenario, children will, driven by their innate imagination, create a "picture-led" narrative of their world (see, for example, Burke, 2005). At the center of giving children cameras is the idea of passing control to them—what Dell Clark (1999) calls "auto-driving."

There is a danger that the process of instructing children in what is required of them will perpetuate the unequal power relationship. Researchers will always have to make judgments about the need to "guide" students and take account of the intentionality of researchers and informants. A common strategy, based on the assumption that children and young people are experts in their own lives, is to invite them to photograph their own special or everyday environments. The Mosaic Approach (Clark & Moss, 2001) adopts standard research methods like observation but in addition suggests providing 2-to 4-year-old children with single-use cameras to photograph what was important to them in their nursery setting. The researcher is taken on a "tour" of the setting by children who also provide a running commentary on their regular

activities. The children were responsible for deciding what and how to record, either by photograph, drawings, or tape recorder. Clark and Moss (2001) make an important point arguing that cameras offer young children the opportunity to produce a fin-ished product in which they can take pride and that they know is valued. Children who have seen the members of their family take photographs, pored over family albums, or looked at photographs in books and comics know that photographs have a value in the "adult world." This is not always the case with children's own drawings and paintings.

Another approach is to ask older children to work collaboratively (child-to-child) to record the lives of younger children. So, for example, a 4-year-old would be asked to use a camera to record the everyday events of an 8-month-old in "the baby room." The photographs produced by the children are later used as discussion points with the older children, the staff in the setting, and the younger children's parents. As this approach shows, age is rarely a barrier to giving young people single-use cam-eras in research settings, although underestimating their capacities is.

Giving Children Digital Video Cameras

Word-based research tends to reproduce hierarchies exacerbating differ-ences between researchers and the researched. Image-making technologies have the potential to reduce the distance between researchers and children, producing a more democratic model. Providing children with digital video cameras, often called "partic-ipative video," offers transformative potential when the practice of "looking at" becomes "looking alongside." Nonetheless, sensitive and reflexive negotiation of research relationships is critical if hierarchical power relations are not to be repro-duced through researcher-dominated procedures leading to subjugated children's imagery. The balance between the responsibilities, needs, and intentions of researchers and informants is difficult to achieve but needs to be transparent to all parties. Where video technology remains physically and metaphorically in the hands of the researchers and is used to capture, document, or note-take a scene, it remains an extension of adult gaze and should be understood as such.

A central aim of the participatory video process is to create a video narrative that conveys what children want to communicate in the manner they wish to com-municate. Of course pragmatic decisions about what should be framed and how the sequences are to be organized to tell a story bring into question the negotiation

roles. Critical reflection on two elements is fundamental to producing trustworthy outcomes. First, participatory video demands attention to the exercise of power within sets of dynamic research relationships reflected in both researcher-children and children-children groupings. Second, children are looking and sense-making before they can walk or talk and quickly adapt to contemporary pervasive visual culture, and adults should accept that children have substantial filmmaking potential.

Young people are often familiar with the technology of image production and capable of becoming image makers themselves following basic instruction. They may mimic adult filming methods even to the extent of adopting a preplanned storyboard approach. However, they are merely embracing generic visual culture, and this should not be a signal for heavy-handed researcher involvement with the express aim of creating an adult notion of a "good," that is, technically proficient film reflecting adult intellectual concerns. Where practicable, children's own unique filmic visual subculture should prevail over researchers' conventions, which are traditionally aligned with documentary film or scientific observation.

A wide range of children-centered topics and research questions are predisposed to the participatory video process. It may be that young people's social class, culture, and situation influence what they want to film (Rich & Chalfen, 1999). Nonetheless, focusing on their everyday lived experience takes advantage of the time-based properties of film. Quite specific contexts are useful as a starting point. Children's homes or social lives, for example, provide situations where they are confident in their own knowledge and that act as a "springboard" for filming. Moreover, key insights could be gained when children and young people film the changing nexus of activities and spheres of influence as they undergo significant transitions in their lives, for example, an illness they are experiencing, leaving school and going to work, or as a means of creating a record of their own physical and emotional space.

Concept Mapping

One important approach to identifying and visually representing children's perspectives on a range of complex topics is through concept mapping. This is defined by Novak and Gowin (1984) as "a visual road map showing some of the pathways we may take to connect meanings of concepts in propositions" (p. 15). It is most commonly used for tracking the development of children's learning, as a diagnostic tool for evaluating their progress, and as an aide to help children learn how to learn

(Georghiades, 2000). These approaches are premised on a constructivist notion of learning and on the idea that learners frame their understanding of new knowledge on preexisting beliefs. However, importantly, concept mapping can be used as a tool to articulate children's perceptions, promote reflection, and generate and communicate complex ideas on a range of topics. An example of a child-created concept map in which the starting point is "food" and the subconcepts need to be related to one another is given in Figure 1.

A search of the Internet for "concept mapping" will uncover a plethora of commercially available word-graphic tools. A simple version of a concept map, sometimes referred to as a "mind map," consists of a central word or concept around which about 5 to 10 main ideas are drawn, and then an additional 5 to 10 ideas are drawn that relate to each of those main ideas (Buzan, 1995). Whereas mind maps have only one main concept represented like a (family) tree, concept mapping may require a network of representation. Concept maps may take various forms. Novak and Gowin (1984) propose a hierarchical form in which key concepts are placed at the top and lesser concepts positioned lower down on a page. Others prefer a "spider" map in which the trigger word or pivotal concept is placed centrally (see Figure 1) and participants are asked to provide additional linked concepts.

Fig. 1: An example of a concept map from Georghiades and Parla-Petrou (2001)

SOURCE: From Georghiacles, P., & Parla-Petrou, E. (2001). *Diverse use of concept mapping across two domains: The cases of primary food and science education*. Presented at the British Educational Research Association Annual Conferences, University of Leeds, 13–15, September. Used with permission of Petros Georghiades.

Since children will be unfamiliar with concept mapping; important terms like *concept*, *mapping*, and *linking words* will need explanation, discussion, and activities. A useful approach may be to involve a group of children in a joint construction of a concept map and to provide examples of concept maps of unrelated themes.

Draw and Write

Many of the above methods use visuals as a stimulus for communication. Images that have meaning for children may be used within orthodox research methods such as questionnaires to identify and differentiate between levels of response. Figure 2, for example, illustrates how Snoopy, a widely known cartoon character, is depicted in various poses and children are asked to circle the pose that corresponds to their feelings. However, the "draw and write" approach is based on the notion that "starting where the children are," that is, children's *own* drawings and words, is of fundamental significance.

Children have the ability to capture feelings and emotions through drawings and paintings while lacking an equally expressive written or spoken language. This opens up a range of active participation in research to disadvantaged children. Special educational needs (SEN) children have been habitually and systematically excluded from discussions about their education. The underlying assumption has been that they are neither well informed nor sufficiently articulate to contribute. To be a child and disabled is to be doubly disadvantaged in terms of voice.

1. How do you feel when your teacher reads a story aloud?

2. How do you feel when someone gives you a book for a present?

Fig. 2: Snoopy questionnaire

SOURCE: From Hopkins, D, (1985), *A Teacher's Guide to Classroom Research 3/e*, published by Open University Press, Milton Keynes, UK, Reproduced with the kind permission of the Open University Press Publishing Company.

There are many visual methods and techniques that help SEN children to learn and that can be used to understand their experiences of the world. The "draw and write" method was used to help Jane, a young girl with a fire phobia who was experiencing recurrent nightmares with a fire theme. She was autistic and aphasic with learning difficulties, experienced problems relating to others, and was unable to speak or write expressively. Jane was asked to draw her nightmare (Figure 3), and a more able peer, her only friend, helped her to write a prayer to accompany the image. It became apparent from the drawing and words and later interviews that Jane had seen TV footage of the New York 9/11 disaster. She was deeply disturbed by the experience, particularly by the sight of people leaping from the World Trade Center building to avoid the fire. Later, counseling based on the visual data enabled Jane to escape the nightly replay of the film loop in her mind that caused the nightmares to recur.
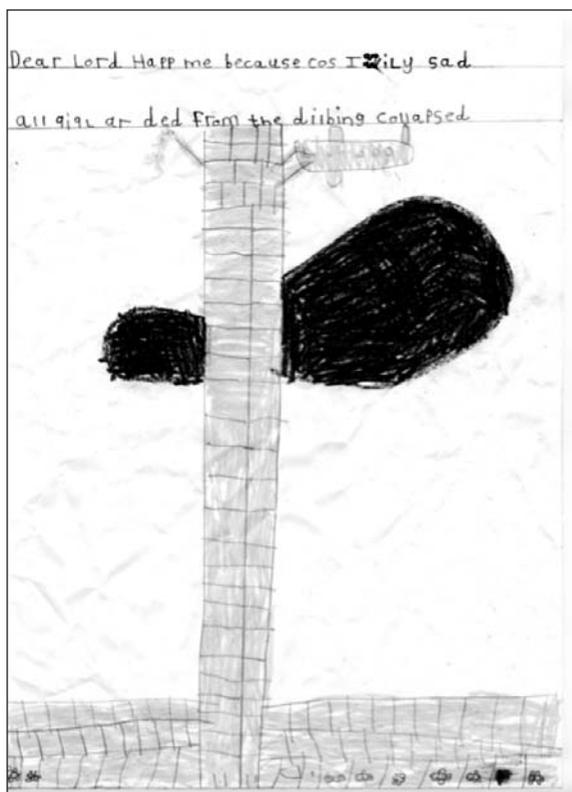

Fig. 3: Drawing and words by Jane (name changed) with help from a friend

Interpreting children's drawings is particularly difficult but rewarding. Diem-Wille (2001), adopting a psychoanalytical perspective, argues that drawings show a child's emotional state better than verbal descriptions since they are "expressions of the unconscious emotional aspects of a person" (p. 119). Adopting the view that children's drawings are expressions of their "inner world," Figure 3 gains significance suggesting that in addition to distinguishing likes and dislikes, it represents Jane in terms of an emotional map.

Visual Research as a Vehicle for Change

Cameras can be employed in imaginative ways to enable children and young people to confront difficult aspects of their lives. "Seeing Beyond Violence: Children as Researchers" (Egg, Schratz-Hadwich, Trubwasser, & Walker, 2004) is a research project that foregrounds children and young people's photography. Children's understanding of violence in Colombia, Thailand, India, and Nicaragua was explored through a methodological device that required that they use digital cameras to photograph the opposite of violence. Adult researchers were in the background and acted as "assistants" to the children. This repositioning of the adult in the research field is an important shift if children are to wear the mantle of researcher. A combination of "digital ethnography" with symbolic interactionism was intended to give children more than a voice but also provide the opportunity to build visual evidence of their social reality. Here the images are the priority; they are not merely present as a tool to elicit language or to illustrate a report.

Cameras are now becoming used quite commonly as part of a method to allow the very youngest children to express their views. Sometimes the adult researcher will take the photograph for the child from the child's own height; sometimes they will leave the camera with professionals to allow them to record activities. Polaroid cameras were used with the youngest children in a study on children's views on child-care quality, allowing instant conversations about the photographs to be recorded. The children took the researcher on a tour of their childcare setting and then took photographs of what they liked or disliked (Clark & Moss, 2001). The reports of such research rarely if ever present the photographs created by children or include these nontextual views of children in their summaries and conclusions. They appear to be tools to create engagement and participation while the language—what the child says—is all important.

International nongovernmental organizations such as UNICEF are employing visual means of empowering children. Drawing allows the youngest children to "speak." At the United Nations' Special Session on Children (May 8–10, 2002; http://www.unicef.orglspecialsession), the voices of nearly 34,000 children from more than 125 countries were heard through their paintings. In another project, more than 500 children and young people from 45 countries captured images of their lives on camera as part of "Imagine: Your Photos Will Open My Eyes," a joint youth photography project of the German Agency for Technical Cooperation (GTZ) and Philip Abresch, a journalist in Berlin. Such projects illustrate and realize the potential available through information and communication technology (ICT) as digital photo exhibitions and image-based online conversations can enable cross-cultural collaboration between and among young people. Save the Children's "Eye to Eye" project does just this. The project enables Palestinian children living in refugee camps in Lebanon to record their lives using cameras and video. The result is a vivid and accessible online resource for communities of children and their teachers throughout the world (http://www.savethechildren.org.uk/eyetoeye). Photovoice (Wang, n.d.) is an organization committed to the principle of enabling those traditionally not the subject of photography to be its creator and thus works with street children throughout the world, allowing them control over ways of seeing them. They have worked in Vietnam, Afghanistan, the Congo, Nepal, and the United Kingdom. A key intention of this initiative is to enable participants to become advocates for change.

The Dilemmas of Visual Ethics

Research with children is fraught with complex ethical issues. A visual dimension adds to the list of potential dilemmas and deserves more space than encapsulated within this brief review. The most common principles that underpin ethical codes of practice have been referred to as "mutual respect, non-coercion and non-manipulation, and support for democratic values and institutions" (House, 1993, p. 167). This is a useful starting point, but visual ethical principles are best discussed in concrete situations (Pink, 2004; Prosser, 2000; Simons & Usher, 2000).

Participatory research by its nature is ethical—potentially. Just as action research shifts power to practitioners, an ethical participative epistemology empowers the disempowered and suggests a shift in the power balance away from researchers toward respondents. The notion that research is solely concerned with finding out about the world and is essentially politically neutral is rejected by emancipatory

research. An aim of emancipatory and participatory research is to reduce discrimination, marginalization, and inequality and increase empowerment through social action, that is, the participation of children within a child-centered methodology.

Informed consent is central to good ethical practice. With all forms of longitudinal ethnographic and emergent studies with children, the notion of informed consent is problematic since direction and outcomes are variable. The notion of "provisional consent" may be appropriate in these circumstances. Here, the ongoing relationship between researcher and children is seen as evolving and dependent on reciprocal trust and collaboration. This enables ethical problems to be explored and resolved as they emerge within specific contexts and provides the possibility for children (and parents) to opt in or out at different phases.

Anonymity, unless participants choose to be identified and are fully aware of potential repercussions, is common practice in social science research. It is possible to blur or "cloak" children's faces in photographs using a relatively simple pixel reduction technique, thereby blurring their faces and protecting their identity. Where data are intended for reproduction and wider consumption, it is possible to restrict access to video data on CDs and Web sites using encryption. However, using visual images of young people or created by them makes issues of anonymity problematic. In America, for example, where restrictive research codes of practice operate, authors of artwork or those depicted in the artwork of others may be assured of anonymity, but in doing so they are denied the choice to be named and their work celebrated. This is questionable ethical practice.

There are times when children are happy for their work to be displayed publicly (and the researcher is keen to publicize their achievements) but wish to remain anonymous (for example the author of Figure 3). Equally, there are occasions when a researcher decides, against the author's wishes, not to name the creator because in the researcher's judgment, the author may be damaged or put in danger. These dilemmas are only the tip of the ethical "iceberg" and not easily resolved. Adult visual researchers with child visual researchers will need to make decisions and resolve ethical problems as they arise. This is not an avocation of ad hoc decision making since knowledge, planning, and awareness of potential problems prior to conducting visual research are central to ethical practice.

Conclusions

In this chapter, we explored the possibilities of image-based research with children. Childlike perspectives, we hope we have demonstrated, are worthwhile pursuing, necessary to include in ethical practice, and complex to attain. Images, art, and interpretation of the visual in the research approach can facilitate childlike perspectives and empower the child participant as researcher or as subject in research. Seeing the world through the eyes of a child means literally getting down to the eye level and realizing the difference that scale makes in a person's view of the world. Image-based research approaches, principles, and practices, illustrated in this chapter, can bring the adult closer to the view of the child in the research process. An ethical practice will not only realize the usual agreed conventions on consent and protection of rights but also be sensitive to the particular status and position of the child in its social and cultural context.

Notes

1. Jim Hubbard's work can be found at http://www.shootingback.org. He teaches photography to street youth and conducts workshops around the world through universities and government agencies.

2. Ewald works through Duke's Center for Documentary Studies, Durham, NC. Her Web site is http://globetrotter.berkley.edu/Ewald/

References

Banks, M. (2001). *Visual methods in social research*. London: Sage.

Bateson, G., & Mead, M. (1942). *Balinese character: A photographic analysis*. New York: New York Academy of Sciences.

Burke, C. (2005). "Play in focus": Children researching their own spaces and places for play. *Children, Youth, and Environments, 15*(1), 23–53.

Burke, C., & Grosvenor, 1. (2003). *The school I'd like*. London: RoutledgeFalmer.

Buzan, T. (1995). *The mind map book*. London: BBC Books.

Cameron, D., Frazer, E., Harvey, P., Rampton, M. B. H., & Richardson, K. (1992). *Researching language*. London: Routledge.

Clark, A., & Moss, P. (2001). *Listening to young children: The mosaic approach*. London: The National Children's Bureau & Joseph Rowntree Foundation.

Collier, J. (1986). *Visual anthropology: Photography as a research method* (Rev ed.). Albuquerque: University of New Mexico Press. (Original work published 1967)

Dell Clark, C. (1999). The autodriven interview: A photographic viewfinder into children's experience. *Visual Sociology*, 14, 39–50.

Diem-Wille, G. (2001). A therapeutic perspective: The use of drawings in child psycho-analysis and social science. In T. Van Leeuwen & C. Jewitt (Eds.), *Handbook of visual communication* (pp. 119–133). London: Sage.

Egg, P., Schratz-Hadwich, B., Trubwasser, G., & Walker, R. (2004). *Seeing beyond violence: Children as researchers*. Innsbruck, Austria: Herman Gmeiner Academy.

