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## ▲ HEY, IT'S ELEMENTARY ~ THE CONTEXT CONUNDRUM



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*If we are to achieve a richer culture, rich in contrasting values, we must recognize the whole gamut of human potentialities, and so weave a less arbitrary social fabric, one in which each diverse human gift will find a fitting place. Margaret Mead*

### **The Aboriginal Teacher Education Program at Queen's**

Between March and June, 2004, I had the privilege and pleasure of instructing the elementary mathematics curriculum course that is part of the Queen's Aboriginal Teacher Education Program (ATEP). In an effort to increase the representation of First Nations people in teaching and allied roles, since 1991, Queen's Faculty of Education has offered both a Degree and Diploma Program in Aboriginal Teacher Education, aimed at preparing Aboriginal candidates to teach in First Nations and provincial elementary and secondary schools.

When possible, courses are not only delivered in education centres on provincial reservations by Aboriginal instructors, they are adapted to local context, local needs and include First Nations perspectives. ATEP balances First Nations specific and student-centered learning with knowledge of the teaching/learning process and research on First Nations education. Program components include courses specific to First Nations education, courses that address general educational issues and theories as well as other courses which have been adapted for community-based delivery in response to First Nations community needs and practice-teaching placements always occur in First Nation schools.

To accommodate the individual needs and situations of candidates, there are two options for completing this unique teacher preparation program. The first is an on-campus option conducted in Kingston that is a full time, one year program. This full-time program includes education courses and practice teaching that is usually completed in the student's home community (usually Tyendinaga near Belleville or other relatively near-by First Nations communities).

The second option is a two-year, part-time community-based studies option that is presently being delivered on a part-time basis in the Manitoulin North Shore at M'Chigeeng, the Western James Bay at Moose Factory, and at Fort Frances.

### **At Kenjgewin and Omushkego**

On Manitoulin and Moose Factory Islands I worked with a number of highly committed teacher candidates, all of whom were determined to obtain their teacher certification in order to become role models and leaders in the communities in which they were born, raised and, in many cases, now raise their own children. As with other courses, mathematics curriculum was delivered through short, intensive course sessions scheduled so that those who have work or family responsibilities are able to attend without being away from home for extended periods.

On my first trip to M'Chigeeng, I left Kingston at 5:45 a.m., flying to Toronto and then Sudbury. The short flights were followed by a 3 h drive along winding northern highways through Espanola and Little Current. Class started at 2:00 p.m. and was scheduled until 9:00 p.m. (with one hour for dinner at Mom's in nearby Mindemoya). I thought I would win the "who has travelled the furthest" contest, hands down. How wrong I was. Kay had driven from Thunder Bay. Laura had made the trek from Orillia. Lorie journeyed from London. Amy and Tracey originated at Tyendinaga. Only Levy and Cynthia lived on Manitoulin, and even then, they lived a one-hour car trip across the island at the Wikwemikong Unceded Reserve.

There is no road to Moosonee. To get there, one has two options: the Polar Bear Express, a 6 h train ride from Cochrane or a one-hour flight on Air Creebec from Timmins. The Education Centre is on Moose Factory, an island in the middle of the mighty Moose River, accessible only by boat or helicopter from Moosonee. Once again, I learned that my journey was easy. Many of my students had come from small Cree communities further north on James Bay, accessible only by air. They came to class just days after returning home, having been evacuated from their communities weeks before when the ice from Hudson Bay choked the mouth of the river and flooded villages all along the Moose's trail.

In spite of the physical, fiscal and personal challenges of getting to class, in both sites, my students arrived bright-eyed and eager to learn. We were in class much of Friday, on Saturday until 9 p.m. and most of Sunday, when our respective trips home began, usually complicated by Mother Nature and exhaustion.

Out of respect for the learners, whenever possible (and with the help and advice of Ed Doolittle<sup>1</sup>), I tried to incorporate what I knew of aboriginal traditions into my math lessons. I used beading and art, tipi construction and drum making whenever possible to illustrate and illuminate concepts and processes. Through their assignments, my students did the same, using local legends and artifacts, from corn and tamarack geese to the Gathering Spirit and Medicine Wheel to make connections between the Ontario curriculum and the reality of their children.

We learned enormously from each other, but nonetheless, I was forced to realize just how far apart our respective worlds were on two occasions, neither of which had to do with geographical distance.

### **The Great Pterodactyl Scare and The James Bay Goose Hunt**

On the first occasion, after lunch one day, I arrived at class out of breath, screaming that I had practically been eaten by a pterodactyl just outside the Education Centre on Moose Factory. My students listened to my tale. “The pterodactyl was about five feet tall. It stood its ground as we met on that muddy road on the way to the community centre. It never stopped blinking its huge eyes at me. Even worse when it turned its bald head away, I saw these huge bright red flashes on its cheeks. I was terrified, and then all of a sudden, another one appeared, lurching out from the marsh. I stopped breathing because I could tell that they were sizing me up. I was sure I was a goner, but then for no good reason, they walked slowly into the field on the opposite side of the road. When they took flight, they gave this prehistoric cackle, their long necks outstretched, and their seven foot wingspans seeming to fill the sky. I ran all the way back here under their shadow. Let me tell you, I would rather have met the polar bears you warned me about.”

