Honoring Our Heritage

Culturally Appropriate Approaches for Teaching Indigenous Students

edited by
Jon Reyhner
Willard Sakiestewa Gilbert
Louise Lockard

NORTHERN ARIZONA UNIVERSITY

Flagstaff, Arizona
2011

Northern Arizona University's College of Education has published a series of monographs on Indigenous issues. These include *Stabilizing Indigenous Languages* edited by Gina Cantoni (1996), *Teaching Indigenous Languages* edited by Jon Reyhner (1997), *Revitalizing Indigenous Languages* edited by Jon Reyhner, Gina Cantoni, Robert St. Clair and Evangeline Parsons Yazzie (1999), *Learn in Beauty: Indigenous Education for a New Century* edited by Jon Reyhner, Joseph Martin, Louise Lockard and W. Sakiestewa Gilbert (2000), *Indigenous Languages Across the Community* edited by Barbara Burnaby and Jon Reyhner (2002), *Nurturing Native Languages* edited by Jon Reyhner, Octaviana Trujillo, Roberto Carasco and Louise Lockard (2003), and *Indigenous Language Revitalization: Encouragement, Guidance & Lessons Learned* edited by Jon Reyhner and Louise Lockard (2009). This new book, *Honoring Our Heritage*, includes papers from two Indigenous education conferences held at Northern Arizona University in 2009 and 2010 as well as other papers.

Copies of the above publications that are still in print can be obtained from the College of Education, Northern Arizona University, Box 5774, Flagstaff, Arizona, 86011-5774. Reprinting and copying on a nonprofit basis is hereby allowed with proper identification of the source. These publications are also available on the world wide web at http://nau.edu/AIE. For more information contact Jon Reyhner at 928 523 0580 or Jon.Reyhner@nau.edu.

Book layout in Adobe InDesign CS3. Cover shows an Apache burden basket.

Library of Congress Cataloging-in-Publication Data

Honoring our heritage : culturally appropriate approaches for teaching indigenous students / edited by Jon Reyhner, Willard Sakiestewa Gilbert.
p. cm.
ISBN 978-0-9670554-5-9 (pbk.)
1. Multicultural education. 2. Multicultural education--Curricula. 3. Indigenous peoples--Education. 4. Educational anthropology. I. Reyhner, Jon. II. Gilbert, Willard Sakiestewa.
LC1099.H655 2011
370.117--dc22

2010051549

Contents

William G. Demmert, Jr.
1934-2010

Introduction

This book is dedicated to the memory of William G. Demmert, Jr. (Tlingit/Ogala Lakota) who spent his life working to improve the education of Indigenous students. Bill was born in Klawock, Alaska in 1934 and began his formal schooling in a Bureau of Indian Affairs school in Sitka, Alaska in 1940 as a kindergarten student. He graduated from Seattle Pacific College with a B.A. in Education with a Social Studies Major and Physical Education Minor and taught from 1960 to 1964 in Forks, Washington and from 1965 to 1968 in Fairbanks, Alaska. After receiving his Masters Degree in Educational Administration from the University of Alaska in 1968 he moved back to his hometown of Klawock where he became chief administrator and part-time teacher of seventh and eighth grades in the public school and experimented with culturally sensitive education. The school had about 65 Tlingit students and two non-Tlingit students. Bill entered the field of education just as concerns about the quality American Indian and Alaska Native education were intensifying in the 1960s and universities became interested in seeing what they could do to help. Bill joined a cohort of twelve Indigenous graduate students at Harvard University in 1970, beginning a doctoral program and becoming deeply involved in efforts to improve Indigenous education (Demmert, 1999).

Bill wrote in a 1999 *Journal of American Indian Education* (*JAIE*) article,

> In March of 1970, during my last year as teacher and administrator for the Klawock Public School, I was invited to attend the "First Convocation of American Indian Scholars." Organized by Rupert Costo and Janette Henry, founders of the American Indian Historical Society in San Francisco, California, the Convocation was held at Princeton University. This was my first exposure to other American Indian educators and it was the birthplace for the idea of creating the National Indian Education Association [NIEA].... Invitees to the Convocation had to have an advanced degree of at least a masters level or be recognized as a traditional medicine person or hold some other special status in a tribe. Over 200 people met and discussed the issues facing us as Indian educators and issues concerning the education of Indian children. It was an exciting opportunity for most of us attending to meet other Indian educators and discuss ideas and issues that were important to us as individuals and as indigenous peoples of the United States. (Demmert, 1999, pp. 7-8)

At this convocation Bill talked about "the tremendous dropout rate" and "parents turning away from the school because they were no longer involved" in the education of their children (*Indian Voices*, 1970, p. 230). He also recalled in his 1999 *JAIE* article,

> I remember getting acquainted with a number of the participants during that first day of the convocation. I had met several of them through my National Education Association activity and, as we talked and renewed acquaintances, we decided to get together that evening. We were all teachers or administrators working with Indian children and we were all members of one of the many tribes that still exist in the United States.... We talked about how great it was to have the chance to meet together as professionals in the Indian community, to discuss common interests, and talk about the education of Indian students. We felt that it would be important to explore what we might do to become more effective teachers, better school administrators, and to create a forum to explore practical experiences that might provide a path for improving schools serving Native America.
>
> We met that evening, as we had agreed to do, and discussed what we might do as a group to create a forum for an annual discourse on education. Rosemary [Christensen] indicated that the Minnesota Indian Education Department, headed by Will Antell, had held a national Indian education conference in the fall of 1969, and that the continuation of such a conference would provide a great forum for getting together.
>
> At the meeting that evening we agreed to form a national organization. Sparlin Norwood and I suggested a National Indian Education Association. (We were both very involved with the National Education Association at the time and thought that an organization specifically for Indian education would be a great model to follow.) (Demmert, 1999, pp. 8-9)

It was noted the following year that "Indian cultures and values emerged as a dominant concern" and that became the theme of the second Indian education conference held in August 1970 in Minneapolis (*NIEA Newsletter*, 1971, p. 1). In the NIEA's first newsletter published on February 1971, Bill, now the NIEA's treasurer, wrote,

> If the school is to be effective and play a more important role in the development of a child, then it must work with community problems as it attempts to educate its young. Responsibilities to others as well as self must be recognized and understood. Interaction of rights and responsibilities between the school and community is necessary. (*NIEA Newsletter*, 1971, p. 2)

He went on to receive the first NIEA Educator of the Year award in 1977 and received its lifetime achievement award in 2004.

As he was working on his doctorate at Harvard he and other cohort members were enlisted by Senator Edward Kennedy to help draft and gain tribal input and support for legislation in Washington, D.C. that eventually became the Indian Education Act of 1972. Bill later wrote that Senators Kennedy and Walter Mondale told him that the legislation "might not include everything I wanted, but

it would not include anything I opposed" (Demmert, 1999, p. 11). Bill went to Washington and his work on this legislation became his Harvard doctoral thesis *Critical Issues in Indian Education 1972–1973*, and he received his Doctor of Education degree in 1973. As Deputy Commissioner of Education in the U.S. Department of Education from 1975 to 1976 he helped implement this new legislation. He then served as Director of the Bureau of Indian Affairs' Office of Indian Education Programs from 1976 to 1978. He went on to become Alaska's Commissioner of Education from 1987 to 1990 and subsequently co-chair of U.S. Secretary of Education Lauro Cavazos' Indian Nations at Risk Task Force. In the Task Force's final report's transmittal letter Bill and former Secretary of Education Terrel H. Bell wrote:

> The Task Force believes that a well-educated American Indian and Alaska Native citizenry and a renewal of the language and culture base of the American Native community will strengthen self-determination and economic well-being and will allow the Native community to contribute to building a stronger nation—an America that can compete with other nations and contribute to the world's economies and cultures. (INAR, 1991, p. iv)

The Task Force recommended as one of four national priorities, "Establishing the promotion of students' tribal language and culture as a responsibility of the school" (INAR, 1991, p. 22).

From 1992 to 2008 Bill taught at Western Washington University, and on June 12, 2009 we were honored to have him come to Northern Arizona University and deliver the keynote address on "What is Culture-based Education? Understanding Pedagogy and Curriculum" at our American Indian Teacher Education Conference. A biographical sketch of Dr. Demmert adapted from one he provided us when we invited him to keynote our conference can be found on page 196 of this volume.

Culture-, community-, place-based education

Dr. Demmert emphasized again and again that students have trouble finding meaning in decontextualized one-size-fits-all curriculum and instruction that does not relate to their cultures, communities and homes. Indigenous groups have lobbied the United Nations to support their right to self-determination and culturally appropriate education, and in 2007 they achieved their goal of a *Declaration on tne Rights of Indigenous Peoples* that states in Article 14:

> 1. Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning....
> 3. States shall, in conjunction with indigenous peoples, take effective measures, in order for indigenous individuals, particularly children,

> including those living outside their communities, to have access, when possible, to an education in their own culture and provided in their own language.

Culturally appropriate education is not just a basic human right, it is also good educational practice. The best way to contextualize education is to relate what students are learning to their cultures, communities, lives and land. While students need to learn the knowledge and skills included in tribal, state and national standards, they and their teachers also need to respond to local concerns and have some choice in what type of learning projects they can become engaged in.

In a study of ten schools in north, central and eastern Canada, from the islands of Hudson Bay to the coast of Newfoundland that were identified as having exemplary success with Indigenous students, the researchers concluded:

> All schools worked to provide culturally relevant learning experiences and affirm students' pride in their identity. Aboriginal language immersion programs were present in about half the schools and in some this was the language of instruction until Grade 6. Most offered local cultural classes—some of which were accredited, and the reminder infused cultural content across the core curriculum. In all schools, the importance of the traditions and culture was affirmed by displays, ceremonies, excursions on the land, and the use of elders and local resource people. (Fulford, 2007, p. 12)

A previous Canadian study of successful schools for Indigenous students noted, "the fully independent band-operated model provides Aboriginal communities with the greatest control of their educational systems" (Bell, 2004, p. 295). The researchers in that study found that band-operated schools could better integrate the delivery of education from Pre-K to post-secondary into an overall community plan.

Culture is ever-present in schools. As Shawn Kana´iaupuni writes,

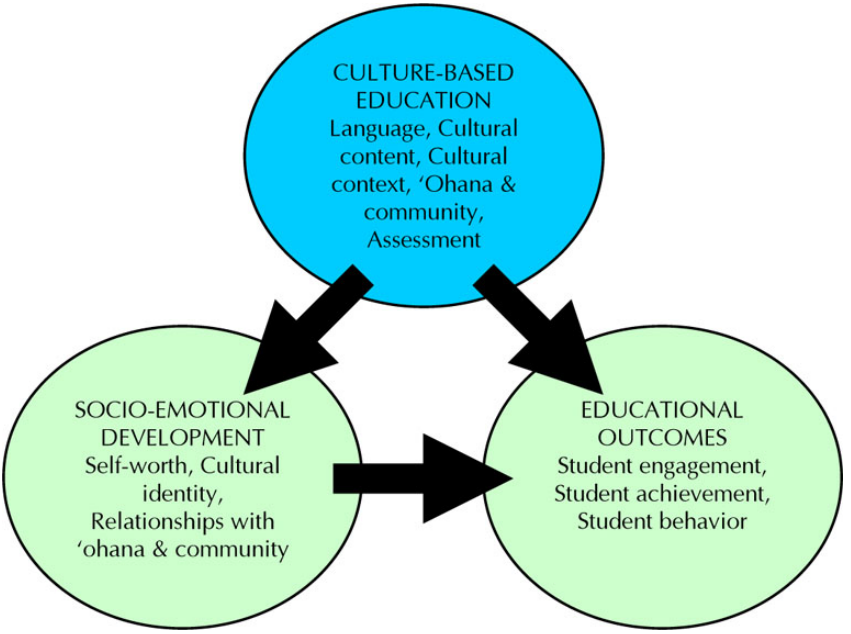
> culture refers to shared ways of being, knowing, and doing. Culture-based education is the grounding of instruction and student learning in these ways, including the values, norms, knowledge, beliefs, practices, experiences, and language that are the foundation of a(n indigenous) culture. Because U.S. society typically views schools through a Western lens—where Western culture is the norm, what many do not recognize is that all educational systems and institutions are culture-based. Hence, the term is conventionally used to refer to "other" cultures, and in this case indigenous cultures. (2007, p. 1)

Brandon Ledward and Brennan Takayama (2008, p. 4) in a Hawaiian study categorize culture-based activities into seven broad themes:

PILINA ʻOHANA: Involvement of the family in education;
PILINA KAIĀULU: Incorporation of community members into the classroom and the classroom into the community;
HAKU: Development of original compositions;
MĀLAMA ʻĀINA: Land stewardship and environmentally-based projects;
KŌKUA KAIĀULU: Active service promoting community well-being;
HŌʻIKE: Authentic performances and demonstrations of competency;
OLA PONO: Practical application of life and cultural skills and the teaching of values.

Ledward and Takayama maintain that "culture-based educational strategies affect socio-emotional development and education outcomes" and put forward a theoretical model diagrammed in Figure 1 below.

Figure: Hawaiian Cultural Influences in Education theoretical model (Ledward & Takayama, 2008, p. 1)



Closely related to culture-based education is place-based education. A 2006 report on the National Science Foundation's Rural Systematic Initiative notes that "Place-based education strengthens communities" and is "inherently interdisciplinary and project-based, it builds on local resources and expertise without great cost" (Boyer, 2006, pp. 114-115). This idea of teaching students about their specific locality and its people and their cultures and languages is not new. Neither

is the criticism of teaching that focuses on test preparation and memorization, which can lead to American Indian and Alaska Native school dropouts. Studies by Paul Platero (1986) and Donna Deyhle (1989) found that most frequent reason given by American Indian students for dropping out of school is that they were bored. They got tired of being told to read textbooks with content that they could not relate to their lives and being told to answer the questions at the end of the chapter—chapters often written a couple of grade levels above their reading ability. They perceived teachers who were more interested in the subject matter they taught than their students as uncaring (Reyhner, 1992).

In the 1933 edition of *How We Think* John Dewey (1933/1998) called on teachers to engage their students in "constructive occupations" or "projects" that engage students' interests, have intrinsic worth, awaken curiosity, and are carried out over an extended period of time. Projects should integrate as many of the basic subjects taught in schools as possible, and the "project method" was used successfully with American Indian students in the 1940s. In a 1944 article anthropologist Ruth Underhill declared that Tohono O'odham children traditionally "learned through activity, in a system surprisingly like our modern project method" (p. 5). In a 1948 article on day school methods for Dakota Sioux students the Indian Services' Associate Supervisor of Education Gordon MacGregor wrote:

> The project method is exceptionally well suited to educating the Dakota because it follows their own method of learning by doing and following the example of others. By bringing the children to participate and to share in the work and the responsibility for completion of a project, this method also reinforces the training for cooperative work already begun in the family. (pp. 6-7)

He noted that this method had been used for seven or eight years very successfully in Pine Ridge schools, and he found the competition between students and individualism fostered by traditional American teaching methods was difficult for young Sioux children to understand as they were taught at home to work cooperatively and not to outshine their peers (MacGregor, 1964).

Indigenous education has been criticized for being too vocational and slighting academics in the past with racism seen as a factor that lowered academic expectations for Indigenous students (see e.g., Barrington, 2008). However, the Director of Education for the U.S. Indian Service from 1936 to 1952, Willard Beatty was himself a graduate of a model vocational high school in San Francisco and saw the value for everyone of a challenging curriculum that combined academics with vocational education (Stefon, 2009). Beatty in a 1944 collection of articles from the Indian Service's *Indian Education* biweekly newsletter included 17 articles in a section on "Culture: Background for Learning" that emphasized teachers need to understand, appreciate and build on the cultural background of American Indian and Alaska Native students.

There are many ways that creative teachers can put before their students the many issues Indigenous nations face today from which their students can

pick projects that can get them reading, writing, and learning more about their culture, history, science, mathematics, economics, the arts and other subjects. The editors hope that this collection of papers will help educators and policy makers understand how the education of Indigenous children can be improved. First, Bill Demmert and Navin Singh give overviews of research on culturally based education and its effects on American Indian and other students. Subsequent chapters in this monograph provides a variety of examples of how Indigenous students can be "turned on" to education by providing them with an education they can relate to. Former NIEA president Willard Sakiestewa Gilbert describes the National Science Foundation Native Science Connections Project, and Pauline Chinn describes how a *Mālama I Ka ʹĀina* sustainability workshop helped teachers become aware of the need for understanding the role and importance of Indigenous knowledge and practices to better serve their students. MaryLynn Quartaroli and Frederick Sherman describe how a university-based environmental education outreach program can recognize and build on the cultural background of Indigenous students. James W. Bequette and Kelly Hrenko describe Project Intersect that helped teachers incorporate Indigenous art into their classes. Sandra Wolf describes a history project that motivated three seventh graders and got them to better understand the American Indian Movement. Then Matt Oppenheim describes the development in Guatemala of a textbook for Mayan youth that describes efforts at community development. Finally, Lorenzo Cherubini and John Hodson describes a large Canadian school district's attempt to understand better what Indigenous parents want for their children.

We want to thank Northern Arizona University's College of Education and Department of Educational Specialties for the support given to the American Indian Teacher Education Conferences that were held at NAU in 2009 and 2010.

Jon Reyhner
Willard Sakiestewa Gilbert
Louise Lockard
College of Education
Northern Arizona University

References

Barrington, J. (2008). *Separate but equal? Māori schools and the crown 1867-1969.* Wellington, NZ: University of Victoria Press.

Beatty, W. (1944). *Education for action: Selected articles from Indian education 1936-43.* Chilocco, OK: Education Division, U.S. Indian Service.

Bell, D. (2004). *Sharing our success: Ten case studies in aboriginal schooling. Kelowna,* BC, Canada: Society for the Advancement of Excellence in Education. Retrieved Dec. 14, 2010 at http://saee.ca/upload/021.pdf

Boyer, P. (2006). *Building community: Reforming math and science education in rural schools.* Fairbanks, AK: Alaska Native Knowledge Network. Retrieved Dec. 7, 2010 at http://www.ankn.uaf.edu/publications/building_community.pdf

Declaration on the Rights of Indigenous Peoples. (2007). Retrieved Dec. 3, 2010 at http://www.un.org/esa/socdev/unpfii/en/drip.html

Demmert, Jr., W. (1999). Indian education revisited: A personal experience. *Journal of American Indian Education, 38*(3), 5-13.

Dewey, J. (1933/1998). *How we think* (2nd Ed). Boston: Houghton Mifflin.

Deyhle, D. (1989). Pushouts and pullouts: Navajo and Ute school leavers. *Journal of Navajo Education 6*(2), 36-51.

Fulford, G. (2007). *Sharing our success: More case studies in Aboriginal schooling*. Kelowna, BC, Canada: Society for the Advancement of Excellence in Education. Retrieved Dec. 14 at http://saee.ca/upload/SOSMoreCaseStudies.pdf

INAR–Indian Nations at Risk Task Force. (1991). *Indian nations at risk: An educational strategy for action* (Final report of the Indian Nations at Risk Task Force). Washington, DC: U.S. Department of Education.

Indian voices: The first convocation of American Indian scholars. (1970). San Francisco, CA: The Indian Historian Press.

Kana´iaupuni, S. (2007). *A brief overview of culture-based education and annotated bibliography* (Culture in Education Brief Series). Honolulu, HI: Kamehameha Schools Research & Evaluation Division.

Ledward, B., & Takayama, B. (2008). *Ho´opilina kumu: Culture-Based education among Hawai'i teachers* (Culture in Education Brief Series). Honolulu, HI: Kamehameha Schools Research & Evaluation Division.

MacGregor, G. (1964). *Warriors without weapons: A study of the society and personality development of the Pine Ridge Sioux.* Chicago: University of Chicago Press.

MacGregor, G. (1948, Sept. 15). Federal schools meet Sioux needs. *Indian Education, 167,* 6-8.

NIEA Newsletter, 1(1). (1970).

Platero Paperworks, Inc. (1986). *Executive summary: Navajo area student dropout study.* Window Rock, AZ: Navajo Nation, Navajo Division of Education.

Reyhner, J. (1992). American Indians out of school: A review of school-based causes and solutions. *Journal of American Indian Education, 31*(3), 37-56. Retrieved Dec. 14, 2010 at http://jaie.asu.edu/v31/V31S3ind.htm

Stefon, F.J. (2009). Willard Beatty and Progressive Indian education. *American Indian Culture & Research Journal, 33*(4), 91-112.

Underhill, R.M. (1944). Papago child training. *Indian Education, 103*, 5-8.

What is Culture-Based Education? Understanding Pedagogy and Curriculum

William G. Demmert, Jr.

To understand the pedagogy associated with teaching in a Culturally-Based Education (CBE) setting for Native American students (this includes American Indians, Native Alaskans, and Native Hawaiians) there must be a basic understanding of what it includes. First and foremost is the recognition that CBE programs will not be all the same and may vary for different Indigenous student groups schools serve; second, assessment tools have to be developed that will accurately measure the levels of a school's CBE program that reflects the priorities of the students community; and third, assessment tools must be developed that are linguistically as well as culturally appropriate that meet the academic priorities and needs of the community.

Issues of culture, language, cognition, community and socialization are central to learning. The primary socialization of infants and young children (as well as all later socialization into new communities of practice) is accomplished through joint, meaningful activity with guidance by more accomplished participants, principally through language exchanges or other semiotic processes. Language vocabularies and routines acquired by learners through these processes are the elements that account for community, linguistic and cultural continuity and are the primary cognitive tools for individual and group problem solving and adaptations (e.g., culturally-based secondary socialization processes like schooling can be facilitated by activating the learners' cognitive and linguistic tools laid down by community socialization). Primary to this understanding is that activity (primarily joint activity) is the setting in which language and cognition are developed, and that patterns of activity have a cultural basis.

Harvard professor Jerome Bruner notes, "culture shapes mind...it provides us with the tool kit by which we construct not only our worlds but our very conceptions of our selves and our powers." He further states that "you cannot understand mental activity unless you take into account the cultural setting and its resources, the very things that give mind its shape and scope. Learning, remembering, talking, imaging: all of them are made possible by participating in a culture" (Bruner, 1996, pp. x-xi). A child's education must include social, emotional, and ethical competencies as well as academic priorities. A growing number of schools serving indigenous communities agree with these premises conceptually. The task as we envision it is to accomplish this in a culturally compatible and supportive environment.

In recognition and support of these positions I helped bring together a group of like-minded schools and professionals. This consortium of schools and educators represent a variety of institutions that focus on the development and strengthening of a CBE curriculum through teaching in their Indigenous language, or through teaching the Indigenous language as a subject as part of a school improvement strategy. This consortium developed a set of CBE rubrics to help define what one might strive for in a CBE program. Although this set

of rubrics was designed specifically for the tribal and community groups in our consortium, I believe they have implications for a broader selection of schools interested in developing a CBE curriculum. For the purposes of this paper I have identified three types of schools. First is Generic (designed to meet the academic needs of students without regard to the multicultural or ethnic mix of students), second is Multicultural (designed to meet the cultural as well as academic needs of the different student racial or ethnic groups served by a school or system), and third is Culture Specific (designed to meet the needs of a specific cultural or ethnic group of students).

The public school systems in each state may be defined as Generic (because they are designed to meet the academic needs of all students without regard to the racial or ethnic mix of students served by each local school. In many cases it may be appropriate to define the public schools as Culture Specific because many believe public schools reflect the cultural mores and priorities of middle class America. In either case the language of instruction is English with limited opportunity to learn one's heritage language or one's indigenous language if that language is other than English.

In this presentation the CBE pedagogy and curriculum priorities proposed are Culture Specific. That is, the programs I work with focus on a particular Indigenous cultural group and a specific language (although there may be students from other language groups in the classroom or school). The movement to develop a specific language and cultural focus in modern times has its genesis from Rough Rock Demonstration School founded in 1966, Klawock Public School in 1968, and the Bethel School District under the auspices of the Bureau of Indian Affairs in 1968. These school-based cultural and indigenous language programs pre-date the Indian Education Act of 1972 (now referred to as Title VII of No Child Left Behind Act or NCLB), which offered the first large-scale opportunity for Indian and Native groups to develop CBE programs. The language in the Indian Education Act of 1972 supported the idea of CBE as well as the development and use of Native languages in K-12 schools and early-childhood education opportunities. The Act resulted from the 1969 U.S. Senate Report, *Indian Education: A National Tragedy—A National Challenge*, which is based on a review of early literature and reports on Indian Education and national testimony gathered by a special sub-committee in the U.S. Senate to look for ways to improve the educational opportunities of Indian students.

The consortium I reference above is a research project designed to assess the effectiveness of a strong indigenous language based program in a school culture that supports and reflects the cultural base of the students served (i.e., a CBE or Culture Specific program). Each school partner teaches in the indigenous language as the medium of instruction, teaches in a bilingual approach or teaches the language as a class or course. Our position is that teaching in more than one language, the inclusion of a CBE program and having teachers that know the languages and cultural base of the students will result in students that will do as well or better than their peers whom do not have the benefit of learning their indigenous language and receiving a program of culturally-based education.

The assessment tool we developed for measuring levels of academic performance are called Curriculum Based Measures (CBMs) and are used for measuring basic skills in reading, writing and mathematics. At some point we hope to develop a set of CBMs that measure oral competence—Indigenous language expectations for high school students for which CBMs have not yet been developed and tested. We currently have a set of measurements in the language of instruction for reading and have developed a test set in mathematics and writing in Hawaiian, Navajo, Yupik and English (the latter for a specific CBE program that teaches in the English language with the Indigenous language currently taught through a class setting rather than through an immersion or bilingual context.

We also developed a set of CBE rubrics used to measure the level of a CBE program as defined by the rubrics. The CBMs are in the language of the school (with a set in Diné, Hawaiian, Yupik, Ojibwe and English) and meet national standards for validity and reliability. The CBE rubrics we have developed have five sets of rubrics, each with levels of CBE called indicators which are a general definition of CBE rubric levels and a set of exemplars for each indicator. These rubrics include:

1. Culturally-Based Indigenous Language Use
2. Culturally-Based Pedagogy
3. Culturally-Based Curriculum
4. Culturally-Based Patterns of Participation in Leadership and Decision-Making
5. Culturally-Based Methods of Assessing Student Performance.

The four different levels (indicators) for each of the Rubrics listed above from low to high are: 1) Not Present; 2) Emerging (Indicators); 3) Developing (Indicators); and 4) Enacting (Indicators).

CREDE principles for effective teaching

Teachers are one of the most important aspects of *Atuarfitsialak* ("A Cool School" in Greenlandic) or schools that are able to help motivate students to achieve academically as well as socially, culturally, psychologically and spiritually or generally create an environment that will help meet the general-well being of indigenous students. Roland Tharp, a member of our consortium, promotes a research base set of principles for effective teaching that meets our view of pedagogy and classroom management. These seven principles have five implementation levels for assessing how well the principles have been implemented and include the following:

- *Teachers and Students Working Together.* Joint productive activity.
- *Development of Language and Literacy Across the Curriculum.* Development of the languages of instruction and the content areas is the meta-goal of all instruction...

- *Connecting Lessons to Students' Lives.* Contextualize teaching and curriculum in students' existing experiences in home, community, and school.
- *Engaging Students with Challenging Lessons.* Maintain challenging standards for student performance; design activities to advance understanding to more complex levels.
- *Emphasizing Dialogue over Lectures.* Instruct through teacher-student dialogue, especially academic, goal-directed, small-group conversations (known as instructional conversations), rather than lecture.
- *Learning Through Observation.* Providing demonstration or models of requested performance.
- *Encouraging Student Decision Making.* Involving students in the choice or design of instructional activities.

The five different levels for assessing implementation of these seven principles from low to high are: 1) Not observed, 2) Emerging, 3) Developing, 4) Enacting, and 5) Integrating.

In an effort to identify a tool for assessing individual student wellbeing we develop a set of rubrics for measuring an individual student's level of understanding and application of his or her Native "Roots." This will take additional work but it is based on my own experiences, a field examination conducted among the Navajo by Florian Johnson, the Culture-Based Rubrics presented earlier, and work done in Hawaii on Hawaiian wellbeing.

The Indigenous Cultural (Socio-Psych) Wellbeing Continuum Rubrics have five levels of measurement and include:

1. Strong, positive indigenous identity and active involvement in cultural community;
2. Active and practical traditional spirituality.
3. Understands and demonstrates responsibility to family, community, and broader society.
4. Shows continuing development of cognitive and intellectual skills.
5. Knows, understands, respects, and applies kinesthetic activity for physical development.

The four different levels (indicators) for each of the rubrics listed above from low to high are as follows: 1) Not Present; 2) Emerging Indicators; 3) Developing Indicators; and 4) Enacting Indicators.