Ewald, W. (2001). *I wanna take me a picture: Teaching writing and photography to children*. Boston: Lynhurst Books and Beacon Press.

Georghiades, P. (2000). Beyond conceptual change learning in science education: Focusing on transfer, durability, and metacognition. *Educational Research, 42*(2), 119–139.

Harper, D. (2002). Talking about pictures: A case for photo-elicitation. *Visual Studies, 17*(1), 13–26.

Hine, L (1932). *Men at work*. New York: Macmillan.

House, E. R. (1993). *Professional evaluation: Social impact and political consequences*. London: Sage.

Novak, J. D., & Gowin, D. R. (1984). *Learning how to learn*. New York: Cambridge University Press.

Pink, S. (2004). *Doing visual ethnography*. London: Sage.

Prosser, J. (Ed.). (1998). *Image-based research: A sourcebook for qualitative researchers*. London: Falmer Press.

Prosser, J. (2000). The moral maze of visual ethics. In H. Simons & R. Usher (Eds.), *Situated ethics in educational research* (pp. 116–132). London: Routledge Falmer.

Rich, M., & Chalfen, R. (1999). Showing and telling: Children teaching physicians with visual narrative. *Visual Sociology*. 14, 51–71.

Riis, J. A. (1971). *How the other half lives*. New York: Dover.

Rollins, T. (1995). Kids of survival. In N. Paley (Ed.). *Finding art's place* (pp. 92–98). London: Routledge.

Rose, G. (2001). *Visual methodologies: An introduction to the interpretation of visual materials*. London: Sage.

Sharples, M., Davison, L., Thomas, G., & Rudman, P. D. (2003). Children as photographers: An analysis of children's graphic behaviour and intentions at three age levels. *Visual Communication, 2*(3), 303–330.

Simons, H., & Usher, R. (2000). *Situated ethics in educational research*. London: Routledge Falmer.

Stasz, C. (1979). The early history of visual sociology. In J. Wagner (Ed.), *Images of information: Still photography in the social sciences*. Beverly Hills, CA: Sage.

Van Leeuwen, T., & Jewitt, C. (Eds.). (2001). *Handbook of visual analysis*. London: Sage.

Wagner, J. (Ed.). (1979). *Images of information: Still photography in the social sciences*. Beverly Hills, CA: Sage.

Wagner, J. (Ed.). (1999). Seeing kid's worlds [Special issue]. *Visual Sociology*, 14.

Wakefield, H., & Underwager, R. (1998). The application of images in child abuse investigations. In J. Prosser (Ed.), *Image-based research: A sourcebook for qualitative researchers* (pp. 176–194). London: Falmer Press.

Wang, C. (n.d.). *Photovoice*. Retrieved May 24, 2007, from http://www.photovoice.com/index.html

Worth, S., & Adair, J. (1972). *Through Navajo eyes: Explorations in film communication and anthropology*. Bloomington: Indiana University Press.

Jon Prosser works in International Education Management at Leeds University, United Kingdom. He is perhaps best known for editing *Image-based Research: A Sourcebook for Qualitative Researchers*, (1998) which was the first book in the field to present visual research as a theoretically and methodologically varied approach to conducting research. Currently he is contributing to the groundbreaking *Realities* program based at the Morgan Centre, University of Manchester. He is also involved in HIV/AIDS research in South Africa, creating a Special Needs School in Mongolia, and creating calendars for *Riding for the Disabled Association*.

Catherine Burke, PhD, is Senior Lecturer in History of Education at the Faculty of Education, University of Cambridge, UK. She is a historian currently engaged with cultural and material histories of educational contexts and of childhood in the 19th, 20th and 21st centuries. She has researched and published widely on the history of educational spaces, the participation of children in the design of school, and the use of visual sources in educational research. She is currently the editor of the Sources and Interpretations section of History of Education Journal.

Stories of Sustaining: A Narrative Inquiry Into the Experiences of Two Beginning Teachers

Lee Schaefer & D. Jean Clandinin, University of Alberta

ABSTRACT

Attending to early career teacher attrition as a problem of identity shaping and shifting enabled this narrative inquiry into two beginning teachers' experiences. We first created a fictionalized survey to show how their experiences could fit neatly into the dominant narratives of early career attrition. We then composed narrative accounts to show each participant's uniqueness. Seeing beginning teacher attrition through this lens allowed us to become attentive to sustaining moments in these teachers' lives.

> "The teaching pool keeps losing water because no one is paying attention to the leak." (Peske et al., 2001, p. 306)

*A*s Lee completed his autobiographical narrative inquiry[1] we began to awaken to the importance of attending to beginning teachers' stories to live by (Connelly & Clandinin, 1999), to their identities, to who they are and are becoming as teachers. We wondered if beginning teachers' imagined stories of who they were and who they were becoming as teachers, might shape whether or not they stayed in the profession. Would they become leavers, stayers, movers or shifters (Freedman & Appleman, 2009)? Although teacher education programs may help to shape beginning teachers' stories to live by, it seems that, as Lawson (1983a, 1983b) and Lortie (1975) suggested, we think about becoming teachers long before we begin to teach. We live on school landscapes for much of our young lives and are shaped by our teachers and experiences on school landscapes.

We adopted Clandinin and Connelly's narrative conceptual framework (1995, 1999) of identity[2] as "stories to live by." Stories to live by is a phrase that brings together teacher knowledge and teacher contexts. Teacher knowledge, their personal practical knowledge, is knowledge "imbued with all the experiences that make up a person's being. Its meaning is derived from, and understood in terms of a person's experiential history, both professional and personal" (Clandinin, 1985, p. 362). School context is understood metaphorically as a professional knowledge landscape composed of relationships among people, places and things, and is both a moral and intellectual landscape (Clandinin & Connelly, 1995). The concept, stories to live by, is "given meaning by the narrative understanding of knowledge and context" (Connelly & Clandinin, 1999, p. 4).

Following from this conceptualization, we understand individuals enter teacher education programs embodying stories to live by and, as part of their stories to live by, embody forward-looking stories of their imagined identities as teachers. This makes studying beginning teachers' experiences, both those experiences that brought them to teaching and those experiences that may help them stay in teaching, a very complex phenomenon.

In order to inquire into studying beginning teachers' experiences, we need to be aware of the multiple experiences each teacher has encountered. All beginning teachers' stories to live by, including their forward-looking stories, are much more than a result of their experiences in teacher education. Through attending to their stories to live by, we hope to add insight into what may help to keep them in the profession.

There are two main ways teacher attrition is conceptualized in the literature (Ingersoll, 1999): one way frames the problem of attrition with a focus on the individual teacher, the person. In this view, the person is seen in terms of individual factors such as age, gender, ethnicity, and educational background. The second framing examines the organizational contexts in which beginning teachers work, that is, with a focus on the context. In this view, attrition is seen in terms of contextual factors such as support, resources, collegiality, and classroom management.[3]

While there is discrepancy about the exact percentage of teachers who leave teaching within five years (from 5% to 50%), "one very stable finding is that attrition is high for young teachers" (Guarino, Santibañez, & Daley, 2006, p. 185). High rates of early career teacher attrition create a significant economic strain on the system (Hahs-Vaughn & Scherff, 2008; Macdonald, 1999; Smith & Ingersoll, 2004). In the United States, over 2 billion dollars are spent each year replacing teachers that leave the profession (Alliance, 2005, p. 2).

Research shows trends and tendencies of early career teacher attrition from both individual and contextual frames. However, in our view, sanding beginning teachers' stories to fit within these trends and tendencies does not provide a sense of each teacher's stories to live by. When we use the metaphor of "sanding stories to fit into the boxes," we are referring to how narrow framings of teacher attrition and retention do not take lives into account. Thus, in looking at the sanding away of stories, we attended to who Shane and Kate were and are becoming. Using the metaphorical conceptualization of lives as being sanded away portrays Shane and Kate as more than trends and tendencies, more than graduates from particular programs and more than just beginning teachers. While they can be seen in that way, attending to their lives, that is, thinking narratively allows us to see their lives in motion, lives in the midst. Greene's (1995) view of seeing big and seeing small provides guidance.

> To see things or people small, one chooses to see from a detached point of view, to watch behaviors from the perspective of a system, to be concerned with trends and tendencies rather than the intentionality and concreteness of everyday life. To see things or people big, one must resist viewing other human beings as mere objects or chess pieces and view them in their integrity and particularity instead. One must see from the point of view of the participant in the midst of what is happening. (p. 10)

The Study and Participants

We engaged in a narrative inquiry (Clandinin & Connelly, 2000) into the experiences of two beginning physical education teachers as a way to understand their experiences as teachers and as people who are in the midst of composing their lives.

Methodology

The conceptual framework of narrative inquiry builds upon Dewey's view of experience. Through narrative inquiry, experience is studied through explorations of the personal/social, temporality, and place. These dimensions connect, as Clandinin and Connelly (2000) show, to Dewey's criteria of continuity (temporality) and interaction (sociality) and to situation (place). The narrative inquirer's gaze shifts from the

personal (inward), that is, feelings, hopes and dispositions, to the social (outward) existential conditions as it simultaneously attends to temporality (backward and forward), and to place, that is, "to the specific concrete physical and topological boundaries of inquiry landscapes" (Clandinin & Connelly, 2000, p. 51). These three dimensions constitute the metaphorical/conceptual space of narrative inquiry. Because narrative inquiry is relational inquiry, Lee, as researcher, co-composed both the field texts and the research texts with participants.

Participants

Two beginning teachers, Kate and Shane, participated. They graduated from the same physical education teacher education program and received combined degrees in physical education and education. They were in their first year of full-time teaching: Shane in a Grade 1-12 school where he taught grades 7 to 12; Kate in a high school, teaching grades 10 to 12. They both taught other subject areas as well as physical education.

Field Texts

Lee met with Shane and Kate four times each. The first three meetings were one-on-one conversations, and the final meeting was a conversation among the three. Each conversation ranged between one and two hours, and were digitally recorded and transcribed. The conversations ranged from stories of the experiences that brought them to teaching; first year teaching experiences; possible sustaining experiences; and experiences with the research process.

Sanding the Stories

As we began to move from field texts to research texts, we realized we could fit their stories into the individual and contextual framings discussed earlier. We imagined a survey instrument and analyzed the transcripts to fit into our fictionalized survey tool. We created the survey drawing on current conceptualizations of beginning teacher attrition from the literature. We show the results in tables 1 and 2. We then problematized this process and showed that in sanding beginning teachers' stories to fit into the conceptualizations, the stories to live by of each individual teacher are rendered invisible.

Table 1:

Sanding Kate's Stories

Beginning Physical Education Teacher Survey

Participant Information:

Gender: Female   **Type of school** (i.e., elementary, high school): high school

Age: 22   **Current year of teaching:** 1

Current classes you are teaching (please include grade level):
Physical education 10, 20, Sports Performance 10

Education: Bachelor of Education, Bachelor of Physical Education

Approximate number of students at your school: 2400

Please answer questions according to the Likert scale: Bold the number that you feel is most appropriate.

1- very low   **2**- low   **3**- average   **4**- high   **5**- very high

Below each question there is an area for you to add comments if you choose.

---

1) How would you rate the support you have been given throughout your first year of teaching?   **①** 2 3 4 5

Comments:
"I was assigned a mentor teacher from the school, and we have had one meeting, and that was it."(Kate, Con 1, p. 13)

"I am like I don't know if I am doing the right thing, and no one is telling me I am doing a good job, and sometimes that is all I want to hear" (Kate, Con 1, p. 23).

---

2) Please rate your average level of frustration you have had over your first year of teaching.   1 2 3 **④** 5

Comments:
"In September and October I was like I cannot do this, cause that was when I did not know anything…September and October I was awful, I was so mean to everyone I was stressed out and not finding a balance, I could not do it, I was like screw this I don't know what I am going to do with my life, but it is not this. I am not having any fun at all" (Kate, Con 1, p. 32).

3) On the Likert scale rate the level of frustration physical education has caused you throughout your first year.	1 2 3 ④ 5
Comments: "I did not realize it is such a take-home job, but with PE it is not marking it is almost emotional, especially with girls there are so many things going on, and you're stressed cause you don't know how to fix it" (Kate, Con 1, p. 22).	
4) Rate the level of frustration that came from feeling like you were teaching in a marginalized subject area.	1 2 3 ④ 5
Comments: "oh you teach PE…you just play" (Kate, Con 3, p. 5). "It sounds better than oh I am a student but it does not have the credibility of oh I teach LA, cause people are like you don't have any marking. That must be so easy, no prep work" (Kate, Con 3, p. 6).	
5) Rate the level of classroom management and discipline issues that you have had throughout your first year.	1 2 3 4 ⑤
Comments: "It is baffling and sometimes it literally upsets me the amount of excuses I have in a day as to why they cannot participate, or just the refusal. They will take a 0 and be fine, and I am like how do you just take a 0" (Kate, Con 3, p. 7). "You ask what is up, are you not feeling good, are you having a bad day. I hate PE, well why, I just hate it" (Kate, Con 3, p. 8).	

Table 2:

Sanding Shane's Stories

Beginning Physical Education Teacher Survey

Participant Information:

Gender: Male	**Type of school** (i.e., elementary, high school): Junior high school
Age: 27	**Current year of teaching:** 1
	Current classes you are teaching (please include grade level): Physical education 7, 8, 9, Science 7, 8, 9.
	Education: Bachelor of Education, Bachelor of Physical Education
	Approximate number of students at your school: 500

Please answer questions according to the Likert scale: Bold the number that you feel is most appropriate.

1- very low   **2**- low   **3**- average   **4**- high   **5**- very high

Below each question there is an area for you to add comments if you choose.

---

1) How would you rate the support you have been given throughout your first year of teaching? | **①** 2 3 4 5

Comments:
"She did (come in to observe), it was in the context of my evaluation, formal evaluation, so it was you've already done bad, and I am just letting you know right now, it is not like let's sit down and make this better" (Shane, Con 2, p. 24).

---

2) Please rate your average level of frustration you have had over your first year of teaching. | 1 2 3 **④** 5

Comments:
"That first six weeks, you know you're in the classroom sweating and tired and stressed out, and, you know, you're thinking, 'What am I doing here?'" (Shane, Con 1, p. 12).

---

3) On the Likert scale rate the level of frustration physical education has caused you throughout your first year. | 1 2 3 **④** 5

Comments:
"I don't know if it's just that it seems to be the PE thing right, if there is coaching to be done it falls on the PE guy" (Shane, Con 1, p. 15).

4) Rate the level of frustration that came from feeling like you were teaching in a marginalized subject area.	1 2 3 **4** 5

Comments:

"Everyone just thinks we don't do any planning or marking, all of these things that our status as a teacher is lower. We are there to be coaches and we also teach PE on the side" (Shane, Con 2, p. 19).

"I guess even at our school before this principal was there, I was talking to social teachers when they had to teach PE…they were just thrown in there cause they needed someone to do it; and they figure anybody can do it" (Shane, Con 2, p. 20).

5) Rate the level of classroom management and discipline issues that you have had throughout your first year.	1 2 3 4 **5**

Comments:

"I feel bad, it sucks the kids are bored, and again it comes back to the classroom management, maybe if I was able to plan more engaging lessons they would be less inclined to mess around" (Shane, Con 2, p. 12).

"I've got behavior problems and you try to solve them resorting back to just disciplinarian style, you are losing relationships, at the end of the day it is like, 'What was I doing here all day?'" (Shane, Con 2, p. 12).

Disrupting the Sanding of Stories

By analyzing the field texts in this way, that is, by sanding the storied lives, it is apparent that Kate's and Shane's stories can fit into current conceptualizations. We see them as part of the trends, tendencies and patterns, that is, we see small (Greene, 1995). However, Shane's and Kate's individual experiences are lost; their stories are reduced to common trends, when they are surely not. We knew something of their unfolding lives in motion: they taught in different professional landscapes shaped by different plot lines and different characters; they grew up in different places, with different parents, different families and different values; they came to teaching living out different stories and told unique imagined stories of who they would be as teachers. Through their stories we saw their lives.

Imagined Stories to Live By: Bridging the Gap

All my writing is about the recognition that there is no single reality. But the beauty of it is that you nevertheless go on, walking towards utopia, which may not exist, on a bridge which might end before you reach the other side (Young, n.d.).

Young's words helped us imagine this bridge as the space that beginning teachers are in/on as they try to live out their imagined stories of being teachers on their school landscapes. How does their search for utopia shape beginning teachers' stories to live by on their professional and personal landscapes? If these beginning teachers leave teaching, do they realize the bridge may not reach the other side?

We are not the first to attend to beginning teachers' experiences using an identity frame. Flores (2006) notes identity shifting is "a process that involves complex interplay between different, and sometimes conflicting, perspectives, beliefs, and practices that are accompanied by the development of a new identity" (p. 2021). Estola (2003) emphasizes, "teachers cannot separate their personal identities from their professional ones" (p. 181). Flores and Day (2006) allude to beginning teachers' struggles with negotiating their personal visions of who they want to be within school structures. Shane's and Kate's stories show their struggles as they tried to negotiate their personal and professional landscapes while hanging onto their imagined stories of who they wanted to be as teachers. Their stories of who they were going to be bumped against who they were expected to be as beginning physical education teachers (Clandinin et al., 2006).