My students smiled and then Andrew gently and

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<sup>1</sup> Dr. Edward Doolittle is a Mohawk Indian from Six Nations Reservation in southern Ontario. He earned his PhD in pure mathematics (partial differential equations) from the University of Toronto in 1997. Since then he has taught Mathematics, Business, Leadership, and Native Studies at the University of Toronto, Queen's University in Kingston Ontario, York University in Toronto, and the Six Nations Polytechnic. He has also studied in the Onkwawenna Kentsyokwa Mohawk Language Immersion Project in Six Nations. Currently he is Assistant Professor of Mathematics in the Department of Science, First Nations University of Canada. Dr. Doolittle was awarded a Governor General's Gold Medal for his M.Sc. in mathematics, and has been named one of the Great Minds of the University of Toronto and one of 50 top young alumni of the University of Toronto.

respectfully assured me that there were no pterodactyls on James Bay. What I had seen, he explained, had been a pair of Sandhill Cranes – and he kindly said he understood how I could have come to such a conclusion since he had read that fossil evidence proved that the Sandhill Crane is the oldest still-living species of bird and has many similarities to a pterodactyl.

It was not so easy for me to explain my world when the tables were turned. At one point during my springtime course, the schools on James Bay were preparing to close for the annual goose hunt. By chance, I had been on Moose Factory when the geese began to arrive — much later than usual this year because of the unusual spring weather. As gaggles of geese began to appear overhead, the children ran happily, “calling” the geese realistically, tracking their path on the ground below. As the children’s calls and the geese’s trumpeting filled the air, adults too ran from their houses, looking skyward, grateful for the return of the geese, and hopeful for a major harvest of the big birds for food. It was a time of celebration. It also turned out to be a time that reinforced the clash of the contexts of different worlds.

“Did non-Aboriginals not realize”, my students asked, “about the ways in which Aboriginal people used the natural environment to survive? Did non-Aboriginals not realize that Aboriginal peoples were required to adapt to the resources in the eco-area in which they resided and develop techniques to harvest food from a variety of sources and animals?”

It was difficult to answer, “yes, of course,” when the reality and necessity of the goose hunt contrasted so starkly with the theme of the EQAO test that their children were being asked to write at the same time –namely, Saving the Geese.

These would-be teachers explained that the children in their communities were confused by the theme of the readings and nature of the tasks. My teacher candidates explained how difficult it was to teach their children to take pride in their First Nations traditions when something as important as a provincial assessment made their children feel that it was wrong to kill the geese upon which they depended for sustenance.

Equally important was the public face of the measurement of their children’s academic success. The children’s genuine distress at this clash of values and behaviours would naturally be reflected in their performance on the test and yet when the league table of results was published in the newspapers, there would be no contextual information to accompany the bald facts of

achievement data. It would be reported that their children are, “below standard,” with no attention to the inappropriateness of the context of the tasks the children on James Bay faced.

### **One Context Does Not Fit All**

These two examples taken from my experiences in Northern Ontario underscored for me the challenge of creating a one-size-fits-all context in which one can embed authentic mathematics tasks. A problem that began “One Sandhill Crane left Moosonee at 12 km/h and another left Moose Factory at 8 km/h ...” would have as little meaning to an inner city student in Toronto as the “Saving the Geese” task had for the children of James Bay.

Cognitive psychologists have proved what every teacher knows to be true: context is an integral facet of learning. Children “get it” when examples that can situate genuine mathematical concepts and understanding emerge from their own local, real world of daily experience.

As educators, we acknowledge that knowledge is not independent—it is the product of an activity in the context of the culture in which it is shaped and developed.

As educators, we believe that all children share the same characteristics in terms of their desire, potential curiosity and interest in engaging in social interactions and in negotiating with the unique ‘thinker toys’ their immediate environment offers to them.

Therefore, as mathematics educators we should want to help all students to call upon mathematics to solve problems of their everyday lives, to help them participate intelligently in civic affairs in their local communities, and to prepare them for jobs, vocations, or professions anywhere in the world.

Our commitment as mathematics educators, then must be to make it a priority to design compelling alternatives to traditional mathematical learning and assessment tasks—authentic experiences that enable learning and assessment to occur equitably across student groups, be they urban, rural, poor, immigrant or aboriginal. From textbooks to standardized instruments, all students must know that they are equally valued and all students must have the same opportunities for participation and success.

The challenge is daunting, but as Sitting Bull, the Dakota Sioux Chief who lived from 1834 to 1890 said, “Let us put our minds together and see what kind of life we can make for our children.” ▲