Conclusion

A general summary of what we have learned from research on cognitive development, schooling, and academic performance that I have personally used in my work includes:

1. Each of us possess a set of intelligences (cognitive skills) that an early stimulating environment and challenging experiences can influence (Sternberg, 1985; Sternberg, Forsythe et al., 2000; Sternberg & Grigorenko, 2000; Gardner, Howard, 1985; Sousa, 1998).
2. Early development of language and other literacy skills are closely associated with cognitive development and academic success in school ((Donovan et al., 2001; INAR, 1992; NICHD, 2004; O'Sullivan & Goosney, 2007).
3. Developing more than one language does not limit a person's ability to learn and may even enhance cognitive development (Ackerman, 2004; Au, 1992).
4. Most young children are automatically programmed to use a certain section of the brain for learning a language and when they learn a second language early enough use that same part of the brain to learn second and other languages. Children learning another language later in life use a different part of the brain and it becomes a learning experience (and more difficult) rather than remaining a natural process (Pugh, 2006).
5. The influences of cultural environments are necessary for educators to understand because of the role this environment has on learning and what children become (Bruner, 1966; Demmert, 2001; Demmert & Towner, 2003; Gardner, 1985, 1995; Vygotsky, 1944).
6. Children where the language of instruction is different from the language of the home, or the child's first language and where the testing of academic performance is in a second or third language, will not test well (Mullis, 2003; Rasmussen, 2003; Demmert, 2005).
7. Children who learn to read in one language are able to transfer the reading skills to reading in a second language (Bournot-Trites & Tellowitz, 2002).
8. Learning to read in the second language should be delayed until the learner is able to develop his or her reading skills to an automatic level (automaticity). The transfer from reading in the first language to reading in the second language then becomes a natural transition (practical experience of LKSD, Pūnana Leo, & Window Rock).
9. It takes 3–5 years to develop oral proficiency for limited English proficient (LEP) students and it can take 4–12 years to develop academic English proficiency (Devlin, 1997; Ontario Ministry of Education, 2001; Hakuta et al., 2000).
10. Moving from a Native language to English or French has been shown to affect a Native student's self esteem if done before the first language has been well established (Bougie, Wright & Taylor 2003).
11. Dyslexic children use a different part of the brain than normal "readers" to read and if caught early enough can learn to develop that part of the brain that most of us use to read (Ackerman, 2004; Au, 1992).
12. High quality teachers that know context, pedagogy, and understand the different learning periods and preferences can be affective teachers (NCTAF, 1996; Cotton, 1995; Snow et al., 1998; Tharp, 2006).

13. Physical activity develops a glucose important to cognitive development (building synaptic connections in the brain) and kinesthetic activity is necessary for the cognitive development of all young children (Bagley, 1996)
14. Two of the most accurate predictors of a young person's ability to succeed in school are reading readiness (phonemic awareness, vocabulary, alphabet naming, and listening comprehension) and two dimensions of a youngster's social behavior: 1) interpersonal skills (the quality of social relationships with peers), and 2) work-related social skills (a child's degree of independence, responsibility, and self-control) at 54 months of age (5 ½ years of age) (NICHD, 2004).
15. There are three environmental influences linked to levels of academic performance among young children. These influences include the following: 1) High quality parenting: the degree to which a youngster is provided with an enriched warm and responsive learning environment (which includes appropriate control and discipline over children, each closely associated with both higher first grade reading and mathematics skills); 2) High quality child-care environments: stimulating activity and nurturing as reflected in high quality parenting and 3) High quality first-grade classrooms: with a focus on literacy instruction, evaluative feedback, instructional conversation, and encouraging child responsibilities (NICHD, 2004).
16. The most important contributors to learning include the curriculum, teacher quality, instructional practices, and assessment include low child-to-teacher ratio and small classes; pre-literacy, and pre-numeracy activities; motor, emotional, and social development; health and nutritional services; including significant opportunities for structured and unstructured play (Lynch, 2004; Parlakian, 2004; Pica, 2006).

    My research indicates a need to focus on:

    - early childhood education
    - health and wellbeing of prospective mothers
    - development of language and other cognitive skills
    - the inclusion of a culturally-based education
    - the need to train, hire and maintain highly qualified educators that understand and support the social and cultural mores of First Nation peoples
    - adequate financial support for schools
    - the importance of "ownership of schools"

All of these are consistent with my own knowledge of the literature regarding what is necessary to provide high quality schools and schooling for Aboriginal students. The issues of identity, motivation, traditional knowledge, development of modern skills, and self-worth are all important elements leading to academic success.

Note: This is a summary provided by Dr. Demmert of his presentation on June 6, 2009 at the American Indian Teacher Education Conference at Northern Arizona University in Flagstaff, Arizona. He was not able to review the final document before his death and the editors take responsibility for any errors or omissions.

References

Ackerman, Diane. (2004). *Alchemy of mind: The marvel and mystery of the brain.* Scribner, New York.

Au, T.K., (1992). Cross-linguistic research on language and cognition: Methodological challenges. In H. Chen & O.J.L. Tzeng (Eds.), *Language processing in Chinese: Advances in psychology* (pp. 367-381). Oxford, UK: North-Holland.

August, D., & Shanahan, T. (2007). *Developing literacy in second language learners. National Literacy Panel.* Mahwah, NJ: Lawrence Erlbaum (Chapter 14 in this report reports on the effectiveness of bilingual education programs compared with English-only programs).

Begley, S. (1996, February 19). Your child's brain. *Newsweek*, 55-62.

Bougie, E., Wright, S.C., & Taylor, D.M. (2003). Early heritage language education and the abrupt shift to a dominant language classroom: Impact on the personal and collective esteem of Inuit in Arctic Québec. *International Journal of Bilingualism and Bilingual Education, 6*, 349-373.

Bournot-Trites, M., & Tellowitz, U. (2002). *Report of current research on the effects of second language learning on first language literacy skills.* Halifax, NS: Atlantic Provinces Educational Foundation. Retrieved Nov. 5, 2010 at http://www.edina.k12.mn.us/normandale/media/weblinks/teachers/pdfs/report1.pdf

Bowman, B.T., Donovan, M.S., & Burns, M. S. (Eds.). (2001). *Eager to learn: Educating our preschoolers* (National Research Council, Committee on Early Childhood Pedagogy, Commission on Behavioral and Social Sciences and Education). Washington, DC: National Academy Press.

Bruner, Jerome. (1966). *The culture of education*. Cambridge, MA: Harvard University Press.

Cotton, K. (1995). *Effective schooling practices: A research synthesis 1995 update.* Portland, OR: Northwest Regional Educational Laboratory. Retrieved Nov. 5, 2010 at http://home.comcast.net/~reasoned/4410/PDFonCRM/Effective%20School%20Prac.pdf

Demmert, W.G., Jr. (2001). *Improving academic performance among Native American students: A review of the research literature.* Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools. Retrieved Nov. 5, 2010 at http://www.eric.ed.gov/PDFS/ED463917.pdf

Demmert, W.G., Jr. (2005). The influences of culture on learning and assessment among Native American students. *Learning Disabilities Research & Practice, 20*(1), 16-23.

Demmert, W.G., Jr., & Towner, J.C. (2003). *A review of the research literature on the influences of culturally based education on the academic performance*

of Native American students. Portland, OR: Northwest Regional Educational Laboratory. Retrieved Nov. 5, 2010 at http://educationnorthwest.org/resource/561

Devlin, B. (1997). Links between first and second language instruction in Northern Territory bilingual programs: Evolving policies, theories and practice. In P. McKay et al. (Eds.), *The bilingual interface project report* (pp. 75–90). Canberra: DEETYA.

Donovan M.S., & Burns, M.S. (Eds.) (2001). *Eager to learn: Educating our preschoolers* (National Research Council, Committee on Early Childhood Pedagogy, Commission on Behavioral and Social Sciences and Education). Washington, DC: National Academy Press.

Gardner, H. (1985). *Frames of mind: The theory of multiple intelligences.* New York: Basic Books.

Gardner, H. (1995). The development of competence in culturally defined domains: A preliminary framework. In N.R. Goldberger & J.B. Veroff (Eds.), *The culture and psychology reader.* New York: New York University Press.

Hakuta, K., Goto Butler, Y., & Witt, D. (2000). *How long does it take English learners to attain proficiency?* University of California Linguistic Minority Research Institute Policy Report 2000-1.

Hammer, P.C., & Demmert, W.G., Jr. (2003). *American Indian and Alaska Native early childhood health, development, and education assessment research.* Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools. Retrieved Nov. 5, 2010 at http://www.ericdigests.org/2005-1/indian.htm

Howard, E.R., Christian, D., & Genesee, F. (2004). *The development of bilingualism and biliteracy from grade 3 to 5: A summary of findings from the CAL/CREDE study of two-way immersion education.* Santa Cruz, CA: Center for Research on Education Diversity & Excellence.

INAR–Indian Nations At Risk Task Force. (1992). *Indian nations at risk: An educational strategy for action*. Washington, DC: U.S. Department of Education.

Lynch, Robert G. (2004). Preschool pays, high-quality early education would save billions. *American Educator*, *28*(4), 26-35.

Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., & Kennedy, A.M. (2003). *PIRLS 2001 international report: IEAs study of reading literacy achievement in primary schools.* Chestnut Hill, MA: Boston College.

NCTAF–National Commission on Teaching and America's Future. (1996). *What matters most: Teaching for America's future.* New York: Author. (ERIC Document Reproduction Service No. ED395931).

NICHD–National Institute of Child Health and Human Development. (2004). Multiple pathways to early academic achievement. *Harvard Educational Review, 4*(1), 1-29.

Ontario Ministry of Education. (2001). *The Ontario curriculum, grades 1–8: English as a second language and English literacy development—A resource guide.* Toronto, ON: Author.

OECD–Organization for Economic Co-operation and Development. (2002). *Understanding the brain: Towards a new learning science.* Paris: Author. Retrieved Nove. 5, 2010 at http://browse.oecdbookshop.org/oecd/pdfs/browseit/9102021E.PDF

O'Sullivan, J., & Goosney, J. (2007). *Get ready, get set, get going: Learning to read in northern Canada*. Thunder Bay, Canada: Center of Excellence for Children's Well-Being, Lakehead University. Retrieved Nov. 27, 2010 at www.coespecialneeds.ca/uploads/docs/getreadygetsetenglish.pdf

Parlakian, R. (2004). Zero to three. *Early Literacy and Very Young Children, 25*(1), 37-43.

Pica, R. (2006). Physical fitness and the early childhood curriculum. *Young Children, 61*(3), 12-19.

Pugh, K.R. Sandak, R., Frost, S.J. Moore, D., & Mencl, W.E. (2006). Examining reading development and reading disability in diverse languages and cultures: Potential contributions from functional neuroimaging. *Journal of American Indian Education, 45*(3), 60-76.

Rasmussen, J.B. (2003). Reading literacy performance in Norway: Current practice and critical factors. *European Journal of Education, 38*(4), 427-443.

Snow, C.E., Burns, S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

Sousa, D.A. (1998, December 16). Is the fuss about brain research justified? *Education Week, 18*(16), 35-52.

Sternberg, R.J. (1985). *Beyond IQ: A triarchic theory of human intelligence.* New York: Cambridge University Press.

Sternberg, R.J., Forsythe, G.B., Hedlund, J., Horvath, J., Snook, S., Williams, W.M., Wagner, R. K., & Grigorenko, E. L. (2000). *Practical intelligence.* New York: Cambridge University Press.

Sternberg, R.J., & Grigorenko, E.L. (2000). *Teaching for successful intelligence.* Arlington Heights, IL: Skylight Training.

Strong Foundations. (2007). *Early childhood care and foundations, EFA Global Monitoring Report.* Paris: UNESCO Publishing. Retrieved Dec. 11, 2010 at http://unesdoc.unesco.org/images/0014/001477/147794e.pdf

Tharp, R.G. (2006). Four hundred years of evidence: Culture, pedagogy, and Native America. *Journal of American Indian Education, 45*(2), 6-23.

Vygotsky, L. (1944). The problem of the cultural development of the child. In R. van der Veer & J. Valsiner (Eds.), *The Vygotsky reader*. Oxford, UK: Blackwell.

Culturally Appropriate Education
Theoretical and Practical Implications

Navin Kumar Singh

> *In every school, in every learning community, we can and will find stories of success, if we look for them. We must focus on accomplishment and achievement, we must be tolerant of each other's differences, and we must learn to share our stories from all of our different perspectives. When we do, we will discover that we all have inside of us the mana–the spiritual power, the wisdom of our ancestors—that can guide us to help ignite our students' and our own passion for learning, living, and teaching. This can be hard work. There are no shortcuts. But, by doing this, we will enhance our students' connections to themselves, their families, their communities, and their world. We must learn to talk-story with each other in ways that tap into that part of us, that energy and excitement that looks for the best in us and each other, and then build our educational strategies from that wisdom.* (Culture-Based Education Working Group, 2006, p. 32)

This chapter presents background information and rationale for culturally appropriate education along with some South Asian examples. In the changed national, regional, and global contexts, the concept of culturally appropriate education is drawing much more attention of educationists in curricular reforms all across the globe. The concept has become even more prevalent after the *Declaration on the Rights of Indigenous Peoples* was adopted by the United Nations' General Assembly in 2007.

Realizing the importance of providing children with a linguistically and culturally appropriate education, UNESCO published *The Use of Vernacular Languages in Education* in 1953. In the report's introduction the authors declare, "It is axiomatic that the best medium for teaching a child is his mother tongue" (p. 11) and in its general statement, they conclude,

> On educational grounds we recommend that the mother tongue be extended to as late a stage in education as possible. In particular pupils should begin their schooling through the medium of the mother tongue, because they understand it best and because to begin their school life in the mother tongue will make the break between home and school as small as possible.
>
> We consider that the shock which the young child undergoes in passing from his home to his school life is so great that everything possible should be done to soften it....
>
> The use of the mother tongue will promote better understanding between the home and the school when the child is taught in the language of the home. (pp. 47-48)

Since then the concept of culturally appropriate education has been debated at both national and international levels. However, it gained greater importance in the 1990s when the need for a new pedagogy was realized by educators to take into account cultural factors and responses arising from with increased levels of cultural diversity in North America, Europe, and elsewhere. Teachers face new challenges of educating children who come from a multiplicity of cultural backgrounds. In addition, the importation of Western educational theories and practices into other parts of the world create new challenges for teachers (Nguyen, Terlouw & Pilot, 2006). In this regard, it is important to note that UNESCO has also reiterated its stand on the use of culturally appropriate educational materials in a 2003 position paper (see Appendix A on p. 38). As it is stated under its principle three, "Education should raise 'awareness of the positive value of cultural [and linguistic] diversity' and to this end: 'curriculum [should be reformed] to promote a realistic and positive inclusion of the minority [or indigenous] history, culture, language and identity" (UNESCO, 2003, p. 33).

Elwyn Thomas (1997), referring to the new challenges that educators face in this highly globalized word, identified two major tasks for educators: (1) to decide what the key elements are in the process of globalization that are likely to affect education and schooling, and to assess which of these elements can be used as part of the core strategy for curriculum planning in schools and teacher training and (2) to decide and deal with the social mores–the fabric of a cultural niche, with teaching and learning that should be more culturally sensitive. This second task is related to the concept of "culturally appropriate pedagogy," a pedagogy that focuses on educational competence in a global context, and which deals with the cultural context of learners and teachers. It is worthy of note that there are many other terms used to denote this type of pedagogy including: Culturally responsive, culturally respective, culture-sensitive, culturally-rooted, culturally relevant, and culturally congruent (Campbell, 1997; Gay, 2010; Ladson-Billings, 1992, 1994; Yamauchi, 2005). Notwithstanding the differing terms, the underlying assumption is the same–respect for multi-ethnic knowledge, skills, and cultural diversity in educational practices.

Citing the definition of culture by English anthropologist, Edward B. Tylor, "that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society" (Tylor, 1924/1871, p. 1), Young Pai (1990) writes:

> Education is an intentional attempt to pass on such a complex whole because it is the design by which cultural contents are transmitted from one generation to another…the structure of educational system, the role of the school, and the teacher-learner relationships reflect the social organization and cultural norms of the society…no part of educative process, neither its contents nor products, is free from cultural influence. (p. 4)

Therefore, it is imperative that educators should acknowledge the fact that teaching and learning processes are entrenched by the core values, beliefs, and attitudes as well as the predominant cognitive and communication styles and linguistic patterns of a culture. Moreover, educational practices (formal and informal) are equally influenced by the socioeconomic status of the learner, peer pressures, the nature of the relationships between dominant and minority groups, and the impact of technology on the society.

Theoretical and philosophical perspectives

As noted in UNESCO's *The Use of Vernacular Languages in Education* (1953) there is strong evidence that the use of children's mother tongue in school will develop a good home-school relationship and relieve students from psychological shock and give them the best opportunity to express their ideas and communicate well if the classroom environment (Cummins, 2000). Too often formal education systems ignore and underutilize the knowledge and experience that ethnic minority children bring to school. Advocates of bilingual education argue that learning in a language which is not one's own exerts extra pressure for children, not only is there the challenge of learning a new language but also that of learning new knowledge and skills. As a result, children find it difficult to cope with the challenges that emerge from the so-called standard language of instruction, which ultimately can alienate them (Banks & Banks, 2010; Gay, 2010; Nieto, 2010; Skutnabb-Kangas & Dunbar, 2010). Similarly, some scholars have underscored that the role of resistance to cultures of domination in student disaffection from school learning is a fundamental issue in public education in the US, Canada, Australia, Britain, and the rest of Europe (see Banks & Banks, 2010, p. 46).

Children obviously understand their first language best and are most comfortable speaking it. Eventually, education in school can become a burden for them when they have to learn a new language of instruction. McAlpine and Crago (1995) argue that conflict between classroom culture and home culture may make it difficult for children to participate in class or force children to deny their family and heritage in order to succeed in a culturally alien school. That is why successful pedagogy requires that teachers become culturally literate. That is, they must work towards understanding to the best of their ability the culture and home backgrounds of their students. It has been established that culture-based misunderstandings can create tensions between teachers and students. As Lars Anders-Baer, et al. (2008) write:

> The dominant language medium of education prevents access to education because of the linguistic, pedagogical and psychological barriers it creates...most indigenous peoples and minorities have to accept *subtractive* education where they learn a dominant language *at the cost of the mother tongue* which is displaced, and later often replaced by the dominant language. (pp. 3-4, emphasis in original)

According to Jacqueline Jordan Irvine (1990):

> African American, Hispanic, Asian, Native American, as well as some poor and working-class white students often bring to the school setting a distinctive set of cultural values, beliefs, and norms that is often incongruous with middle-class cultural norms and behaviors of schools. (p.7)

Emphasizing the importance of culturally responsive education to bridge the gap between home and school, she states that when students perceive that the school setting is hostile and incongruous, or when there is a cultural mismatch or cultural incompatibility between students and their school, there inevitable occurs miscommunication; confrontations between the student, the teacher, and the home, leading to hostility, alienation, diminished self-esteem, and eventual school failure. Similarly, referring to the gap between home languages of children and the language of instruction in Nepal, Skutnabb-Kangas and Dunbar (2010) state that "it would therefore be appropriate to educate the children in their mother tongue in order to make the break between home and school as small as possible" (p. 51).

What is culturally appropriate education?

A culturally appropriate education melds instruction to better fit the expectations and cultural patterns of the group being served. The group's language, culture, and its worldview are built into the routines, curriculum, and structure of the school. Apart from improving learning achievement of students, culturally appropriate education is a way to perpetuate and build pride in the students' home culture (Ah-Nee Benham & Cooper, 2000; Cajete, 1994; Cantoni, 1998; Fordham, 1998; McCarty, 2003).

By defining culture as shared ways of being, knowing, and doing, Shawn Kana'iaupuni (2007) argues that culture-based education is the grounding of instruction and student learning in the values, norms, knowledge, beliefs, practices, experiences, and language that are the foundation of a culture. Furthermore, because U.S. society typically views schools through a Western lens—where Western culture is the norm—what many do not recognize is that all educational systems and institutions are culture-based. According to Kana'iaupuni there are five basic elements that comprise culture-based education:

- **LANGUAGE:** Recognizing and using native or heritage language.
- **FAMILY & COMMUNITY:** Actively involving family and community in the development of curricula, everyday learning, and leadership.
- **CONTEXT:** Structuring the school and the classroom in culturally-appropriate ways.
- **CONTENT:** Making learning meaningful and relevant through culturally grounded content and assessment.

- **DATA & ACCOUNTABILITY:** Gathering and maintaining data using various methods to insure student progress in culturally responsible ways. (2007, p. 1)

However, these five elements vary from context to context, depending on cultural ways of being, knowing, and doing. Likewise, Geneva Gay (2010, pp. 31-32) identifies five characteristics of culturally responsive teaching: (a) the legitimacy of the cultural heritages of different ethnic groups, both as legacies that affect students' dispositions, attitudes, and approaches to learning and as worthy content to be taught in the formal curriculum; (b) bridges of meaningfulness between home and school experiences as well as between academic abstractions and lived sociocultural realities; (c) a wide variety of instructional strategies that are connected to different learning styles; (d) students to know and praise their own and each others' cultural heritages; and (e) multicultural information, resources, and materials in all the subjects and skills routinely taught in schools. She further emphasizes that by using these characteristics to improve culturally responsive teaching, would involve considerations to the classroom environment. For example, literature in the classroom would reflect multiple ethnic perspectives and literary genres. Math instruction would incorporate everyday-life concepts, such as economics, employment, and consumer habits of various ethnic groups. In order to teach to the different learning styles of students, activities would reflect a variety of sensory opportunities–visual, auditory and tactile.

The Alaska Native Knowledge Network (ANKN) highlights specific standards to ensure culturally appropriate education practices in their *Alaska Standards for Culturally Responsive Schools*. The preface states:

> These "cultural standards" are predicated on the belief that a firm grounding in the heritage language and culture indigenous to a particular place is a fundamental prerequisite for the development of culturally-healthy students and communities associated with that place, and thus is an essential ingredient for identifying the appropriate qualities and practices associated with culturally-responsive educators, curriculum and schools. (ANKN, 1998, p. 2)

The ANKN lists specific standards for schools, curriculum, educators, students and communities for sustaining culturally responsive education practices (see Appendix B on page 40). Similarly, Castagno and Brayboy write:

> The curricular and pedagogical strategies are important, but we suggest that they might become even more powerful and meaningful for Indigenous youth and tribal communities if they were explored and analyzed within the context of sovereignty and self-determination, racism, and Indigenous epistemologies. Without a tight connection to these three themes, culturally responsive curricular and pedagogical efforts will continue to provide only surface-level and compartmental-

> ized opportunities for Indigenous students to see themselves and their communities in schools. Curricula and pedagogy developed with a deep understanding of sovereignty and self-determination, racism, and Indigenous epistemologies will be far more powerful in their ability to provide good schooling to Indigenous youth. These elements—particularly the first and last–are what set CRS for Indigenous youth apart from other educational efforts. (2008, p. 969)

Why do we need culturally appropriate education?

As previously stated, the concept of culturally appropriate education is not new. The importance of the cultural background of students was recognized in the *Meriam Report* in 1928 in the US, in which the recognition of Native American's different world view and incorporation of their traditions, cultures and epistemologies in education were emphasized. The report noted:

> It is true in all education, but especially in the education of people situated as are the American Indians, that methods must be adapted to individual abilities, interests, and needs. A standard course of study, routine classroom methods, traditional types of schools, even if they were adequately supplied—and they are not—would not solve the problem. The methods of the average public school in the United States cannot safely be taken over bodily and applied to Indian education. Indian tribes and individual Indians within the tribes vary so much that a standard content and method of education, no matter how carefully they might be prepared, would be worse than futile. (Meriam et al., p. 347)

Referring to the different world view and perspectives of American Indians, in that report it was stated:

> it is the task of education to help the Indian, not by assuming that he is fundamentally different, but that he is a human being very much like the rest of us, with a cultural background quite worthwhile for its own sake and as a basis for changes needed in adjusting to modern life. Moreover, it is essential for those in charge of education for the Indian to remember that the Indians' attitudes towards society have been determined largely by his experiences, and that these can, wherever necessary, be changed to desirable social attitudes by exposing him to a corresponding set of right experiences in the relationships of home, family, and community life. (Meriam et al., 1928 p. 354)

Referring to the current United States situation, James and Cherry Banks (2010) note that education in the U.S. is not a single, uniform system that is available to every child in the same way. Children of different social classes are likely to attend different types of schools, to receive different types of instruction, to study different curricula, and to leave school at different rates and times.

As a result, when children end their schooling, they differ more than when they entered, and society may use these differences to legitimate adult inequalities. If we understand better how schools can help construct inequalities, we may be in a better position to try to change them.

Today's classrooms require teachers to educate students varying in culture, language, abilities, and many other characteristics (Gollnick & Chinn, 2002). For Irvine (1990), some female students of color and poor white students have ways of doing and knowing that often conflict with and sometimes are even antithetical to the ways in which schools expect them act and know. Thus, to increase student success, it is imperative for teachers help student to bridge the discontinuity between home and school cultures and contexts (Allen & Boykin, 1992). In other words, a culturally responsive instructional environment minimizes the students' alienation as they attempt to adjust to the different "world" of school (Heath, 1983; Ladson-Billings, 1994). Likewise, Skutnabb-Kangas et al. (2009) state, "Marginalized peoples who undergo culturally and linguistically appropriate education are better equipped both to maintain and develop their cultures and to participate in the wider society" (p. xvii). Culturally responsive teaching is empowering because it enables students to be better human beings and more successful learners.

Empowerment can be described as academic competence, self-efficacy, and personal initiative. For this, students should believe that they can succeed in learning tasks and have motivation to persevere, while teachers should demonstrate high and appropriate expectations and provide support for students in their efforts toward academic achievement (Gay, 2010). In this context, it is worth referring to Ira Shor who characterizes empowering education as critical-democratic pedagogy for self and social change:

> It is a student-centered program for multicultural democracy in school and society. It approaches individual growth as an active, cooperative, and social process, because the self and society create each other. The goals of this pedagogy are to relate personal growth to public life, to develop strong skills, academic knowledge, habits of inquiry, and critical curiosity about society, power, inequality, and change. (1992, pp. 15-16)

For example, Kaiwi and Kahumoku (2006) found that the introduction of a Native Hawaiian approach to analyze literature by acknowledging and validating students' perspectives empowered them. They concluded that students showed a sustained connection to ancestors, greater appreciation for parents and grandparents, and an increased desire to learn.

For some, culturally responsive teaching is also liberating in that it guides students in understanding that no single version of "truth" is total and permanent. For this, teachers make authentic knowledge about different ethnic groups accessible to students. Geneva Gay (2010) states, "The validation, information, and pride" that culturally appropriate pedagogy "generates are both psychologically

and intellectually liberating" (p. 37). This freedom results in improved achievement of many kinds, including increased concentration on academic learning tasks, such as clear and insightful thinking; more caring, concerned, and humane interpersonal skills; better understanding of interconnections among individual, local, national, ethnic, global, and human identities; and acceptance of knowledge as something to be continuously shared, critiqued, revised, and renewed.

It is worthwhile to note that culturally relevant education is also viewed by many as a way to achieve political power and independence. For instance, Mahatma Gandhi when he led the Indian Independent Movement in 1930s used the notion of culturally appropriate education as an alternative to the British educational system, which was also known as Macaulay's education system, (Mehta, 1976). Launching the movement against the British in 1938, Mahatma Gandhi advocated the inclusion of practical knowledge and cottage skills such as, traditional weaving, also known as Charkha Andolan, and agriculture into the Basic Education, by laying stress on integrating education with work experience through "down-to earth" vernaculars (mother-tongues/local lingua francas) and language acquisition with communicability (Khubchandani, 2008, p. 371).

Later, in 1960s, Julius Nyerere applied the same model of culture-based education in Tanzania immediately after its independence. Nyerere is famous for his "Education for Self Reliance" philosophy in which he emphasized the need for mother-tongue education in the local language, Kiswahili. In 1967 Kiswahili was made the sole language of instruction for primary education, and it was planned to extend in secondary education as well. The focus of the program was to establish settlements and allow people to access water, electricity and schools more easily. The Ujamma family villages were to be governed by those living in them, and Kiswahili was made the language of instruction for all seven years of primary schooling. Birgit Brock-Utne (2008) argues that President Julius Nyrere implemented the education policy in Tanzania that revived the Kiswahili language and developed it into a national language, which flourishes today, even beyond Tanzania's borders.

Even today in the U.S., some Native American writers and activists suggest that one key to the regeneration of the political power of their people and culture lies in a reorganization of political structures and educational systems to reflect indigenous knowledge, ways of learning, and ways of being (Alfred, 1999, 2005). Moreover, culturally responsive teaching does not confine to traditional educational practices, but rather it appreciates the cultures and experiences of various groups and also uses them as resources for teaching and learning. For example, the verbal creativity and story-telling that is unique among some African Americans in informal social interactions should be acknowledged as a gift and contribution and used to teach writing skills. Similarly, other ethnic groups of students prefer to study in small groups. Thus, more opportunities for them and other students to participate in cooperative learning can be provided in the classroom. Highlighting the importance of culturally appropriate education, Bowers and Flinders (1990) state, "it is imperative to ground pedagogical practices, as well as curricular decisions, in a more culturally informed manner."