This bumping encouraged both Kate and Shane to shift their stories to live by, to try to cross different metaphoric bridges to enable them to live imagined stories. The shifts they made in living on both their professional and personal landscapes seemed to enable them to have moments of feeling sustained. We noticed these shifts on their professional and personal landscapes were so intertwined that it was difficult to discern which experiences initiated the shifts. As they shifted, Shane and Kate caught glimpses of their imagined teacher stories to live by, the forward-looking stories with which they entered the profession. Within these glimpses Kate and Shane found moments that allowed them to continue to cross that metaphoric bridge.

From Field Text to Research Text

In what follows we share story fragments which suggest threads that became apparent within Kate's and Shane's stories. Becoming attentive to beginning teachers' stories to live by and how they shift and change on their professional and personal landscapes may help us to better understand their stories of being sustained as teachers.[4]

Kate's Journey of Becoming a Teacher

Thread 1: Not a subject area

> I remember the exact moment that I wanted to be a teacher. I was 16 and I was volunteering with Sports Central…We started with 30 kids and by the end of the week we had 70…I was, like, this is so fun. I am playing with these kids all day and I was like I want to be a gym teacher…I started working in Sports Central because my brother passed away and instead of flowers we asked people to donate to Sports Central. We created a fund with the donations. That happened when I was in grade 10… gym class was the only class I could handle going to…These younger guys who were super fun and laid back, and they just wanted to play and that was it…And it was that passion, I was fortunate to have great classes, and good friends, but it's mainly that I understood then that sport can pull people together, that's why I wanted to be there…I could just be me…And I was like I want to create that environment for someone else. That was what inspired me…I felt like they were more inclined to think of me as a person, and not just a student. You know you were not a subject area to teach you were a person that needed things outside of those subject areas[5] (Kate, transcript, March 4, 2010).

Kate's story alludes to the importance of physical education in her life. Kate's experience of losing her brother was difficult and her physical education class was her place of respite. She speaks of sport and physical education in a powerful way, but also speaks to the environment that was created. "*You were not a subject area to teach, you were a person.*" Kate's stories of physical education drew forward experiences of being herself and having fun. Her imagined stories of teaching include these strong feelings. "*I wanted to create that environment for someone else.*"

Kate told other stories of what brought her to teaching. She storied herself as outgoing and interactive and saw that as fitting with being a teacher and noted being a teacher "*was always a bit of a calling in a sense, like what I really need as a person to be satisfied*" (Kate, transcript, March 8, 2010).

Thread 2: Bumping of stories: Professional landscape

September and October, I was trying so hard to seem like the expert in everything, especially to my kids, cause I felt like I had to prove something. I was faking confidence, like, I know how to do this… I just felt like I had to be way more strict and sort of almost like a bitch because I look so young and I am so small…you know you're told you have to be evil until Christmas, don't smile until Christmas so they (the students) don't take you for all you got…in university you are always told to never be their friends… I was always so stressed, nothing was good enough, I was never feeling satisfied (Kate, transcript, March 4, 2010).

Although Kate's stories to live by as she entered the profession spoke of creating an environment that made her students feel like people, not a subject area, Kate felt she had to live out a different story. Being "*strict*," and being a "*bitch*" did not fit in to the story she told of physical education as she entered. The metaphorical use of bumping alludes to Kate's imagined story of teaching coming into conflict with the stories of school that shaped her teaching practice. For example, her need to be "*perfect*," and knowledgeable did not seem to fit with Kate's imagined story. Her stories to live by spoke of joy and of fun as more important than learning.

In Kate's stories to live by she valued how her physical education teachers were involved with students, yet spoke, in her beginning months, of standing on the sidelines and evaluating students. Other teachers in the school followed this procedure, so she felt it was expected. Although Kate spoke of her past physical education teachers as friends who made her feel like she mattered, on her professional landscape she distanced herself from students, and adhered to what she said she was told in university; "*don't smile until Christmas or they will take you for all you got*" (Kate, transcript, March 4, 2010).

Thread 3: Bumping of stories: Personal landscape

I still live at home and my Mom was like, you need to move out, you are awful to be around. I was barely seeing my friends, I was being an awful girlfriend and I was just mean to everyone. At school you put on this happy face, and when you get home you are so desperate to feel something not fake (Kate, transcript, March 4, 2010).

Kate's stories to live by on her personal landscape seemed to create tensions not apparent before she began teaching. Although she spoke of putting on a happy face at school, she was not who she wanted to be on either landscape. At one point Kate mentioned she thought about leaving teaching, but did not know where to go. Kate's desperation to "*feel something not fake*" spoke of how she was not able to live her imagined stories on either landscape. The tensions on both her professional and personal landscapes created a dilemma. Feeling like she had to change something to *survive* to be herself, Kate began to cross the bridge she felt might allow her to live out her imagined stories. As she did so, her story began to shift to one that tried to incorporate more of her imagined stories.

Thread 4: Shifting stories to live by

I started to feel slowly more like myself and more content even though I was having crazy days at work, it was more bearable. That's when I was like ok I need to start doing more things just for me (Kate, transcript, March 4, 2010).

We do not know if experiences on her personal or professional landscape prompted Kate to begin shifting her stories to live by; the shifts happened simultaneously on both landscapes. When Kate spoke of feeling "*more like herself*" (transcript, March 4, 2010), she appeared to be catching a glimpse of her imagined story.

I was like, screw this supposed teacher hat I am supposed to have on. It is not working…I started just being me and said I would have fun, put myself out there. I found that kids were more likely to relax at the very least, and laugh a lot. So I went and said to them, my goal is to talk to each of you each class about anything, and even now a student said I love the fact that I worked at a deli and you remembered it. That was what my teachers did (Kate, transcript, March 4, 2010).

"*Screw this supposed teacher hat.*" We wondered if Kate realized the shifts she pointed out were enabling her to live out a piece of her imagined stories as a teacher. Feeling "*more like herself*" illustrates a movement from doing what others thought was important to doing what she felt was important. Kate noted she had, in some ways, created the environment her physical education teachers created for her. In becoming more like herself, her story of her personality being a "*perfect fit for teaching*" (transcript, March 18, 2010), allowed her to connect with students. As Kate talked about the environment created, and the connections with students, she smiled.

> *I was showing this girl how to do a stretch, and she was injured, and she looked so awkward, and we just started laughing for like five minutes…Like everyday if you could have a stellar thing and you, like, feel good, I am making a difference in this kid's life…She never learned the stretch, but at the same time when she is asked who her favorite teacher is, I may be one of them* (Kate, transcript, March 18, 2010).

Although Kate referred to these "*stellar things*" as minor successes, these successes with students were significant in Kate's imagined stories. Kate's stories to live by spoke of shaping students' lives in positive ways and allowing them to have fun while engaged in physical education. In Kate's words and demeanor during this conversation, we saw the connections with students as sustaining moments. Were these "*stellar things*" glimpses of her imagined story?

There is much more to Kate's stories to live by and to her imagined stories. Along with stories of connections with students and "*stellar things*," Kate storied frustration from the bumping of her imagined stories with the stories she felt she had to live out on the professional landscape. We wonder what might happen next for her as a teacher. What happens to beginning teachers' stories to live by as they try to negotiate their imagined stories? How might beginning teachers see their new landscapes differently if they entered with knowledge of how school landscapes could be negotiated? We wonder if Kate's *stellar* moments will be enough to sustain her as a beginning teacher.

Shane's Journey of Becoming a Teacher

Thread 1: Teacher of the house

> *I grew up with a brother who is about the same age as me and he had some learning disabilities, so I really liked helping him out with his schooling. I also have a younger sister and I helped her along as well. Neither of my parents at the time when I was going through school had graduated from high school, so if there were any scholastic problems it was me that tried to solve them. So I guess I was always kind of the teacher in the house, and I have always enjoyed explaining things to people. That aha moment when you see them get it, and they are happy, and then you are happy because they are happy* (Shane, transcript, March 1, 2010).

This fragment shows Shane was storied by himself, and by others, as a teacher long before he entered the profession. His desire to help others learn,

become better, resonated throughout our conversations. Shane's imagined stories of himself as a teacher were ones that involved him enabling others to learn. Shane also spoke of other experiences that fostered his desire to become a teacher.

Shane spoke of teachers as well as coaches he storied as "*being funny, good at their jobs,*" who "*made learning easy*" (transcript, March 1, 2010). Although he enjoyed these teachers, he did not want to force himself to become like them. He was aware, and believed it was important to create his own style. Shane's desire to "*create his own style*" (transcript, March 1, 2010) is in contrast to Kate's stories to live by. Later in our conversation, Shane told another story that brought him to teaching.

> *As I got older, um, and kind of started looking at education from a First Nations Perspective and seeing First Nations people falling through the cracks and stuff like that, that really kind of, like, helped to solidify the career choice for me…and now it is definitely a want, a desire to help kids and teaching seems to be a good avenue for that….kids just seem like the correct entry point…you can help save so many lives; it's a dramatic thing…I guess you hope to set them on the right track, to get the ball rolling, to help them on the right track* (Shane, transcript, March 1, 2010).

Shane is of First Nations heritage. Through his words and passion he made evident that helping First Nations students is an important part of his stories to live by. Shane works in a school with a high First Nations population. He requested a placement there so he might fulfill his desire to impact First Nations children's lives.

Thread 2: Bumping of stories

> *I guess it was probably the build-up of like slogging through the mud, so to speak. Just getting worn down to the point where I had a class where I just, you know, my office I can see in the gym so it is not like I left my class unattended, but I just left the class and went and sat in my office, and I was just like what is going on here. This is not going the way I want it to. You reflect on the day and the week and you just find that things do not add up…just thinking how long can I go at this rate with this type of stress, and this type of running into a brick wall everyday? Eventually something was going to break, and I did not want it to be me physically or mentally, so I knew I had to change something* (Shane, transcript, March 15, 2010).

We could construe these words as Shane becoming burned out. However, when we consider Shane's stories of wanting to keep students from "*falling through*

the cracks," we wonder if the metaphoric "*brick wall*" may be his imagined stories bumping against the dominant stories shaping his professional landscape. Shane's metaphorical use of "slogging through the mud" creates an interesting image as Shane tries to cross the bridge to reach his imagined stories. The mud makes the process difficult.

> *I am only focusing on classroom management and planning and how am I going to get through the curriculum. And you know a lot of the relationships are not getting built because I don't have time. Unfortunately, the way things are going, you know I have created an adverse relationship with some of the harder students I need to be reaching…unfortunately I can't build relationships to get them to work, so I have to force them to work, which further polarizes it…I want a comfortable, relaxed atmosphere where we can joke around and have fun, but unfortunately you know with discipline problems that I am dealing with, all of that gets pushed to the side and I don't feel like I am being who I want to be in the classroom* (Shane, transcript, March 8, 2010).

Shane's frustration as he spoke of the lack of relationships being built was clearly apparent in his voice. The juggling of teaching duties was getting in the way of relationship building. The management issues he faced, due to the lack of relationships, bumped with Shane's imagined stories of shaping students' lives in a positive way. Shane's long hours and the bumping of his imagined story with the stories he was living, were taking a toll. As Shane struggled with life on his professional landscape, his imagined story of who he would be as a teacher was also creating bumps on his personal landscape.

> *I pictured first-year teaching, I guess just being out of school for the first time, as having more time than I did at school. School was booked up, especially me trying to pay for school. I was working 30 hours a week on top of my school schedule. So I [as a teacher] I saw myself joining sports leagues, or Friday night darts. That first summer me and some friends went to a big festival in Vancouver, and being able to do things spur of the moment, trips and that is kind of what I was hoping for. Like I said, that young urban professional* (Shane, transcript, March 15, 2010).

Shane spoke often of the "*young urban professional*" he imagined himself becoming. He envisioned a life outside of school that allowed the freedom working a full-time job, and attending university at the same time, did not allow. He was spending less time with friends than he wanted to, and not living the lifestyle he hoped teaching would provide. Like Kate, Shane made the decision to change the stories he was living on both landscapes to try to create a bridge to his imagined stories.

Thread 3: Shifting stories to live by

> You talk about a breaking point of work and things like that, and I found that's what I had to do. I had to cut down my planning and marking and all the other things I was doing in the evening because the stress and frustration was boiling over and it was completely killing everything else that I had going on. So in order to keep my identity, keep myself sane and happy and healthy, I had to scale back what I was doing (Shane, transcript, March 15, 2010).

Although Shane spoke of shifting on the professional landscape, like Kate's shift, it is difficult to separate shifts on the professional landscape from shifts on the personal landscape. As Shane spoke of hanging onto his identity, did he mean hanging onto what is important to him as a person and a teacher? Shane felt spending more time with friends, and with students, rather than planning and marking, would allow him to sustain his identity, to sustain what was important to him.

> I think that is the thing. Where I want to put my best is in the classroom, and so, you know, I am always going to be a little behind in my marking, my planning is probably never going to be quite as good because I want to be focused on what is going on in the classroom…by providing after school drop in floor hockey, by having a wrestling team, and volleyball team, doing the things that are extra curricular that cut in to my time to do all the other things I think it's just, it is going to get me farther (Shane, transcript, March 15, 2010).

When Shane spoke of "*getting himself farther,*" we did not see this as moving himself up the school ranks. We saw Shane talking about getting himself farther by living his imagined stories, those stories built around plotlines of keeping students from "*falling through the cracks,*" and being an adult that cares. Shane's decision to do less marking and planning was a way to try to catch a glimpse of his imagined stories.

> Last semester I had a grade 12 class…they were literally my rock last semester…I would come in, they were really quiet…You know I would set them up, and we could play games, trying to play games with 8 students can be difficult, so I would try lots of different things, and they did anything I could ever ask them to do. I found I made more connections with that group; they were a little bit older, more mature (Shane, transcript, March 18, 2010).

Shane referred to this group of students as "*his rock*" a number of times. Shane's "rock", like Kate's "*stellar thing*", seemed to be something that allowed him to live his imagined stories, to create a sustaining moment. The connections with students

are something that clearly stands out, as they link to Shane's imagined stories of teaching. We wondered if this was an experience that enabled Shane to experiment with, and to create, his own teaching style. This may have allowed him to create sustaining moments and to move farther across that metaphoric bridge, closer to his imagined stories. We wondered if these sustaining moments were enough.

> *I've got class averages of 50%, so the kids are not getting the information I am giving them. I've got behavior problems and [if] you try to solve them by resorting back to just disciplinarian style you are losing those relationships. At the end of the day it is like what was I doing here all day. I did not build relationships and I did not pass on any knowledge* (Shane, transcript, March 8, 2010).

Shane's frustration with the environment being created in his classes is evident. Shane's imagined stories of "*aha moments*" (transcript, March 1, 2010) and "*keeping kids from falling through the cracks*" seem to bump hard against the professional landscape stories. How will this tension, created between Shane's imagined stories and the stories he is living out, shape his decision to stay or leave?

What will happen if Shane's next year looks similar to this one? How many years like this one will he endure? Will Shane stay long enough to tell if he has saved a student from "*falling through the cracks*"? Will Shane be able to "*slog through the mud*" long enough to cross the bridge to his imagined stories?

Complexities in the Lost Sand

In looking at the remnants of Kate's and Shane's lives that may remain after the sanding, we begin to awaken to how complex their sustaining stories really are. Although we focused on only certain aspects of Kate's and Shane's stories, we learned both Kate and Shane had stories to live by composed on their personal landscapes prior to beginning teaching. It was apparent these stories to live by bumped against the stories shaping their professional landscapes. As stories bumped, both Kate and Shane shifted their stories to live by in order to catch glimpses of their imagined stories; they tried to cross the metaphoric bridge. Although they both had sustaining moments that came out of these shifts on their personal and professional landscapes, it is difficult to tell if these sustaining moments will turn into stories that will sustain them in teaching.

The changes Kate was making to her stories to live by allowed her to experience sustaining moments. Through becoming "*more like herself*" on the professional landscape she connected with students, had fun, and became "*that teacher*" (transcript, March 18, 2010). She re-created, at least in the stories she told herself, the environment that meant so much to her as a student in physical education.

For Shane, things are murkier, and perhaps messier. Although he made shifts on his personal and professional landscapes, it is difficult to tell if these shifts created the positive experiences. Kate's imagined stories were of creating a certain environment important to her, that was created for her as a student. Shane's imagined stories were different; he wanted to create his own style, experiment, and create a different environment. Shane's stories seemed to continue to bump after the shifts took place. It seemed that, at this time, the bridge to his imagined stories of "*aha moments*" and "*keeping kids from falling through the cracks*" could not be crossed.

What do we learn from attending to these stories? On the surface, Kate's and Shane's experiences are similar. As illustrated in tables 1 and 2, by analyzing their comments, sanding their stories and putting them into boxes, they fit nicely into common beginning teacher trends and tendencies. However Kate's and Shane's stories are far too complex and messy to fit neatly into boxes. Attending to the stories that brought Kate and Shane to teaching, the stories of their personal and professional landscapes, and their stories of moments of sustaining helps us see the complexities. Their stories are diverse, shifting and changing in different ways. This raises questions about the multiplicity of stories beginning teachers enter the profession with, and tell, as they negotiate their stories to live by and their imagined stories on their professional landscapes.

The interconnectedness between Kate's and Shane's personal and professional landscapes became apparent. The landscapes they lived within were so interconnected that, at moments, we could not differentiate them. "A narrative way of thinking about teacher identity speaks to the nexus of teachers' personal practical knowledge and the landscapes, past and present, on which teachers live and work" (Clandinin, Downey, & Huber, 2009). If beginning teachers' stories to live by are continuously negotiated on their personal and professional landscapes, it is important to be attentive to this complex and messy phenomenon.