However, they also underscore the fact that not all cultural groups value the same forms of knowledge, and the fact that they "reflect differences in cultural views of reality, brings into the open the political nature of the teacher's role" (p. 27). On the other hand, Peter McLaren noting the work of Henry Giroux highlights the problems that teachers are facing now:

> As cultural sites, schools are contested terrains in which different values, conventions, and knowledges variously intersect, juxtapose, and exclude one another. Teachers and others interested in education must understand how the dominant culture of all levels of schooling functions to disconfirm and, less frequently, to legitimate or celebrate the cultural experiences of students who inhibit subordinate cultures. (1989, p. 200)

Likewise, Etta Hollins (1996) contends that education designed specifically for students of color incorporates culturally mediated cognition, culturally appropriate social situations for learning, and culturally valued knowledge in curriculum content (p. 13), and James Banks (1991) argues that if education is to empower marginalized groups, it must be transformative. For him, being transformative involves helping students to develop the knowledge, skills, and values needed to become social critics who can make reflective decisions and implement their decisions in effective personal, social, political, and economic action.

How to make school culturally appropriate?

For culturally appropriate education, Romaine (2009) has emphasized the need for paradigmatic school reforms in terms of its power structures, interaction between teachers and students, culture, curriculum, extracurricular activities, classroom dynamics, evaluation system, and attitude toward minority languages. Similarly, Richards, Brown and Forde state that reforms must occur in three specific areas to make schools culturally appropriate:

1. Organization of the school—this includes the administrative structure and the way it relates to diversity, and the use of physical space in planning schools and arranging classrooms.
2. School policies and procedures—this refers to those policies and practices that impact on the delivery of services to students from diverse backgrounds.
3. Community involvement—this is concerned with the institutional approach to community involvement in which families and communities are expected to find ways to become involved in the school. (2006, p. 5)

The culture of learning that students and teachers bring to the classroom is a taken-for-granted framework of expectations, attitudes, values, and beliefs about what constitutes good learning (Cortazzi & Jin, 1996, 1999). It is acquired in early socialization patterns and through the internalization of roles and expectations

that students learn at school. It influences a teacher long before he/she was a student and becomes a framework of cultural interpretation that is unconsciously employed in later teaching methods.

In this respect, Erasmus and Ferreira (2002, p. 34) suggest that "teachers in a multicultural school system should be able to meet the needs of learners from pre-industrial, modern and post-modern environments as well as from different cultural, socio-economic and historic-political backgrounds." In this regard, they suggest that it "is as imperative that educators should possess the necessary interpersonal and professional skills" to deal with multicultural challenges. It is clear that the complexity of culturally appropriate education requires relevant teacher education. In other words, the pivotal role of teacher educators in addressing the challenges of diversity should become more forefront than ever before. On the other hand, some scholars have emphasized the need for community involvement in sustainable culturally appropriate education practices. For them, tribal members, elders, parents, and other adults need to be invited in culturally appropriate ways to take active roles in the development of culture-based education initiatives, programs, and school policies and generally should be viewed as equal partners and collaborators in the schooling of their children (Castagno & Brayboy, 2008; Demmert & Towner, 2003).

In this regard, Patricia Schmidt (2005) notes, "Research and practice demonstrate that strong home, school and community connections not only help students make sense of the school curriculum, but also promote literacy development." (p. 3). Citing numerous studies, she lists five major challenges for culturally appropriate education practices in the United States:

1. our school population has become increasingly diverse, both culturally and ethnically, our teaching population has mostly originated from European-American, suburban experiences....
2. most current and future teachers have not had sustained relationships with people from different ethnic, cultural, and lower socioeconomic backgrounds. As a result, much of their knowledge about diversity has been shaped by media stereotypes....
3. School curriculum, methods, and materials usually represent only European-American or white culture and ignore the backgrounds and experiences of students and families from lower socioeconomic levels and different ethnic and cultural backgrounds....
4. Many teacher education programs do not adequately prepare teachers for "culturally relevant pedagogy"....
5. When cultural differences are ignored in classrooms, student fears and alienation increase.... Consequently, this disconnect has become a national problem whose influence has been linked to poor literacy development and extremely high dropout rates among students from urban and rural poverty areas.... (pp. 3-4)

What is culturally appropriate pedagogy?

Culturally appropriate pedagogy recognizes and utilizes the students' culture and language in instruction, and ultimately respects the students' personal and community identities (Irvine, 1992) and comprises three dimensions: 1) institutional—it refers to the administration and its policies and values; 2) personal—refers to the cognitive and emotional processes teachers must engage in to become culturally appropriate; and 3) instructional—includes materials, strategies, and activities that form the basis of instruction (Richards, Brown & Forde, 2006, p.1). Teachers need to be aware of their pedagogy, and for this, they can check whether their pedagogy is culturally appropriate or not by using tools such as the checklist found in Appendix C on page 42.

For Geneva Gay (2010), culturally responsive teaching uses the cultural knowledge, prior experiences, and performance styles of diverse students to make learning more appropriate and effective for them; it teaches to and through the strengths of these students. In other words, culturally responsive teachers teach the whole child. It means that culturally responsive teachers realize not only the importance of academic achievement, but also the maintaining of cultural identity and heritage. In other words, culturally responsive pedagogy helps students clarify their ethnic values while correcting factual errors about cultural heritage by focusing on those elements of cultural socialization that most directly affect learning. For this, students are held accountable for knowing, thinking, questioning, analyzing, feeling, reflecting, sharing, and acting (Gay, 2010).

Similarly, Gloria Ladson-Billings (1992) views that culturally responsive teachers develop intellectual, social, emotional, and political learning by using cultural referents to impart knowledge, skills, and attitudes. Ladson-Billings (1994) studied instruction in elementary classrooms and concluded that students performed like members of an extended family-assisting, supporting and encouraging each other. She also observed that students performed much better when they were part of a more collective effort designed to encourage academic and cultural excellence, expectations were clearly expressed, skills taught, and interpersonal relations were exhibited. By promoting an academic community of learners, teachers responded to the students' need for a sense of belonging, honored their human dignity, and fostered their individual self-concepts. As a result, students got engaged in creating relationships, shared resources, and collaborate among themselves and with the teacher to achieve their common learning goals.

However, Ngai and Allen (2007) argue that "in the past, Native students tended to keep their cultures inside. Now many of them have started to express pride in their heritages and confidence in themselves. They have become more comfortable participating in class and they appear to be happier at school" (p. 9). Likewise, Klump and McNeir (2005) emphasize the dynamic nature of the word "responsiveness," and argued that the ability to acknowledge the unique needs of diverse students, take action to address those needs, and adapt approaches as student needs and demographics change over time are crucial for ensuring culturally appropriate education practices. It means that contrary to traditional

education system, culturally responsive education should be flexible enough to accommodate the needs of students in curriculum, content, pedagogy and classroom delivery for the given local situations and contexts.

Why do we need culturally appropriate pedagogy?

It is imperative that teachers explore their personal histories and experiences, as well as the history and current experiences of their students and their families. It means that with knowledge comes understanding of self and others, and greater appreciation of differences. That is why teachers should recognize their "power" and use it wisely in teaching other people's children (Delpit, 1988). Teachers should demonstrate understanding and support for their learners and create a bridge where the curriculum falls short in addressing the needs of all students, and where the system reflects cultural and linguistic insensitivity. For this, teachers need to be culturally responsive, utilizing materials and examples, engaging in practices, and demonstrating values that include rather than exclude students from different backgrounds. Lisa Delpit writes:

> Appropriate education for poor children and children of color can only be devised in consultation with adults who share their culture…members of poor communities must be allowed to participate fully in the discussion of what kind of instruction is in their children's best interest. Good liberal intentions are not enough. (Delpit, 1988, p. 296)

It is important to note that sometimes teachers develop their own ethnocentric attitude towards students of a particular ethnic group and treat them differently, based on stereotyping. In this regards, Pai and Adler (2001, p. 271) have cited an incident when a teacher gave a D on a well written English essay of an Asian American student because of his/her preconceived notion that Asian students cannot be competent writer in English. When the father of the student asked the teacher to explain the reasons for giving a D on the essay to his daughter, the teacher responded, "I thought that someone else had written the paper for her because, being an Asian, I assumed that she would naturally have problems in writing an English essay." This is an eye opening example of stereotyping, since this type of attitude still persists in academia in the US, and other parts of the world. Citing this example, Pai and Adler (2001, p. 171) emphasize the need for educators to be cognizant about other cultural beliefs and practices. As they write:

> It is essential for educators to know how or at what point the values held by the various ethnic groups may come into conflict with school goals. For example, schools reward students for individual competence, achievements, and involvement…. Navajos are said to prize group harmony and hence conformity to the group norm…a Navajo child may be helped to learn function differently in school and in the Navajo community.

Alienating students from their ethnicities and cultural practices diminishes the chances of ever being fully realized their achievement potentiality. Pai (1990, p. 229) categorically emphasizes for cultural awareness of teachers, writing:

> Our goals, how we teach, what we teach, how we relate to children and each other are rooted in the norms of our culture. Our society's predominant worldview and cultural norms are so deeply ingrained in how we educate children that we seldom think about the possibility that there may be other different but equally legitimate and effective approached to teaching and learning. In a society with as much sociocultural and racial diversity as the United States, the lack of this wonderment about alternative ways often results in unequal education and social injustice.

Geneva Gay (2010, p. 36) emphasizes the need for respecting students' diverse cultural backgrounds and ethnic identities, along with academic success in responsive pedagogy, writing,

> Culturally responsive teaching makes academic success a non-negotiable mandate for all students and an accessible goal. It does not pit academic success and cultural affiliation against each other, rather both are developed simultaneously, so that students are obligated to be productive members of and render service to their respective ethnic communities as well as to the national society.

Villegas and Lucas (2002) contend that teachers' values impact relationships with students and their families and that teachers must modify negative feelings towards any cultures, languages, or ethnic groups they may have. Santoro and Allard (2005) carried out a study in Australia to assess the role of social class and ethnicity in learning achievement of children. They explored how student-teachers understand their own ethnicity and social class and how they address the needs of students who are ethnically different from the student-teachers. The study's findings underscore the need for teachers to consider their students' ethnicity and culture when planning for teaching. It is imperative for teachers not only to understand how students' ethnicity shapes their learning experiences, but also how a teacher's own ethnicity shapes and determines classroom practices and how he or she categorizes children.

In the fall issue of *Teachers of Color* Sara Smith (2010) responds to the question:

> Cultural diversity should be infused in the classroom and school setting. Yet, many academic institutions and school districts keep this vital aspect of education at the bottom of the priority ladder. What routes can be taken within educational settings in order to "climb" to a higher level of understanding and acceptance? Should action be proposed to

> administrators? If so, what should this entail? Or, should more emphasis be placed on teacher training? (p. 26)

In answer, she cites the importance of culturally responsive teaching at all levels of education in the US:

> Culturally relevant practice is important at all levels of school functioning. The critical issue here is acknowledging and exploring the relationship between culture and learning. Learners and teachers need opportunities to share their cultural ways of knowing and learning, to acknowledge and appreciate the differences, and to reflect on the multiple ways of demonstrating what is known. Learning about the connections between culture and learning helps teachers not only to assist their particular learners in accessing and mastering the school curriculum, but also to broaden their own awareness of the various ways that individuals approach and manipulate content, language and literacy. These understandings are important to administrators, too, so that they can make informed decisions about program, policy and procedure across grades and subject areas. (p. 26)

Schmidt (2005) argues, "to get the most from students, teachers must plan instruction for the diverse populations in their classes and make learning relevant to motivate students to do their best." He further stated that "And what seems more apparent than ever before is that culturally responsive instruction is excellence in teaching – excellence in teaching for successful learning" (pp. 30-31).

Some South Asia examples of culturally appropriate educational practices

Today, the notion of culturally appropriate education is gaining momentum in every nook and corner of the world. In this respect, it is important to note that along with the United States, Australia and New Zealand, Canada did not sign the 2007 Declaration of the Rights of Indigenous People (DRIP) though in 2010 Canada reversed its position. Canada's Director General of the Education Branch, Indian and Northern Affairs Canada Line Pare (2004) emphasized at the Paris Indigenous Education in The 21st Century: Executive Seminar the need for promoting culturally appropriate education practices in the world:

> Canada believes that, in the case of Indigenous education, the two concepts of "cultural appropriateness" and "learner centered" approaches lead to the same place: namely, a situation wherein Indigenous children feel safe, welcome and respected and thus ready to learn as much as possible on their terms. Recognizing this, Canada announced a year ago $100 million over five years to create a National Aboriginal Language and Cultural Centre to advance Indigenous languages and culture priorities and interests. (Pare, 2004)

Referring to Canadian experience as a model, he stated:

> If the goal is improved education results for Indigenous students, then some of the key ingredients are: a) increased use of Indigenous languages; b) increased presence of Indigenous teachers; c) increased Indigenous content in curricula; and d) development of innovative ways of delivering Indigenous education services based on an effective mix of Indigenous language, Indigenous role models and Indigenous content. (Pare, 2004)

Here, I would like to present some examples of culturally appropriate education practices with special reference to the South Asian region. It is important to consider the historically diverse contexts of South Asian region when we talk about culturally appropriate education practices. Referring to the multiethnic diversity of the Himalayan region, Mark Turin (2007) wrote:

> The greater Himalayan region, which extends for 3,500 km from Afghanistan in the west to Myanmar in the east, sustains over 150 million people and is home to great linguistic diversity and many of Asia's most endangered languages. Moving across the region in alphabetical order, Afghanistan boasts 47 living languages, Bangladesh is home to 39, Bhutan has 24, China 235, India 415, Myanmar 108, Nepal 123, and Pakistan 72. The entire Himalayan region is often described as one of the ten biodiversity 'mega centers' of the world. This stretch of mountainous Asia is also home to one-sixth of all human languages, so the area should be thought of as a linguistic and cultural 'mega centre' as well, and an important site for the common heritage of humanity. (p. 1)

Following are some examples of culturally appropriate education practices, in terms of teacher training of India, teaching materials of Nepal and cultural awareness program of China. In India, the concept of culturally appropriate education practices came into vogue along with its independent movement in the early 1920s and 30s, when Mahatma Gandhi emphasized for inclusion of local knowledge and skills to be incorporated in the place of the then British education system (Mehta, 1976). In 1986 India's *National Policy of Education* recognized the need for culture-based rfuvstion. However, for sustaining the culturally appropriate education practices. Previously, the Centre for Cultural Resources and Training (CCRT) was established in 1979 (see http://ccrtindia.gov.in/). Now, the CCRT functions as an autonomous organization under the aegis of Ministry of Culture, Government of India. Its main thrust is to make students aware of the importance of culture in all development programs by conducting a variety of training programs for in-services teachers, teacher educators, educational administrators and students throughout the country. It conducts a variety of in-service teacher training programs by covering broad areas of interlinking education with culture, for development of the child's personality–particularly

in terms of helping the child to discover his/her latent talent–and to express it creatively. It also conducts various academic programs on Indian art and culture for foreign teachers and students. The center has adopted its motto to develop consciousness of the "Indian Cultural Heritage" through the utilization of local resources and community interaction. As it is stated, "for education to be effective and result-oriented, it has to be culture based, and it must take into account the cognitive, emotional and spiritual needs of the student.... Knowledge of culture plays a prominent role in democratic thinking: a democratic citizen is known for his ability to sift truth from false and he/she is more receptive to new ideas" (The Centre for Cultural Resources and Training, New Delhi. 2010).

A local tribal culture-based education project, Janshala was launched in nine Indian states as a joint program of the Government of India and five United Nations agencies (UNDP, UNICEF, UNFPA, UNESCO and ILO) for the universalization of primary education among educationally underserved communities. The Program covered nearly three million children, and 58,000 teachers in 18,000 schools. Out of 139 blocks more than 75 blocks had substantial tribal population. The proportion of tribal children was 33% of the total target group children in the project area. However, in a survey study, records collected in schools in the Janshala program areas indicated continuing high "dropout" rates among tribal children. A major reason for that was that in most states the medium of instruction was the regional language. Most tribal children did not understand the textbooks, which were generally in the regional language. The appointment of non-tribal teachers in tribal children's schools was another problem as the teachers did not know the children's language and children did not understand the teacher's (Gautam, 2003).

Recently, the *Curriculum Framework for Teacher Education of India* (2006) has emphasized cultural appropriateness. The framework comprises four clusters of competencies encircled by four supportive themes. It suggests that each teacher is allowed to interpret the framework within his or her context and personal approach to pedagogy. One of the four themes, Context and Culture, identifies factors that must be considered in infusing technology into the teacher education curriculum. This theme includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modeled by teachers (*Curriculum Framework,* 2006). Likewise, in a project serving 200 schools started in 2007 in the Indian state of Orissa for Indigenous ("tribal") children from ten language groups, students are being taught through their mother tongues in the primary grades with materials collected from children, parents and teachers. Sixteen more languages were added in 2008 (Muthukumaraswamy, 2009, p. 5).

Similarly in China, culture awareness is also stipulated as one of the integrated language capabilities in current reforms in the English as a Foreign Language (EFL) national curriculum. China's Ministry of Education in 2003 called for the Basic EFL curriculum to include cultural knowledge, cultural perception and cross-cultural communication awareness and competence (Ministry of Education, China, 2001, 2003 cited in Muir, 2007, p. 39). However, research shows

that educators in the teaching practice have not yet realized this profoundly, or some just mistake speech acts which are embedded in different cultures for culture awareness. However, Nguyen, Terlouw and Pilot (2006) cited an article in *The Economist* ("Roll over Confucius" 25 January 2003) reporting that innovative schools with modern US–Western-based learning are being shunned by parents in favor schools that retain traditional educational methods" (p. 3). In this regard, UNESCO (2010) states, "Linguistic and cultural barriers to education, often combined with geographic isolation, are major factors of exclusion of minority children. UNESCO is advocating for linguistically and culturally appropriate education and the Beijing Office is cerebrating International Mother Language Day in China annually. In China, two UN Joint Projects are being implemented under the UN Spanish MDG Funds supporting the education of ethnic minorities and life skill training for young migrants."

Like its large neighbors, India and China, Nepal has also recognized the importance of culturally appropriate education practices in its diverse sociocultural contexts. In this respect, it is worthwhile to refer to Turin (2007) who states:

> In Nepal, linguistic and cultural identities are closely interwoven, and many of the country's indigenous peoples define themselves in large part according to the language they speak. Language is often used as a symbolic badge of membership in a particular community, and is a prominent emblem of pride in one's social or ethnic identity. (p. 27)

Below are examples of teaching materials from an English textbook that not only help us to comprehend the nature of culturally appropriate education practices, but they also give us some perspectives in terms of various cultural practices of indigenous communities of Nepal:

> In Nepal if you ask someone about Terai festivals they will probably mention Holi or Chhath. But I like Sama Chakewa best. It's a festival which is celebrated in the month of Kartik. When the full moon comes out in the sky, here on earth, women and girls come out of their houses carrying flat baskets on their head in

> which which there are dozens of different birds made of clay, so beautiful and real, they look as if they are ready to fly. Cranes, herons, ducks and many others, among them Sama-Chakewa, the loving birds. And among the birds, there is also a bearded character, called Chugla. Some baskets also contain rice, fruit, flowers and betel. Small dios twinkle in the baskets and the innocent, beautiful faces of the women are reflected in their

light. They ask Sama-Chakewa to give their blessing to their brothers and the sweet notes of their song fill the tranquil night air: D-e-e-p is the river and forceful's the current Sama might be drowned Chakewa is d-y-i-n-g of crying, O God ! Come back Sama, p-l-e-a-s-e....

Have you ever seen Chandi Naach? If you are lucky, you might see it at Tundikhel, Kathmandu. But if you want to experience its real flavor, you have to go to the eastern hills of Nepal. It's a festival which is celebrated by Rai people on Baishakh Purnima. They celebrate it with the help of their priests who perform rituals to worship their ancestors. Men and women, old and young, everybody participates and enjoys the occasion. First they form a circle by holding each other's hands. With the beating of the drum people start dancing, at a slow pace in the beginning but faster as the drum beats more quickly. The festival provides an opportunity for young Rai men and women to meet and get to know each other. Their song and dance reflect their simple life.

Possible student activities include:

(a) Write a couple of paragraphs about a festival which is celebrated in your village or town or by your community.

(b) Write a letter to your pen friend describing any one of the following festivals: Gaura, Christmas, Ramjan, Gaijatra, Chhatha, Losar, Holi, Bhaitika

(Source: *Grade 10 English Textbook*, pp. 60-61, Curriculum Development Centre, Government of Nepal, 2000)

It is important to consider the diverse social and cultural contexts of Nepal, to understand the above given examples of culturally appropriate educational materials for teaching English language to Nepalese students. Basically, Nepal is a small country, but it is very diverse in every respect as there are more than 30 different languages being spoken and so many communities live together in harmony and practice their own cultures and traditions. In other words, culturally, Nepal is a mosaic of many different cultures, languages and religions. The last 2001 Nepal census reported more than 101 ethnic groups, nonetheless, more than 90 % of the nation's population, is Hindu.

Festivals in Nepal generally begin with religion but end as social events. There are more than 50 major festivals by various social groups and ethnic communities celebrate in Nepal, in a year. Although most of these festivals are religious, some have historical significances, and others are seasonal celebrations only. The dates of most festivals are fixed by famous astrologers after consulting the lunar calendar. Popular festivals include Dashain, a celebration of the Hindu Goddess Bhagawati's (Goddess of power) victory over devil, Mahisashur; and

Tihar, a celebration of lights, dedicated to the Hindu Goddess Lakshmi (Goddess of wealth). They fall mostly in the months of September and October. It is not hard to catch colorful processions in different streets of the nation, almost every other day of the week. That is why, it is said that Nepal is a country which is based on "unity in diversity and diversity in unity principle."

It is important to note that cultural acts of dances and songs are integral parts of some celebrations, while some celebrations are just quiet family gatherings. Some of the grand celebrations like Ghode Jatra and Gai Jatra (mostly in Kathmandu valley) entertain participants and spectators every year in the month of July or August. Furthermore, Nepal is also the birthplace of the Lord Gautama Buddha. So the anniversary of the Buddha's birth, enlightenment and death, is observed on the full-moon day in May every year. People celebrate the occasion by paying homage to Lord Buddha. Gai Jatra is an eight-day carnival of dancing, singing, mirth and laughter. The festival usually falls in July or August and as part of the festival family members of (Newar communities) those who died in the past year send people (mostly children) dressed as cows to parade on the streets.

In the contexts of multiethnic communities and cultural diversity, the given examples of English textbook materials (the story of Sama Chakewa is a cultural practice of an indigenous community, Tharu in the Terai region; whereas, the story of Chandi Nach is a cultural practice of another indigenous community, Rai in the hilly region of Eastern part of Nepal) clearly show that how local cultures in the forms of various festivals like Holi, Chhath, Sama-Chakewa, Teej, Chandi Naach and Baisakh Purnima, which are representatives of different ethnic groups of Nepalese societies, are being incorporated to promote culturally appropriate educational practices. However, this does not mean that all cultures are equally represented in teaching materials, which are almost impossible to do. As Geneva Gay writes:

> Responsive teaching requires tapping into a wide range of cultural knowledge, experiences, contributions, and perspectives… to make curriculum and instruction more reflective of and responsive to ethnic diversity. However, every conceivable aspect of an ethnic group's culture is not replicated in the classroom. Nor are the cultures included in the curriculum used only with students from that ethnic group. (2010, p. 34)

It means that culturally appropriate pedagogy aims at generating interests, sense of cooperation, community, and interconnectedness by bringing cultural awareness among students. It is important to note that raising awareness towards Indigenous languages and cultures is crucial in Nepalese contexts. As Turin (2007) warns, "In Nepal, a disturbingly large number of the country's ethnic mother tongues are severely endangered, and will likely be reduced from communicative vernaculars to symbolic identity markers within a generation" (p. 5).

Effectiveness of culturally appropriate education

Referring to the success stories of culturally appropriate education, with reference to American Indian education, Ngai and Allen (2007) state, "Indian education not only increases students' understanding of Montana tribes; it also lays the foundation for continuous development of the intercultural competence required for effective and meaningful participation in our increasingly diverse society and the interconnected world" (p. 12). Similarly, Klump and McNeir (2005) describe some exemplary culturally responsive educational programs for Indigenous youth in the US, including the Russian Mission School in rural Alaska, which integrates Native knowledge with academic standards through a hands-on curriculum centered around subsistence activities indigenous to the local community. Students engage in learning experiences related to real activities that are of high interest to the community and draw on local resources, materials, and knowledge:

> Traditional knowledge is carefully integrated with academic standards. A unit on berry picking, for example, asks students to study and identify five types of berries, learn where those berries are traditionally harvested, and then use the berries to create traditional Yup'ik foods. The berry picking activity incorporates benchmarks from science, health, and personal/social skills standards. Students then demonstrate what they have learned through writing assignments and using technology to create a PowerPoint presentation about making traditional foods. (Klump & McNeir, 2005, p.12)

However, the notion of culturally appropriate education practice is still strongly criticized by some social and political leaders. Despite the diversity of student population in today's schools, students from non-mainstream communities are still expected to adapt to the monolithic Euro-American culture that schools disseminate (Corson, 2001). Although researchers and educators now know more about the intersection of students' background (including language) and schooling, in reality, these students operate from two worldviews and often have two or more cultures to contend with. The gap between these cultures can create tensions and difficulties for students from diverse backgrounds. Therefore, there is an urgent need for accommodating discourse and cultural learning styles, it is an empowering and practical strategy for teachers to show that all their students are equally valued (Egbo, 2001; Erickson, 2001; Ogbu, 1992; Villegas & Lucas, 2002).

Likewise, Peter Muir (2007) argues that "there is culture-based instruction for high achievement in classroom acquisition of the target culture. It deems the systematic permeation of cross-cultural communication aiming at developing cross-cultural awareness is one of the most effective step toward cultural appropriateness in authentic communication" (p. 38). Referring to the effectiveness of culturally appropriate English language teaching in China, Muir states, "In many investigations, Chinese learners of English have fewer pragmatic failures

when they employ the expressions from the texts to express themselves, but in a different circumstance…they actually don't know how to apply the materials to their daily use" (2007, p. 41).

On the other hand, in a study of Indian schools in the Persian Gulf region, Joshi (2007) found that students in these schools strongly value "peaceful coexistence with people from other cultures" and "pride for the country, the anthem, the flag" as over 90 percent of respondents rated them very high. According to the researcher, responses to "peaceful coexistence with people from other cultures," which received rank one in the study (65% of the respondents strongly agreed). The study also found that 86 percent of respondents stated that students show "respect for elders while interacting," follow "dress culture" (85.0%) and have "awareness and respect for traditional dance and music (83.0%). Based on these findings, the researcher concluded that "In the present day, in any society, there is an urge toward the spirit of coexistence, tolerance, and mutual respect among individuals" (Joshi, 2007).

In their study of "Global Cultural Flows and Pedagogic Dilemmas of Australian teachers" Parlo Singh and Catherine Doherty (2004) found that while most teachers expressed a need to be culturally sensitive or culturally appropriate, the pedagogic strategies articulated in their talk and enacted in classroom practices ranged from acultural technocratic, bald cultural assimilationist, and more tempered compromising approaches (p. 15).

A recent ground-breaking Hawaiian study of culture-based education by the Kamehameha Schools Research and Evaluation Division used survey data from 600 teachers, 2,969 students, and 2,264 parents at 62 participating schools, including conventional public schools, charter schools, schools with Hawaiian-immersion programs, and several private school campuses and found,

> First, culture-based education (CBE) positively impacts student socio-emotional well-being (e.g., identity, self-efficacy, social relationships). Second, enhanced socio-emotional well-being, in turn, positively affects math and reading test scores. Third, CBE is positively related to math and reading test scores for all students, and particularly for those with low socio-emotional development, most notably when supported by overall CBE use within the school. (Kana'iaupuni, Ledward & Jensen, 2010, p. 1)

Conclusion

In the past two decades, significant economic and political changes have occurred all across the globe. Consequently, cross-cultural contact is at an all time high in human history. The identities of all societies are evolving as social and political boundaries are shrinking day-by-day. It is challenging to explore innovative perspectives to educate humankind for future universal citizenship, where global cooperation is the social norm. In an era of globalization, a society that has access to multilingual and multicultural resources is advantaged in its ability to play an important social and economic role on the world stage. The

challenge for educators and policy-makers is to shape the evolution of national and global identity in such a way that the rights of all citizens (including school children) are respected, and the cultural, linguistic, and economic resources of the nation are maximized (Skutnabb-Kangas, 2000). The issue of how best to deliver just and inclusive educational programs for all students will remain a widely debated issue in contemporary diversified societies. The diversity of children brings challenges to teachers in that there are no easy solutions for catering needs of diverse children. Nevertheless, the diversity children bring to schools enriches the learning environment, both for the teachers and the children. So there is an urgent need for respecting diverse culture and heritage of minorities and immigrants and treating their children with respect and dignity, by giving them a sense of belongingness in the 21st century.