Thoughts for the Future

Certainty is not a part of narrative inquiry, and we offer no knowledge claims to resolve the problems of beginning teacher attrition. We, however, show that by sanding beginning teachers' stories to fit into the boxes, we make invisible many of the lived experiences that make these individuals who they are and who they are becoming. Without knowing what has brought teachers to teaching, or what their imagined stories of teaching are, we wonder if we will ever know how we might keep them in the profession. Although beginning teachers are socialized as teachers long before they enter their formal education career, their stories to live by are being negotiated throughout their teacher education programs and into their teaching careers. It is important that beginning teachers are awakened to the possibilities of this complex process.

For beginning teachers to become reflective, spaces must be provided, in both teacher education and induction programs, for them to turn back upon the stories that brought them to becoming teachers. In becoming reflective to what has brought them to teaching, as well as to what they believe is important to them, and why it is important, beginning teachers may come to understand their imagined stories in a different way. The negotiation of their professional landscape and personal landscapes may become more purposeful if they understand how they have come to the bridge they need to cross; in bridging the gap to these imagined stories beginning teachers may be able to create forward-looking stories that include them in the profession.

Notes

1. Schaefer, L. (Under Review). Beginning Teacher Attrition: A Question of Identity Making and Identity Shifting. *Teachers and Teaching: Theory and Practice*.

2. There are multiple ways to conceptualize identity (Gee, 2000).

3. For further information see: Schaefer, L. (Under Review). Beginning Teacher Attrition: A Question of Identity Making and Identity Shifting. *Teachers and Teaching: Theory and Practice*.

4.   The narrative accounts, composed as the first level of analysis within the three-dimensional narrative inquiry space, are included in Schaefer (2010). Here we focus on the stories that brought Kate and Shane to teaching, their shifting stories to live by, and their sustaining stories. We selected story fragments to show these shifts.

5.   Kate's and Shane's quotes are italicized throughout.

References

Alliance for Excellent Education. (2005). Teacher attrition: A costly loss to the nation and to the states. (Issue Brief). Washington, DC: Author.

Clandinin, D. J. (1985). Personal practical knowledge: A study of teachers' classroom images. *Curriculum Inquiry, 15*(4), 361–385.

Clandinin, D, J., & Connelly, F. M. (1995). Narrative inquiry: A methodology for studying lived experience. *Research Studies in Music Education, 27*(1), 44–54.

Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research*. San Francisco: Jossey-Bass.

Clandinin, D.J., Downey, D.A., & Huber, J. (2009). Attending to changing landscapes: Shaping the interwoven identities of teachers and teacher educators. *Asia-Pacific Journal of Teacher Education, 37*(2), 141–154.

Clandinin, D. J., Huber, J., Humber, M., Murphy, S., Orr, A. M., Pearce, M., et al. (2006). *Composing diverse identities: Narrative inquiries into the interwoven lives of children and teachers*. New York: Routledge.

Connelly, F. M., & Clandinin, D. J. (1999). *Shaping a professional identity: Stories of educational experience*. New York: Teachers College Press.

Estola, E. (2003). Hope as work: Student teachers constructing their narrative identities. *Scandinavian Journal of Educational Research, 47*(2), 181–203.

Flores, M. A. (2006). Being a novice teacher in two different settings: Struggles, continuities, and discontinuities. *Teachers College Record, 10*, 2021–2052.

Flores, M. A., & Day, C. (2006). Contexts which shape and reshape new teachers' identities: A multi-perspective study. *Teaching and Teacher Education, 22*(2), 219–232.

Freedman, S. W., & Appleman, D. (2009). "In it for the long haul": How teacher education can contribute to teacher retention in high-poverty, urban schools. *Journal of Teacher Education, 60*, 323–337.

Gee, J. P. (2000). Identity as an analytic lens for research in education. *American Educational Research Association, 25*, 91–125.

Greene, M. (1995). *Releasing the imagination: Essays on education, the arts and social change*. San-Francisco: Jossey-Bass.

Guarino, M. G., Santibañez, L., & Daley, A. G. (2006). Teacher recruitment and retention: A review of the recent empirical literature. *Review of Educational Research, 76*(2), 173–208.

Hahs-Vaughn, D. L., & Scherff, L. (2008). Beginning English teacher attrition, mobility, retention. *The Journal of Experimental Education, 77*(1), 21–53.

Ingersoll, R. M. (1999). The problem of under qualified teachers in American secondary schools. *Educational Researcher, 28*, 26–37.

Lawson, H. A. (1983a). Toward a model of teacher socialization in physical education: The subjective warrant, recruitment, and teacher education. *Journal of Teaching in Physical Education, 2*(3), 3–16.

Lawson, H. A. (1983b). Toward a model of teacher socialization in physical education: Entry into schools, teachers' role orientations, and longevity in teaching (part 2). *Journal of Teaching in Physical Education, 3*(1), 3–15.

Lortie, D.C. (1975). *Schoolteacher*. Chicago: University of Chicago Press.

Macdonald, D. (1995). The role of proletarianization in physical education teacher attrition. *Research Quarterly for Exercise and Sport, 66*(2), 129–141.

Peske, G. H., Liu, E., Johnson, S. M., Kauffman, D., & Kardos, S. M. (2001). The next generation of teachers: Changing conceptions of a career in teaching. *Phi Delta Kappan, 83*(4), 305–307.

Schaefer, L. (2010). A Narrative Inquiry into the Experiences of Two Beginning P.E. Teachers' Shifting Stories to Live By. Unpublished masters thesis, University of Alberta.

Smith T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal, 41*(3), 681–714.

Young, M. (n.d.). BrainyQuote.com. Retrieved June 22, 2010, from http://www.brainy quote.com/quotes/quotes/m/margue rite196731.htm.

Lee Schaefer is a graduate student at the University of Alberta studying in the area of Secondary Education. His own experiences as a junior high school physical education teacher, mentor, and university facilitator inform his current master's thesis work which inquires into the experiences of beginning teachers. Working alongside Dr. Jean Clandinin and other narrative inquirers has furthered contributed to his understanding of the complexities and possibilities of narrative work.

D. Jean Clandinin is Professor and Director, Centre for Research for Teacher Education and Development, University of Alberta. A former teacher, counselor, and psychologist, she co-authored with F. Michael Connelly four books and many chapters and articles. Their most recent book is *Narrative Inquiry: Experience and Story in Qualitative Research*. Jean also co-authored a 2006 book entitled, *Composing Diverse Identities*. Jean edited the *Handbook of Narrative Inquiry: Mapping a Methodology* (Sage, 2007).

Crystallization: Teacher Researchers Making Room for Creative Leaps in Data Analysis

Ruth Shagoury, Lewis & Clark College

ABSTRACT

In this article, the author shares new approaches to data collection and analysis which encourage using "crystallization": an intriguing new method that has emerged in recent years as a kind of three-dimensional data analysis strategy that welcomes the new lens that artistic thinking can bring to conducting and writing research. Examples from teacher-researchers include ways to use storytelling, art, self-reflection, children's books, metaphor, and imagination to expand the field of data collection and analysis.

If we believe that teacher research matters now more than ever, then we need to return attention to ourselves as teacher-researchers. As educators, what do we believe in? How can we investigate our teaching assumptions and teach grounded in what we know and believe about children and how they learn?

Shelly Harwayne says it eloquently:

Classroom practice must be based on richly understood and deeply held beliefs about how children learn… In other words, what teachers say and do and how they engage with children must have theoretical underpinnings. Their practice is not based on a publisher's set of directions, or a handbook filled with teaching tips, but on concepts they themselves have examined carefully. (2000, p. 26)

"Richly understood and deeply held beliefs." How do we access them to examine them carefully? Self-reflection has always been a cornerstone of good teaching—and a crucial tool for teacher-researchers. We take notes, write in journals, keep teaching notebooks, and engage in deep conversations with each other about what we believe and what we are seeing. But it can help to take a different perspective to get at a deeper level of what we believe is essential in our experiences and in our teaching.

"Crystallization" is an intriguing new approach in qualitative research that has emerged in recent years as a kind of three-dimensional data analysis strategy that welcomes the new lens that artistic thinking can bring to research, whether it is storytelling, painting, poetry-writing, metaphor, or photography (Ellingson, 2008; Janesick, 1998; Richardson, 1994). It expands the field of data collection and analysis. Crystallization makes room for those creative leaps in thinking that teacher researchers need to help ground their work.

The term crystallization was coined by Laurel Richardson as a method of analysis that included creative forms of representation in order to tap deeper thinking (Richardson, 1994). The method, as detailed by Richardson, uses crystals as a metaphor to describe the data analysis process:

> [Crystallization] combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach… Crystallization provides us with a deepened, complex, thoroughly partial understanding of the topic. Paradoxically, we know more and doubt what we know. (p. 522)

Other researchers since Richardson have built on her original work. Laura Ellingson (2008) elaborates on Richardson's articulation of crystallization to include multigenre representations and encourages researchers to be open in selecting genres that best represent the truths in their research. She further suggests that crystallization provides an effective approach to richly describing our findings as we "encounter and make sense of data through more than one way of knowing" (p. 11).

Valerie Janesick (2000) has used this method extensively in her work with researchers, with the idea that the researcher uses other disciplines to help understand findings. By including different genres such as storytelling, poetry, artistic expression, visual thinking, live performance, and so on, we have more and more angles of vision on a particular topic of research question (Ellingson, 2008).

Crystallization can offer possibilities to represent ways of producing knowledge about a particular phenomenon through generating a deepened, complex interpretation.

Crystallization Using Stories

For example, I'm working with a group of new teachers. We are seeking to understand what is central in our teaching. Rather than discuss or journal about "what is central in my teaching," I asked them for two stories:

First, "Tell me about a time this year when you felt like you were born to teach."

Katie told the following story: "It was just really simple: we were all sitting on the floor, and I finished reading a book to the kids, and I said, 'OK, turn to one or two people near you and start talking about your questions.' You know they're all sitting there talking---and I was walking through them, kind of just sitting down and listening to some of their questions and seeing everybody chatting with each other. That was really---things like that are: ok, this is good."

"And on the other hand," I asked, "Tell us a story about a time when you were in the classroom and you wished you'd never been born?"

Katie: (laughter) "Yeah, those happen, too. Let me think. In my last period class of the day, one time, I went through a whole lesson and explained something and gave them time to work on it, and right away someone raised her hand and said, 'Um, I don't understand. What were we supposed to do here?' I had to explain again. And then another kid raised his hand---pretty soon, there are 10 kids coming up to me and saying, 'I don't understand. What do we do?' And then I just knew, Gosh. . . I didn't do this right, this isn't ok, I don't know what else to say. I just felt kind of frustrated and bad about myself---because I obviously didn't do a very good job communicating. Maybe it's a bad lesson. And I thought, 'What do I do now?'"

So, with these two stories in mind, I asked Katie another question to take us a little deeper: "Do you see any relationship between those two stories?"

"I guess I was just thinking what I see in my experience when I felt really good about it, it was that I was so excited to see that they were independent learners… And I think that is when it is frustrating is when they don't take the ball and run with it. It's when they really need me to almost do it for them. I guess that would be the big thing. The best parts about teaching for me, the best days are when the kids are really creating the lesson and they're really taking the learning themselves."

So, what we discovered is central to Katie's philosophy is a belief in children being able to be independent learners. When Katie told these two stories and compared the beliefs they represented, she engaged in a different kind of introspection, an analysis using "crystallization."

Picture Books as a Starting Point

In my teacher researcher group, we've all been looking closely at one student we work with that we are intrigued by or wondering about. Of course, we have samples of student work, anecdotal notes, and interviews. We also used crystallization to look at each student through fresh—and positive—eyes. We read aloud the book *What's the Most Beautiful Thing You Know About Horses* (1998) by Richard Van Camp.

Van Camp is a member of the Dogrib nation of the Northwest Territories of Canada, and an emerging voice in the Native American literary movement. He writes this children's book in order to understand horses, since his people are not horse people and he's always been curious to learn more about them—and come to understand them. The format of his book is simple: he asks different people, "What's the most beautiful thing you know about horses?" He receives responses such as: "The most beautiful thing about horses is that they always find their way home" and "I love their breath. You can feel their breath move through their chest. They stare at you as they breathe. Their soul comes right out."

After we read the book aloud and shared the vivid and colorful illustrations, we all wrote on the prompt: "What's the most beautiful thing you know about…your student?"

After a ten-minute quickwrite, we shared our writing in partners, and then with the whole group. As we discussed our discoveries, we found a different way to approach our understanding of each student—and how we might work with him or her.

Sandy wrote that the most beautiful thing about Jack is "when he is excited about something, his face lights up as if it is the best idea he has ever been part of. He is at the same time, joyous and serious, determined and open, elated and hard-working." Sandy is determined to try to tap into this energy more intentionally.

Erika decided, "The most beautiful thing I know about Skye is her smile and the quirky, flirty way she said, 'Maybe I will.' When she gives me hints of confidence like this, I'm going to believe her and pursue it."

Rob wrote about his case study's "quiet determination to succeed that I could not see at first." This realization, in turn, sparked Rob's "determination to stick with him and share in his vision of success."

It's important to see—and re-see—our students. What we can recognize as "the most beautiful thing we know about them" can lead us to see new possibilities in our work together.

Imagine a Dinner Party

Crystallization enables teacher-researchers to push the envelope of what is possible, particularly in terms of integrating narrative, poetic, and artistic thinking with our other data and the patterns we are finding. One of the other benefits is the joy in creativity that can come with expanding our horizons as teacher-researchers. This last fall, everyone in my teacher-research group had framed her research question and was collecting data and beginning to have conversations about the community of professional books and authors that might enrich their research. We turned to a very playful—and informative—crystallization endeavor as a way to discover our scholarly community.

I encouraged teachers to imagine some of their favorite teacher-researchers, theorists and important people from their lives attending a dinner party to discuss their research question. We heard teacher-researchers envisioning conversations about community with Debbie Miller, Parker Palmer, and Jerry Garcia. When you imagine what people with different interests would consider in discussing your research question, you can cut through accepted notions of what the critical issues are.

For our next step, everyone planned a dinner party where they invited a group of people to get together and discuss their teacher-research question. The framework was simple:

1. Invite a minimum of 6 guests—living, dead, even fictional!
2. For each guest, state the reason for including that person and what you think or hope each would contribute.
3. Be as creative as you like!

Valerie invited E.B. White, Carl Anderson, Ralph Fletcher, Linda Rief, Sandra Cisneros, and Jennifer Allen to discuss her research question: "What happens when third graders are given choice in their writing?" In these samples, you can see her reasons for her choices and what she hopes to learn from imagined dialogue at her dinner party (See Figures 1, 2, and 3).
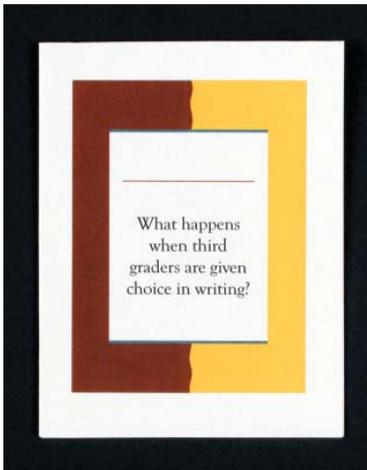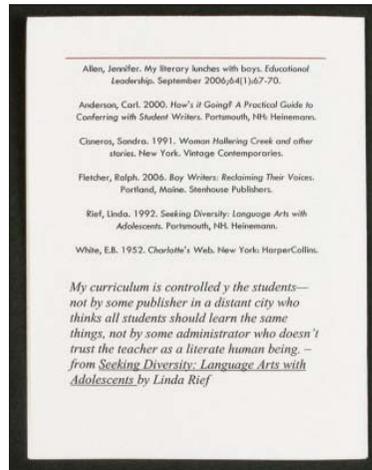
Fig. 1: Research question

Fig. 2: The authors and their works

Fig. 3: The guest list

High school teacher Susan's question centered on adolescents finding voice in their writing. Her invitation reads:

> You are invited to a summer evening under the stars, where we'll savor good food, wine, and conversation. Celebrate the end of the school year and anticipate possibilities for students we are yet to meet. We'll talk about writing, voice, and how choice in writing may help students find their voices. Each of you is invited because I am grateful to have learned from you.

She invited Linda Christensen, Barbara Kingsolver, Anne Lamott, and fellow teacher Wendy Doss.

Fig. 4: Invitation and menu

After completing her dinner party invitations, Jessica reflected:

> I really enjoyed the dinner party invitations. It really made me think deeply about my research question… I had to consider my question and what I am *really* wondering about. It also gave me the opportunity to think about the inspirations in my life, as well as teacher-researchers and other academics.

Self-Reflection to Spark Conversation

A crucial aspect of crystallization is a kind of cycle of action. As Laura Ellingson stresses, crystallization includes "a significant degree of reflexive consideration of the researcher's self and roles in the process of research design, data collection, and representation" (2009, p. 10).

The ongoing cycle of action and reflection are at the heart of our journeys as teachers. Our group has been exploring questions like, "What drew us to teaching in the first place?"; "What are the threads in our teaching lives and commitments that ground us and keep us teaching?"; "How has our teaching practice evolved and changed?"

Rather than exploring these reflections in isolation, we have found it helpful to write, and then use our writing to spark conversations with each other that lead us to insights and revitalized classroom agendas.

We found one simple structure for self-reflection that helped us focus on our professional changes. Using the format of parallel lists, we brainstormed what we used to do and what we now do.