In the end, I would like to quote Lindsey, Roberts and CampbellJones (2005, p. xv) to conclude this chapter:

> Cultural and social diversity is certainly not a new issue facing us as humans. It has always existed, and we remain challenged by it. However, the burgeoning complexity of our times calls upon us as educators to face this challenge more directly, to value diversity, honor it with integrity, and to preserve the cultural dignity of our students.

References

Ah-Nee Benham, M. K., & Cooper, J. (Eds.). (2000). *Indigenous educational methods for Contemporary practice: In our mother's voice.* Mahwah, NJ: Erlbaum.

ANKN (Alaska Native Knowledge Network). (1998). *Alaska standards for culturally-responsive schools* adopted by the Assembly of Alaska Native Educators. Retrieved November 28, 2010 at http://www.ankn.uaf.edu/publications/standards.html

Alfred, T. (1999). *Peace, power, righteousness: An indigenous manifesto.* Don Mills, Ontario, Canada: Oxford University Press.

Alfred, T. (2005). *Wasáse: Indigenous pathways of freedom and action.* Petersborough, Ontario, Canada: Broadview Press.

Allen, B. A., & Boykin, A. W. (1992). African American children and the educational process: Alleviating cultural discontinuity through prescriptive pedagogy. *School Psychology Review, 21*(4), 586-596.

Anders-Baer, L., Dunbar, R., Skutnabb-Kangas, T., & Henrik-Magga, O. (2008). *Forms of education of indigenous children as crimes against humanity?* Expert paper written for the United Nations Permanent Forum on Indigenous Issues. United Nations, Economic and Social Council. Retrieved Mar. 10, 2009 at http://www.un.org/esa/socdev/unpfii/documents/E_C19_2008_7.pdf.

Banks, J.A., & Banks, C.A.M. (2010). *Multicultural education: Issues and perspectives* (7th ed.). Danvers, MA: John Wiley & Sons, Inc.

Bowers, C.A., & Flinders, D.J.. (1990). *Responsive teaching: An ecological approach to classroom patterns of language, culture, and thought.* New York: Teachers College Press.

Brock-Utne, B. (2008). Democracy in a multilingual and multicultural society. In L. Timm (Ed.), *Mother tongue and bilingual education: A collection of conference papers* (pp. 33-42). Copenhagen: Danish Education Network. Retrieved March 12, 2010 at http://www.uddannelsesnetvaerket.dk/rdb/1205421604.pdf.

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

Campbell, L. (1997). Antioch's efforts to develop culturally congruent teacher education. Retrieved Nov. 20, 2010 at http://www.newhorizons.org/strategies/multicultural/lindacampbell.htm

Cantoni, G. (1998). The role of cultural factors in the maintenance of indigenous languages. *Intercultural Communication Studies, 8*(1), 1-11.

Carter, S. (2005). Culture in the classroom. *The Oregonian.* Retrieved July 21, 2005 at http://www.oregonlive.com/printer/printer.ssf?/base/news/1107176

Castagno, A.E., & Brayboy, B.M.J. (2008). Culturally responsive schooling for Indigenous youth: A review of the literature. *Review of Educational Research,78*(4), 941-993.

Centre for Cultural Resources and Training, New Delhi. *About us*. Retrieved Dec. 11, 2010 at http://ccrtindia.gov.in/aboutus.htm

Corson, D. (2001). *Language diversity and education.* Mahwah, New Jersey: Lawrence Erlbaum Associates.

Cortazzi, M., & Jin L. (1996). Cultures of learning: Language classrooms in china. In H. Coleman (Ed.), *Society and the language classroom* (pp. 169-206). Cambridge: Cambridge University Press.

Cortazzi, M., & Jin, L. (1999). Cultural mirrors: Materials and methods in the EFL Classroom. In E. Hinkel (Ed.), *Culture in second language teaching and learning* (pp. 196- 219). Cambridge: Cambridge University Press.

Council for Teacher Education, New Delhi in collaboration with National Council of Educational Research and Training (2006). *Curriculum Framework for Teacher Education* (2006). New Delhi, India: Author.

Culture-Based Education Working Group. (2006). *Na lau lama community report.* Retrieved Nov. 11, 2010 at http://www.ksbe.edu/spi/PDFS/Reports/Na-Lau-Lama/Culture-Based_Education_Worknig_Group_Final.pdf

Cummins, J. (2000). *Language, power, and pedagogy. Bilingual children in the crossfire.* Clevedon, England: Multilingual Matters.

Curriculum Development Center, Ministry of Education and Sports. (1999). *Grade nine English textbook.* Sanothimi, Bhaktapur, Nepal: Author.

Curriculum Framework for Teacher Education. (2006). Council for Teacher Education, New Delhi in collaboration with National Council of Educational Research and Training, New Delhi, India.

Demmert, W., & Towner, J. (2003). *A review of the research literature on the influences of culturally based education on the academic performance of*

Native American students. Portland, OR: Northwest Regional Educational Lab.

DRIP-Declaration on the Rights of Indigenous Peoples. (2007). Retrieved Dec. 3, 2010 at http://www.un.org/esa/socdev/unpfii/en/drip.html

Egbo, B. (2001). Differential enunciation, mainstream language and the education of immigrant minority students: Implications for policy and practice. *Journal of Teaching and Learning, 1*(2), 47-61.

Erasmus, P. & Ferreira, G.V. (2002). Black grade nine learners in historically white suburban schools and their experiences of integration. *South African Journal of Education, 22*(1), 28 - 35.

Erickson, F. (2001). Culture in society and in educational practices. In J. Banks & C. M. Banks (Eds.), *Multicultural education: Issues and perspectives* (4th ed.). New York: John Wiley and Sons.

Fordham, M. (1998). The politics of language and the survival of indigenous culture: From suppression to reintroduction in the formal classroom. *Equity & Excellence in Education, 31*(3), 40-47.

Foster, M. (1995). African American teachers and culturally relevant pedagogy. In J.A. Banks & C.A.M. Banks (Eds.), *Handbook of research on multicultural education* (pp. 570-581). New York: Macmillan.

Gautam, V. (2003). *Education of tribal children in India and the issue of medium of instruction: A Janshala experience.* United Nation/Government of India, Janshala Program, New Delhi, India.

Gay, G. (2010). *Culturally responsive teaching: Theory, research, & practice* (2nd Ed.). New York: Teachers College Press.

Gollnik, D.M., & Chinn, P.C. (2002). *Multicultural education in a pluralistic society* (6th ed.) Upper Saddle River, NJ: Prentice Hall.

Heath, S.B. (1983). *Ways with words: Language, life, and work in communities and classrooms.* Cambridge, MA: Cambridge University Press.

Hollins, E.R. (1996). *Culture in school learning: Revealing the deep meaning.* Mahwah, NJ: Lawrence Erlbaum.

Hollins, E.R., King, J.E., & Hayman, W.C. (Eds.). (1994). *Teaching diverse populations: Formulating a knowledge base.* Albany: State University of New York Press.

Irvine, J.J. (1990). *Black students and school failure: Policies, practices, and prescriptions*. New York: Greenwood Press.

Irvine, J.J. (1992). Making teacher education culturally responsive. In M.E. Dilworth (Ed.), *Diversity in teacher education: New expectations* (pp. 79-82). San Francisco, CA: Jossey-Bass.

Joshi, P. L. (2007). *Enhancing educational and cultural values among students in Persian Gulf-based Indian schools: A study.* Retrieved July 22, 2010 at http://www.worldpress.org/Asia/2988.cfm

Kaiwi, M. K. & Kahumoku, W. (2006). Makawalu: Standards, curriculum, and assessment for literature through an indigenous perspective. *Hülili: Multidisciplinary Research on Hawaiian Wellbeing, 3*, 182-206.

Kana'iaupuni, S., Ledward, B., & Jensen, U. (2010). Culture-based education and its relationship to student outcomes. Honolulu: Kamehameha Schools, Research & Evaluation. Retrieved January 11, 2010 from http://www.ksbe.edu/spi/PDFS/CBE_relationship_to_student_outcomes.pdf

Kana'iaupuni, S. (2007 June). A brief overview of culture-based education and annotated bibliography. *Culture in Education Brief Series, 1-4*. Honolulu, HI: Kamehameha Schools Research & Evaluation Division. Retrieved Nov. 29, 2010 at WWW.Ksbe.edu/spi

Khubchandani, L. (2008). Language policy and education in the Indian sub continent. In S. May & N. H. Hornberger (Eds.), *Encyclopedia of language and education: Language policy and political issues in education* (pp. 369-381). Springer Science+Business Media LLC.

Klump, J., & McNeir, G. (2005). *Culturally responsive practices for student success: A regional sampler.* Northwest Regional Educational Laboratory Portland, Oregon.

Ladson-Billings, B. (1992). Reading between the lines and beyond the pages: A culturally relevant approach to literacy teaching. *Theory into Practice, 31*(4), 312-320.

Ladson-Billings, G. (1994). *The dreamkeepers: Successful teachers for African-American children.* San Francisco: Jossey-Bass.

Lee, C.D., & Slaughter-Defoe, D.T. (1995). Historical and sociocultural influences on African American education. In J.A. Banks & C.A.M. Banks (Eds.), *Handbook of research on multicultural education* (pp. 348-371). New York: Macmillan.

Lindsey, R.B., Roberts, L.M., & CampbellJones, F. (2005). *The culturally proficient school: An implementation guide for school leaders.* Thousand Oaks, CA: Corwin Press.

Lipman, P. (1995). Bringing out the best in them: The contribution of culturally relevant teachers to educational reform. *Theory into Practice, 34*(3), 202-208.

Little, J. W. (1999). Organizing schools for teacher learning. In L.Darling-Hammond & G, Sykes (Eds.), *Teaching as the learning profession: Handbook of polity and practice* (pp. 233-262). San Francisco, CA: Jossey-Bass.

McAlpine, L., & Crago, M. (1995). The induction year experience in a cross-cultural setting. *Teaching & Teacher Education, 11*(4), 403-415.

McCarty, T. L. (2003). Revitalizing indigenous languages in homogenizing times. *Comparative Education, 39*(2), 147-163.

Mclaren, P(1989). *Life in schools: An introduction to critical pedagogy in the foundations of education.* New York: Longman.

Mehta, V. (1976). *Mahatma Gandhi and his apostles.* New York: Penguin Books.

Meriam, L. et al. (1928). *The problem of Indian administration.* Baltimore, MD: Johns Hopkins Press.

Muir, P. (2007). Toward culture: Some basic elements of culture-based instruction in China's high schools. *Sino-US English Teaching, 4*(4), 38- 43.

Muthukumaraswamy, M.D. (2009). Multilingual education. *Indian Folklife Serial, 32*, 1-24. National Folklore Support Centre, Chennai, India. Retrieved March 11, 2010 at http://indianfolklore.org/nfscpress.

Nguyen, P., Terlouw, C., & Pilot, A. (2006).Culturally appropriate pedagogy: The case of group learning in a Confucian heritage culture context. *Intercultural Education, 17*(1), 1-19.

Nieto, S. (2010). *Language, culture, and teaching: Critical perspectives* (2nd ed.). New York: Taylor & Francis Group.

Ogbu, J. (1992). Understanding cultural diversity and learning. *Educational Researcher, 21*(8), 5-14.

Pai, Y. (1990). *Cultural foundations of education*. New York: Macmillan Publishing Company.

Pai, Y., & Adler, A.S. (2001). *Cultural foundation of education* (3rd. ed.). Upper Saddle River, NJ: Merill Prentice Hall.

Pare, L. (2004). *Culturally appropriate quality education: Learner centered approaches.* A statement by the Government of Canada at Indigenous Education In The 21st Century: Executive Seminar, Paris October 18-20. Retrieved Nov. 30, 2010 at http://www.ainc-inac.gc.ca/ap/ia/stmt/unp/ine/caq-eng.asp.

Pewewardy, C.D. (1994). Culturally responsive pedagogy in action: An American Indian magnet school. In E.R. Hollins, J.E. King, & W.C. Hayman (Eds.), *Teaching diverse populations: Formulating a knowledge base* (pp. 77-92). Albany, NY: State University of New York Press.

Philips, S.U. (1983). *The invisible culture: Communication in classroom and community on the Warm Springs Indian reservation.* Prospect Heights, IL: Waveland.

Richards, V. H., Brown, F.A., & Forde, B.T. (2006). *Addressing diversity in schools: Culturally responsive pedagogy.* NCCERST, 1-16. Retrieved May10, 2010 at http://www.nccrest.org/Briefs/Diversity_Brief.pdf

Romaine, S. (2009). Language, culture and identity across nations. In J. A Banks (Ed.), *The Routledge international companion to multicultural education* (pp. 373-384). New York: Routledge.

Santoro, N., & Allard, A. (2005). (Re) Examining identities: Working with diversity in the pre-service teaching experience. *Teaching and Teacher Education, 21*(7), 863-873.

Schmidt, P. R. (2005). *Culturally responsive instruction: Promoting literacy in secondary content areas.* Learning Point Associates. Retrieved Dec. 24, 2010 at www.learningpt.org/literacy/adolescent/cri.pdf

Shor, I. (1992). *Empowering education: Critical teaching for social change.* Chicago: University of Chicago Press.

Skutnabb-Kangas, T., & Dunbar, R. (2010). Indigenous children's education as linguistic genocide and a crime against humanity? A global view. *Gáldu Čála–Journal of Indigenous Peoples Rights, 1*. Resource Centre for the Rights of Indigenous Peoples Guovdageaidnu/ Kautokeino.

Smith, S. (Fall 2010). Culturally responsive teaching. *Teachers of Color Magazine, 5*(2), 1-72.

The Centre for Cultural Resources and Training (CCRT). (2010). New Delhi, India. Retrieved 24 Nov., 2010 at http://ccrtindia.gov.in/index.php).

Thomas, E. (1997). Developing a culture-sensitive pedagogy: Tackling a problem of melding 'global culture' with existing cultural contexts. International *Journal of Educational Development, 17* (1), 13-26.

Tricoglus, G. (2001). Living the theoretical principles of critical ethnography in educational research. *Educational Action Research, 9*(1), 135-148.

Trudeau, C.M. (1984). *Montessori's years in India.* Honolulu, HI: Hawai'i Printing.

Turin, M. (2007). *Linguistic diversity and the preservation of endangered languages: A case study from Nepal.* International Centre for Integrated Mountain Development (ICIMOD). ICIMOD Talking Points: Kathmandu, Nepal. Retrieved March 22, 2010 from http://books.icimod.org.

Tylor, E.B. (1958). *The origins of culture* (First published under the title *Primitive culture* in 1871). New York: Harper & Brothers.

UNESCO. (2010). *EFA–striving for equity and quality*. Retrieved Nov. 30, 2010 at http://www.unesco.org/en/migrated/beijing/education/

UNESCO. (2003). *Education in a multilingual world* (UNESCO Education Position Paper). Paris, France: United Nations Educational, Scientific and Cultural Organization. Retrieved Dec. 3, 2010 at http://unesdoc.unesco.org/images/0012/001297/129728e.pdf

UNESCO. (1953). *The use of vernacular languages in education* (Monographs on Fundamental Education-VIII). Paris, France: United Nations Educational, Scientific and Cultural Organization. Retrieved Dec. 3, 2010 at http://unesdoc.unesco.org/images/0000/000028/002897eb.pdf

Villegas, A. & Lucas, T. (2002). *Educating culturally responsive teachers: A coherent approach*. Albany, NY: State University of New York Press.

Yamauchi, L. A. (2005) Culture matters: Research and development of culturally relevant instruction. In C.R. O'Donnell & L.A. Yamauchi (Eds.), *Culture and context in human behavior change: Theory, research and applications* (pp. 103-123). New York: Peter Lang.

Appendix A
UNESCO (2003) Guidelines on Language Education

Principle I

UNESCO supports mother tongue instruction as a means of improving educational quality by building upon the knowledge and experience of the learners and teachers.

(I) Mother tongue instruction is essential for initial instruction and literacy and should 'be extended to as late a stage in education as possible': 'every pupil should begin his [or her] formal education in his [or her] mother tongue'; 'adult illiterates should make their first steps to literacy through their mother tongue, passing on to a second language if they desire and are able'; if a given locality has a variety of languages, ways and means should be sought 'to arrange instruction groups by mother tongue'; 'if mixed groups are unavoidable, instruction should be in the language which gives the least hardship to the bulk of the pupils, and special help should be given those who do not speak the language of instruction'.

(II) 'Literacy can only be maintained if there is an adequate supply of reading material, for adolescents and adults as well as for school children, and for entertainment as well as for study': The production and distribution of teaching materials and learning resources and any other reading materials in mother tongues should be promoted.

(III) With regard to teacher training and mother tongue instruction: 'All educational planning should include at each stage early provision for the training, and further training, of sufficient numbers of fully competent and qualified teachers of the country concerned who are familiar with the life of their people and able to teach in the mother tongue.'

Principle II

UNESCO supports bilingual and/or multilingual education at all levels of education as a means of promoting both social and gender equality and as a key element of linguistically diverse societies.

(I) 'Communication, expression and the capacity to listen and dialogue [should be encouraged], first of all in the mother tongue, then, [if the mother tongue is different from the official or national language,] in the official [or national] language in the country, as well as in one or more foreign languages' through: 'the early acquisition… of a second language in addition to the mother tongue'; the introduction of 'the second language… as a subject of instruction' the amount of which 'should be increased gradually' and which should not become the medium of instruction 'until the pupils are sufficiently familiar with it' 'further education in this second language at primary-school level based on its use as a medium of instruction, thus using two languages for the acquisition of knowledge throughout the school course up to university level; intensive and trans-disciplinary learning of at least a third… language in secondary school, so that when pupils leave school they have a working

knowledge of three languages – which should represent the normal range of practical linguistic skills in the twenty-first century'.

(II) 'International exchanges of primary- and secondary-school teachers [should be promoted] for teaching their subjects in schools in other countries, using their own languages and thus enabling their pupils to acquire both knowledge and linguistic skills'.

(III) Emphasis should be given to the formulation of 'strong national policies designed to promote… language teaching in cyberspace [and the strengthening and extension of] international support and assistance to developing countries to facilitate the development of freely accessible materials on language education in the electronic form and to the enhancement of human capital skills in this area'.

Principle III

UNESCO supports language as an essential component of inter-cultural education in order to encourage understanding between different population groups and ensure respect for fundamental rights.

(I) Measures should be taken 'to eliminate discrimination in education at all levels on the basis of gender, race, language, religion, national origin, age or disability or any other form of discrimination'.

(II) The 'educational rights of persons belonging to … minorities, as well as indigenous peoples' should be fully respected, through: the implementation of 'the right to learn in the mother tongue' and the 'full use of culturally appropriate teaching methods of communication and transmission of knowledge'; the teaching of and through, not only the mother tongue, but also the national or official languages, as well as global languages of communication, so that minority and indigenous peoples have the opportunity to participate in and contribute to the larger community.

(III) Education should raise 'awareness of the positive value of cultural [and linguistic] diversity', and to this end: 'curriculum [should be reformed] to promote a realistic and positive inclusion of the minority [or indigenous] history, culture, language and identity'; the cultural component of language teaching and learning should be strengthened in order to gain a deeper understanding of other cultures; 'languages should not be simple linguistic exercises, but opportunities to reflect on other ways of life, other literatures, other customs'.

From the United Nations Educational, Scientific and Cultural Organization 2003 *Education in a multilingual world* (UNESCO Education Position Paper). Paris, France: United Nations Educational, Scientific and Cultural Organization, pp. 31-33 with footnotes deleted. Retrieved Dec. 3, 2010 at http://unesdoc.unesco.org/images/0012/001297/129728e.pdf

Appendix B

Cultural Standards (Alaska Native Knowledge Network, 1998)

Cultural Standards for Students

Culturally-knowledgeable students:

1. are well grounded in the cultural heritage and traditions of their community.
2. are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.
3. are able to actively participate in various cultural environments.
4. are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
5. demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.

Cultural Standards for Educators

Culturally-responsive educators:

1. incorporate local ways of knowing and teaching in their work.
2. use the local environment and community resources on a regular basis to link what they are teaching to the everyday lives of the students.
3. participate in community events and activities in an appropriate and supportive way.
4. work closely with parents to achieve a high level of complementary educational expectations between home and school.
5. recognize the full educational potential of each student and provide the challenges necessary for them to achieve that potential.

Cultural Standards for Curriculum

A culturally-responsive curriculum:

1. reinforces the integrity of the cultural knowledge that students bring with them.
2. recognizes cultural knowledge as part of a living and constantly adapting system that is grounded in the past, but continues to grow through the present and into the future.
3. uses the local language and cultural knowledge as a foundation for the rest of the curriculum.
4. fosters a complementary relationship across knowledge derived from diverse knowledge systems.
5. situates local knowledge and actions in a global context.

Cultural Standards for Schools

A culturally-responsive school:

1. fosters the on-going participation of Elders in all aspects of the schooling process.
2. provides multiple avenues for students to access the learning that is offered, as well as multiple forms of assessment for students to demonstrate what they have learned.
3. provides opportunities for students to learn in and/or about their heritage language.
4. has a high level of involvement of professional staff who are of the same cultural background as the students with whom they are working.
5. consists of facilities that are compatible with the community environment in which they are situated.
6. fosters extensive on-going participation, communication and interaction between school and community personnel.

Cultural Standards for Communities

A culturally-supportive community:

1. incorporates the practice of local cultural traditions in its everyday affairs.
2. nurtures the use of the local heritage language.
3. takes an active role in the education of all its members.
4. nurtures family responsibility, sense of belonging and cultural identity.
5. assists teachers in learning and utilizing local cultural traditions and practices.
6. contributes to all aspects of curriculum design and implementation in the local school.

Adapted from the Alaska Native Knowledge Network's 1998 *Alaska standards for culturally-responsive schools* adopted by the Assembly of Alaska Native Educators. Retrieved Nov. 28, 2010 at http://www.ankn.uaf.edu/publications/standards.html

Appendix C

Culture-Based Education
Checklist for Teachers in Cross-Cultural Schools

	Yes	Some	No
1. Does the culture of my classroom reflect the language and culture of the community?	0	0	0
2. Do instructional materials: • Portray Aboriginal people as diverse peoples with a rich heritage? • Portray Aboriginal people in an authentic way? • Recognize and value contributions of Aboriginal peoples to present Canadian society? • Present positive images of Aboriginal people in contemporary settings? • Receive evaluation for stereotyping, bias, racism and other inaccuracies?	0	0	0
3. Do I use a variety of teaching methods to accommodate the diverse learning styles of my students?	0	0	0
4. Do I encourage students to take pride in their culture?	0	0	0
5. In my classroom, do I observe community celebrations and important cultural events?	0	0	0
6. Do I use community resources (people, materials) when appropriate and possible?	0	0	0
7. Are my evaluation tools sensitive to cultural bias?	0	0	0
8. Do I take time to learn more about community culture?	0	0	0
9. Do the parents of my students feel welcome in my classroom?	0	0	0
10. Do I contact my students' parents with positive messages about their children?	0	0	0
11. Am I aware of the way culture affects styles of communication and ways of interacting with others?	0	0	0

Adapted from Saskatchewan Education's 1995 *Assessment Checklist in the Indian and Metis Staff Development Program*, p. 243. Retrieved from http://www.newteachersnwt.ca/culture_based_education2.html

Developing Culturally Based Science Curriculum for Native American Classrooms[1]

Willard Sakiestewa Gilbert

This paper provides an overview of an academically rigorous, culturally relevant and responsive curriculum and instruction model that is based on the Native Science Connections Research Project (NSCRP) and funded by the National Science Foundation. The model is action and inquiry oriented as well as culturally based and integrates or "connects" Native students' traditional culture knowledge with Western science for fifth grade students in public, contract and BIA schools on the Navajo, Hopi, San Carlos Apache and Zuni reservations. One school principal stated, "the NSCRP brings purpose and meaning to what the students are doing because it integrates Navajo thought and content with Western content. It honors who the students are…it [also] strengthened our teachers' self-confidence about using their native language and culture."

As educators we have many responsibilities not only to our students, but also to our teachers to provide them the resources, materials and skills necessary to engage in meaningful dialogue and activities that will deepen their knowledge, broaden their horizons and instill a desire to learn more both inside and outside of the classroom. American Indians have a rich cultural heritage and that heritage has been transmitted orally to each successive generation in song, stories, legends, and history via their native language and traditions. This knowledge provides an understanding of the natural order of existence both personally and communally. Cultural knowledge provides order and understanding both to the individual within the community, but also order and survival within the larger context of the natural environment.

This rich cultural knowledge and the understanding of it is what students bring to the classroom. It is through parents, grandparents, elders and the local community members that children first gain this cultural and environmental perspective. Unfortunately, all too many times, this valuable information and knowledge that students obtain prior to their formal schooling is left at the school house door and not given a place within the classroom. Why is this? Within Native communities there appears to be a disconnect or cultural divide between a native child's environment at home and within their local community and the school (Lipka & Adams, 2004). When the current educational system ignores American Indian students' own traditional teachings nurtured in the home and within the local community, the educational system has lost a valuable educational tool to augment the existing curriculum as critical opportunities to build upon or draw from Indian students' existing knowledge are disregarded and overlooked (Gilbert, 2005; Nelson-Barber & Estrin, 1995).

Historically, federal education policy stripped Indian children of their language and culture in order to assimilate them into the mainstream society. A number of factors contributed to the suppression and elimination of Native American languages, therefore decreasing the number of fluent Native speakers. According to Reyhner (1992), one major contributor to Native language loss has been coercive assimilative federal policies implemented throughout the educational system. Language and culture are intertwined and cannot be separated. When a people lose their language, they lose their culture and eventually their identity as a people group. Paradoxically, it is this same cultural heritage that for years the federal government was determined to eradicate now is being recognized as a method by which Native students may connect their traditional cultural knowledge with academic disciplines including Western science and have greater success academically vis-à-vis culturally based education.

Culturally based education

According to Demmert & Towner (2003) culturally based education may be defined as approaches that recognize and utilize native languages as a first or second language, pedagogy that incorporates traditional cultural characteristics and involves teaching strategies that are harmonious with the native cultural knowledge and contemporary ways of knowing and learning. Culturally based education includes curricula based on native culture that incorporates legends, oral histories, songs and fundamental beliefs and values of the community. It also includes parents, elders, and community members' involvement and participation in educating native children in the social and political mores of the community. This is similar and reflective of other indigenous learning models which incorporate several of the above mentioned approaches and includes learning approaches that are holistic, a lifelong process, experimental in nature and integrates both the indigenous and western knowledge attributes that shape and influence how students view themselves interdependently and interrelated to the world that forms the foundation of their learning (*Redefining How Success is Measured*, 2007).

The learning approaches that incorporate culturally based education are woefully absent from the curriculum and pedagogy because it has been assumed that if native language and culture is taught it must be taught separately from other content areas which would require additional time and resources to implement successfully within the allotted school day or after school programs. This is even more so with the mandates of the No Child Left Behind (NCLB) Act of 2001 whereas teachers all too often are teaching to the test in this case; reading and mathematics, in order to achieve Adequate Yearly Progress (AYP). It also implies that the curriculum must be developed in isolation from the other subject areas or teaching language and culture as a special, one time project. Rather than compartmentalizing into an "either/or" position, an interdisciplinary approach must be taken. Integrating native language and culture in conjunction with other content areas is not mutually exclusive; instead, it is compatible, complementary and enhances knowledge and academic achievement (Gilbert, 2008b). Therefore,

Native children's ability to learn is enhanced by the integration or immersion of their native language and culture into the curricula in an academically rigorous and culturally relevant and responsive manner. Culturally based education is the full integration and incorporation of specific and consistent cultural ways of thinking and learning into the educational practice. Culturally based education should be integrated in an intentional way, not as add-ons, but deeply embedded in the curricular content of the subject. Regardless of whether a teacher is native or non-native, culturally based education focuses on helping all teachers to be skilled in cultural and linguistic inclusive practices that recognizes and affirms cultural-based strengths in inquiry, problem-solving and learning for the benefit of all students (Gilbert, 2008b).

Culturally based education models

Current research is demonstrating that culturally based education may be successfully integrated into the classroom in a manner that would provide Native students with instruction in the core subject areas based upon their cultural values and knowledge. Math, reading, language arts, history, science, physical education, music, cultural arts and other subjects may be taught in curricula instilled in Native traditional and cultural concepts and knowledge (Gilbert, 2007).