High school English teacher Susan was surprised to note how much her teaching practice had changed:

I used to:
1. be a grammar and usage stickler, proofing and correcting every tiny error on a student's final draft.
2. act as if mine was the only class for my students, giving lengthy reading assignments and papers.
3. have rigid deadlines with grades lowered one letter for each day late.
4. give lots of "fix-it" comments and red-pen editorial marks, and few notes on what worked well.
5. be strict about needing to keep a boundary between myself as a young(ish) teacher and adolescent students.

Now I:
1. grade one or two writing traits per paper and allow students (and myself) to break some rules and find a voice.
2. assign shorter papers and short stories as well as novels to read.
3. am more flexible with deadlines according to the needs of my students.
4. focus much more on the positive when I give students feedback.
5. allow myself to be more relaxed, smile a lot—and can still be in charge.

Cassie works with younger children and also saw big changes in her expectations for her students—and for herself:

I used to:

1. expect children to work at their desks.
2. expect children to all write on the same topic.
3. expect kids to make friends and "behave."
4. only rarely share my own writing.
5. be afraid to challenge my students much or make work "too hard."
6. sit back and listen passively at faculty meetings.
7. expect to be a classroom teacher forever.

Now I:

1. encourage children to work everywhere in the room, wherever they need to.
2. encourage children to choose to write on their own topics.
3. model and teach what cooperation and being friends looks like.
4. share my stories, poems, and all kinds of writing all the time.
5. figure out what each of my kids can do, and set high expectations for their work.
6. speak up and take action, volunteering to lead committees and advocate for new policies.
7. think about going into a leadership position in literacy and curriculum.

Cassie's reflection led to dialogue in our group about how changes in our teaching and evolving practices can help map out future directions for our work. Most importantly, we had the opportunity for rich conversations about our classroom practice, stories from the classroom, and evolving plans. We found this to be a great way to start our meeting time together. Depending on the amount of time you have, you might also use it as a closing reflection, or write your parallel lists at one session, and open with the conversation about them at the next meeting.

Though our teaching situations are different, we are all in this work together. We found it invigorating to give ourselves the time to follow up on our quiet reflection and pave the way for renewed action.

Teacher-researchers are finding many benefits to integrating the notion of crystallization into their teacher-research. The creativity and conversation are invigorating—and it's also a way to intentionally bring our teacher voices into our work. Using narrative and story, personal images and poetry bring the reality of our teaching and living experiences to our audiences.

As we move into the 21st century, it is important to remember that teacher-research is a gift: to the profession, helping us change the way we see old problems and bring us new solutions; to research communities, showing us new research strategies such as crystallization, and how we might take risks in writing up our research; and to ourselves, reminding us of the energy and passion in learning that made us teachers in the first place. Teacher-research may not give us all the answers we crave, but it will help us find creativity and joy in living our questions.

References

Ellingson, L. (2008). *Engaging crystallization in qualitative research*. Thousand Oaks, CA: Sage Publications.

Harwayne, S. (2000). *Lifetime guarantees*. Portsmouth, NH: Heinemann.

Janesick, V. (1998). *Stretching exercises for qualitative researchers*. Thousand Oaks, CA: Sage Publications.

Janesick, V. (2000). "The choreography of qualitative research design: Minuets, improvisations, and crystallization." In N.K. Denzin & Y.S. Lincoln (Eds.) Handbook of qualitative research (pp. 66–81). Thousand Oaks, CA: Sage Publications.

Richardson, L. (1994). Writing: A method of inquiry. In N.K. Denzin & Y.S. Lincoln (Eds.) *Handbook of qualitative research* (pp. 516–529). Thousand Oaks, CA: Sage Publications.

Van Camp, R. (1998). *What's the most beautiful thing you know about horses?* San Francisco: Children's Book Press.

Ruth Shagoury can't imagine anything more fascinating than exploring the minds of children and adolescents as they grow as writers, readers, and language users. Though she teaches new and veteran teachers at Lewis & Clark College in Portland, Oregon, her passion for working with children keeps her connected to classrooms, collaborating with teacher-researchers who serve largely immigrant populations as they investigate student-based approaches to literacy. She holds the Mary Stuart Rogers Chair of Education at Lewis & Clark College.

LINK TO:

www.lclark.edu/graduate/faculty/members/ruth_shagoury/

Of Birdhouses and Mosaic Cats: Conquering Fears in the Muddle of Inquiry

Alane Starko, Eastern Michigan University

ABSTRACT

This reflection considers the aspects of classroom focus, instructional practice, and evaluation that impact successful inquiry, as viewed through the author's experience in an adult art class. Topics considered include varying organization for the appropriate problem type; and creating a classroom supportive of inquiry through encouraging questioning, teaching independence, and using effective formative and self-evaluation.

Of Birdhouses and Mosaic Cats

While its roots go even deeper, the concept of inductive, or inquiry, teaching has been an important part of the modern educational landscape since Bruner's (1963) *The Process of Education*. It has taken many shapes, from concept attainment, to inquiry-based teaching, to problem-based learning (see, for example, Joyce, Weil, & Calhoun, 2009). But the underlying assumption of inquiry in its many varieties is that because learning is a constructive task, students will learn best when they are provided with experiences that allow them to discover concepts and generalizations through experience. The idea of learning as a constructive task is supported by the growing knowledge base in cognitive psychology (Bransford, Brown, & Cocking, 2000), but the processes of inquiry teaching and learning are less universally accepted.

Both a cadre of researchers and any experienced teacher can tell you that inquiry activities are not always successful (Kirschner, Sweller, & Clark, 2010; Klahr &

Nigam, 2004; Mayer, 2004). Some students may explore materials without drawing the hoped-for conclusions. Other students may jump three steps down the logic path, confusing those they leave behind. Kirschner et al. (2010) argue that while cognitive psychology supports learning as a constructive process, it also explains the failures of inquiry-based teaching because of the increased cognitive demands placed on novice learners. It can be argued that the "pure discovery" (Mayer, 2004, p. 14), used to define inquiry in such critiques, is a straw man, representing an extreme of practice seldom seen in classrooms, but still, demonstrations of limited student learning must be taken seriously.

On the other hand, lack of opportunity to explore and inquire also carries risks, what one author calls the "double-edged sword of pedagogy" (Bonawitz et al., in press). Children who are directly taught about the uses of an object are less likely to explore it and discover alternatives, and are more likely to imitate what they've been shown, even when it is less efficient (Bonawitz et al., in press; Buchsbaum et al., in press). The notion that students explore less after direct instruction is particularly problematic if varied explorations are likely to lead to more substantial understanding.

This leads to the logical question, "Under what circumstances are inquiry activities successful?" and more particularly, "What can teachers do to maximize the possibility of success within their inquiry activities?" Researchers have investigated the question, examining the impact of teaching strategies (Herrenkohl, Tasker, & White, 2011; Viilo, Seitamaa-Hakkarainen, & Hakkarainen, 2011), feedback format (Moreno, 2004), and level of structure (Mäkitalo-Siegl, Kohnle, & Fischer, 2011), among other approaches. This reflection will take a more personal view, examining the circumstances that led the author through a successful inquiry experience in an area that was both unfamiliar and uncomfortable.

In considering this experience, and the relationship it may have to other forms of inquiry, I've used the broadest of definitions. For purposes of this discussion, "inquiry" will entail a variety of types of experience with differing levels of teacher guidance and differing goals. These include the following categories.

1. Inductive teaching activities focused on specific content. These include activities such as concept attainment lessons (Joyce et al., 2009), where the focus of the lesson is to teach specific concepts or generalizations through the purposeful presentation of exemplars.

2.   Inductive teaching activities focused on teaching inquiry methodologies. These activities are focused on teaching the inquiry methods of a discipline, including strategies associated with the scientific method, or strategies for gathering and evaluating information from multiple sources. Such activities may be structured to also teach needed content, as in Herrenkohl et al. (2011).

3.   Creative activities focused on creating original products or solving original problems. These are the activities that represent "real-world" inquiry, where the problem is genuinely new and the results unknown. This is the type of inquiry in which I engaged in the adventure described below. While it may be viewed as "extreme inquiry," I believe it also provides opportunities to consider implications for inquiry more broadly.

Conquering Fears in the Muddle of Inquiry

Last summer, while in the midst of the brilliant chaos that is the Ann Arbor Art Fairs, I saw a large mosaic mirror that would have been stunning over my fireplace. Unfortunately, a quick glance at the price tag was stunning as well. For reasons I still do not understand, I was struck with the idea, "I'll bet I could make a mosaic mirror." At a number of levels, this idea made no sense. Not only did I have no clue how to make a mosaic, but I have also thought of myself since elementary school as a person with no evident artistic talent. My drawings never look the way I intend them. During my early first-grade teaching days (that, sadly for my students, pre-dated both clip art and Google Images), I frequently had to explain the illustrations on my newly created learning activities with comments such as, "I don't care what it looks like, it is supposed to be a chicken." Clearly, I was no artist.

Still, the idea persisted, so with a burst of courage, I signed up for a community mosaic class. The first day of the class I was nervous but found my way to the studio, built in a detached garage behind the instructor's home. Opening the door felt a bit like walking into an art supply store that had exploded. There were mobiles hanging from the ceiling—some of beads, some of toys—and a skein of plastic flamingos dangling in one corner. There were boxes of beads, crates of glass, broken dishes and bins of unidentifiable objects covering three walls. In the middle of the room was a tall wooden worktable at which about half the students were busily working, and the

other half were sitting, looking about as dazed as I felt. I sat on a tall stool with the other obvious newcomers.

This did not look like my idea of a first day of class. My classes begin with a syllabus, clearly defined outcomes, and grading criteria. I wasn't anticipating that, but I was expecting someone to say something like, "There are three basic steps to making a mosaic," or "Some of the earliest art we still admire is mosaic art," or even, "First, take out a pencil!" We waited for someone to tell us what to do. Instead, the teacher looked at us and said, "Do you know what you want to make?" My first thought was, "Uhhhh, a mosaic??" but I couldn't quite bring myself to say it. When most of us just sat there, the teacher produced an extraordinary collection of books about mosaics and piled them on the table. "Here, see if these give you any ideas."

So we started looking through the books, and looking around the studio. My initial impression of explosion gave way to a vision of organized chaos. There were projects of every description all over the room: on shelves, on the walls, and on the ceiling—even one that was a frame for a large mirror. There were students working on house numbers, picture frames, trays, and boxes. It didn't take many books to realize the scope of mosaic art was much broader than I'd imagined. One by one, the new students looked up and identified projects they wanted to begin. I became intrigued with a round mosaic of water creatures, divided into sections by curved black lines. I knew I didn't want mosaic fish, but the curved lines captured my imagination. Ultimately, I explored the various wooden objects around the room. I wanted to start with something small, but I didn't want to make house numbers or a picture frame, so I settled on a small decorative birdhouse.

I showed the teacher the picture of the fish mosaic and the black lines. She produced paint (to even the background), glue, and several varieties of small black tiles. And so it began. I took the entire semester to complete my birdhouse. It started with curved black lines that circled the wooden frame, dividing it into irregular shapes. I found I loved exploring the bins of colored glass. The birdhouse ultimately was covered with winding bands of color: green to blue to purple, with an iridescent snow-like roof. When it came time to grout the birdhouse, the instructor and I puzzled over the colors that would highlight the glass best, and what emerged was a project that now holds the studio record for the number of different colors of grout in a single project (4)! To my amazement and delight, I like my birdhouse. I'm proud of it. And even more astonishing, there is a glimmer of a thought in my head that perhaps I'm not a person completely without artistic ability. After all these years—do you think this is how Grandma Moses felt?

So now, I really am going to tackle a mirror for my fireplace. It has evolved into a project even more elaborate than the original Art Fair inspiration. This mirror will have a rectangular frame with a wooden cat sprawled across the corner, tail and feet hanging down into the mirror. I've managed to create a cat pattern that is recognizable as a cat, and I'm excited to begin.

As I anticipate the new project, I've been thinking about my mosaic-class experience and how it relates to the things we ask of students beginning inquiry. What about this experience allowed me, a person who, for 50+ years has thought of herself as having no artistic talent, to genuinely enjoy this journey? Many of our students have similar thoughts about themselves as learners. Where I think of myself as someone who "can't do art," others think of themselves as students who "can't do" science, social studies, math, or any number of things. Our students, in general, come to us with the expectation that they'll be told exactly what to do. And my initial reaction of "Uhhhh, I want to make a mosaic," was not really very different from the countless students I have asked, "What would you like to study?" and who looked at me with blank expressions. Clearly there are differences between an adult taking a recreational art class and students in school. But it seems there are lessons to be learned, nonetheless.

Every Project Needs the Right Beginning

One of the first considerations in planning any kind of inquiry activity is, what is the goal? There are several kinds of activities that are sometimes grouped under the term "inquiry." Each of these needs the right beginning. A mismatch between the type of activity and its beginning can short-circuit an activity before it starts.

Content-Focused Inquiry: Presented Problems

Some inquiry activities are structured inductive activities designed to teach particular concepts or generalizations. For example, young children might explore a variety of materials to determine that are attracted by a magnet, or older students explore a series of poems to discover the strategies used in descriptive imagery. In these projects, the method allows students the flexibility to discover the targeted

principles, but the desired end result is pre-determined. It is the teacher's responsibility to carefully select the materials and target questions to assure that the students have the opportunity to discover the desired principles. For example, if the teacher in the magnet activity failed to provide any items that were copper or aluminum, students could reasonably develop the generalization, "Magnets attract all metals," and have no examples to contradict it. A good beginning for these inductive activities entails careful selection of materials and framing questions. Such problems, where the questions and goals are known and structured by the teacher, can be called *presented problems* (Getzels, 1964, 1987). In this case the problems could be called Type 2 problems, because the problem and correct answer, but not the precise method of solution, are known. (A Type I problem would be like an example in a traditional math book: the problem is known, the steps to solution are directed, and the answer is in the back of the book.)

Other inquiry activities are designed primarily to teach investigative skills, while still based in some aspect of core content. Many typical school research projects are of this type, another variety of presented problems. If the intent is to learn how to organize and communicate information from multiple sources, it doesn't matter whether the content investigated is medieval weaponry or medieval music—and if having different students investigate different content allows the group access to more content, so much the better. In this case, the activity begins with the teacher identifying the skills to be mastered, and then determining how much flexibility in content is desired. Then the activity—and, in particular, the evaluation criteria—can be developed at the beginning, to direct students for maximum success. If particular strategies or skills are to be demonstrated, those can be specified. Similarly, if specific content outcomes are to be addressed, those can be made clear to students. For example, if a general content outcome is to describe cultural transformation from medieval to Renaissance times, that understanding could be demonstrated using changes in either music or weaponry as examples of broader patterns. If those expectations are clear from the beginning, students are much more likely to successfully tie their varied explorations to the desired content and skills. If we are dealing with presented problems, the problems should be clearly presented.

Creative Activities and Problem Finding: Discovered Problems

Some inquiry activities, like my birdhouse adventure, are, at their heart, creative ventures. They may incorporate essential skills (for example, I learned a lot about glass cutting and grouting), but the project itself is designed around a problem the student selects. These are the kinds of problems Getzels (1964, 1987) called *discovered*

(or Type 3) problems, since the problem, method, and results are all unknown. Activities of this type can occur in any domain, but in school they may most often be found in creative writing, science projects, and the arts.

If we want students to experience the full creative process, they must experience the often-muddling beginning stage called problem finding. The problem itself must be discovered. Problem finding, in its broadest sense, underlies all types of creativity. Some of the most basic research in problem finding was done with visual artists (Getzels & Csikszentmihalyi, 1976). In those studies, artists were considered to be problem finding as they manipulated materials to find ideas for their paintings— much as I did with my birdhouse. *The more time and care the artists spent in finding and defining their problem (task), the more creative the outcome.* But problem finding is not limited to artistic endeavors. Every area of creativity requires an initial decision about the task to be addressed. Writers decide what to write; scientists decide what to investigate; historians set out to explore a new area of analysis. In each case they are finding a "problem"—a situation to address or ideas to communicate. Extending these processes into classroom situations can allow creative activities to occur there naturally. It is for this reason that it is so essential that we clarify our instructional goals at the beginning. If our focus is on concepts and generalizations to be understood, our key beginning task is making sure the activity has clarity of purpose and a structure that will allow students to interact with materials in a way that will allow the concepts to develop. On the other hand, if one of our core goals is to engage in the creative process (while, we assume, also teaching the skills associated with that process in a discipline), we cannot assign all students an identical "creative project" to pursue. Finding the task IS the task—or at least part of it. This means that just as I had to have time to look at books, see sample projects, and explore the available materials before beginning to learn the skills of mosaic-making, so students who begin a major creative writing project or individual scientific investigation will need time and support to find their problems. It is possible to structure activities specifically designed to teach students the skills or problem-finding, including exploring with interest, playing and wondering, and capturing questions (see Starko, 2010).

Alane Starko

Skill Development and Just-in-Time Teaching

A second key to my growing confidence in mosaic-making has been the just-in-time teaching of needed skills. I initially envisioned class starting with instruction on all needed skills before beginning the project. Instead, we began the projects and learned skills as the need for them arose. While at the beginning this felt disconcerting (How could I be starting a mosaic knowing nothing about grout?), as I learned each new skill I gained confidence, not just in that skill, but in the fact that I would not be left to flounder. When the need for a skill came, the instruction was targeted and clear.

Similarly, in an inquiry activity, it is essential that teachers anticipate the needed skills and how they will be taught. In any inquiry process there are likely to be some parts where students should just "muck about" and learn things through experimentation, analyzing errors and critical thinking. There are other parts where leaving students to flounder on their own is inefficient, unsafe, or just silly. Clearly we would not let students "discover" how to use power tools. But it also may be foolish to have students spend a lot of time figuring out processes that can be taught in a straightforward manner, or concepts necessary for further analysis. For example, we could allow students to experiment with litmus paper or temperature probes, but we also could just teach them how those tools can be used, and then let them apply the skills to research questions. The choice depends on your goals for that lesson.