There are culturally based research studies that demonstrate that culturally based education improves students academic achievement and assists in revitalizing and preserving native language and culture. For example, in Alaska, the quasi-experimental study, Mathematics in a Cultural Context (MCC), a culturally based math curriculum shows statistically significant results and modest to strong effect sizes all in favor of rural Alaska Native treatment groups (Lipka & Adams, 2004). Another example of a quasi-experimental study is the Native Science Connections Research Project (NSCRP), a National Science Foundation funded research project. This research study also showed statistically significant results for the Navajo study and an upward trend toward significance in the Hopi results. The San Carlos Apache and Zuni results were inconclusive due to caveats in the research process (Gilbert & Carrasco, 1999). The integration of native language and culture into the existing science curriculum for fifth grade students with four Native nations (Navajo, Hopi, San Carlos Apache and Zuni) was an integral component of the study. This research project established an instruction and curriculum model that builds systematically upon the premise that integrating native language, culture and traditions into the school science curriculum improved student academic achievement and attitudes toward science and science education.

Developing culturally relevant science curriculum

In ensuring that the native cultural science knowledge is "connected" to or incorporated into the existing elementary school science curriculum, curriculum developers must work jointly with local community members to obtain native science cultural knowledge. In developing such a curriculum from a Native American perspective, one must be concerned with the authenticity of the cul-

tural information being collected and presented in the classroom. For example, at the beginning of this project, the researchers, Gilbert and Carrasco, met with the respective tribal leaders to solicit interest in the project and to acquire their blessing to proceed. This is a vital and important first step in working with any tribe/nation. In the majority of cases, when curriculum is written for Native American children, it is typically written by an outsider, someone who is not a member of that particular community and who may not be familiar with the proper tribal etiquette and protocol. Therefore, it is important that curriculum developers contact the necessary tribal representatives to acquire permission and/or to seek their guidance in order to work collaboratively in developing culturally relevant curriculum.

How does one go about gathering this cultural knowledge? Based upon my experiences, it is recommended that this knowledge be obtained from primary resources that include tribal elders, medicine men and women, respected native community leaders and educators, local cultural experts, and parents – grassroots people. As a researcher, educator and an enrolled member of the Hopi tribe in northeastern Arizona, I respect the fact that cultural information acquired through these means, also adheres to tribal intellectual property rights and exercises tribal sovereignty. Therefore, I encourage individuals to have this discussion with their own tribal officials.

For this particular project, native educators, elders, cultural experts, medicine men and women, and other respected adults were consulted and included as part of this process. Utilizing the "grass-roots" approach to developing culturally relevant curriculum is essential to any program. For example, when developing the food and nutrition unit from a Native perspective, medicine men and women were consulted regarding the information about native plants; their uses, gathering locations, and seasons. Cultural experts provided stories, legends, and what students needed to do in order to prepare themselves before and after collecting these traditional native plants. For example, before students carried out the experiments utilizing traditional tea plants, they were taught the importance of thanking mother earth for providing the plants, and after the tea was processed, they were taught to return the tea plants back to the local environment. The teachers and students were also taught only to collect what was required for that particular time so as not to be wasteful.

These grassroots people also assisted in providing guidance as to what topics could be taught in the classroom and what topics were best left to the native community and families to teach. Other considerations included time sensitive matters such as teaching culturally sensitive topics that were seasonal, (e.g., certain traditional stories that can only be shared in the winter) or age appropriate topics. Obtaining the appropriate knowledge and pedagogy is always an important component to any culturally relevant and responsive curriculum.

One of the major components in developing and designing culturally relevant curriculum is that one must also consider his/her own level of expertise and the amount of training s/he has had in teaching science. In general, the majority of teachers who graduate with a teaching degree are likely to have only a minimum

number of science courses. For example, at the beginning of this project, I gathered preliminary data on two issues: 1) how science was currently being taught in the classroom, and 2) what type of science curriculum was being utilized in the school and in the local school district. This data indicated that teachers only taught what they were comfortable in teaching. Several were intimidated by the lack of science knowledge they possessed which was reflected in what they taught and how they taught science. I also found that the textbooks that were being used in the classrooms were outdated and the school districts did not have a cohesive science curriculum from grades K-12th. This was a major concern because it necessitated a decision as to which science curriculum to adopt as part of this research project. Several science curricula were reviewed and it was decided upon the Full Option Science System (FOSS) and Great Explorations in Math and Science (GEMS). The reason these two science curriculum were chosen is because they contained the current national science standards, were identified as conducive to the learning styles of Native children, developed critical thinking and problem solving skills, and fostered parent participation. In addition, the curriculum incorporates a hands-on approach to learning science as well as being teacher friendly. Once the regular classroom science curriculum was selected, then all the participating teachers were trained in how to teach science in the classroom via the Science & Mathematics Learning Center at Northern Arizona University.

During two and half weeks on campus, teachers learned the metric system of measurement, learned how to teach science utilizing the FOSS Food and Nutrition Unit, and carried out the experiments that they later would facilitate with their own students. Once the FOSS training was complete, the teachers identified as the experimental group remained on campus for an additional two weeks and were taught how to teach and integrate the Native Science Connections Supplemental Curriculum (NSCSC) into the FOSS curriculum. They received instruction on cultural sensitivity, taboos in the science classroom, how to "connect" the cultural component to the regular science curriculum, participated in field trips to collect specimens (traditional plants) in the location of their school and community environment, developed plant boards, and received instruction from cultural experts and medicine men and women. Once the cultural component training was complete, the teachers returned to their respective communities to prepare for the academic year.

The FOSS Food and Nutrition Unit was selected as the regular science unit to be taught at the beginning of the school year because this unit is an appropriate unit to teach during the fall semester when local crops are being harvested after a long summer growing season. More importantly, this would be an excellent opportunity at the beginning of the school year to teach Native children about good eating habits and a proper and nutritional diet especially given the high prevalence of diabetes among American Indians.

Teaching the instructional sequence of the Native Science Connections Supplemental Curriculum took eight weeks to complete, with instruction given three times per week. It is highly recommended that in developing your les-

son plans, you include the national science standards, state, and tribal cultural standards (if available). In some cases, Native American cultural standards have been developed and adopted by many tribes in the U.S. For example, in Arizona, the Diné Department of Education has developed the Diné cultural standards. If your tribe/nation has not yet developed cultural standards, I recommend that you consult with your local tribal education department for recommendations.

The Learning Cycle

The Native American way of life deals with the interaction of all the elements of the universe. There is harmony in the Native American perception of learning. This does not mean that Native Americans live a non-troubled life; it means that Native American understanding of life is in reflections to cycles. The cycles of life, nature and the elements are circles without beginning and end.

When examined closely, all types of circles and cycles reflect the Native American perception of wholeness. It is intriguing that the Learning Cycle is indeed relevant to the Native Americans' perception of a natural education, and that this concept parallels learning in this manner (Renner & Merek, 1988). It is also necessary that the concepts and language of Native Americans be included in order for the relevancy of lessons to be made. The native language must be appropriate for specific content areas, the grade level, and the terminology for which it is intended. The Learning Cycle can rekindle the Native American teachings that are natural for learning. It is for these reasons that the Learning Cycle has been adopted for the construction of and is used as a guideline for the development of the NSCRP lesson plans.

Each lesson plan developed adheres to the "hands-on" activities approach if it is to be successful. Teachers need to be knowledgeable in the concepts as a precautionary measure to insure the questions asked or raised may be answered. Renner and Merek (1988) describe the Learning Cycle in such a manner that the students become the main focus of learning:

> The learning cycle, therefore, is not a method of teaching science, the learning cycle comes from the discipline itself; it represents science. If science is to be taught in a manner that leads students to construct knowledge, they must make a quest. The learning cycle leads students on that quest for knowledge. (p. 170)

The students are engaged in observing, measuring, interpreting, experimenting, model building, and predicting as they experience the Learning Cycle. These essential elements of learning science should be constantly implemented in all phases of the cycle.

The Learning Cycle uses "teacher friendly" terminology. Each learning cycle begins with an "Introduction," that allow the teacher and students to get a general understanding of what is already known. In science, the terms of a lesson are interchangeably used with the Learning Cycle such as: Exploration – is labeled Gathering Data; Conceptual Invention is labeled The Idea; and Expansion is

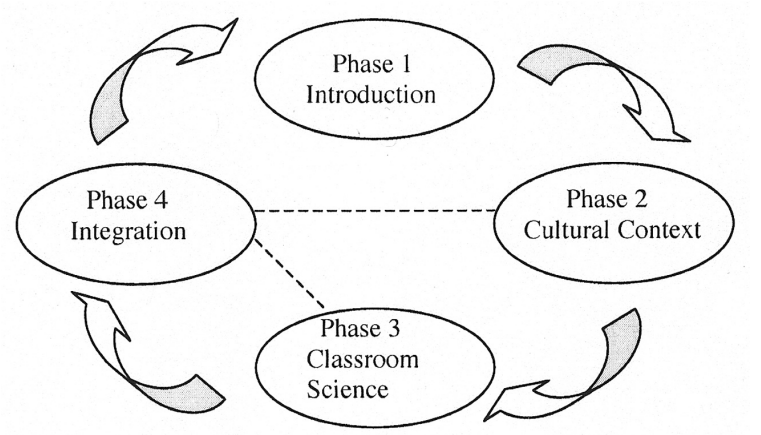
labeled Expanding the Idea. The Learning Cycle concludes with a Teaching Suggestions section providing the teacher additional information to allow diversity, and other alternatives to the concept.

The following is a brief overview of what a lesson plan should include. It includes a format of what may be included, but can also be modified. Again, the appropriateness for the students, the grade and their environment are important.

Developing culturally appropriate lesson plans

The following instructional sequence and design criteria, created for this project functions as a template for all science teachers using the assemblage of modules and lesson which have been designated to integrate a cultural context for teaching scientific concepts to grades K-12 (see Figure 1 below).

Figure 1: Instructional Sequence of the Native Science Connections Supplemental Curriculum



The Loololma Model

Phase One: Introduction/Exploration (Inquiry and Students Perceptions)

Introduction – the purpose of an introduction is to directly or indirectly motivate the students' interest in a concept. This is through dialogue in the child's first language (L1) and second language (L2), through a short excerpt of the lesson without the mention of the concept which could consist of a web-making activity. The introduction needs to be relevant to the Native American child's environment in order for the general purpose of learning to take place. In a sample lesson plan on Nutrients in Native Food Plants, designed for a fifth grade class, the introduction briefly discusses how the Navajo people gathered foods and use native plants for beverages. In this section, is a list of "performance

objectives" eliciting cultural, affective and science objectives. Also included in the introductory phase is a section "getting ready" (teacher preparation), and a brief history of the Navajo people that provide guidance in teaching the lesson. The concepts to be learned are identified as: investigating fats, sugars and vitamin C in native plant foods. The reasoning skills to be developed include: observing, relating, communicating, inferring, identifying and comparing.

Students were encouraged to identify what is known and the procedure begins for learning the "how" of gathering information and data to substantiate the idea they have chosen. Appropriate ways of organizing data for presentations to classmates, family and the community at large are also taken into consideration, discussed and agreed upon. The children use their prior knowledge, gained from others and their environment and learn in a more relaxed classroom atmosphere. At this point, the role of the teacher as a "facilitator" can limit or expand the discussion and activity for the topic depending on the grade, skill and ability levels of the students. For example, if the lesson is on food and nutrition, the teacher can begin the class by talking about traditional Native foods. A graphic organizer (see Figure 2 below) may be used to record the responses from the students in which all answers are to be accepted. Depending on how much information you would like to cover, the time the students spend on this activity will vary. Once the discussion is complete, the graphic organizer should be placed on a wall so that you and the students may refer to it and continue to add to it. This is an excellent opportunity to assess the improvement of your students and how they have progressed in the unit. This phase of the lesson will take anywhere from one to two days to complete. This part of the process requires time therefore; it is necessary to allow adequate time for all materials to be used that will lead to the concept to be learned.

Figure 2: Example of a graphic organizer

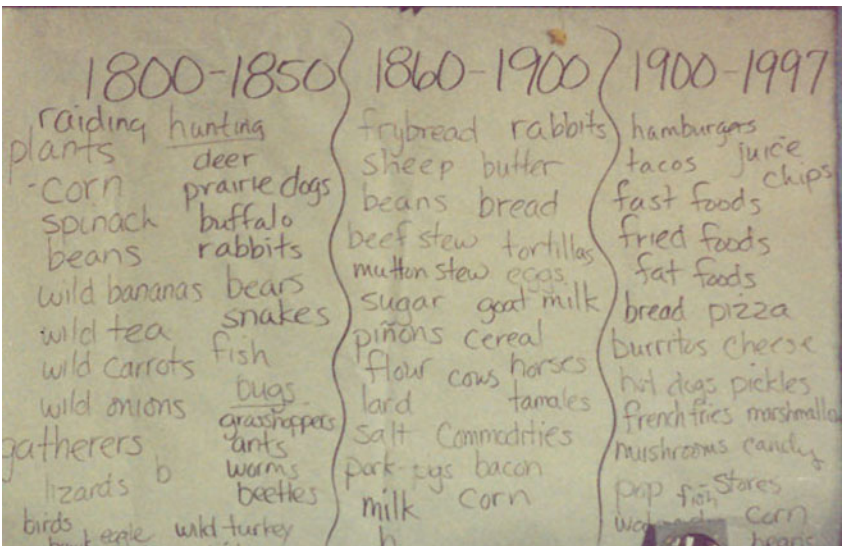
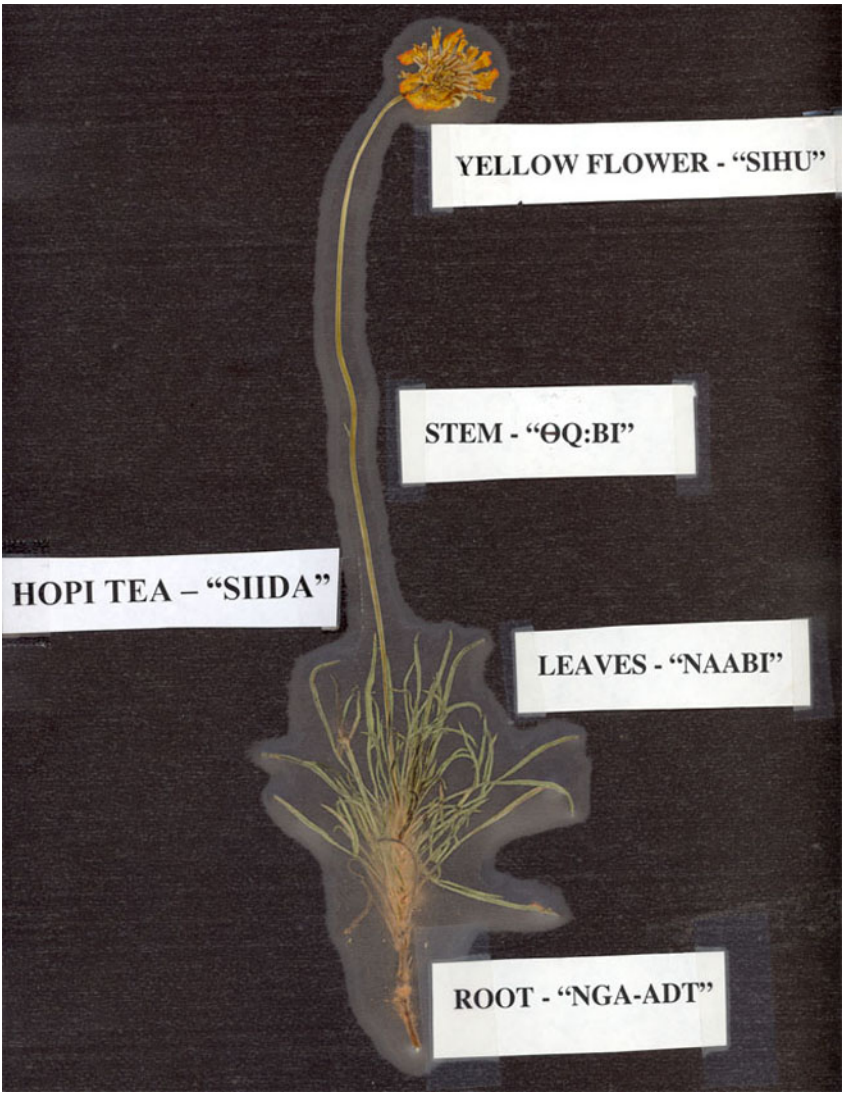


Figure 3: An example of a student's plant board



In addition to the graphic organizer, the lesson plan should include a section on "getting ready" which is in essence the teacher preparation component of the lesson plan. This list includes the materials that the teacher needs to carry out their teaching. For this particular lesson plan, that would include basic essentials, but also pictures of the Food Pyramid, variety of foods from magazines and recipe books, Navajo Tea Plant Boards, Sumac Plant Boards (see Figure 3 above), dried tea, sumac berries, student science journals, and a pre/post quiz. Plant boards facilitate the learning process and include the preservation, labeling and identification of the various plants that are grown within the child's surrounding

environment. The "doing the activity" section highlights questions that you will ask your students in the discussion to engage them in inquiry as well as obtain students' perceptions. The "culminating activity" involves the students drawing a picture of the Navajo tea plant in their science journals and labeling the plant with the words: leaf, stem, blossom and roots. Navajo language labels will be added in phase two. In order to record the progress that students make after teaching the unit, you need to develop a quiz that covers the cultural content that was introduced in phase one. It is recommended that you administer the quiz at the beginning of the unit and at the end upon completion of the unit, utilizing the same quiz as a pre- and a post-quiz. This is an excellent way to determine how much your students have learned.

Phase Two: Cultural Context (Cultural Perspective)

The cultural context is where the traditional Native cultural knowledge as it pertains to the science topic to be studied and which have been imparted in an oral tradition are taught. This includes a vocabulary of specific words in the Native language with English translations. It is recommended that five to eight vocabulary words be selected for each lesson plan in the unit. Additional information in this phase includes traditional Native stories and teachings as well as traditional uses. The class is introduced to the cultural information and teaching on the topic of focus for each lesson and the traditional protocols for imparting information and knowledge are observed and shared. This part of the process also integrates the oral sharing of information and includes field trips in the child's specific surroundings and environment where plants, landforms and other tangible examples within the children's realm or experience can be recognized, identified, explored, explained and their knowledge based on the topic of focus is expanded and amplified. Phase two is established as a building block for the children's sense of knowing, sense of self, sense of place, sense of belonging and a traditional knowledge database on which textbook science can then be integrated. Student cultural sheets are also available for the students so that they may read native stories, legends, and history. In addition, community members visit the classroom and share about their cultural knowledge as it pertains to the lesson at hand.

Phase Three: Classroom Science (Expansion/Scientific Explanation)

During this phase the focus is on communicating concepts, ideas and honing skill exercises taught in science textbooks and/or science kits. An objective way of viewing and learning concepts through teacher classroom lectures including other hands on and inquiry based activities, the written format of textbooks and the use of computer technology and other electronic media to access knowledge and information is introduced to the children at this point. The use of measuring tools, rulers, test tubes, microscopes, telescopes and cameras for recording and monitoring information is also taught here. The western view and approach to learning, teaching and absorbing information about the specific topic becomes the focus of activity. Students are exposed to the process of beginning to think

inductively and deductively. It is here that they begin to hone math skills, and learn to develop an objective view in the learning process by identifying the specific topic for study, the guidelines for gathering data and are taught how to arrange and organize the materials gathered into a format from which observations can be made and conclusions drawn. The students are also taught how to present the materials in report form for the class, family and the community in general.

Phase Four: Integration of Cultural Knowledge (Connecting to Western Science/ Expanding the Idea)

During this phase the students are to organize the newly learned concept with other concepts that are related to it. The terminology of the new concept, at this phase, needs to be utilized more to ensure students are accommodating the learned experiences. It is important to expand with activities that will be well correlated with the concept.

I emphasize that interaction of the students inside and outside of the classroom with the materials and lab equipment is vital. It makes the difference between passive learning and active learning. At the onset of the project, teachers were videotaped teaching science to their students. It was all too common for the teachers to stand in front of the classroom with an open science textbook and ask several students to read sections of the lesson to be studied. After the selected students read their sections, the teacher proceeded to conduct the experiment for the class. The students were then asked to answer the questions at the end of the chapter. Later, after the teachers were trained how to teach science, the interaction with the materials and equipment became central to their learning and students became more engaged in the learning process.

The use of the child's mother language is highly important. The utilization of the child's mother tongue and English was instrumental in the learning process (Gilbert, 2008a). The NSCRP curriculum and instruction benefits went beyond improving the students' science knowledge as English language learners were learning scientific terminology in English through the use of their mother tongue. A science vocabulary dictionary was also developed with respective Native definitions and English translations. In addition, students who were minimally proficient in their native language were encouraged to speak their native language by their fellow classmates who were proficient. Working in cooperative learning groups also is another factor to learning. Students need to interact with one another and learn from each other to become teachers as well as learners in the classroom. This occurred with both the subject matter and the language instruction.

One of the goals of the Native Science Connections project was to create a curriculum of science education materials which is inclusive of and creates a place for traditional cultural belief systems and values while simultaneously amplifying and expanding existing Native American traditional knowledge bases in an interdisciplinary manner. The NSCRP interdisciplinary curricula also incorporated language arts, social studies and mathematic components as well as science.

Conclusion

The need for the development of culturally based science curriculum to become part of the existing classroom science curriculum is a reflection of the movement in native communities to address these important cultural issues and academic performance of young Native American students. The call for a culturally based science curriculum is due to the fact that over the years, the educational system has failed to fully implement these learning approaches that embody the importance of language and culture in the education of Native students. Culturally based science curriculum however may not only improve student academic achievement in science education and other content areas, but also change the students' attitudes in a positive direction that will in turn, help Native American communities maintain their language, culture and traditional "ways of knowing." This cannot be accomplished without the help of first and foremost the local tribal community members, elders, educators, parents and students and secondly the educational system that develops professional and teacher preparation programs to create a high quality teaching force.

The Native Science Connections research project was conducted between 1993 and 1999 and more than a decade later, the Native Science Connections "Loololma" model continues to be implemented by the NSCRP teachers, administrators and curriculum developers. One teacher replicated the Loololma model from an elementary grade level to a middle school level. Her class, at the time, was the only class making AYP at her reservation school and she attributes this to the NSCRP teacher training and professional development she acquired as a participant in this project (E. McCabe, personal communication, September 8, 2006). The principal at one of the participating NSCRP schools is currently a charter school principal and continues to implement the Native Science Connections Loololma model (M. Sorensen, personal communication, March 30, 2010). One of the NSCRP curriculum development specialists who assisted in developing the curriculum for the Navajo module is currently utilizing the Native Science Connections curriculum and instruction model to teach Native culture in the Applied Indigenous Studies department at Northern Arizona University (M. Little, personal communication, April 20, 2010). I also incorporated the Loololma model with the Navajo Bilingual Advantage grant and developed culturally based K-12 curriculum for language arts, social studies and math. These and other NSCRP outcomes demonstrate that recognizing and integrating cultural and linguistic intellectual strengths of Native students in an academically rigorous and culturally relevant and responsive manner improves academic achievement while simultaneously revitalizing and preserving traditional cultural knowledge.

References

Demmert, W.G. & Towner, J. C. (2003). *Final paper: A review of the research literature on the influences of culturally based education on the academic performance of Native American students*. Portland, OR: Northwest Regional Educational Laboratory.

Gilbert, W.S. (2007, April 28). *U. S. House NCLB Testimony of Dr. Willard Sakiestewa Gilbert, President-Elect National Indian Education Association before the United States House of Representatives Education and Labor Committee Hearing on the Reauthorization of No Child Left Behind in Indian Country.* Sacaton, AZ: Gila River Indian Community.

Gilbert, W.S. (2008a, December 28). Blending Western, Traditional Cultural Science for Success. In L. Petrinjak (Ed.), *National Science Teachers Association (NSTA) Reports, 20*(4), 19.

Gilbert, W. S. (2008b). *Impact of culturally based teaching on student academic and social development.* Campaign for High School Equity (CHSE) Congressional Briefing: Culturally Based Teaching: A Model for Student Success. Alliance for Excellent Education. Retrieved March 3, 2009 at http://www.highschoolequity.org/events/congressional-briefings/

Gilbert, W. S. & Carrasco, R.L. (1999). *Native Science Connections in Native American Classrooms: Final Report of the National Science Foundation Native Science Connections Research Project. U.S. National Science Foundation Grant #ESI-9353217*. Washington, DC: National Science Foundation

Lipka, J. & Adams, B. (2004). *Culturally based math education as a way to improve Alaska Native students' math performance.* Retrieved May 17, 2010 at http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED484849&ERICExtSearch_SearchType_0=no&accno=ED484849

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

No Child Left Behind Act. (2001). P.L. 107-110.

Nelson-Barber, S. & Estrin, E. (1995). Bringing Native American perspectives to mathematics and science teaching. *Theory into Practice. 34*(3), 174-185.

Redefining how success is measured in First Nations, Inuit and Metis learning. (2007). Ottawa, Canada: Government of Canada. Retrieved Nov. 30, 2010 at http://www.ccl-cca.ca/ccl/Reports/RedefiningSuccessInAboriginalLearning.html

Reyhner, J. (Ed.). (1992). *Teaching American Indian students.* Norman, OK: University of Oklahoma.

Renner, J.W. & Merek, E.A. (1988). *The learning cycle and elementary school science teaching.* Portsmouth, NH: Heinemann.

Problem-Based Learning: Valuing Cultural Diversity in Science Education with Native Students

MaryLynn Quartaroli & Frederick Sherman

This paper describes a university-based environmental education outreach program that for more then ten years hosted a series of Summer Scholars programs using Problem-Based Learning (PBL) to provide Native American middle and high school students with one-week, on-campus residential science experiences to improve their academic performance in science while bridging mainstream and Native cultural differences in philosophy, values and beliefs.

Much has been written about culturally appropriate education for Native American students (for recent reviews see Brayboy & Castagno, 2009; Castagno & Brayboy, 2008). While acknowledging that Native American tribal cultures are multiple and widely diverse, there are some commonalities of Native American values and behaviors. Gregory Cajete (1999a) summarizes these as an emphasis on cooperation rather than competition, respect for personal differences and for nature, patience and reflective contemplation as a way to truly consider problems, the importance of an authentic and practical purpose for learning and holistic conceptions of knowledge. According to Cajete (1999b) mainstream Euro-American culture contrasts with indigenous ones over issues related to philosophies, values, customs, beliefs and ways of being. As Brewton Berry observed more than forty years ago, "Those who have been involved in the formal education of Indians have assumed that the main purpose of the school is assimilation… it was always the white man's way of life which must set the pattern" (1968, pp. 15-16). Assisting Native students in exploring the differences between their cultural worldview and that of mainstream Western science remains a critical step in promoting student success.

In addition to understanding conventional science as a way of knowing, Native students also require an introduction to the concept of "embedded science" (Fasheh, 1990), which originates in traditional indigenous knowledge. Cajete finds that Native American languages do not include a word for the Western concept of science. Instead, he says,

> the thought process of 'science' which includes rational observation of natural phenomena, classification, problem solving, the use of symbol systems and applications of technical knowledge, was integrated with all other aspects of Native American cultural organizations. (1986, p. 129)

One way to begin this integration within science classrooms is to overlay traditional ecological knowledge onto a Western science curriculum. Important as that may be, this is only a first step (Garroutte, 1999).

In a curriculum development course for teachers of American Indian students, Davison and Miller (1998) focused on creating culturally relevant activities as part of the science curriculum to suggest that the development of these connections helps Native students make sense of what they are learning, both in the context of the culture and in the context of school science. As Nelson-Barber & Estrin (1995) state,

> Many American Indian students have extensive knowledge of mathematics and science…. Unfortunately, a majority of teachers recognize neither Indian students' knowledge nor their considerable learning strategies. Thus, not only is potentially important content knowledge ignored but well-developed ways of knowing, learning, and problem solving also go unrecognized. (p. 174)

Bang, Medin and Atran (2007) endorse this perspective, arguing that the ecologically based way of understanding the natural world can be an advantage when Native children learn science, especially biology. Unfortunately, many Indian students are alienated by classroom approaches that are culturally inappropriate, lack hands-on experiences and assume they have no prior knowledge or skills. Other classroom research shows that simply adding on cultural instruction to the existing curriculum is not necessarily effective (Carrasco & Gilbert, 1999; Hakuta & Gould, 1987). Thus, including a "patch" of tribal stories overlain onto standard instructional practices may not be a sufficient enough modification to ensure the interest or understanding of science for Native American students.

In a study about American Indian identity, cultural values and perceptions of science and technology, James (2006) argues that appropriate alternative approaches to science education and practice can have a positive effect on Native students' achievement in science. One example of an effective science instruction initiative with Native students is an inquiry into the effect of the accidental introduction of the coqui (a type of frog) into the Hawaiian islands developed by the Hawaiian Networked Learning Communities. Its goal is

> to nurture greater environmental awareness by giving students in rural schools the opportunity to investigate real-world environmental issues. By using the tools and skills of scientists and mathematicians to examine local ecosystems, this RSI [rural systemic initiative] is both strengthening the curriculum and teaching something else: Malama i ka 'Aina – an understanding of stewardship within the cultural and environmental context of the Hawaiian Islands. (Boyer, 2006, p. 24)

This inquiry-based science instruction initiative encompasses 37 schools on six islands. Measurable gains were made in 5th and 10th grade math scores (the state science assessment is still in development).

In summary, the following are characteristics of a culturally relevant science education: 1) it explicitly discusses the assumptions of each way of knowing; 2)

it does not relegate traditional knowledge to only the social and spiritual worlds; 3) it stresses situated, place-based contexts for evaluating knowledge that is inextricably linked with community values, needs, language and experiences; 4) it explores and addresses the relationships and tensions between Native and Western science; 5) it incorporates active teaching methods; 6) it allows time for processing and responding; 7) it encourages cooperation; 8) it allows students to participate in curricular decisions; and 9) it requires the application of information into daily life, placing science in social and community contexts (Bang, Medin & Cajete, 2009; Cleary & Peacock, 1998; Garroutte, 1999; Gilliland, 1995; Rhodes, 1994). Problem-Based learning (PBL) has the potential to meet these goals.

What is Problem-Based Learning?

In the late 1960s, medical educators at McMaster University in Canada and at Case Western Reserve University in Ohio began using PBL to address the weaknesses in their medical school graduates. Although these students could memorize huge amounts of detail, they were not very adept at applying this knowledge in clinical settings. Since that time, PBL has been used to educate architects, social workers, managers, economists, lawyers and other professionals. Beginning in the 1990s at the Illinois Mathematics and Science Academy, PBL began to be used in public schools, first in science instruction and then across the curriculum.

As an instructional strategy, PBL involves students as stakeholders in the investigation of a significant and interdisciplinary real-world problem, creating an active learning environment in which the teacher acts both as a learner and coach to guide student thinking and inquiry. Students are introduced to the problem before they have learned the necessary content knowledge. They then work collaboratively to define the issues and their learning needs, locating relevant information, questioning and researching to build a deeper understanding, evaluating possible solutions to the problem, choosing a "best fit" solution and reflecting on both the process and the solutions (Delisle, 1997; Lambos, 2004; Stepien, Senn & Stepien, 2000; Torp & Sage, 2002). Throughout the investigation, they "engage in ongoing reflective activities such as journaling, self-evaluation, and group debriefings" (Ertmer & Simons, 2006, p. 41).

What's a "Problem"? PBL scenarios or problems are situated in the students' real world. Ideas for problems might come from community, school, family or social issues, newspaper or magazine articles, literature or movie situations, or from the students themselves. Whatever the source, the traits of a "good" problem or scenario are:

- Complex, ill-structured, and "messy"—not easily solved using a specific formula
- Robust—includes the "big ideas" of one or more academic subjects
- Significant—fascinating and meaningful to the students themselves
- Researchable—changes with the addition of new information
- Boundaryless—incorporates multiple subjects

- Open-ended—does not result in one "right" answer (Lambros, 2004; Stepien, Senn & Stepien, 2000; Torp & Sage, 2002):

Many examples of problems applicable to science and other school subjects can be found on the internet and in the resources listed in the Appendix on page 74. These can be quite diverse, as indicated in this brief list.

- Stop the Frankenfood Monster! (genetically modified foods)
- Sink It to the Bottom (environmental impact of an oil storage tank)
- HELP–H1N1 in High School (public health, epidemics, viruses)
- Should Teresa and Carl Get Married? (genetic diseases)
- Should Our Tribe Build a Casino? (benefits and drawbacks of "gaming")
- Should the Tribe Lease Coal for Stripmining? (environmental impacts)
- There's Nothing to Do (development of a local youth activity center)

The case study discussed later in this paper provides additional examples of environmental problems that have been successfully investigated by Native students.

Why use Problem-Based Learning? Students often ask, "Why do I need to learn this?" Good PBL experiences answer that question by engaging students in real-world content and process skills, making learning much more relevant and authentic. By developing a PBL problem that is of local importance to the community, groups of students have the opportunity to identify and investigate significant and meaningful questions, resulting in more motivated and engaged students.

Because there is potential for different learning emphases within the same problem, students are allowed the flexibility to specialize, thereby avoiding competition for the same answer or solution. As Glasgow (1997) points out, "Projects that offer different roles create slight variations in classroom climate that may inspire certain students to become more engaged when not directly competing with one another" (p. 54).

During the PBL process, students take responsibility and are accountable for their own learning, assisting teachers in providing differentiated instruction for each student. The use of on-going assessments during PBLs allows the students to demonstrate their acquisition and application of new content in authentic ways.

PBL and Academic Standards: Teachers often find the sheer number of state and national standards to be overwhelming to try to accomplish within an academic year. Problem scenarios effectively incorporate multiple standards across many subject areas within one PBL experience. The concepts and skills required to investigate a PBL scenario are likely to be applicable in multiple contexts and are fundamental to the "big ideas" (i.e., concerning change, structure, function, power and authority) across numerous academic subjects.

PBL instruction can move learners along the continuum from novice to expert more rapidly than conventional instructional strategies. Further, it provides

teachers with the opportunity to utilize in-depth assessments of students learning, in addition to conventional tests, providing a more complete picture of student progress and performance.

PBL and 21st Century Skills: The Partnership for 21st Century Skills (2004), based in Tucson, Arizona, advocates that every child in America needs 21st century knowledge and skills to successfully face rigorous higher education coursework, career challenges and a globally competitive workforce. So far, 14 states have signed on to this initiative as P21 Leadership States. The knowledge and skills identified as critical for 21st citizens are:

- *Core Subjects/Themes*: global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; health literacy
- *Learning/Innovation Skills*: creativity and innovation; critical thinking and problem-solving; communication and collaboration
- *Information, Media & Technology Skills*: information literacy; media literacy; ICT (information, communications & technology) literacy
- *Life/Career Skills*: Flexibility and adaptability; initiative and self-direction; social and cross-cultural skills; productivity and accountability; leadership and responsibility

Using PBL allows teachers to help their students become successful in most of these areas, including learning/innovation skills; information, media and technology skills; and life/career skills. Depending upon the PBL scenario, many of the core subjects and themes can also be included.

As students work together to define the problem, find and evaluate evidence and reconsider the problem from multiple angles, they develop higher order thinking, problem-solving, collaboration and communication skills. These skills are transferable to all contexts, in school settings as well as in real-life. Research indicates that the use of PBL enhances problem-solving skills and effective reasoning strategies, while increasing long-term student retention and application of knowledge (Goodnough & Cashion, 2006; Strobel & van Barneveld, 2009).

Summer Scholars—A case study

The Summer Scholars programs for Native American middle and high school students are held on the main campus of Northern Arizona University. These programs were cosponsored and co-funded by an environmental educational outreach program of a university institute and by the participating school districts. Between 2001 and 2008, more than 640 students from four southwestern tribes attended 32 week-long sessions, accompanied by over 120 teacher-chaperones. Native American college students serve as assistant instructors and mentors for the Summer Scholars participants. Working in collaborative groups, students explored environmental problems of local, regional and cultural concern, improved their technological skills and built mentoring relationships with college student assistant instructors "developing skills necessary for informed participation in public debate about complex social, environmental, and political issues" (Nelson-Barber & Estrin, 1995, p. 2).

The PBL problems for investigation during these Summer Scholars sessions included such topics as the reduction of visibility at sacred sites, increasing tribal economic prosperity by developing energy production, the use of reclaimed water for snowmaking at a ski resort located on a sacred mountain, forest fire management practices on tribal lands and reducing their school's carbon footprint by designing a "green" school. Students defined specific questions to investigate within these larger topics, in order to make recommendations for resolving these problems.

A case study research methodology (see Hays, 2004; Stake, 1995) was used to examine teaching science in a PBL format with Native American students during the Summer Scholars program. Multiple sources and methods of data collection and analysis were employed. Sources of data included observations, daily and final feedback questionnaires with both ratings and open-ended items, focus groups with students and with teacher-chaperones and assistant instructor written reflections. A review of the final student-produced web pages and PowerPoint presentations for accuracy, depth of understanding and cultural implications or significance provided additional information about the quality and effectiveness of the learning experiences.

On the first day, students were assigned to rooms in campus dormitories, given meal cards for campus dining halls and a research binder outlining the week's agenda and study materials, including a set of daily Problem Logs (adapted from Stepien, Senn & Stepien, 2000) to guide their research. Following the evening meal, students met with the instructional team, participated in ice-breaking activities and were introduced to the problem they are to investigate during the week. At this time, the PBL process is explained, emphasizing that their investigations would be framed by three questions:

1. What do we know?
2. What do we need to know?
3. How can we find out?

Students were assigned to PBL groups of two to six members and began their research with a short homework reading assignment.

The daily schedule for the rest of the week included meeting in the morning as a large group to discuss their work on the problem logs and to be briefed on the day's activities. Throughout the week, students worked in the computer lab, participated in laboratory and other hands-on activities, listened to guest speakers, watched videos and went on field trips related to the problem under investigation. Each evening there was recreational time, in addition to reading assignments and PBL small group work facilitated by the assistant instructors.

For their final presentations the Summer Scholars created web pages or gave PowerPoint presentations to the large group and other visitors, at the end of each week-long session, explaining their recommendations for addressing the problems. On a feedback form, one student praised this final expectation as a strong point of the Summer Scholars program, writing, "I liked when we got to speak

on front of the other students." Most of the others expressed fear and shyness, although with encouragement from the staff and their peers, all did complete the activity. To develop these presentations, students could choose to use one of several templates provided by the instructional team, to modify the provided templates to meet their own aesthetic preferences, or to create their own. In addition to the students, teacher-chaperones and instructional team members, the audiences for these final presentations often include other guests, such as school principals or university staff.

Over the years of the Summer Scholars program, students created 437 web pages. A content analysis of these pages revealed that almost all students were able to identify issues of importance relevant to the problem, to list the pros and cons of a possible solution and to justify their recommendation, even though they did not know anything about the issue prior to attendance. As one student explained, "When I first came to Summer Scholars I didn't know anything about prescribed burning. After spending a week studying fire and how it works, I learned that it's good forest management." The rest of the web page supports this student's conclusion, accurately explaining the pros and cons of the practice. In a different year, one student stated on his web page, "I didn't really think Summer Scholars was important until I came and learned something [about energy production from different sources] that I never thought pertained to me before."

In addition to using the information presented during the course of the week regarding the benefits and hazards of a variety of ways to resolve the problems, some students also suggested highly creative ideas. As an example, to address the problem of reduced visibility at the Grand Canyon, one student recommended the use of large solar-powered fans to supplement the wind to move the pollution and haze out of the canyon; another suggested that an air filtering system could be installed on all scenic over-flight aircraft to remove the haze while tourists view the canyon.

The web pages also revealed that students considered important cultural impacts in evaluating options and making recommendations. In the problem related to visibility reduction, students cited concerns about the health and survival of eagles, a sacred bird, or high incidences of respiratory problems on the reservation related to air pollution. One also wrote,

> My grandmother told me that when she was my age she could see Navajo Mountain [a sacred mountain] very clearly, but now all you can see is the silhouette of the mountain. Also back then you could see 80 or 90 miles, now you are lucky if you can see 30 or 40 miles.

On the topic of energy production, many recommended solar or wind generation as having the least impact on the environment, thus protecting community air and water sources. One Summer Scholar noted, "It doesn't pollute the environment, it doesn't destroy the land we live on, it would make the bills a whole lot less for the elders, and it could be powered for anywhere." Not all agreed; another student recommended the use of coal, writing "We have a lot

of coal on the reservation which we can use in a power plant…and it's another way to help out the citizens on the reservation by giving them work that can pay a lot of money."

Regarding the use of prescribed burning for forest fire management on tribal lands, one student's web page noted, "Native Americans were probably the first people to use prescribed burning." A second suggested that the use of prescribed burning "helps put Mother Nature back on course." However, one student expressed this cultural concern, "It could burn the medicine plants we use for traditional use."

The investigation into the proposed use of reclaimed water for snowmaking at the ski area on the San Francisco Peaks generated a strong opposition to the proposal. In all cases, the primary reason given was a concern for this sacred mountain. Examples included:

- They don't want to disrespect any of the four sacred mountains
- The San Francisco Peaks don't need mankind to do their job on making snow. In the native way things are made by Mother Nature.
- The Peaks are a sacred home to the Holy people and ceremony plants.
- Not only does our tribe think it's sacred, but 13 other tribes also think it's sacred.
- This is where the Holy Ones emerged to this world. The soil guides our people, it affects how we treat them, it's how we treat ourselves.
- I got a whole new perspective about the whole traditional way and the meaning of the Navajo way.

Not all students agreed. As one noted,

> I think the [ski area] should use reclaimed water because the Native people do not clean and respect the land. If you go on the reservation you will see a lot of trash on the side of the road. So that means that the people do not respect the land.

Of all the problems investigated during the years of Summer Scholars, this issue clearly engaged the students in considering the importance of traditional culture, in addition to environmental and economic impacts of a controversial problem.

At the end of each Summer Scholars session, participants are asked to rate their awareness of the environmental issue addressed during the PBL process and their awareness of science, mathematics and technology, using a scale of 1 to 5 (1 = Poor, 5 = Excellent). As shown in the tables below, teacher-chaperones generally gave higher ratings than students. In all cases, the median ratings were "very good" to "excellent." For awareness of the environmental issue, overall, teachers rated the PBL experience as 4.65; students' ratings were 4.10 (see Table 1).

Table 1: Awareness of PBL Environmental Issue

Point value	Poor 1	Fair 2	Good 3	Very Good 4	Excel-lent 5	Average Rating
Students (n=546)	6	10	126	186	218	4.10
Teacher-Chaperones (n=104)			1	34	69	4.65
Overall (n = 650)	**6**	**10**	**127**	**220**	**287**	**4.19**

On awareness of science, mathematics and technology, teacher-chaperones again gave higher ratings, averaging 4.38; overall students rated the experience as 3.97 (see Table 2).

Open-ended response questions also solicited feedback from students, teacher-chaperones and assistant instructors, providing many examples of positive responses to using PBL to learn about environmental issues and cultural concerns, in addition to those included on the web pages. Students mentioned the importance of being exposed to a wide range of possible solutions, each

Table 2: Awareness of Science, Mathematics and Technology

Point value	Poor 1	Fair 2	Good 3	Very Good 4	Excel-lent 5	Average Rating
Students (n=550)	4	25	129	215	177	3.97
Teacher-Chaperones (n=106)			15	36	55	4.38
Overall (n = 656)	**4**	**25**	**144**	**251**	**232**	**4.04**

having positive and negative consequences. As one student working on the energy production problem wrote, "I have been able to think about the pros and cons of using uranium vs. coal." Others also commented on becoming more knowledgeable about the issues. For example, one stated, "The thing I liked about PBL was that it help[ed] me to understand a little bit more."

Students indicated their appreciation for the opportunity to form their own opinions. For example, one Scholar wrote, "I think that we are allowed to make our own decisions." Or as another described, "At home, my community is very much against pumping water out of the aquifers. I feel like I have to support their beliefs. I will make the decision on my own." Students also became more sensitive to the impacts of their personal decision-making; one stated, "It makes me more aware of how the decisions we make today will affect our families."

The process itself presented both challenges and rewards for the Summer Scholars. Students described using PBL as "challenging" or "a lot of work." Another mentioned that it taught them "how to ask questions." A third noticed, "They made us feel like real scientist[s] by giving us the chance to study for info[rmation]." The PBL process was not easy for all students; as described by one participant, PBL was "okay but you got to think." Although students regu-

larly approved of getting to work together, the small group work to define and refine what they know, what they need to know and how they would find out also presented some challenges. As one student described, "It helps you to know and understand the problem and other people's personalities." Another commented on the PBL group process, "You got to listen to other people's point of view and work together." Others credited their success in the PBL process to the assistance that they received from the college assistant instructors: "The teachers from [the university] were helpful because they pushed us."

Teacher-chaperones also responded positively to the PBL learning process. A typical response was, "I really enjoyed the PBL session. I like to see the kids engaged in thinking." Another mentioned, "[I] have seen PBL being used during teacher certification classes but this is the first [I'd] seen it used with students." The teacher-chaperones went on to praise the process, writing "Watching the students work together to get their water samples. Listening to them learn from each other and feeling successful because they understood what they were doing today." Further, "I really think that the students are realizing that they actually practice what they learn in the classroom." Many recommended, "Keep PBL format for next year." One went so far as to state, "I plan to implement PBL method in all of my science lesson[s]. This is an excellent way of teaching science."

Teacher-chaperones mentioned another advantage to the use of PBL during Summer Scholars facilitated by the Native American college student assistant instructors. As one described, "The chaperones felt it was nice to see Caucasians and Natives working together, they also said that the kids see the Natives as role models and this is good." Another wrote, "I like the way the instructors emphasize personal decision making—this puts the responsibility on the kids instead of having the teachers tell them which energy source to choose." As one teacher-chaperone wryly observed, "Through the PBL, many of us are learning not to force our opinions on the kids."

With no expectation that they were to be the sole sources of all information, one teacher-chaperone described the experience, "Teachers were given the opportunity to learn right along students and teachers did not realize these issues because they are too caught up in their own daily lives." Others concurred. During the exploration of energy production, one wrote, "PBL has got me thinking about using other sources of energy in my community. From discussing energy sources, I have learned that every decision you make has a consequence for someone." The snowmaking problem prompted this response from a teacher-chaperone, "We saw the pros and the cons during PBL sessions and had to make our own decision on whether [the ski area] should or shouldn't make snow [using reclaimed water]."

The Native American college student assistant instructors provided additional support for the use of PBL to teach science to Native students. A typical response was, "Overall, the PBL small groups seemed to be a great success. The students all seemed to contribute." This led one to suggest, "Many come back with a more serious, mature perspective of their education in school." Not all responses were positive. One instructor expressed concerns, "I found many kids wanted to be

told what to do, they weren't used to being in charge of their own learning and they wanted their hand held." One assistant instructor suggested, "gathering [students] in a circle activity such as a debate, would increase student's motivation to research information, make recommendations and work as a team." Others indicated that the final expectation of a presentation did not go far enough toward resolving these real-life problems. One idea was, "I think we need to be asking them, 'OK, now what are YOU going to do in YOUR community?' [emphasis in original]" Another concurred, stating that Summer Scholars needs to be "asking the students to carry some of their new-found knowledge back home to their communities and to commit to some action."

There were other suggestions for improving the learning experiences. Students, teacher-chaperones and rec instructors all called for the inclusion of more Native American perspectives on the issues. One student wrote, "[I] would like to hear more about the Native American issue - an issue that wasn't really brought up even in the articles that were selected for readings were written by Caucasians." A teacher-chaperone agreed,

> [I] would have liked to known why the mountain is sacred to native tribes. Kids did not understand why the mountain is sacred. A way to achieve this could be through readings or having guest speakers who can present on the topic…. I think the students would also greatly benefit from hearing the Native American side or views.

Another chaperone went further, saying, "[I] would like more on the traditional viewpoint because **sponsors** don't fully understand why the mountain is sacred [emphasis added]." An assistant instructor also noticed this same weakness in the program:

> [We need to include] a component to acknowledge the wealth of information that the current natives bring to the table. Maybe this information is not considered "scientific" but it is information that has enabled generations of Navajo, Hopi and other Native people to survive and prosper for hundreds of years in the high deserts in the southwest. We seem only to be pushing the mainstream concept of science to these students. Even if the program feels uncomfortable addressing these issues, it is important to mention that the knowledge of the student's cultures should not be dismissed when they are making recommendations.

Another noticed, "I don't believe they [the students] are familiar with any of the tribes mentioned in the articles and this may have caused further alienation for them." However, program planners recognized that much traditional knowledge is sacred and better taught within the appropriate cultural contexts, such as families or private ceremonies. With this caveat, there is room for improvement to incorporate traditional expertise and viewpoints into the program.

Despite this perception of a bias towards mainstream science, all Summer Scholars participants praised the diverse learning activities scheduled during the week. There was widespread approval of the hands-on lab activities and the field trips. One student suggested, "Can we do experiments (like the ones where [sic] doing) next year because it helps us understand things a little better?" Another noticed, "The program gave me a week full of opportunities that I can't get at [home school]. Thanks (but it was too short)." Teacher-chaperones also supported the scheduled learning activities; typical responses were, "[I] like how events were planned out and organized with the times on the agenda" and "Activities and hand[s]-on made it easier to understand concepts." One also noticed, "After doing the field [trip] we were able to make the connections."

Teacher-chaperones also took the opportunity to participate in the activities during Summer Scholars. They noted a number of benefits, including "[I] learned a lot of ideas or tools to use in the classroom" and "Giving examples of how to teach using hands-on." They were positively impressed by "the importance stressed on protocols and correct data collection and recording." Teachers also described having the presenters available for questions from students and teachers as "an additional benefit."

PBL and cultural diversity

The case study data illustrate student and teacher-chaperone enthusiasm and excitement in using PBL to learn science, although the unfamiliarity of this teaching strategy also generated some anxiety. The PBL problems were personally relevant to the students, addressing timely community issues, thus establishing a valid connection with the learners. Using PBL problems that focused on tribal concerns emphasized the ownership of these issues by the community; the acquisition of knowledge in this context had direct application to the students' daily lives.

Student engagement in the PBL investigations was holistic, interdisciplinary and hands-on, emphasizing student choice in how and what they learn. This problem-based learning process promoted collaboration between students as they worked in teams, seeking answers to their research questions. During the week, students modeled their behavior on the roles and activities of adults in analyzing and solving problems. Students gathered information by watching, listening and questioning during activities and field trips, in addition to reading information in articles and on the Internet. Responsibility for identifying and refining their specific research questions and their sources of information gave them ownership in the quality of their results.

Students assisted each other in finding information, evaluating the results and weighing multiple considerations before making a final proposal. This was especially true for those groups with members who previously attended Summer Scholars and were familiar with the PBL instructional process. Much of the learning took place in private practice, sharing with other members of their small groups; this reduced the risks of public performance or correction, allow-

ing students to develop confidence prior to displaying their knowledge in their final web page or PowerPoint presentations to the large group.

In their investigations, students were afforded the opportunity to respond to the problems in multiple ways, pursuing information and understanding from different sources. In addition to the "standard" science resources of texts, journals and the Internet, learners went on data collecting field trips and contacted tribal elders, professionals and other community resources via e-mail, telephone, or in person, to seek insights and advice concerning their research questions.

Research cited in Deyhle & Swisher (1997) supports the view that Native American students are much more successful in classrooms in which a strong personal connection is made with the teacher. The role of the assistant instructors as facilitators or guides framed their relationships with the students as informal partnerships. The college student assistant instructors also directed students through hands-on activities that related to the PBL problems. However, these instructors were not the sole authorities or experts; indeed, they learned about the problem along with the students.

The assistant instructors provided less authoritative role models than lead instructors and presenters, critical in fostering student inquiry, freedom and confidence. Because the students had an active role in the development of the questions to be answered and in suggesting resolutions to the PBL problems, they became equal partners in learning, a critical component of Native American student success (Bartolomé, 1994). During the investigations, instructor "talk" was minimized; students had time for processing information and responding in less stressful settings. Communication with these instructors became more open, friendly and supportive. In effect, these assistant instructors took on the role of mentors, reproducing traditional pedagogical practice, gently guiding the students through their inquiries to reach deeper and richer levels of understanding.

The requirement that students make a final presentation of their research results to the large group, including outside guests, met the students' needs for their learning experiences to be a worthwhile activity, with a practical real-life application in presenting solutions to complex social issues. Working collaboratively, usually in pairs, to develop these artifacts resulted in demonstrating the use of multiple modalities. In addition to itemizing several considerations in support of and in opposition to, their recommendations, students also included art, personal stories and photographs in their presentations.

Challenges in using PBL in classrooms

While the use of PBL as an instructional strategy has many factors in its favor, there are also some challenges in using it in the classroom. These include the changing roles for students and teachers, creating a collaborative classroom climate, maintaining students' engagement, facilitating concept and cultural integration and time (Ertmer & Simons, 2006). Woodward-Kron and Remedios (2007) also highlighted that students may find PBL experiences challenging if their cultural and language backgrounds are different from that of the classroom.

The adjustment from the "sage on the stage" to the "guide on the side" called for in PBL can be difficult for both students and teachers; parents and administrators may also find this instructional strategy unnerving, as it is unfamiliar. Teachers and students together could develop "rituals" (standard procedures for specific types of activities at different times within the PBL process) to make the transition more comfortable. Teachers can enhance their facilitation skills by observing experienced PBL facilitators (in person or through video/on-line cases), working in pairs or teams and practicing using open-ended questions as prompts and during debriefing sessions with each other, before using these with student groups.

To further assist students in adopting their changing roles as independent and interdependent inquirers, teachers can provide scaffolding by conferencing with at least one student group each class period, by providing graphic organizers [i.e., KWL (What do I **K**now about the subject, what do I **W**ant to learn about it and what did I **L**earn) charts and problem logs] and by verbalizing their own thinking as an example of the process.

A collaborative classroom climate is central to successful PBL instruction. Teachers can assist students by providing structure and examples as they make the transition to working productively together. Moving over time from a PBL instructional model that is primarily teacher-directed, to one in which teachers and students share the inquiry, then ending with student-directed inquiries can eases the transition from teacher-centered to student-centered instruction. Teachers can also assist in groups in establishing culturally appropriate group behavior norms ("how we are going to work together") and learning goals, dividing up project responsibilities, managing deadlines and dealing with group dynamics. Whole-class debriefings during the early parts of the process can serve as models for how small groups can work together. The use of learning contracts or daily group worksheets may also assist in establishing a collaborative mindset.

Students often enjoy working in groups, but they do not always use the time productively. Teachers need to carefully monitor group progress; the use of frequent checkpoints and record-keeping devices (e.g., group folders, goal charts) can help with this. As facilitators, teachers also need to have students articulate what they are learning and challenge them to support their claims by presenting evidence. Keeping students focused on the central question in the scenario and the description of the task keeps the "big picture" visible to remind students why they are working on the activities.

It is easy for students to focus on the details, due dates and project timelines; making sure that they are developing a deep understanding of the content and concepts is the teacher's responsibility. This is a huge challenge in PBL environments. Having students regularly "think" about their findings orally (in small groups or individual conferences) and in writing will encourage synthesis of new content. Sometimes teachers will find that many students have the same misconceptions; a mini-lesson or lecture by the teacher could be an appropriate and efficient intervention at times.

Teachers' time is limited. Many cite a lack of time to develop and implement PBL instruction, especially in a climate of standardized testing mandated by the No Child Left Behind Act. One suggestion is to use "posthole" units, essentially mini-PBLs, to enrich regular conventional classroom activities. These can be incorporated into the academic calendar as a once a week strategy (i.e., every Friday). Another alternative is to use PBL during those times when students have difficulty remaining focused on the standard curriculum (i.e., right before the semester break or end of the year). In a study of using PBL with urban minority middle-school students, Gordon, Rogers, Comfort, Gavula and McGee (2001) noted improved student behavior and increased science performance, even when PBL was used as an enrichment activity during just two percent of the time.

The Appendix provides a list of resources teachers may fine useful to support their efforts to implement PBL in the classroom. The books listed are very teacher-oriented and often provide step-by-step instructions on designing, implementing and assessing student achievement. Up to date research about using PBL in many settings is available in the on-line journal *Interdisciplinary Journal of Problem-Based Learning* at http://docs.lib.purdue.edu/ijpbl/

Summary

There is a tremendous need for Native American and other students to pursue careers in science, mathematics and technology (James, Khoo & Harbold, 1996). Tribal agencies desperately search for tribal members who are qualified for professional positions that are crucial in resolving community problems by making decisions for the benefit of the tribe from both Western and Native perspectives. If the tribes are going to be able to fill these positions, educators must first find ways to develop enthusiastic, culturally and scientifically knowledgeable students. Investigating local tribal community issues using PBL holds real promise for science teachers of middle-school and high-school Native students to facilitate the achievement of these goals. If so much can be gained using PBL during a one-week-long learning experience, even more scientific and cultural understandings could be expected for regular classes on an academic calendar, with additional time to explore and incorporate community knowledge and values, as deemed appropriate by community elders (Carrasco & Riegelhaupt, 2006).

References

Bang, M., Medin, D. L., & Atran, S. (2007). Cultural mosaics and mental models of nature. *Proceedings of the National Academy of Sciences, 104*(35), 13868-13874.