To me, this represents an important fallacy in some of the articles touting the "failure" of inquiry. For example, Klahr and Nigam (2004) claim to be comparing direct instruction with inquiry learning. However, all students designed experiments and gathered data. The more successful "direct instruction" group was given specific instruction on the characteristics of a good experiment before being asked to design experiments of their own. In my view, this is not a repudiation of inquiry; it is an example of well-structured inquiry, including instruction that facilitated students' investigations. Viilo et al.'s (2011) assessment is a classic understatement, "The delicate balance that enables novice performers not to experience cognitive overload . . . is difficult to achieve" (p. 52).

Creating a Place to Try

The bedrock of successful inquiry is a classroom atmosphere that encourages trial-and-error, a "problem-friendly classroom" (Starko, 2010, p. 120). Even as an adult, I've been struck by how much my interactions with the other students have affected both my willingness to try, and my enjoyment of the journey. For the first several weeks of my mosaic class, I said very little. Several of the other students clearly knew each other well and talked about their outside activities during the class. Those of us who were new kept quiet. Then one week I was unable to come to my usual class, so I attended another section offered on a different day of the week. By chance, I knew one of the other students. We started talking, then I ended up talking with most of the people in that class. I attended that class several times and always felt more comfortable there than in my assigned group.

What is important in this experience is not that one group was more welcoming than the other—those things happen in any teaching situation—but how much difference it made in my process of birdhouse building. In my original group, I might occasionally ask a question ("Where did the glue go?"), but basically I stayed quiet and cut glass. In the second group, collaborative problem solving was frequent and effective. Individuals often sought feedback on their glass choices, the color of their grout, placement of individual pieces, and everything else imaginable. One night, while continuing to work on their own pieces, the whole group worked together to figure out a particularly tricky grout problem. It ended up being solved in a manner the teacher had never used before.

In addition to just being a happier place to be, this classroom transmitted important messages loud and clear, "No one has all the answers here. We're all experimenting. If you are stuck, you have lots of resources. Sometimes things go wrong; we just fix them." The collaborative atmosphere also provided countless opportunities for informal learning. After having participated in solving the grout problem, I was much better prepared to address the multiple color needs of my birdhouse.

In contrast to the stereotype of the lone creator in a studio or bubbling lab, much inquiry in the real world is cooperative (see, for example, Sawyer, 2007). Scientists work in collaborative labs, design teams power the business world, and the

Internet supports group efforts in multiple disciplines—even music written collaboratively by people who are never in the same room! Traditional school practices of "do your own work" and "eyes on your own paper" may be appropriate for particular evaluation activities but they do not mirror best practices of learning and inquiry in the real world.

Most classrooms have both more complex needs and richer opportunities for community-building than my once-a-week mosaic class. Inquiry activities often require a focused collaboration. For example, the teachers in Herrenkohl et al.'s (2011) study both emphasized the collective roles of their classes as intellectual communities, establishing a classroom where "any question was an opportunity for thinking" (p. 37).

The challenge is that problem-friendly classrooms cannot function just during "inquiry time." If every problem has a right answer and every answer comes from the teacher—except during those magic intervals when students are to be inquiring and figure the answers out on their own—inquiry is doomed to failure. A problem-friendly classroom isn't always solving problems, but it is always open to them. A class that is a safe place to make mistakes is safe all the time, or students will know that safety is a sham.

What makes a classroom safe for inquiry? This list is long, beginning with respect for individual students as mindful human beings rather than potential generators of test scores—a mindset that is not easy to maintain in today's high-stakes testing climate. A problem-friendly classroom incorporates strategies that are supportive of intrinsic motivation (Amabile, 1989), including support for interests and choice, fostering a sense of increasing competence, and care in using rewards. It also encourages questioning and experimentation, teaches both cooperation and independence, provides informational feedback in assessment, and encourages self-assessment (Starko, 2010).

Questioning and Experimentation

One key goal of a problem-friendly classroom is to encourage students to ask questions—each an opportunity for thinking. It is, after all, impossible for students to investigate, challenge, or dream without raising questions. Although it is important that students feel comfortable expressing confusion or lack of understanding about content being taught, it also is essential that they feel free to ask questions that go beyond the immediate issues. The essence of this type of question

is not, "I do not understand what you have explained," but "I wonder beyond what I know." Productive people wonder all the time—about the things they see, the things they hear, the things that trouble them, and the things that bring them joy. Wondering is at the heart of problem finding and inquiry. Unfortunately, students seldom experience this type of questioning in school. School questions generally have one correct answer, and it can be found in the back of the book. The real world is not like that. Teaching students to question, to wonder, is to provide them with a skill for lifelong learning—as well as creative inquiry.

There are at least five strategies you may consider to encourage student questions. First, teach students the difference between checking for understanding and genuine questions. They should know the difference between "questions" you ask to determine their understanding and things you genuinely want to know. Second, model real questioning behaviors. Share your puzzlement and curiosity with your students. Sometimes this may be a casual comment about a current fad, other times your questions may be more serious and related to the content.

Third, *teach* students to ask questions. Don't expect it to happen spontaneously. Some of your students have long experience in environments in which questioning is not welcomed. You may want to do a lesson on what constitutes a question, why people ask questions, and why questions are important.

Fourth, respond to student questions with respect. A friend's young daughter came stomping home from school one day, disgusted with her teacher's use of the K-W-L reading strategy. In the K-W-L technique, students are asked what they *K*now about a topic, what they *W*ant to know, and, later, what they have *L*earned. Her response was, "I don't know why they bother with the W anyway. She asks us what we want to learn, and then we just do what the teacher wants to do anyway." Although we know it is impossible to investigate every question posed by an enthusiastic group of learners, students should have confidence that at least some of their questions will be addressed and all of them will be valued.

Finally, and fifth, consider teaching the problem-finding (question-asking) strategies of your discipline. History teachers can teach about the kinds of questions historians might ask; science teachers can consider lessons that focus on asking good questions regarding particular observations. In all cases, understanding that knowledge comes from somewhere, often as a result of someone's question, makes it clear that questioning and problem solving are valuable skills.

Teaching for Independence

Organizing a classroom to facilitate inquiry implies many things. Certainly it demands a classroom climate that accepts diversity, welcomes new ideas, respects questions, and promotes exploration. There also are logistic elements that can support—or undermine—student inquiry. Among these are strategies that allow students to spend part of each school day working without specific teacher direction. Remember how disconcerted I felt when entering the mosaic class without directions? Similarly, students who are to work in any kind of inquiry activity are stepping out into unfamiliar territory, where the teacher is no longer the step-by-step guide. Even highly structured inquiry activities require students to make choices, ask questions, and work with some level of independence. Just as cooperative learning advocates clearly articulated that skills of cooperative work must be taught, not simply demanded (Johnson & Johnson, 1994), students' skills of independent work do not happen automatically. If most of your teaching has been teacher-directed whole-group instruction, your transition to a less directive mode will require planning.

The first key to making the transition to independent student work is realizing that you need to *teach* students how to work independently. It is not sufficient to tell them to be independent; you must teach them how to do it. You may start this process by planning a series of lessons specifically targeting independent work and inquiry. Topics could include such things as becoming independent, what it means to do inquiry work, what to do if you are stuck, and expectations about noise, use of materials, etcetera.

The need for specific instruction, modeling, and practice is not limited to young children. *Even secondary students who have had limited experience with independent work benefit from careful instruction on the procedures and expectations for this type of work.* In fact, the more ingrained the habit of waiting for teacher direction, the more vital such instruction may become. Students who are prepared for the ambivalence of inquiry are much more likely to stick with the task and be successful.

But You Didn't Have to Deal With Grades

I will admit I am grateful that no one graded my birdhouse. And yet, feedback from my teacher and my fellow students helped me shape the project and, ultimately feel successful. So we must consider, what about assessment?

One of the most powerful forces in determining classroom climate is the means, timing, and format of evaluation. In a traditional classroom the teacher teaches, students (presumably) absorb what they are taught, and when some segment of teaching is completed, there is an evaluation—most often a test or quiz. I should be clear that I am not opposed to tests, as one form of evaluation. When I teach assessment classes, learning to write traditional tests is one of many skills students must learn. But the traditional model of "teacher teaches, students learn, and teacher evaluates the results" is another source of powerful messages. It communicates that the teacher is both the source of knowledge and the judge who determines if the knowledge is accurate. Of course, both of those things are true in some classroom activities. But if students are to grow into independent inquirers, this cannot be the only perspective. A student who views the teacher as the sole focus of both learning and evaluation is wise to be cautious about attempts at inquiry. What if they don't "inquire" the right way? What if the teacher says they are wrong? Will they get a bad grade? It isn't surprising that such students want someone to just tell them what to do—much as I did at the beginning of my birdhouse adventure. Anything else, logically, feels risky.

Formative Evaluation

Surprisingly, one of the ways students can gain confidence in their academic endeavors is through the thoughtful use of assessment, particularly formative and self-assessments. Formative assessment is one of the most important concepts in assessment—and in education—today. There are a lot of definitions, but the one I think is the clearest comes from W. James Popham (2008) in his book *Transformative Assessment*. His definition is succinct but powerful: "Formative assessment is a planned process in which assessment-elicited evidence of students' status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics" (p. 6). Each aspect of this definition is important enough that it merits a bit closer look.

First, formative assessment is a <u>planned process</u>. It is not a test—despite a lot of publishers' best efforts to market their materials that way. A test can be used in either a formative or summative manner. Formative assessment is not the instrument, it is the thoughtful manner in which teachers and students plan and use assessment information.

The information teachers and students use is <u>assessment-elicited evidence</u>. It can include formal and informal assessments. Formative assessments can include short quizzes or traditional class activities, but they also include my teacher watching my glass-cutting technique and pointing out how I could keep the glass from scattering, or her comment that the way my black lines wound around the birdhouse drew her eye around the piece. Each comment helped me identify either something I could improve or something I'd done well. Inquiry teaching is full of moments of informal assessment, as teachers evaluate "on the fly" whether students' investigations are progressing in constructive ways or devolving into wheel-spinning. Either situation can provide the opportunity for *descriptive feedback*, one of the key elements of successful formative assessment. Moreno (2004) found that even software is more effective at facilitating student inquiry when it gave explanatory feedback, rather than simply identifying if the student's response was correct or incorrect.

Perhaps the clearest identifying characteristic of formative assessment is that it is used to make <u>instructional adjustments</u>. Rather than moving ahead with planned instruction like something of a runaway train—with students either on board, clinging to the sides, or left beside the tracks—formative assessment allows teachers to make mid-course corrections and change tactics while instruction is occurring, instead of waiting until the end of body of instruction for the final judgment. Well-used formative assessment enhances the quality of instruction, because the teacher is constantly aware of the level of students' understanding and working to match it.

This is particularly essential when working with inquiry activities. Inquiry activities can be a challenge to our sense of efficacy as teachers because it is very hard to fool ourselves when things aren't going well. During direct teaching, we can move through the lesson, asking questions of a few students, and assume all students understand the information. It is much harder to delude ourselves during a lesson in which students are supposed to question or experiment and they lapse into blank stares. In truth, I think this is a gift of inquiry instruction, but it isn't easy. It takes sensitivity and a deft touch to involve students in inquiry activities, allow them independence to work, and yet recognize when a bit of helpful feedback will keep them

on course. An effective teacher in inquiry activities is constantly aware of what students are doing, what is going well, and where the sticking points may be. Such feedback has a collaborative spirit—the intent is not to judge, but to help students stay on a successful path.

Of course, teachers are not the only ones who use formative assessment. It is also the basis of student decision-making, as students make tactical changes in their learning strategies based on what they do and do not understand. The process of understanding, and taking responsibility for, their own learning processes can be both motivating and empowering for students. One of the differences I am finding in my second semester of mosaic, is that while I have more confidence in my own judgment, I'm also better able to identify when I need more information and less hesitant to ask for it.

Self-Assessment

Clear descriptive feedback (together with, where appropriate, well-defined scoring rubrics) gives students power. Understanding the criteria by which their work is judged can take evaluation from something a teacher "does to" them, to the application of an understandable set of standards. Students, too, can apply those standards in the process of self-assessment.

Self-assessment requires judgment. Allowing students to correct their own spelling tests is not self-assessment. An outside source (the dictionary) is the absolute determiner of the quality of the work. Effective self-assessment requires students to evaluate their efforts against some scale or criterion, and make judgments about how they measure up. Beginning in primary grades, students can be taught to evaluate their own products. They can assess their stories for complete sentences; a clear beginning, middle, and end; or the use of interesting descriptions. They can judge the use of color in their paintings or the precise definitions of variables in science projects. Initially, teachers should provide guide sheets or checklists to help students focus their evaluations. Later, students can add their own variables or develop their own forms of assessment. Understanding the criteria by which one is being judged can take both the mystery and at least some of the anxiety out of the evaluation process—which is essential if students are to fully engage in inquiries that feel puzzling and unpredictable.

Alane Starko

Finding Our Way

And so, in the end, the road to inquiry remains muddy. Such is the nature of the process. While teachers can define goals, in particular, articulating when there is a "right answer" to be identified and when there is not, in the end, the role of the teacher is not to take the mud out of the road, but to help students develop the skills to make the journey. We start to do this by knowing, ourselves, the kind of journey that lies ahead—is today's jaunt a direct route aiming at a particular peak above, or could it be a meandering trail leading to multiple goals? We prepare students with the skills needed for the journey, and the emotional support to continue when things get rough. And finally, we commit to clear and honest feedback that will help them stay on a successful path. I have learned how exciting it can be to manage a journey I thought was beyond me. May your students share my delight!


Fig. 1: My mosaic birdhouse

References

Amabile, T. (1989). *Growing up creative*. New York: Crown.

Bonawitz, E., Shafto, P., Gweon, H., Goodman, N. D., Spelke, E., & Schulz, L. (in press). The double-edged sword of pedagogy: Instruction limits spontaneous exploration and discover. *Cognition* (2010).

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). *How people learn: Brain, mind, experience and school*. Washington, DC: National Academy Press.

Bruner, J. (1963). *The process of education*. Cambridge: Harvard University Press.

Buchsbaum, D., Gopnik, A., Griffiths, T. L., & Shafto, P. (in press). Children's imitation of causal action sequences is influenced by statistical and pedagogical evidence. *Cognition* (2011).

Getzels, J. W. (1964). Creative thinking, problem solving and instruction. In E. Hilgard (Ed.), *Sixty-third National Society for the Study of Education yearbook: Part I, Theories of learning and instruction* (pp. 240–267). Chicago: University of Chicago Press.

Getzels, J. W. (1987). Problem finding and creative achievement. *Gifted Students Institute Quarterly, 12*(4), B1–B4.

Getzels, J., & Csikszentmihalyi, M. (1976). *The creative vision: A longitudinal study of problem finding in art*. New York: Wiley.

Herrenkohl, L. R., Tasker, T., & White, B. (2011). Pedagogical practices to support classroom cultures of scientific inquiry. *Cognition and Instruction, 29*, 1–44.

Johnson, D. W., & Johnson, R. T. (1994). *Learning together and alone. Cooperative, competitive, and individualistic learning* (4th Ed.). Needham Heights, MA: Allyn & Bacon.

Joyce, B., Wiel, M., & Calhoun, E. (2009). *Models of teaching* (8th Ed.). New York: Pearson.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2010). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist, 41*, 2, 75–86.

Klahr, D., & Nigam, M. (2004). The equivalence of learning paths in early science instruction: Effects of direct instruction and discovery learning. *Psychological Science, 15*, 661–667.

Mäkitalo-Siegl, K., Kohnle, C., & Fischer, F. (2011). Computer-supported collaborative inquiry learning and classroom scripts: Effects on help-seeking processes and learning outcomes. *Learning and Instruction: 21*, 257–266.

Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning?: The case for guided methods of instruction. *American Psychologist*, 59, 14–19.

Moreno, R. (2004). Decreasing cognitive load for novice students: Effects of explanatory versus corrective feedback in discovery-based learning. *Instructional Science, 32*, 99–113.

Popham, W. J. (2008). *Transformative assessment*. Alexandria, VA: ASCD.

Sawyer, K. (2007). *Group genius: The creative power of collaboration*. New York: Basic Books.

Starko, A. J. (2010). *Creativity in the classroom: Schools of curious delight* (4th Ed.). New York: Routledge.

Viilo, M., Seitamaa-Hakkarainen, P., & Hakkarainen, K. (2011). Supporting the technology-enhanced collaborative inquiry and design project: A teacher's reflections on practices. *Teachers and Teaching*, 17, 51–72.

Alane Starko is a professor in the Department of Teacher Education of Eastern Michigan University. A former elementary classroom teacher, teacher of the gifted, college department head and interim dean, she is enjoying her return to faculty life, particularly the new adventure of teaching online classes. Alane is the author of *Creativity in the Classroom: Schools of Curious Delight* and other publications on creativity, gifted education, teaching research to children, and curriculum development.
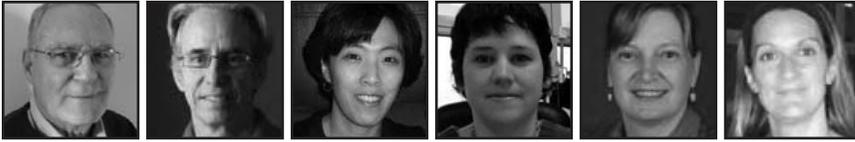
Teacher-Based Inquiry in the BCT Project

A.E. Ted Wall, Alain Breuleux, Gyeong Mi Heo, Karen Rye, Marie-Helen Goyetche & Véronique Lemay

ABSTRACT

Over the past four years, teacher-based inquiry has played a central role in the Building Community Through Telecollaboration Project, which involves Quebec elementary school teachers in a community of practice focused on the integration of ICT-supported learning into the classroom. During the school year, the teachers met in four face-to-face meetings. Between these meetings, three Cycle Team Leaders facilitated ongoing collaboration using a variety of communication tools. Some of the questions that were addressed in the project and the results that were generated through its multi-organizational partnership are shared along with some of the major lessons learned.

The major purpose of this paper is to illustrate the crucial role that inquiry-based activities have had on the development of a community of practice among elementary school teachers in Quebec's English-speaking school boards (Wenger, 1998; Wenger, McDermott, & Snyder, 2002). The participants in this community of practice include teachers, school administrators, consultants and university personnel. Several features of this community of practice are in line with recent recommendations on effective professional learning, namely, its focus on ICT-supported learning in the classroom, its emphasis on teachers meeting and learning from each other over an extended period of time, the use of group processes to support collegial sharing, as well as the use of teacher inquiry and knowledge building processes (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Easton, 2008; Killion & Roy, 2009). In addressing the role of teacher inquiry within our community of practice, we will share some of the key questions we have asked and consider

A.E. Ted Wall, Alain Breuleux, Gyeong Mi Heo, Karen Rye,
Marie-Helen Goyetche & Véronique Lemay

some of the knowledge that has been generated. We will highlight some of the processes that have been used, the benefits and challenges of using them and the interesting and important results that have emerged from this multi-organizational partnership.

What is the Building Community through Telecollaboration (BCT) Project?

The Building Community through Telecollaboration Project (BCT Project) stemmed from a CEFRIO Research Report entitled *IT-Supported Learning and Networking in the Anglophone Educational Community of Québec* (Wall, Breuleux, & Tanguay, 2006) that identified key factors that influence the use of information and communication technologies (ICT) in support of student learning. In addition to having up-to-date computers, access to the Internet and suitable technical support, the study found that teachers had to acquire a variety of new pedagogical and technical skills if ICT-supported learning was to become more widespread. At the same time, it was found that relevant professional learning opportunities had to be provided and educational leaders had to organize in-school time and support for the teachers to acquire the required expertise. Many of these findings echoed ones emerging from the ground-breaking École Éloingnée en Réseau Project (EER Project: http://www.eer.qc.ca/) that provided Internet-enabled collaborative learning possibilities in francophone schools in Quebec, mostly in remote areas. The BCT Project plan, while inspired to a large extent by the success of the EER Project, took into consideration the ecology of the English-speaking school community to achieve similar goals. Moreover, the ongoing research from the EER Project influenced the responses to the teacher-based inquiry questions that arose throughout the BCT Project (Laferrière et al., 2006).

In June 2006, LEARN Quebec hosted a Community Consensus Meeting where stakeholders from across Quebec reviewed the above report. After a series of daylong discussions, the participants underscored the importance of ensuring that the following guidelines were adhered to when implementing the report's recommendations. First and foremost, those attending the session stressed that the Quebec Education Program must provide the guiding vision and ICT should be viewed as simply providing the tools to support it. Second, when making decisions about teaching and learning, pedagogy must come first and technology must be at its service. Third, it was recognized that additional research was needed on the impact of ICT-supported

learning as well as on the means to facilitate the increased use of ICT strategies in the classroom. Finally, those in attendance underscored the value and importance of developing a supportive learning community to facilitate the development and sharing of professional knowledge.

Following the above Community Consensus Meeting, representatives from LEARN Quebec and CEFRIO met with colleagues from MELS and the Directors-General of English-speaking Quebec School Boards to discuss the potential of creating a professional development project designed to address the recommendations in the CEFRIO Report. The proposed name of the project, Building Community through Telecollaboration (BCT), reflected its major purpose of bringing together educators who were interested in ICT-supported learning in English-speaking communities across Quebec, with a special emphasis on meeting the needs of small, remote, rural communities. After gaining the support of the Directors-General and MELS, colleagues at CEFRIO and LEARN Quebec created a BCT Lead Team that consisted of two experienced ICT animators from LEARN Quebec, a doctoral student, as well as two professors from McGill University, one of whom was retired.

The BCT Lead Team met on a number of occasions and with the input of colleagues from CEFRIO and Learn Quebec further shaped the purpose of the project and its basic operational features. Since its inception, the basic purpose of the BCT Project has been to encourage, facilitate and support collaboration among students, teachers and educational leaders to enhance learning across the community. Each year, the participants in the BCT Project have confirmed its appropriateness and relevance. Over the past four years, the major objectives of the project have been slightly modified to meet emerging needs; as Figure 1 illustrates, the objectives for the current year (2010-2011) are to:

- facilitate the integration of ICT into teaching practices to enhance student learning;
- encourage collaboration among students and teachers to facilitate learning;
- encourage teachers to reflect on their practices and share expertise with others; and
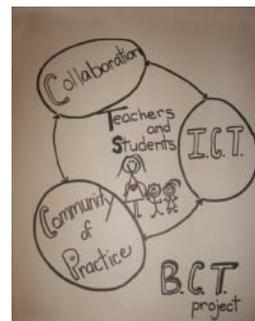- facilitate the development of a community of practice network across Quebec.

Fig. 1: Key elements in the BCT project

A.E. Ted Wall, Alain Breuleux, Gyeong Mi Heo, Karen Rye,
Marie-Helen Goyetche & Véronique Lemay

In order to reach the above objectives, participants in the BCT Project meet on four separate occasions throughout the school year and use a variety of online tools to communicate and collaborate in between those sessions. In addition, online support is available and at times in-person support is provided by members of the BCT Lead Team. Strategic advice regarding the evolution of the project is provided by the BCT Coordinating Committee that consists of members of the BCT Lead Team and representatives from CEFRIO, LEARN Quebec and the Quebec Ministry of Education, Recreation and Sports.

How has the BCT Project evolved over the past four years?

Before discussing the inquiry-based activities that are central to the objectives of the BCT Project, it may be helpful to provide more information on its evolution. The project is currently in its fourth year (2010-2011), during the first two years, the BCT Lead Team worked with approximately 30 teachers and their educational administrators in sixteen elementary schools across Quebec. The teachers and administrators were invited to meet four times each year in Face-to-Face (F2F) meetings in September, November, February and April or May. During those sessions, the purpose and objectives of the project were discussed and information on the use of ICT-supported classroom learning activities, based on the Quebec Education Program, was presented along with information on how to develop collaborative student learning projects. In addition, a variety of ICT tools were introduced and used during those F2F sessions by the teachers including email, blogs, wikis, Google docs and Voice Thread. The teachers were also introduced to the use of Live Classroom, a synchronous online collaboration tool supported by LEARN Quebec, that allows teachers and educational leaders to meet with members of the BCT Lead Team or on their own at pre-arranged times. The Live Classroom platform facilitated the presentation of PowerPoint presentations as well as online discussions by the entire group or smaller groups as was deemed necessary (Breuleux, Heo, Wall, Morgan, & Flores, 2009).

During the first two years, the teachers were encouraged to use previously designed projects that were available on the Internet or develop their own collaborative student projects. A fundamental guideline that was employed during those first two years was to encourage teachers to learn at their own pace. In fact, the teacher feedback emphasized the importance of "taking baby steps" and the value of "reaching out for support" from BCT colleagues.

At the end of the second year, several important organizational changes were made in the project. One of them was the establishment of three networks based on the three Cycles that are used in Quebec elementary schools. In addition, three teachers who were teaching in the different cycles joined the BCT Lead Team. They were offered one-day of release time each week to provide ongoing leadership and support for the teachers in their Cycle Team. The three Cycle Leaders meet on a weekly basis with their university-based colleagues, to review the progress that is being made, share feedback and suggestions from the teachers in their cycles, and plan, deliver and evaluate the professional learning activities that take place in the F2F and online sessions of the project (Heo, Anderson, Goyetche, Taker, & Breuleux, 2011).

In addition to the establishment of a more distributed leadership system, LEARN Quebec opened the Sakai Learning Community Portal (http://sakai.learnquebec.ca). The online space allows the teachers in each cycle to engage in open and sustainable interaction by sharing experiences, thoughts, knowledge, and resources, which can foster inquiry processes in relation to their professional practice, and hence to create a shared repertoire developed within the BCT community of practice (Garrison, 2007; Moore & Barab, 2002; Palincsar, Magnusson, Marano, Ford, & Brown, 1998; Schlager & Fusco, 2003).

What role does inquiry play in the BCT Project?

With regards to the many forms of inquiry in education, see for example the excellent overview by Aulls & Shore (2008), the BCT project engages participants in the following: reflective practice, collaborative action research, and collective problem solving. These three forms of inquiry are encapsulated in the design-based research approach (Bereiter, 2005; Brown, 1992; Collins, Joseph, & Bielaczyc, 2004; Schoenfeld, 2006) that has been a central feature of the project since its inception. The design research process is focused on what works, what needs to be improved and a commitment to gaining a deeper understanding of the benefits, challenges and success factors that underlie the activities that are under investigation. In the case of the BCT Project, those activities include student learning, teacher learning and the leadership efforts of educational administrators who support the project, with a special emphasis on collaboration.

A.E. Ted Wall, Alain Breuleux, Gyeong Mi Heo, Karen Rye,
Marie-Helen Goyetche & Véronique Lemay

Thus, a major focus of the project is on questions related to what actually happens in the classroom as well as online related to student and teacher collaborative learning. Central to the above process is the ongoing collaboration among the teachers and the members of the BCT Lead Team. Hence, questions are routinely posed related to the development, implementation and evaluation of student learning and the professional learning associated with it. Moreover, there has been a continued emphasis on the importance of posing questions that encourage reflection on the part of all BCT participants and the generation of knowledge that can be shared related to the answers to those questions. Thus, a host of inquiry-based questions have been posed to and by teachers, educational leaders and members of the BCT Lead Team in F2F meetings, as well as online.

How are the professional learning needs of the BCT teachers met?

Given the central role of ongoing professional learning in the project, some of the first inquiry-based questions were related to the pedagogical and technological skill level of the teachers. Initially, survey questions were posed to gather this information; however, we began to realize that we needed to develop a more appropriate framework for considering the differential learning needs of the teachers. At the same time, we wanted to create a learning continuum that encouraged the teachers to reflect on their own progress in relation to the expertise they wished to acquire. Table 1 presents the results related to the assessment of computer proficiency during the third year of the project. As the average percentage at each level shows, there was a wide range of computer expertise.

The results related to the self-assessment of the teachers in relation to the classroom use of information technology are presented in Table 2. Again, these results show the widespread professional learning needs that are evident in the group. In fact, one of the major challenges of the BCT Project has been to design F2F and online learning sessions to effectively and efficiently meet these needs.

Table 1:

Self-Assessment of Computer Proficiency by BCT Teachers

	LEVELS	DESCRIPTIONS	%
1	Unfamiliar	Minimal experience with computer technologies	0%
2	Newcomer	Beginning to use computer technologies, but regularly need considerable support	3.4%
3	Beginner	Able to perform basic functions in Word and e-mail applications	13.8%
4	Average	Quite competent in the above and PowerPoint applications	41.4%
5	Advanced	Competently use a broad spectrum of software including digital camera, scanner, and social networking applications	31.0%
6	Expert	Very proficient in using a wide variety of computer technologies	10.3%

Table 2:

Self-Assessment of Classroom Use of Information Technology

	LEVELS	DESCRIPTIONS	%
1	Awareness	I am aware that technology exists, but I am nervous about using it in the classroom	0%
2	Attempting	I am trying to learn the basics, but I lack the confidence to use them in the classroom	17.2%
3	Acquiring	I can comfortably use technology for certain tasks and appreciate that it can be helpful in the teaching-learning process in my classroom	34.5%
4	Adapting	I view technology as a set of tools to facilitate learning in my classroom. I can use different computer applications and peripherals with my students	37.9%
5	Mastery	I can creatively apply computer technologies to support teaching and learning in my class	10.3%

A.E. Ted Wall, Alain Breuleux, Gyeong Mi Heo, Karen Rye,
Marie-Helen Goyetche & Véronique Lemay

The above quantitative data answered several important inquiry-based questions; however, some of the most relevant information emerged from the group discussions and focus group feedback that the teachers shared about the challenges of acquiring increased competence related to ICT-supported learning. On many occasions, experienced BCT teachers shared their initial concerns and fears related to the steep learning curve they initially faced. Due to the collegial sharing of these fears, a basic mantra circulated throughout our community of practice, namely, "remember to take baby steps."

Some of the most important lessons we have learned are related to the factors that impact on the professional learning of the teachers. As we and others have found (Bubb & Earley, 2009; Glazer & Hannafin, 2006), teachers are extremely busy and it is difficult for them to find the time to actually practice the technological skills that they need and at the same time acquire the pedagogical know-how that allows them to feel competent and confident when they are using ICT tools to support learning in their classrooms. Most importantly, we have found that a sure way to discourage teachers from continuing in our community of practice is to set unrealistic deadlines and press them to try and meet them. In our F2F sessions, these "lessons learned" were routinely passed on by the Cycle Leaders as well as by the other more experienced teachers in the groups.

As the BCT Project evolved, it was necessary to adapt the way we gathered information on the key questions that were posed. For example, Table 3 shows the results of a set of questions that were used, during the first F2F meeting in the start of the fourth year (2010-2011) of the project, to encourage self-assessment and reflection by the teachers regarding their progress towards integrating ICT-supported learning into their classrooms. As a perusal of Table 3 indicates, 50% of the 40 teachers who responded to the survey indicated that they were using a variety of ICT tools to facilitate the use of ICT by their students; whereas, only 10% indicated that they were using ICT tools to reflect and share their teaching practices with colleagues. It is interesting to note how the fourth level in this self-assessment is designed to encourage teachers to reflect on the degree to which they are sharing their knowledge with others in the community of practice. By doing so, the BCT Lead Team hoped to encourage teachers to take another "deliciously uncertain" step towards the building of an active professional community of practice, that is, a step just hard enough to make it interesting but not so hard as to discourage people. In fact, it is interesting to note that during the past six months there has been a significant increase in the use of the BCT Sakai Portal by the teachers to communicate and collaborate with each other.

Table 3:

Self-Assessment of Personal Progress on the BCT Journey

LEVELS	DESCRIPTIONS	%
I	I use ICT tools for personal purposes, e.g., email, Word, Internet search, Facebook, etcetera	0%
II	I use ICT tools to support my teaching, e.g., LCD projector, PowerPoint, Internet, Smartboard, etcetera	40%
III	In order to facilitate ICT use by my students, I: • integrate the use of ICT into the QEP curriculum • organize the classroom to ensure equitable and safe access to appropriate ICT tools • facilitate peer support • provide opportunities to develop group projects including online • encourage and develop collaborative group strategies	50%
IV	I use ICT tools to reflect and share my teaching practices with colleagues: • by contributing to an online community of practice • accessing online support • posing relevant questions to colleagues in the network	10%

Do BCT teachers believe their students benefit from ICT-supported learning?

One of the key findings in the CEFRIO Report was the importance of teachers believing that the use of ICT tools in their classrooms would actually help their students learn more effectively. It was believed that if teachers held this belief they would be more willing to acquire the skills they needed to use ICT-supported learning in their classrooms. From the first year of the project, flipchart paper and sticky notes were used to encourage teacher input on this question. An early example of this type of teacher inquiry involved the use of this question: What's In It for Our Students? The teachers responded to this question by posting separate sticky notes

on a flipchart and the results were organized into categories and shared online for additional comments. Table 4 presents the results obtained from posing the above question. The number of responses posted in each of the six categories is noted in brackets along with examples of the items in each category that were posted by the teachers.

Table 4:
Results of the What's in It for Our Students Inquiry

Effects on Student Learning	• children are taking ownership of their own learning • excitement in the classroom • engaged by different learning opportunities	16
Broadening Horizons and Student Networking	• "meet" other schools and students – authentic audience • opportunity to interact with other students in different regions • taking a more global and broader perspective	16
Opportunities to Learn IT Skills	• students learn about and with technology • learn to use different forms of technology properly • access to more technology and learn related skills	12
Curriculum and QEP	• cross-curricular teaching • new ideas and lessons for my students • work on language skills, art, social studies	10
Developing Collaboration	• learn how to work together • collaboration-sharing of ideas • involvement in collaborative projects	9

Subsequently, a set of inquiry-based survey items related to the benefits of student learning were created. The following set of questions related to student learning was included in a survey conducted during the second year of the project. As an analysis of the results in Table 5 shows, on a five-point scale, teachers clearly indicated that their students enjoyed sharing their work with authentic audiences and they enjoyed learning about and with ICT tools. However, when the teachers were asked whether the students in their classes were taking increased ownership for their own learning and whether they were learning how to collaborate more effectively, the teachers who were in their second year agreed with these items to some

extent but those who were in their first year were less willing to do so. Finally, when asked if their students understood the importance of digital etiquette and if they were trying to use ICT tools more appropriately, teachers in both years of the project indicated that they only agreed to some extent. The above results show there was still a considerable amount of student learning that needed to be encouraged.