Bang, M., Medin, D. L., & Cajete, G. A. (2009). Improving science education for Native students: Teaching place through community. *SACNAS News, 12*(1), 8-10.

Bartolomé, L. (1994). Beyond the methods fetish: Toward a humanizing pedagogy. *Harvard Educational Review, 64*, 173-194.

Berry, B. (1968). *The education of American Indians: A survey of the literature.* Washington, D.C.: US Government Printing Office.

Boyer, P. (2006). *Building community: Reforming math and science education in rural schools*. Fairbanks: Alaska Native Knowledge Network, Center for Cross-Cultural Studies, University of Alaska-Fairbanks.

Brayboy, B.M.J., & Castagno, A.E.(2009). Self-determination through self-education: Culturally responsive schooling for Indigenous students in the USA. *Teaching Education, 20*(1)31-53.

Cajete, G. A. (1986). *Science: A Native American perspective. A culturally based science education curriculum*. Unpublished dissertation, International College, Los Angeles.

Cajete, G. A. (1999a). The Native American learner and bicultural science education. In K. C. Swisher & J.W. Tippeconnic (Eds.), *Next steps: Research and practice to advance Indian education* (pp. 135-160). Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools.

Cajete, G. A. (1999b). *Igniting the sparkle—An indigenous science education model.* Skyand, NC: Kivaki Press.

Carrasco, R. L., & Gilbert, W. S. (1999). *The Native Science Connections Research Project: A final report.* United States National Science Foundation Grant #ESI-9353217. Washington: National Science Foundation.

Carrasco, R.L., & Riegelhaupt, F. (2006). Language, culture, science and the sacred: Issues and concerns in curriculum development for Indigenous Americans. In T. Omoniyi & J. A. Fishman (Eds.), *Explorations in the Sociology of Language and Religion* (pp. 259-277). Philadelphia: John Benjamins.

Castagno, A.E., & Brayboy, B.M.J. (2008). Culturally responsive schooling for Indigenous youth: A Review of the literature. *Review of Educational Research, 78*, 941–993.

Cleary, L. M., & Peacock, T. D. (1998). *Collected wisdom: American Indian education.* Needham Heights, MA: Allyn and Bacon.

Davison, D. M., & Miller, K. W. (1998). An ethnoscience approach to curriculum issues for American Indian students. *School Science and Mathematics, 98,* 260-265.

Delisle, R. (1997). *How to use problem-based learning in the classroom.* Alexandria, VA: Association for Supervision and Curriculum Development.

Deyhle, D., & Swisher, K. (1997). Research in American Indian and Alaska Native education: From assimilation to self-determination. *Review of Research in Education, 2,* 113-194.

Ertmer, P. A., & Simons, K. D. (2006). Jumping the PBL implementation hurdle: Supporting the efforts of K-12 teachers. *Interdisciplinary Journal of Problem-based learning, 1*(1), Article 5. Retrieved Nov. 2, 2009 at http://docs.lib.purdue.edu/ijpbl/vol1/iss1/5

Fasheh, M. (1990). Community education: To reclaim and transform what has been made invisible. *Harvard Educational Review, 60*, 19-35.

Garroutte, E. M. (1999). American Indian science education: The second step. *American Indian Culture and Research Journal, 23*(4), 91-114.

Gilliland, H. (1995). *Teaching the Native American* (3rd ed.). Dubuque, IO:

Kendall/Hunt.

Glasgow, N. A. (1997). *New curriculum for new times: A guide to student-centered, problem-based learning.* Thousand Oaks, CA: Corwin.

Goodnough, K., & Cashion, M. (2006). Exploring problem-based learning in the context of high school science: Design and implementation issues. *School Science and Mathematics, 106,* 280-295.

Gordon, P.R., Rogers, A.M., Comfort, M., Gavula, N., & McGee, B.P. (2001). A taste of problem-based learning increases achievement of urban minority middle-school students. *Educational Horizons, 79*, 171-175.

Hakuta, K., & Gould, L.J. (1987). Synthesis of research on bilingual education. *Educational Leadership, 44*(6), 38-45.

Hays, P. A. (2004). Case study research. In K. deMarrais & S.D. Lapan (Eds.), *Approaches to research: Methods of inquiry in education and the social sciences* (pp. 217-234). Mahwah, NJ: Lawrence Erlbaum.

James, K. (2006). Identity, cultural values, and American Indians' perceptions of science and technology. *American Indian Culture and Research Journal, 30*(3), 45-58.

James, K., Khoo, G., & Harbold, D. (1996). Minority women and technology. *Technology Studies, 3*, 94-120.

Lambos, A. (2004). *Problem-based learning in middle and high school classrooms: A teacher's guide to implementation.* Thousand Oaks, CA: Corwin.

Nelson-Barber, S., & Estrin, E.T. (1995). Bringing Native American perspectives to mathematics and science teaching. *Theory into Practice, 34,* 174-185.

Partnership for 21st Century Skills. (2004). *Overview, Mission, and State Initiatives.* Retrieved June 10, 2009, from http://www.21stcenturyskills.org/index.php.

Rhodes, R.W. (1994). *Nurturing learning in Native American students.* Hotevilla, AZ: Sonwai Books.

Stake, R.E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Stepien, W. J., Senn, P. R., & Stepien, W. C. (2000). *The internet and problem-based learning—developing solutions through the web*. Tucson, AZ: Zephyr.

Strobel, J., & van Barneveld, A. (2009). When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. *Interdisciplinary Journal of Problem-based Learning, 3*(1), Article 4. Retrieved Nov. 2, 2009 at http://docs.lib.purdue.edu/ijpbl/vol3/iss1/4

Torp, L., & Sage, S. (2002). *Problems as possibilities: Problem-based learning for K–16 Education* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Woodward-Kron, R., & Remedios, L. (2007). Classroom discourse in problembased learning classrooms in the health sciences. *Australian Review of Applied Linguistics, 30*(1), 9.1-9.18.

APPENDIX
Problem-based Learning Resources

Books

Barell, J. (2007). *Problem-based learning: An inquiry approach* (2nd edition). Thousand Oaks, CA: Corwin.

Barrows, H.S., & Wee Keng Neo, L. (2007). *Principles and practice of PBL*. Singapore: Pearson South Asia.

Delisle, R. (1997). *How to use problem-based learning in the classroom.* Alexandria, VA: ASCD.

Glasgow, Neal A. (1997). *New curriculum for new times: A guide to student-centered problem-based learning.* Thousand Oaks, CA: Corwin.

Lambros, A. (2002). *Problem-based learning in K-8 classrooms: A teacher's guide to implementation.* Thousand Oaks, CA: Corwin.

Lambros, A. (2004). *Problem-based learning in middle and high school classrooms: A teacher's guide to implementation.* Thousand Oaks, CA: Corwin.

Levin, B.B. (2001). *Energizing teacher education and professional development with problem-based learning.* Alexandria, VA: ASCD.

Ronis, D.L. (2008). *Problem-based learning for math & science: Integrating inquiry and the Internet* (2nd ed.). Thousand Oaks, CA: Corwin.

Stepien, W.J., Senn, P.R., & Stepien, W.C. (2000/2008). *The Internet and problem-based learning: Developing solution through the web.* Austin, TX: Prufrock Press.

Torp, L., & Sage, S. (2002). *Problems as possibilities: Problem-based learning for K-16 education.* Alexandria, VA: ASCD.

Websites

Interdisciplinary Journal of Problem-Based Learning. Available online at http://docs.lib.purdue.edu/ijpbl/

- Most up-to-date research on the use of PBL across disciplines & grade levels.
- Vol. 1, No. 1 of particular interest to K-12 educators.
- Vol. 3, No. 1 focuses on efficacy of PBL

Illinois Mathematics and Science Academy website: http://pbln.imsa.edu

Developing a Sense of Place and an Environmental Ethic: A Transformative Role for Hawaiian/Indigenous Science in Teacher Education?

Pauline W. U. Chinn

This qualitative study reports findings from a Hawai‘i-based professional development workshop involving 19 secondary mathematics and science teachers from Japan, Malaysia, Indonesia, Thailand, Korea, Philippines, U.S. and People's Republic of China. Participants learned about place-based science grounded in Native Hawaiian perspectives and practices and wrote about and discussed the role of indigenous knowledge and practices in science curriculum prior to 1) reflective exercises to develop a personal sense of place and 2) a presentation on indigenous Hawaiian practices related to place and sustainability. Responses prior to the interventions showed most participants from Asian nations viewed indigenous practices negatively. Afterwards, most viewed indigenous practices positively. They critiqued the absence of indigenous ecological knowledge in their national science curriculum and identified local issues of air and water quality owing to industrialization, fires, deforestation and resource exploitation. At the end of the two week workshop, videotaped lessons and interviews with the workshop administrator showed most incorporated students' places, prior knowledge, and/or cultural practices in their lessons. After three years, one participant left her school to be able to teach place-based education. Findings suggest professional development that includes indigenous, sustainable practices and personal, place-based activities provides a conceptual framework for transforming mainstream science curricula into meaningful place and problem-based curricula relevant to active environmental literacy.

Students in Hawai‘i have a unique natural laboratory to explore fundamental biological questions involving evolution, adaptation and the development of socioecosystems on isolated island systems. But Hawai‘i's students historically study mainstream, textbook-based science. They may become literate in school science but seldom learn about issues of endangered and invasive species or soil and water pollution in their own communities. At the secondary level, science classes that address locally relevant marine science and natural history tend to be targeted towards lower academic track students, while college bound students enroll in mainstream biology, chemistry and physics courses recognized and required by many colleges.

Middle class students who are likely to pursue postsecondary schooling are served reasonably well in Hawai‘i's mainstream schools. They take college preparatory classes and enter universities where their science and science education professors achieve professional status through research and writings assessed by peers who belong to nationally and internationally recognized knowledge-

based professional subcultures. It is ironic that specialists studying Hawai'i's flora, fauna, terrestrial and marine ecosystems, archeology and geology may be located in research institutions anywhere in the world.

In college, Hawai'i's future teachers, especially those in elementary programs, are unlikely to gain the science knowledge and tools to integrate their familiar environments into their curricula. Even nationally accredited elementary teacher education programs require only two semesters of introductory biological and physical science. A few years ago one of my science methods students said teachers at her public school on Kauai had decided on bears (which are not found in Hawai'i) as the theme of second grade science. Even when teachers are knowledgeable about Hawai'i-oriented science, school administrators' desires to raise standardized test scores by adopting mainstream curricula tends to impede the teaching of standards-based, locally relevant science.

This is unfortunate as public school teachers in Hawai'i work with culturally diverse students whose worlds are largely limited to their immediate families, neighborhoods and communities. Teacher education programs and science teaching standards stress the importance of addressing student diversity through culturally responsive lessons that include and build upon students' lives and experiences (Gollnick & Chinn, 1998). But once in schools, teachers find the institutional focus on standardized tests of reading and mathematics contradicts National Science Education Standards (National Research Council, 1996) directing teachers to:

> Select science content and adapt and design curricula to meet the interests, knowledge, understanding, abilities, and experiences of students. In determining the specific science content and activities that make up a curriculum, teachers consider the students who will be learning the science. (p. 4)

An elementary teacher with a master degree in education enrolled in my EDCS 433 Interdisciplinary Science Curriculum, *Mālama I Ka ʹĀina*, Sustainability class to learn to teach Hawai'i relevant, place and standards-based science lessons. In one of the writing assignments, she critiqued the mainstream language arts, mathematics, and science curricular programs her school purchased:

> With the curricula that we have to cover there is little time for science and the content seems so "mainland." Discussing woods such as oak or redwood is okay, but yet kind of silly because who has seen an oak or redwood tree, much less one in Hawaii? We have our own woods here, but if you follow the _____ science content, you do not get to cover that…There are a lot of great ideas from Mālama…but I am afraid to do too much of it for fear that I would be accused of not following the curriculum (which they paid a lot of $$ for).[1]

[1]This and subsequent quotes that are not otherwise referenced are from student and workshop participants' written reports, e-mails, etc.

These comments reveal teacher disempowerment and a critique of school policies that put scarce financial and teaching resources into curricula unrelated to students' lives and experiences. Environmental literacy, the ability to understand, monitor and maintain or restore the integrity of environmental systems all life relies on is marginalized in hopes of producing what Sternberg (2003) calls pseudo-experts:

> Conventional methods of teaching may, at best, create pseudo-experts—students whose expertise, to the extent they have it, does not mirror the expertise needed for real-world thinking inside or outside of the academic disciplines schools normally teach. (p. 5)

His research shows that teaching and assessment that include analytical, creative, and practical thinking enables students from more diverse racial, ethnic, educational and socioeconomic backgrounds to be successful learners whereas the analytical approaches of mainstream schools reduces diversity. He thinks teaching "must relate to real practical needs of students" and that practical, creative, and analytical teaching leads to the "successful intelligence" needed in fields such as teaching and science (p.5). Sternberg notes that reducing democratic outcomes and producing pseudo-experts incapable of real-world problem solving has serious societal implications. His current work examines the role of thinking in wisdom, defined as "the use of successful intelligence and experience toward the attainment of a common good" (p.7). He worries that test-driven schools will not educate citizens and leaders with the real world experience needed to make wise decisions in an increasingly complex, interrelated world.

Literature review: A world of difference

The history of western science as a cultural enterprise suggests that knowledge-building and technological innovations are driven by the interests of dominant elites (Gould, 1993; Takaki, 1993). Science as an objective quest for knowledge developed in the context of European imperialism and the quest for new lands and resources. Western science methods of knowledge building that involve measuring, classifying, collecting, dissecting, and mapping of everything in a material world are antithetical to a Hawaiian world view that understands humans and nature in a familial relationship.

Hass (1992) writes that Hawai'i's schools began as a vehicle for monoculturism, "the practice of catering to the dominant or mainstream culture, providing second-class treatment or no special consideration at all to persons of non-mainstream cultures" (p. 161). Culture may be defined as "a system of values, beliefs, notions about acceptable and unacceptable behavior, and other socially constructed ideas characteristic of a society of a subgroup within a society" (Garcia, 1999, p. 377). Cultural differences provide a way for dominant groups to portray others as outsiders of lesser importance. Negative stereotypes may lead educators to devalue and exclude the cultural knowledge, perspectives and practices of marginalized groups and hold lower expectations for these students.

A review of the history of education in Hawai'i shows that Hawaiian language and culture were largely excluded from mainstream schools after Hawai'i became a United States territory in 1898. Cultural and economic marginalization contribute to statistics showing that Native Hawaiians in public schools, at 26% the single largest ethnic group, experience the lowest school success of any group (Kanaiaupuni & Ishibashi, 2003).

But Hawaiian cultural practices and perspectives have much to contribute to environmental literacy and an ecosystems understanding of human interactions with the natural world. Until a monetary economy and policies allowing private ownership of land developed in the 19th century, most Hawaiians lived and married within *ahupua'a*, a land division typically extending from mountaintop to the edge of the reef containing freshwater and the resources necessary to sustain the population. Those living upland, *mauka*, exchanged products with those living *makai*, towards the sea (Abbott, 1992). Dependence on the resources of the *ahupua'a* produced long term, detailed environmental knowledge revealed in place names of winds, rains, springs, and other environmental features (Pukui, et al., 1974).

From a Hawaiian perspective, humans, living things, land and sea form an interdependent, ancestral, spiritually-imbued system (Maly, 2001). The connectedness of land and sea is seen in the pairing of land and sea organisms, such as pig, *pua'a* and the triggerfish, *humuhumunukunukuapua'a* (*Rhinecanthus rectangulus*). Close observation is seen in a binary naming system that links *naupaka kahakai, Scaevola sericea*, an indigenous coastal plant dispersed by seawater to *Scaevola gaudichaudiana, naupaka kuahiwi*, an endemic, montane plant dispersed by birds (Howarth, Gustafsson, Baum & Motley, 2003).

Figure 1: *Naupaka kahakai* (left); *Naupaka kuahiwi* (right)

The Hawaiian proverb, *He ali'i ka 'āina; he kaua ke kanaka* translated as "The land is a chief, man is its servant" (Pukui, 1983, p. 62) indicates Hawaiians recognized that active care (*mālama 'āina*) and respect/love (*aloha'āina*) for all that sustained them enabled their survival. In contrast, technologically advanced nations are only beginning to recognize the fundamental importance of healthy ecosystems as negative impacts of human activities become evident. Expressive of an economic orientation, the energy capturing, resource producing, and

cleansing processes of natural ecosystems are evaluated as ecosystem services (Daily, 2003).

A focus on place-based, environmental literacy in science teacher education and curriculum development takes on urgency given evidence that human activities have become the most important evolutionary force in the world (Palumbi, 2001). Emerging as an interdisciplinary theoretical field in education (Gruenewald, 2003; Perez, Fain, & Slater, 2004), learning associated with place produces the ecosystems knowledge integrating humans and nature that characterizes sustainable cultures (Orr, 1992; Cajete, 1999, 2000; Kawagley, 2001). Disinger and Roth (2003) stress the active problem-finding, problem-solving, place-based nature of environmental literacy.

When Hawai'i revised its science content standards in 1999, a Hawaiian saying *Mālama I Ka ʹĀina* (Sustainability) to care for the land that sustains us was included as a standard. With 300 plus plant and animal species, the highest number of candidates for protective status; about a fourth of those already protected under the Endangered Species Act, 107 of 286 (Song, 2005); and 90% of endemic species found nowhere else in the world, environmental literacy is an immediate issue for everyone in Hawai'i. Kanahele (1986) speaks to Native Hawaiians and residents of Hawai'i today:

> If we are to be truly consistent with traditional Hawaiian thought, no one really owned the land in the past…The relationship was the other way around: a person belonged to the land…We are but stewards of the *ʹāina* and *kai*, trusted to take care of these islands on behalf of the gods, our ancestors, ourselves, and out children. (pp. 208-09)

Culture and perception of the natural world

Sociocultural theory assumes that learning cannot be dissociated from interpersonal interactions located in cultural frameworks (Lave & Wenger, 1991; Cole, 1996; Gee et al., 1996). Socially situated learning recognizes that values, emotions, experiences and cultural contexts are integrally related to learning. The recognition that different cultures have different ways of understanding how people relate to each other and the world is the foundation for explicitly addressing cultural contexts in teacher education programs. If not brought to awareness mainstream teachers may only become familiar with superficial, even contrived cultural elements such as the addition of pineapple to make a Hawaiian pizza.

Cross cultural research by Nisbett (2003a) and his Asian colleagues yields insights into the role of culture in shaping views of nature. Comparisons of Asian and American perceptions suggest that Asians are more likely to see humans and their surroundings as part of a complex system while Americans tend to see individual actors. Nisbett suggests that *feng shui*, the study of how a structure relates to its environment, reveals Asians perceive the world as composed of complex relationships while the American tendency to problem-solve with series of steps indicates rule based, atomistic, universally applicable thinking. His results indicate that "Westerners are more analytic, paying attention primarily

to the object and the categories to which it belongs and using rules, including formal logic, to explain and predict its behavior." Nisbett (2003b) warns educators that "it might be a mistake to assume that it's an easy matter to teach one culture's tools to individuals in another without total immersion in that culture." Cultural differences ranging from superficial to ideological provide a context for examining school success of students from different cultural groups. In Hawai'i, for example, a host culture emphasis on relational identity grounded in family and place differs from the dominant American emphasis on personal identity. In mainstream classrooms, students learn science in a culture of individualistic, competitive practices leading to individual rankings. Hawaiian worldviews establishing humans in familial, caring relationships with the natural world are antithetical to mainstream ideologies grounded in scientific progress, individualism, and capitalism. Influenced by Descartes (Orr, 1992) and Isaac Newton's shaping of scientific communication (Bazerman, 1988) mainstream Western Modern Science (WMS) and its product, school science, tend to portray science as the discovery of universal truths based on data gained through objective, reproducible experiments stripped of emotion, cultural contexts and values.

One outcome of being socialized in WMS is a tendency for science teachers to be less aware of issues of culture in education (Greenfield-Arambula, 2005). But some scientists are beginning to recognize the importance of grounding science, especially environmental science, in experiences and emotions leading to an environmental ethic seen in Hawaiian values of *mālama 'aina*, active care for the land and *aloha 'aina*, love for the land. David Orr (1992), an environmental scientist, criticizes WMS for separating people from the natural world:

> Cartesian philosophy was full of potential ecological mischief, a potential that Descartes' heirs developed to its fullest. His philosophy separated humans from the natural world, stripped nature of its intrinsic value, and segregated mind from body. Descartes was at heart an engineer, and his legacy to the environment of our time is the cold passion to remake the world as if we were merely remodeling a machine. Feelings and intuition have been tossed out along with…love. A growing number of scientists now believe, with Stephen Jay Gould, that "we cannot win this battle to save [objectively measurable] species and environments without forging an [entirely subjective] emotional bond between ourselves and nature as well—for we will not fight to save what we do not love" (1991, p. 14).

Transformative learning and curricular restructuring

If mainstream school science is viewed as immersion in the culture of western science, perhaps immersing mainstream teachers in their students' indigenous or sustainability-oriented cultures and communities holds the potential to help them teach a more complex, systems oriented science that supports environmental literacy and recognizes the role of culture in learning. From 2000–2006, awards under the Native Hawaiian Education Act underwrote EDCS 433 Interdisciplinary

Science Curricula, *Mālama I Ka ʻĀina*, Sustainability, a K-12 teacher education and curriculum development course that included a multiple day culture-science immersion co-instructed by Native Hawaiians, science educators, and scientists (Chinn & Sylva, 2000, 2002). Through this class, K12 teachers developed and taught culturally relevant, place and standards-based curricula.

Place-based culture-science immersion supports teachers in developing personal and professional connections to their *ahupua'a*, the bioregion that landscape architect Thayer (2003) calls a *lifeplace* and defines as the region sustaining the unique human-natural community in which one lives and works. As teachers' environmental literacy develops, they learn how to use their immediate environments for interdisciplinary, experiential lessons that lead to an ethic of care and personal responsibility, *kuleana*, as indicated in the former state science standard *Mālama I Ka ʻĀina* (Sustainability).

Establishing a personal connection and acquiring the tools to study one's lifeplace can lead to transformative teaching and learning in science. Hall (2004) defines transformative learning as "the process of learning, whether in formal or informal educational settings which is linked to changing the root causes of environmental destruction or damage" (pp. 170-171). Transformative learning relevant to environmental literacy creates "pedagogical spaces for adults to learn to transform their lives and the structures around them" (p.190). This is in line with National Science Teaching Standards urging teachers to translate science goals "into a curriculum of specific topics, units, and sequenced activities that helps students make sense of their world and understand the fundamental ideas of science (NRC, 1996, p. 4)" and has much in common with Disinger and Roth's (2003) views of an action oriented environmental literacy. It can be seen from Hall's list of elements of transformative environmental education below that environmental education leading to environmental literacy has as much to do with culture and society as science:

- developing a sense of place;
- recognizing the importance of biodiversity;
- connecting with nature;
- revitalizing traditional and indigenous knowledge, values, and practices;
- building social networks;
- understanding power-knowledge relationships; and
- learning from elders.

Teachers who value and incorporate indigenous knowledge and voices into their teaching broaden the knowledge base for thinking and acting critically in the world and provide a conceptual bridge, though one not always easily negotiable due to ideological and ontological differences, between indigenous and mainstream cultural systems. Research collaborations involving indigenous and non-indigenous individuals with expertise in traditional knowledge and western science provide models of the synergies to be gained when traditional and western science knowledge bases are combined to understand particular environmental

issues (Poepoe, et al., 2003). Until Hawaiian became a written language, carefully conserved knowledge was transmitted through apprenticeship and participation in cultural practices. Hawaiians were absolutely dependent on the wisdom of trained individuals and old people viewed by Diamond (2001) as living libraries This transmission was broken with the institution of compulsory schooling in an English only environment after Hawai'i became a territory. Understanding the role of language, place and contextualized, interpersonal experiences in cultural transmission provides insight into indigenous peoples' determination to shape education from their own cultural perspectives (Cajete, 1986; Kawagley, 1999; Smith, 1999; Smith, 2003). Authentic, personalized environments and authentic, experience-based learning are still critical factors for success in the schooling of native Hawaiian students (Kawakami & Aton, 2000).

Connecting informal learning to school science

I learned to love science because my father, a science teacher, exposed his children to informal science through outdoor activities that led to interest-driven study of Hawaii's natural history. Virtually none of my learning and experiences translated into school science, but I never questioned it. As a secondary science teacher, it took me years to recognize the irony in Native Hawaiian students being least successful of all Hawai'i's ethnic groups in school science though coming from a culture sustained through broad-based environmental literacy. Years later I interviewed a Native Hawaiian female engineering student who reported that her friends' academic paths were shaped by elementary teachers who grouped them by perceived academic ability and behavior, setting the stage for academic peer groups that persisted through high school and beyond (Chinn, 1999b). Research with my culturally diverse preservice teachers (Chinn, 2003) revealed that their views of teaching are shaped by life experiences interpreted through the lenses of culture and schooling. These findings support socio-cultural theories of learning that ground Hawai'i Teacher Standards (www.htsb.org/standards/index.html) and National Science Teaching Standards (NRC, 1996) that stress the connections between students' informal and school learning.

Isabella Aiona Abbott, the first Native Hawaiian woman to earn a doctorate in science became interested in botany not through science classes but through her mother's knowledge of plants and her principal's support of her interests (Chinn, 1999a). Abbott (1992) listened as her mother, born and brought up on Maui discussed local differences in knowledge and practices with cultural expert Mary Pukui from the Ka'u district of Hawai'i. She chides "scholars [who] would be tempted to make a determination of which one among the various viewpoints was correct or normative," noting that "Hawaiian culture was diverse, more pluralistic than monolithic." She asks her readers to be researchers of family knowledge, "We Hawaiians have mostly lost our once-great talent for the oral transmission of culture, so if stories of the old ways still reside in your family, search them out and treasure them—and make sure they are preserved in written form" (p. x).

Linda Tuhiwai Smith (1999), a Maori researcher, describes 25 research projects being undertaken by indigenous peoples with "themes such as cultural

survival, self-determination, healing, restoration and social justice" (p. 142). Storytelling, indigenizing, connecting, writing, representing and naming are six research projects implicitly embedded in Abbott's suggestion to Native Hawaiians to seek out, treasure and write their cultural stories.

A Native Hawaiian preservice teacher's assignment to write about her personal place produced the excerpt below that includes the joy of childhood experiences, the internalized voices of elders, Hawaiian place names and cultural uses of land, and a critique of recent changes in her personally lived environment. It suggests that asking teachers to reflect on a personal place could begin a transformation from thinking about science education as the delivery of impersonal content to thinking about it as experiential, real-world learning using a range of research methods and methodologies including those of mainstream science to develop environmental literacy and interest in science:

> Hanalei has all the elements that remind me of my youth in Pupukea on Oʻahu—beautiful bay to swim in, valley to explore and to [play] around in. My cousins and I would explore all over the back country and visit Puʻu Mahuka and clean up the trash up there for fear that if we saw the trash and didn't pick it up, our ancestors would punish us. We would head down the hillside into Waimea Valley and quickly find ourselves playing in the stream. We would look for any sort of creature to look at and float around toward the sea. The best was floating out to the ocean and being able to see the lush valley behind us. We are unable to do those sorts of things now since there are homes in the backcountry and there is ever-present danger of rockslides on the hillsides as well as leptospirosis in the stream that we used to play in…Hanalei reminds me of how things were in Pupukea, it has the beautiful lush valley with impressive and majestic mountains that surround it, (one peak fascinates me, Hihimanu, the giant manta ray). There is the Hanalei River to play around in and it also flows into the loʻi (taro pondfield) which is a reminder for me of what was important to my ancestors.

Introducing the study

After teaching the *Mālama I Ka ʹĀina*, Sustainability class for three years, I was invited to lead the science component of a two week international workshop on curricular trends and issues hosted by a private selective academy for secondary science and mathematics teachers from Asia and the United States. I served as the lead instructor with the support of several Hawaiʻi-born science teachers who taught at the academy and had completed the *Mālama* class with me. This allowed us to focus on two trends in science education: 1) place-based science education and 2) teacher-developed culturally responsive lessons. The workshop would focus on the issue of the role of indigenous knowledge, practices and values in science education.

Nineteen experienced secondary science and mathematics teachers, 8 females and 11 males, from Japan (3), Malaysia (5), Indonesia (1), Thailand (1),

Korea (2), Philippines (2), and United States (5) attended a 10-day workshop in Honolulu, Hawai‘i of which I led two days focusing on science curriculum. My former students guided participants through the remainder of the workshop, presenting their place-based curricula and taking them on fieldtrips. The workshop topic, Trends in Science Curriculum, presented an opportunity to explore science and mathematics teachers' views of indigenous knowledge and sense of place from a cross-cultural perspective. Would exercises to develop a sense of place, explore personal learning, and examine ecological practices from an Indigenous Hawaiian perspective followed by Mālama teachers sharing their curricular projects provide a conceptual framework for transformational learning? The study explores three questions:

- What initial views do mathematics and science teachers hold of local and indigenous knowledge and how do these views influence teaching?
- Do reflective activities and exposure to Native Hawaiian practices oriented to sustainability lead to evidence of transformative learning with elements noted by Hall above?
- What environmental issues relevant to place-based curriculum are of concern to teachers?