Table 5:

Results of the Inquiry-Based Survey Questions on Student Learning

DESCRIPTIONS	YEAR 1	YEAR 2
The students enjoy sharing their work with "authentic audiences" such as other students, parents and friends	4.4	4.5
The students enjoy learning about and with information technology	4.7	4.8
The students are taking increased ownership for their own learning	3.9	4.3
The students are learning how to collaborate more effectively with others	3.8	4.0
The students understand the importance of digital etiquette and are trying to use ICT more appropriately	3.7	3.9

How are BCT teachers encouraged to share their craft knowledge?

A number of different strategies have been used to encourage BCT teachers to share their concerns, ideas and feelings about teaching and learning. In our initial BCT F2F meetings, some teachers readily shared their ideas while others were more reticent about doing so. Over the past several years, during BCT F2F sessions, information on the value of teachers sharing their craft knowledge was discussed. As the research on teacher learning has shown, teachers are often quite reticent about sharing the successes and challenges that they face when teaching. Based on several strategies from the professional learning literature (Bubb & Earley, 2009; Easton, 2008; Killion & Roy, 2009), the Cycle Leaders facilitated group discussions to help teachers express their concerns, ideas and feelings regarding the sharing of their craft knowledge. At the same time, they called for suggestions on how to encourage more open discussion of teaching practices in F2F and online situations. A wide range of suggestions were generated during these discussions; however, the following three ideas

garnered considerable support: (a) the importance of establishing a suitable place and time during school hours for teachers to meet, (b) the recognition that those involved must be willing to share their craft knowledge, and (c) the value of having teacher-leaders within the group to facilitate the sharing, discussing and constructing of knowledge. As the above suggestions show, the use of teacher inquiry questions resulted in some important insights on how to facilitate the sharing of teacher knowledge.

Over the past few years, based on feedback from the teachers, input from the BCT Cycle Leaders and the adaptation of ideas from the research literature on professional learning (Bambino, 2002; Costa & Kallick, 1993; Easton, 2008; Glazer & Hannafin, 2006; Killion & Roy, 2009; Swaffield, 2008), a collaborative group learning protocol was developed based on the acronym: SHARE. Figure 2 presents the key steps in the SHARE protocol. These basic steps were discussed with the teachers and during a F2F session its use was modeled by the Cycle Leaders and then by small groups from each cycle. Since that session, the BCT Cycle Leaders have encouraged teachers to use this collaborative group learning process as it provides structure and a degree of safety that has been shown to encourage increased teacher sharing.
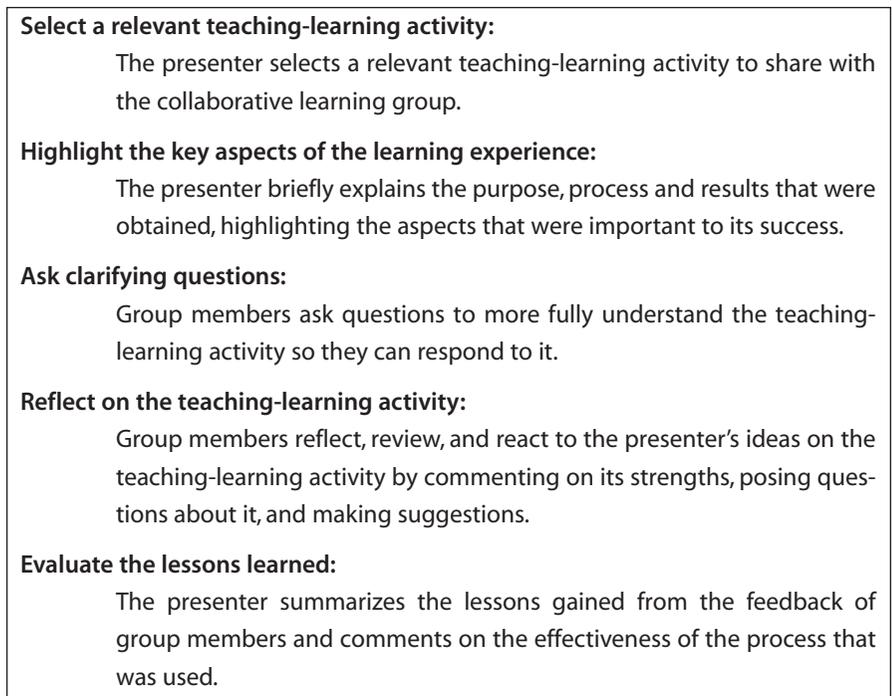

Select a relevant teaching-learning activity:

> The presenter selects a relevant teaching-learning activity to share with the collaborative learning group.

Highlight the key aspects of the learning experience:

> The presenter briefly explains the purpose, process and results that were obtained, highlighting the aspects that were important to its success.

Ask clarifying questions:

> Group members ask questions to more fully understand the teaching-learning activity so they can respond to it.

Reflect on the teaching-learning activity:

> Group members reflect, review, and react to the presenter's ideas on the teaching-learning activity by commenting on its strengths, posing questions about it, and making suggestions.

Evaluate the lessons learned:

> The presenter summarizes the lessons gained from the feedback of group members and comments on the effectiveness of the process that was used.

Fig. 2: SHARE — A collaborative group learning protocol

How do BCT teachers develop collaborative student projects?

As noted above, teacher input and ownership has been a central theme in the BCT Project. During the second year of the project, in a November F2F meeting teachers were asked to brainstorm the question: What does a good collaborative project look like? Within minutes of asking the question, a variety of ideas were shared and a principal who was present kindly agreed to record and organize the results. As the results of this teacher-based inquiry in Table 6 show, by the second year of the project, the BCT teachers had developed a fairly good understanding of the key factors that influence the development of a sound collaborative student learning project.

Table 6:
Results for the What Does a Good Collaborative Project Look Like?

Purpose	• Set a goal and purpose • It is not parallel play—there needs to be built-in knowledge building • Knowledge building—may happen at school level but the hope/goal is to explore outer world (beyond the school/classroom walls)
Teamwork	• Team: sharing, discussing, reflecting, assessing, being creative, practical…. • Set a goal and purpose • Discussion groups—set a time • Set time frames: 3-4 days / a week….a month, etcetera • Use Skype / Live Classroom to communicate with collaborators • Have a recorder for the discussion and put it on a wiki or blog
Monitoring Progress	• Benchmarks are set with dates • Time line for projects/activities • Take time to reflect and assess the project: measurable goals; what went well; what did the students / you as learners get out of it • Reflection and evaluation is essential, but take notes and communicate what you learn (point form) and share it on a wiki or blog

Collaborative	•	Be willing to take risks and learn new ideas
Learning	•	Model what we want students to do
Process	•	Don't be afraid that we are learning and taking risks
	•	Can learn from those outside their school

In subsequent F2F and online meetings, the question of how to develop a good collaborative project continued to be addressed. Based on those discussions, during the third year of the project, one of the teachers in cooperation with a BCT Lead Team member developed a process to facilitate the development of collaborative student projects based on the acronym COLLABORATE with the key steps in the process outlined in bullet-point form. The process was shared with the BCT teachers and then placed in the Resources file in the BCT Sakai Portal (http://sakai.learnque bec.ca) and the BCT website (http://bctcollaboration.wikispaces.com). The above acronym-based process was used to facilitate the development of collaborative projects during the third year of the project; however, during the first F2F meeting of the fourth year of the project, a shorter, more teacher-friendly version was developed in PowerPoint form by two of the Cycle Leaders on the BCT Lead Team (see http://bct collaboration.wikispaces.com/Designing+a+Collaborative+Project). Figure 3 presents the summary of the key steps in the latest version of the COLLABORATE process.

Consider: Consider potential topics that are interesting and relevant

Outline: Outline the purpose of the project and its key features

Listen: Listen to each other to develop and shape the project

List: List the key aspects of the project and its final product

Assess: Assess whether the project is doable and realistic

Build: Build a plan to guide work on the project

Organize: Organize into teams to get things done

Review: Review the progress that is being made

Assemble: Assemble the parts of the project

Try: Try a trial presentation

Evaluate: Evaluate the product and share

Fig. 3: COLLABORATE — A process for developing collaborative student projects

As the above information shows, the input of teachers based on their experiences in the classroom has definitely shaped the professional learning resources used in the project. In fact, the above COLLABORATE process is currently guiding the development of student collaborative projects in each of the three cycle teams.

How do administrators support the BCT Project?

Over the past four years, an absolutely essential aspect of the BCT Project has been the ongoing support provided by the principals and vice-principals involved in it. Each year, these administrators are encouraged to attend at least two of the BCT F2F meetings in order to keep informed about the project and provide feedback on its progress. In addition, they receive a report of all of the sticky notes submitted by the teachers in the Appreciative Inquiry process that is conducted after each F2F session, which updates them on how the teachers view the benefits of the project, the suggestions the teachers made to make it even better, and any questions or suggestions the BCT Lead Team should consider (Cooperrider & Whitney, 2005).

At times, working groups of administrators have met to discuss a variety of technical, financial and support questions. An example of this type of activity was the work of a small group who developed a set of potential guidelines for administrators to consider when they are trying to support teacher involvement in a community of practice such as the BCT Project. A draft of these suggested guidelines was developed and in a subsequent F2F meeting, the administrators present reviewed the draft guidelines and edited them. The results of that process are presented in Figure 4:

Educational leaders at the school level play an important role in supporting the involvement of teachers in the BCT project. They do so in a variety of ways, some of which are described below:

1. **Provide common release time:** Designing the teaching schedule so that teachers can get together to share ideas and develop collaborative projects is one of the most important ways that administrators can support the BCT initiative.

2. **Encourage, empower and support teachers:** As teachers are learning the pedagogical and technological skills that they require, it is important for administrators to encourage them, especially during the inevitable ups and downs of the learning process. Openly encouraging risk-taking and indicating that it is alright to fail are other ways to support the ongoing professional learning process.

3. **Provide the technology and time for hands-on learning of ICT tools:** Teachers need to have appropriate technical resources and time to actually practice using the ICT tools that they will use in their classrooms. Again, trying to provide professional learning time and an appropriate location for teachers to do so is an important administrative support strategy.

4. **Assure technical support is available when required:** Facilitating the access to technical support has been shown to be of great importance in motivating teachers to integrate ICT into their classroom practices. Building ongoing relationships with technical staff and providing up-to-date computers and accessories are two ways to reach this goal.

5. **Showcase the products of ICT-supported learning:** Experienced administrators report that face-to-face and online opportunities that allow students to demonstrate the planning, implementation, and evaluation of ICT supported projects is an effective way to increase public understanding and support.

6. **Reinforce that ICT use is not an "add-on":** Experienced BCT teachers and educational leaders continually emphasize that the use of ICT tools should not be viewed as an "add on," rather it should be seen as an integral part of QEP-based teaching and learning.

Fig. 4: Suggestions on how to support teachers in the BCT project

Six Lessons Learned

Teacher inquiry has allowed us to identify and collaboratively address key questions related to the development of a viable community of practice. As we look back, there are a number of lessons learned that have been generated. First, teacher involvement and feedback allowed us to address a wide variety of needs as they emerged. Second, the Cycle Leaders played a central role in shaping the project due to their classroom experiences and the collegial trust they developed. Third, the ongoing support of school and school board administrators, RÉCIT animators, as well as LEARN Quebec and CEFRIO colleagues was of fundamental importance. Fourth, taking a long-term perspective on educational change was important as it takes time for teachers to acquire the competence and confidence to change their practice. Fifth, the mixture of face-to-face and online communication and collaboration allowed for just-in-time support, collaborative planning and action, the sharing of teaching practices, and the generation of new knowledge over the course of the project. Sixth, a final lesson learned was the importance of building collegial trust and having fun along the way.

References

Aulls, M. W., & Shore, B. M. (2008). *Inquiry in education (vol. I): The conceptual foundations for research as a curricular imperative*. New York: Erlbaum.

Bambino, D. (2002). Critical friends, *Educational Leadership, 59*(6), 25–27.

Bereiter, C. (2005). Design research: The way forward. *Education Canada, 46*(1), 16–19.

Breuleux, A., Heo, G. M., Wall, T., Morgan, L., & Flores, L. (2009). Building community through telecollaboration (BCT) project in Quebec. *Proceedings of the Society for Information Technology & Teacher Education International Conference (SITE) 2009, Charleston, SC, USA.*

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

Bubb, S., & Earley, P. (2009). Leading staff development for school improvement. *School Leadership & Management, 29*(1), 23–37.

Collins, A., Joseph, D., & Bielaczyc, K. (2004). Design research: Theoretical and methodological issues. *Journal of the Learning Sciences, 13*(1), 15–42.

Cooperrider, D. L., & Whitney, D. K. (2005). *Appreciative inquiry: A positive revolution in change*. San Francisco: Berrett-Koehler Publishers.

Costa, A. L., & Kallick, B. (1993). Through the lens of a critical friend. *Educational Leadership, 51*(2), 49–51.

Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Dallas, TX: National Staff Development Council.

Easton, L. (2008). From professional development to professional learning. *Phi Delta Kappan, 89*(10), 755–761.

Garrison, D. R. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks, 11*(1), 61–72.

Glazer, E., & Hannafin, M. J. (2006). The collaborative apprenticeship model: Situated professional development within school settings. *Teaching and Teacher Education, 22*(2), 179–193.

Heo, G. M., Anderson, D., Goyetche, M-H., Taker, D., & Breuleux, A. (2011). Distributed leadership facilitating collaboration in a teacher community of practice. *Proceedings of the Society for Information Technology & Teacher Education International Conference (SITE) 2011, Nashville, Tennessee, USA*.

Killion, J., & Roy, P. (2009). *Becoming a learning school*. Oxford, OH: National Staff Development Council.

Laferrière, T., Breuleux., A., Allaire, S., Hamel, C., Turcotte, S., & Beaudoin, J. (2006). The remote networked schools: Phase II report summary. Quebec: CEFRIO. Retrieved February 26, 2011 from http://www.cefrio. qc.ca/fileadmin/documents/Projets/Synth eseEERphase-2anglaisfinal.pdf

Moore, J., & Barab, S. (2002). The inquiry learning forum: A community of practice approach to online professional development. *TechTrends, 46*(3), 44–51.

Palincsar, A. S., Magnusson, S. J., Marano, N., Ford, D., & Brown, N. (1998). Designing a community of practice: Principles and practices of the GIsML community. *Teaching and Teacher Education, 14*(1), 5–19.

Schlager, M. S., & Fusco, J. (2003). Teacher professional development, technology, and communities of practice: Are we putting the cart before the horse? *The Information Society, 19*, 203–220.

Schoenfeld, A. H. (2006). Design experiments. In J. L. Green, G. Camilli, & P. B. Elmore (Eds.). *Handbook of complementary methods in education research* (pp. 193–205). Mahwah, NJ: Lawrence Erlbaum.

Swaffield, S. (2008). Critical friendship, dialogue and learning, in the context of leadership for learning. *School Leadership & Management, 28*(4), 323–336

Wall, A. E., Breuleux, A., & Tanguay, V. (2006). *IT-supported learning and networking in the Anglophone educational community of Québec*. Quebec: CEFRIO.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. NY: Cambridge University Press.

Wenger, E., McDermott, R., & Snyder, W. M. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Boston: Harvard Business School Press.

A. E. Ted Wall is a retired Professor from McGill University where he served as the Dean of the Faculty of Education. In 2006, he co-authored the CEFRIO Research Report with Dr. Alain Breuleux and Vincent Tanguay entitled: IT-Supported Learning and Networking in the Anglophone Educational Community of Québec. Over the past four years, he has been a member of the Lead Team for the Building Community through Telecollaboration Project that is sponsored by MELS, CEFRIO and LEARN Quebec.

Alain Breuleux is a cognitive psychologist collaborating with school teachers and administrators to design and investigate sustainable technology-enabled networks for learning and advanced pedagogical practices. In recent years, he has led collaborative research to understand how children and educators in small remote schools in the Province of Quebec can best use Internet and multimedia tools to construct and share knowledge (L'École Éloignée en Réseau and Building Community through Telecollaboration). The research in these design experiments looks at attitudes, motivation, interaction, and learning.

Gyeong Mi Heo is an Education Consultant at the Centre francophone d'informatisation des organisations. She has worked for the BCT project for four years as a researcher and facilitator. She received her Ph.D. and M.A. in Educational Psychology from McGill University. Her major was Applied Cognitive Science and her minor was Computer Application in Education. Her research focuses on how technology can support teaching and learning in formal, non-formal and informal learning situations in terms of communities of practice and collaborative learning.

Karen Rye is a Cycle 3 teacher at St. Johns Elementary School in the Riverside School Board. She has been a part of the BCT project for four years, acting as Cycle 3 Lead Teacher for the past two. She has a keen interest in learning how to integrate technology into classroom instruction as a way of motivating students and improving overall results. She likes to work collaboratively with other teachers as a way of improving herself as a teacher and increasing the opportunities for her students to learn.

Marie-Helen Goyetche is the Principal at Arundel Elementary School in the Sir Wilfrid Laurier School Board. She has been part of the BCT project for three years, and has been the Cycle 2 Lead Teacher for the past two. She has an overwhelming passion for Web 2.0 ICT tools. She is always looking for ways to connect and learn with her students, teachers and fellow administrators.

Véronique Lemay is a Cycle 1 teacher at St. Johns Elementary School in the Riverside School Board. This is her first year as a Cycle Leader for the BCT project. She enjoys collaborating on projects across cycles and incorporating technology in her classroom. She is always looking for creative ways to engage her students. This project has enabled her to grow a great deal both as a leader and a learner.

LINK TO:

http://bctcollaboration.wikispaces.com/

LEARNing Landscapes