Methodology

Five of 25 indigenous research projects described by Smith (1999) were employed in this study: indigenizing, connecting, writing, representing, and discovering. Indigenizing refers both to the re-visioning of cultural landscapes from the perspective of indigenous peoples and opposition to colonization through indigenous identity and practices. Connecting "positions individuals in sets of relationships with other people and with the environment" (p. 148). Writing and representing empower indigenous peoples to represent their realities, issues, and identity. Discovering refers both to "development of ethno-science and the application of science to matters which interest indigenous peoples" (p. 160).

To develop texts for personal reflection and stories for group discussion, writing prompts directed teachers to write about: 1) views of indigenous science and relevance to curricula before and after seeing a presentation on Hawaiian cultural practices; 2) a personal sense of place; and 3) personal development of expertise. Following each writing exercise, groups of three to four teachers from different countries, discussed their writings, looking for similarities and differences. Groups reported their findings for whole class discussion. At the end of the inquiries, teachers were asked to think of topics that could be developed into place-based curriculum relevant to their students and communities. Teachers' writings were collected and notes taken of group discussions.

After the workshop ended, videotapes of teachers' lessons were examined, written evaluations of the workshop were analyzed, and the workshop coordinator was interviewed. Three years after the workshop, three participants were

contacted by e-mail to see if the workshop had affected their practices. One replied, an Indonesian biology teacher.

Findings

Before seeing the presentation on Hawaiian cultural practices oriented to sustainability, teachers wrote for a few minutes on the prompts: "I think indigenous science is…" and "The role it has in curriculum is…." Following a PowerPoint presentation of traditional Hawaiian ecological practices related to farming, aquaculture, and conservation practices, teachers responded again to the same prompts.

A male Chinese teacher from Kuala Lumpur, Malaysia, wrote before seeing the presentation:

> Science has no or little place in (lives of) indigenous people—if at all they are used without being understood. Many herbal medications being used are passed down from generation to generation, knowing how to use but not why. The role it has in science curriculum is erroneous. Many traditional or herbal medicines required studies to have a full understanding and may have a great impact on modern medicine.

Following the presentation, the same man wrote: "It is about a balance between the mountain, the land and the sea—a diverse ecological balance. The role it has in science curriculum is to do things correctly and show the ways and means to sustain modern life." A male teacher from Japan wrote before the presentation: "I think indigenous science is when catfish are nervous, big earthquake is coming. Every natural thing, tall tree, mountain, river, pond, large rock is house of Gods (spirit). Therefore we had 2,000,000 Gods all over Japan." After the presentation, he wrote:

> The idea of 'respect to the Nature' was gone when Japan meets Western culture and they found Japan is way behind the West. 'Gods are gone' for 100 years, 1867-1967. When we suffered serous air pollution, 'Gods came back' through education. After 1960, 'environment' and 'natural conservation' became major issues in science education. If you talk to professional people, carpenters, engineers, mechanics, you will find their own traditional and very practical math and science which is not taught in school and it is very interesting.

The groups synthesized and developed generalized analyses of their discussions. The following writing is typical of group reports:

> The earth is our small and only livable planet. We should treat it with care so that the resources it provides for the human race are manageable and sustainable. Many traditional practices are invariably one way or another (related to) very effective ecological cycles one must pay

attention to. The culture of indigenous people must be recognized and respected for its continued perpetuation.

Connecting to others: Learning as socially situated

The writing prompt to describe how personal expertise develops asked teachers to examine their own stages of learning from initial interest to expert performance. After writing for five minutes, teachers from different countries met in small groups to discuss their writings and look for similarities and differences. Groups then reported their findings for class discussion.

Although the skills described by individuals ranged from teaching to skiing to cooking and growing hibiscus, the common patterns that emerged were: 1) Whatever was learned was important to one or more significant others in their lives; 2) learning was supported and encouraged by significant others; 3) practice, feedback and encouragement were important for improvement; 4) enjoyment, interest, and other emotions were important to learning; and 5) active and hands-on learning complemented learning from books and lectures.

As small groups shared their personal stories of developing expertise, international teachers who had only met each other a few hours earlier and were still uncomfortable speaking in English, for most a second even third language began to relax, offering nonverbal encouraging nods, smiles and laughter at each others' stories. These secondary science and mathematics teachers were recognizing how important positive emotions, affect, and connectedness to others are in learning

Developing a sense of place

The exercise intended to sensitize teachers who were initially critical of indigenous peoples' emotional and spiritual connections to place to the emotional aspects of their writings on personally important places. As in the other exercises, teachers responded to a prompt to write for five minutes about a personally meaningful place. They shared their writings in small groups and reported similarities and differences to the whole class. Although specific places with personal connections and meaning ranged from natural settings such as a beautiful beach to being inside a father's house, the places shared some common characteristics. The places were described in emotional terms as being comfortable, familiar, peaceful and secure.

Transformative learning: Implications for curricular change

The final writing assignment employed the preceding exercises and discussions as a springboard for planning place-based, teacher-developed curriculum. Teachers who initially had not favored inclusion of indigenous knowledge and practices in the curriculum now thought it valuable, as noted by Abbott earlier, to teach students to stay connected to elders and traditional knowledge. Students would continue to learn and value their own cultural practices, connect to their environment through cultural practices and learn to treasure instead of exploit local natural resources and raw materials. They regretted that children in their

rapidly developing nations already did not know how it used to be just a few generations ago. They faulted test-driven curricula for eliminating the joys of teaching and learning and having little connection to students and their lives. They thought national science and mathematics curricula should not be generic across countries and were of the opinion that individual countries should be proud of their own indigenous knowledge.

Asian teachers commented frequently on the loss of respect for the elderly and the displacement of traditional knowledge by modern, western models of science and mathematics education. As a group, the international teachers expressed frustration at the irrelevance of the curricula and assessment adopted from former colonizers. They complained about feeling trapped in covering an extensive body of content. They said the curriculum was disconnected from real issues of students and their communities. Both international and U.S. teachers agreed that test-driven curricula did not support independent thinking, encourage learning about traditional knowledge and practices, or address local environmental issues.

Teachers identified issues of sustainability in their localities that could be included in their curricula. Major issues were air pollution from unregulated vehicles and uncontrolled brush and forest fires (Malaysia), soil erosion and water pollution (Philippines), and dangerous driving behaviors on inadequate roads in their rapidly developing nations (Korea and Malaysia). A woman from the Philippines spoke about exploitative logging that left hillsides denuded and eroded and the people below vulnerable to landslides, flooding, and water pollution following heavy rains. The group discussed ways to incorporate local environmental issues into their curricula and discussed how data could be collected, analyzed and reported to policy makers to make changes leading to the common good.

Over the next two weeks teachers learned about place-based sustainability projects developed by teachers who had taken my place-based class the previous year, studied trends in mathematics, then wrote and presented lessons. The 45 minute videotape did not record every lesson fully or capture every participant, but most provided evidence of planning to engage students' prior knowledge, culture, or place. A Malaysian teacher presented a scenario of two taro pond fields identical in size and number of plants with different weights of production. Her place and culture-based lesson prepared students for examination questions requiring identifying and classifying relevant variables. A math teacher from the Philippines used maps of Honolulu streets in the vicinity of the institute to introduce his geometry lesson on intersecting angles. Three teachers mentioned the importance of connecting their lesson to students' prior knowledge before presenting a skit referring to water, wine, and apple juice in a lesson on acids and bases. They stressed that indicators are found in natural products, such as familiar foods such as red cabbage. Three others used spaghetti and Korean foods to introduce their topics. A biology teacher used familiar animals and plants in her lesson and referred to students' prior knowledge in her lesson. Three U.S. science teachers addressing temperature and kinetic energy asked participants to

work in pairs. But four Asian, male teachers did not make connections relevant to students' prior knowledge, culture, or places. One of the lessons employed mathematical terminology and did not engage prior knowledge or employ active learning strategies.

Interview with institute coordinator

Two interviews with the coordinator, one via telephone and the other at the institute, were unstructured and informal. Questions involved her recollections of teachers' lessons. She recalled the Filipino math teacher's geometry lesson using Honolulu streets—when he returned he planned to use streets on his campus as a place-based example. She commented on two teachers who were not on the videotape. The first was a female teacher from Indonesia whose lesson on corals was relevant both to Hawai'i and her country. The second was a female, elementary Asian American teacher from the U.S. who was especially interested in teaching that addressed cultural contexts.

Comments from final evaluations

Teachers wrote more than eighty comments related to questions on the program, assignments, improvements, extracurricular activities, growth or change as a result of the program, and implementation of strategies. A quarter of responses related to social and cross-cultural aspects of learning showing they highly valued learning from peers and gaining strategies for active, hands on learning, and group work:

> I really enjoyed meeting and talking to teachers from around the U.S. and Asia. This was the richest part of the experience. I learned so much from my peers/colleagues here. They gave me a lot of concrete ideas and also got me thinking more globally about science/math education.
>
> My world focus now can include Southeast Asia due to the connections with the teachers here. Previously, my world view was not so inclusive al all parts of Asia and I was more oriented to Europe when thinking about "overseas." I felt so validated to work with ___ and other teachers who came to the institute when it came to teaching from experience, giving kids more hands on engagement of the material!

Seven responses, including the two above were related to the importance of culture in teaching and learning: "I will add a culture component to my chemistry classes to make my class more relevant to my students, I can hardly wait to do the lesson ____ and I formed for the final project," "Take time to plan good lessons where culture and humour is (sic) present."

Three participants specifically mentioned the presentation on indigenous culture: "The more time I spent in Hawai'i, the more I came to appreciate Dr. Chinn's lessons and discussions. The idea of indigenous science is truly a rich

one," "I found the information on indigenous science especially fascinating… Pauline and the Bishop [Museum] were worth the trip all by themselves."

Teachers enjoyed and valued place-based learning, "Interesting, real original examples are the best teaching aids, even better at the original site," suggested longer and different field experiences, "Perhaps also a trip into the mountains to the native rain forest?" and planned to incorporate place-based activities into their teaching:

> A visit to the Bishop Museum, the stream and Hanauma Bay gave me an opportunity to really understand the works of nature and I think these should be available for the next group of teachers! I would like to have more field trips so the students are exposed to actual happenings around them. Our students lack hands on but as the saying goes, 'When there's a will, there is a way!' I would try my level best to bring my students back to Nature at least three or more times in a year.

A key idea that participants took from science sessions was the ethical relationship between humans and the natural world and the role of embodied, active learning that supports knowledge oriented to sustainability. A few years later, I e-mailed 3 teachers who had developed place-based lessons to ask if they had followed up on their ideas to shift teaching into her students' lived environment. The teacher from Indonesia who presented a lesson on coral responded. An excerpt from her e-mail follows:

> P: Have you followed up with some of the environmental science ideas in your own teaching?
> A: No, not yet. But I'd love to know, and let me know what can I do about it. Because I'm a "jobless" now, I'm waiting for next month to pursue my master degree majoring "education management." There, I hope I could find knowledge about how to educate, because my background was biology. And in the future, I have a dream to become a teacher trainer, sharing knowledge, and creating a local, needs-based curriculum for rural areas in Indonesia. If you look at the map, we're the maritime country, but we don't have curriculum to develop the student skills about how to hatch fish, how to plant algae, etc. What they have been learning at school is the regular, high standards, biology, physics, chemistry, those sucks, boring, don't have any use, and caused the frustration to the kids.
>
> And believe me you have a contribution in bearing those thoughts into my mind. When I saw you guys spend a lot of time, making a field trip to the Hawaiian village, and learn their wisdom. Thank you for any help you can provide. Thank you for contacting me, for listening to my "burden" also.

Discussion

The findings of this study suggest that a presentation on indigenous practices and reflective writings on personal place, patterns of learning, and traditional practices provide opportunities for western trained science and mathematics teachers to bring culture and personal experiences into discussions of curriculum and pedagogy. Written comments by several Asian teachers initially devalued traditional practices, indicating the cultural dominance of western science and marginalization of indigenous science knowledge. Following a presentation on Hawaiian environmental practices oriented to sustainability that interpreted cultural practices from western science perspectives, the same teachers appeared freer to speak as indigenous persons trained in western modern science but still connected to and familiar with traditional, indigenous practices.

The Chinese teacher from Malaysia who initially dismissed indigenous science ("Science has no or little place in (the lives of) indigenous people—if at all they are used without being understood.... The role it has in science curriculum is erroneous.") was still willing to consider the potential value of traditional herbal medicines following discovery of active principles through science research. After the presentation on indigenous Hawaiian practices he understood indigenous science in a completely different light. He still wrote predominantly from the perspective of a non-indigenous person, but now thought indigenous science's role in science curriculum would be to connect students to the natural world from an ethical and ecosystems standpoint: "It is about a balance between the mountain, the land and the sea—a diverse ecological balance. The role it has in science curriculum is to do things correctly and show the ways and means to sustain modern life."

Before the presentation on indigenous Hawaiian practices, the teacher from Japan gave a folk science example of indigenous science, "when catfish are nervous, big earthquake is coming," and referred to traditional Shinto animism that imbued natural features with "2,000,000 gods." After the presentation he noted that "respect to the Nature (sic) was gone" and "Gods are gone" for 100 years while Japan was industrializing to catch up with the West. "Gods came back" through education only after the country began to suffer serious air pollution. His writing suggests that becoming westernized separated people from traditional beliefs and practices connecting them to their environment in a relationship of respect and reverence with negative consequences. The return of the gods represents re-indigenizing and discovery of the positive ecological effects of indigenous perspectives and behavior in the natural world.

This teacher knew and was proud that "professional people, carpenters, engineers, mechanics" were still using "traditional and very practical math and science which is not taught in school and it is very interesting." Writing as an indigenous person from a nation with its own cultural knowledge and practices, he implicitly critiqued his country's WMS school programs for excluding traditional, indigenous math and science knowledge. He represented this knowledge as so "very practical" that "professional people" even engineers with WMS training knew and used it.

As teachers shared and discussed their stories, traditional belief systems connecting people, places and natural phenomena were reevaluated in a more positive light as the wisdom and ethics of indigenous science became apparent. In discussions following sharing of cultural and personal experiences, teachers touched on the elements of transformative environmental education listed by Hall (2004) and began to formulate the concept of a lifeplace (Thayer, 2003) connected to cultural and ecological issues affecting their lives and the lives of their students.

This study suggests that transformative learning, "the process of learning… which is linked to changing the root causes of environmental destruction or damage" (Hall, 2004, pp. 170-171), develops when teachers connect their personal experiences and understanding of place to their professional roles as teachers and curriculum developers. Unfortunately, in 2005, *Mālama I Ka ʹĀina* (Sustainability) the only standard grounded in indigenous understandings of limited resources, fragile ecosystems, and active care (mālama) was eliminated in a standards revision contracted to a mainland consultant. Hawai'i's administrators worry that curricula centering on local environmental issues and indigenous knowledge will not prepare students for standardized tests even if it addresses standards. This narrow vision leads to decisions restricting teachers to mainstream texts covering content likely to be tested. Teachers' professional knowledge is marginalized to produce pseudo-experts (Sternberg, 2003).

McNeil (2003) notes that teacher education and professional standards promoting student-centered pedagogy, constructivism, collaboration, problem solving and inquiry conflict with accountability as measured by standardized tests produced by "business [with] a new vision that there is money to be made… in meeting the clamor for choice, privatization, and testing" (p. 34). Western modern science curricula oriented to preparing students for an increasingly technological, urbanized global economy provides a universalistic view of science that separates learners from their experiences with local environments and their host culture's traditional ecological knowledge (Snively & Corsiglia, 2001; Kawagley, 1999). Science learning is driven by standardized science tests and international tests such as TIMSS, Trends in International Mathematics and Science Study, that lead to increasingly uniform curricula as nations compete on student performance (Martin, Mullis & Foy, 2008). In the current test-driven environment, teachers of place-based science curriculum must present evidence this approach increases achievement as environmental literacy and stewardship are not high stakes outcomes.

Conclusion

At the start of the workshop, teachers tended to critique indigenous knowledge as possibly erroneous, based on superstition and empty ritual, and serving only as a negative example in science. After the presentation of Hawaiian cultural perspectives, teachers began to openly acknowledge the value of indigenous and traditional practices in teaching environmental sustainability. Written exercises followed by small group and whole class discussion helped teachers develop the

concept of a personal sense of place and an awareness of the social contexts of learning. Discussions of the impact of WMS on their science and mathematics curricula led to critiques of western, test-driven models of science and mathematics curricula as colonizing and irrelevant to pressing environmental issues related to economic development, globalization, exploiting of natural resources and marginalization of indigenous peoples.

The evidence of transformed views of science education was the teachers' recognition of a need for reinhabitation as "learning to live-in-place in an area that has been disrupted and injured through past exploitation (Berg & Dasmann, p. 35; cited by Gruenewald, 2003, p. 9). Negative attitudes toward indigenous knowledge and practices changed in the direction of respecting cultures that understand and care for their environments.

Developing a personal sense of place and reflecting on traditional and indigenous knowledge oriented to place and sustainability appear to play a critical role in transformative learning leading to environmental literacy. For the highly diverse science and mathematics teachers in the workshop, revisiting traditional practices led to understandings echoing the Hawaiian proverb "*He ali'i ka 'āina, he kaua ke kanaka*" (the land is a chief, man is the servant) (Pukui, 1983).

References

Abbott, I. (1992). *La'au Hawai'i: Traditional Hawaiian uses of plants*. Honolulu: Bishop Museum Press.

Bazerman, C. (1988). *Shaping written knowledge: The genre and activity of the experimental article in science.* Madison: University of Wisconsin Press.

Cajete, G. (Ed.). (1999). *A people's ecology: Explorations in sustainable living.* Santa Fe, NM: Clear Light Publishers.

Cajete, G. (2000). *Native science: Natural laws of interdependence.* Santa Fe, NM: Clear Light Publishers.

Cajete, G. (1986). *Science: A Native American perspective: A culturally based science education curriculum.* Unpublished doctoral dissertation, International College, Los Angeles.

Chinn, P. (2003, March 23-26). *A Hawaiian sense of place: Science curricula incorporating Hawaiian ways of knowing.* Paper presented at the NARST Annual International Conference, Philadelphia.

Chinn, P. (1999a). Isabella Aiona Abbott and the education of minorities and females. *Teaching Education, 10,* 155-167.

Chinn, P. (1999b). Multiple worlds and mis-matched meanings: Barriers to minority women engineers. *Journal of Research in Science Teaching, 36*(6), 621-636.

Chinn, P. (2003). What preservice teachers bring to the classroom: How sociocultural experiences shape future teachers of diverse learners. In K. Wallace (Ed.), *Working with mixed heritage students: Critical perspectives on research and practice* **(**pp. 187-204**).** Westport, CT: Greenwood/Praeger.

Chinn, P., & Sylva, T. (2000). *Mālama I Ka ΄Āina: Using traditional Hawaiian and modern environmental practices to develop standards-based K-12*

science curricula for teachers of Hawaiian and part-Hawaiian students. U.S. Department of Education, Office of K-12 Education Programs, Native Hawaiian Education Act.

Chinn, P., & Sylva, T. (2002). *Pikoi ke kaula kualena, Focus on the essential core: Developing culturally relevant, standards-based science curricula for teachers of Hawaiian and part Hawaiian students.* U.S. Department of Education, Office of K-12 Education Programs, Native Hawaiian Education Act.

Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.

Daily, G. (2003). What are ecosystem services? In Lorey, D. (Ed.), *Global environmental challenges for the twenty-first century: Resources, consumption and sustainable solutions* (pp. 227-231). Lanham, MD: SR Books.

Diamond, J. (2001). Unwritten knowledge. *Nature, 410*, 521-522.

Disinger, J. & Roth, C. (2003). *Environmental literacy in America*. Eric Clearinghouse for Science, Mathematics, and Environmental Education. *CSMEE Digest 92-1*.

Fain, S. (2004). The construction of public space. In D. Callejo Perez, S. Fain & J. Slater (Eds.), *Pedagogy of place: Seeing space as cultural education* (pp. 9-33). New York: Peter Lang.

Garcia, E. (1999). *Student cultural diversity: Understanding and meeting the challenge* (2nd Ed). Boston, MA: Houghton Mifflin.

Gee, J., Hull, G., & Lankshear, C. (1996). *The new work order: behind the language of the new capitalism.* Boulder, CO: Westview Press.

The geography of thought: How culture colors the way the mind works. News Service, University of Michigan, February 27, 2003. Retrieved June 18, 2010 at http://www.umich.edu/news/Releases/2003/Feb03/r022703a.html.

Gollnick, D.M., & Chinn, P.C. (1998). *Multicultural education in a pluralistic society* (5th Ed). Upper Saddle River, NJ: Prentice-Hall.

Gould, S. (1993). American polygeny and craniometry before Darwin: Blacks and Indians as separate, inferious species. In S. Harding (Ed.), *The racial economy of science: Toward a democratic future* (pp. 84-115). Bloomington, IN: Indiana University Press.

Gould, S. J. (1991). Enchanted evening. *Natural History, 100*, 4–14.

Greenfield-Arambula, T. (2005, April 4–7). *The research lens on multicultural science teacher education: What are the research findings, if any, on major components needed in a model program for multicultural science teacher education?* Paper presented at the NARST Annual International Conference, Dallas, TX.

Gruenewald, D.A. (2003). The best of both worlds: a critical pedagogy of place. *Educational Researcher, 32*(4), 3-12.

Hall, B. L. (2004). Towards transformative environmental adult education: Lessons from global social movement contexts. In D.E. Clover (Ed.), *Global perspectives in environmental adult education* (pp. 169-191). New York: Peter Lang.

Haas, M. (1992). Institutional racism: The case of Hawaii. Westport, CT: Praeger.

Hawaii Teacher Standards Board: Empowering teachers through excellence. Retrieved May 26, 2005 from http://www.htsb.org/standards/index.html

Howarth, D. G., Gustafsson, M. H. G., Baum, D. A., & Motley. T. J. (2003). Phylogenetics of the genus Scaevola (Goodeniaceae): Implication for dispersal patterns across the Pacific Basin and colonization of the Hawaiian Islands. *American Journal of Botany, 90*, 915–923.

Kanahele, G. (1986). *Ku kanaka stand tall: A search for Hawaiian values.* Honolulu, HI: University of Hawaii Press.

Kanaiaupuni, S. & K. Ishibashi (2003). *Left behind? The status of Hawaiian students in Hawai'i public schools* (PASE Report 02-02:13). Retrieved Feb. 28, 2003 at www.hawaii.gov/gov/Members/Rhonda/e-Newsletter/Members/Rhonda/Documents/Left-Behind-PASE-Report-6.2003

Kawagley, O. (2001). *Living voice/voces vivas, Profiles. Oscar Kawagley*, Vol 2, Track 5. Smithsonian National Museum of the American Indian, August 2001. Retrieved Mar. 10, 2005 at http://www.nmai.si.edu/livingvoices/html/eng_vol2.html.

Kawakami, A.J., & Aton, K.K. (2000). Ke A'o Hawai'i (critical elements for Hawaiian learning): Perceptions of successful Hawaiian educators. *Pacific Education Research Journal 11*(1), 53-66.

Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, UK: University of Cambridge Press. Maly, K. (2001). *Mālama pono i ka ʻāina–An overview of the Hawaiian cultural landscape.* Retrieved June 19, 2010 at http://www.kumupono.com/Hawaiian%20Cultural%20Landscape.pdf.

Martin, M.O., Mullis, I.V.S., & Foy, P. (with Olson, J.F., Erberber, E., Preuschoff, C., & Galia, J.). (2008). *TIMSS 2007 International science report: Findings from IEA's Trends in international mathematics and science study at the fourth and eighth grades.* Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College. Retrieved Sept. 2, 2010 at http://timss.bc.edu/timss2007/sciencereport.html

McNeil, J. (2003). *Curriculum: The teacher's initiative* (3rd Ed.). Upper Saddle River, NJ: Merrill/Prentice Hall.

National Research Council (1996). *National Science Education Standards.* http://www.nap.edu/readingroom/books/nses/html/3.html

Nisbett, R. (2003a). *The geography of thought: How Asians and Westerners think differently...and why.* New York: The Free Press.

Nisbett, R. (2003b). February27, 2003 interview retrieved Sept. 2, 2010 at http://www.umich.edu/news/Releases/2003/Feb03/r022703a.html

Orr, D. (1992). *Environmental Literacy: Education as if the Earth Mattered.* 12th Annual E. F. Schumacher Lectures October 1992, Great Barrington, MA.

Palumbi, S. (2001). Humans as the world's greatest evolutionary force. *Science, 293,* 1786-1790.

Poepoe, K.K., Bartram, P., & Friedlander, A. (2003). The use of traditional Hawaiian knowledge in the contemporary management of marine resources. In *Putting Fishers' Knowledge to Work* (pp. 328-339). Vancouver, BC: Fisheries Centre Research Report, University of British Columbia.

Pukui, M. (1983). *'Olelo no'eau: Hawaiian proverbs and poetical sayings.* Honolulu: Bishop Museum Press.

Pukui, M, Elbert, S., & Mookini, E. (1974). *Place names of Hawaii* (Rev. Ed.). Honolulu: University of Hawaii Press.

Smith, G. (2003, October). *Indigenous struggle for the transformation of education and schooling.* Keynote address to the Alaskan Federation of Natives Convention. Anchorage, AK.

Smith, L.T. (1999). *Decolonizing methodologies: Research and indigenous peoples.* New York: Zed Books.

Snively, G. & Corsiglia, J. (2001). Discovering indigenous science: Implications for science education. *Science Education, 85*, 6-34.

Song, J. (2005, May 17). Isles tops in count of species in danger. *Honolulu Star-Bulletin,* A9.

Sternberg, R. (2003). What is an "expert student"? *American Educational Research Journal, 32*(8), 5-9.

Takaki, R. (1993) Aesculapius was a white man: Race and the cult of true womanhood. In S. Harding (Ed.), *The racial economy of science: Toward a democratic future* (pp. 201-209). Bloomington, IN: Indiana University Press.

Thayer, R., Jr. (2003). *LifePlace: Bioregional thought and practice.* Berkeley, CA: University of California Press.

Culture-Based Arts Education

James W. Bequette & Kelly Hrenko

This chapter focuses on two teachers who participated in Project Intersect (PI), a federally funded arts in education demonstration grant that supported the collaborative efforts of over 50 educators teaching at a Bureau of Indian Affairs (BIA) tribal school and two neighboring public elementary schools in the upper Midwest. PI teachers worked with a team made up of education researchers from their state's urban Land Grant university, local Native[1] and non-Native program managers, and over 20 local Native cultural experts—crafters, visual artists, musicians, linguists, historians, and others—to fashion culturally responsive curriculum in all academic areas.

Project Intersect (PI), an arts in education demonstration project, began with a planning year during which a small design team made up of Native elders, teachers, linguists and other tribal leaders interested in cultural literacy and local control of schooling were asked to help envision what culture-based arts education might look like if it were a means for increasing the relevance of study in mathematics, language arts, science and other traditional subjects. Non-Native design team members included classroom teachers, public school administrators and university-based arts educators and researchers who envisioned arts education that promotes sensitivity and cultural awareness of American Indian societies among all teachers and students as well as familiarity with the historical and contemporary work of present and past Native artists and crafters. Together the entire design team laid the foundation for teacher professional development in three area schools that resulted in culture-based curriculum that helped students' respect and appreciate their own and other's cultures. PI then focused on a three-year teaching intervention that stressed the importance of increasing K-8 American Indian and non-Indian students' interest, understanding, enthusiasm and performance in culture-based arts education.

PI was designed to assess how culture-based arts education enhances and/or remediates learning specific to identified state and national academic standards for student achievement. All PI teachers' were expected to develop and implement curriculum that mapped where teaching about American Indian art and culture could meaningfully intersect with interdisciplinary learning activities involving other core academic subjects. When external funding for the PI grant ends in 2010, examples of successful curriculum projects developed for K-8 Native and non-Native students by Native and non-Native teachers will be published and disseminated regionally and nationally. That said, this chapter provides a preview of two PI teachers' culturally responsive and critically focused curriculum endeavors. We showcase their diverse projects that weave American Indian arts

[1]This chapter uses American Indian, Indian, Native and Native American to represent the Indigenous Peoples of North America.

education into existing standards-based language arts, mathematics, science and social studies teaching. Our exemplars, Ms. Roberts[1], a tribal school second grade teacher, and Ms. Christenson, a public school upper elementary teacher, were members of the first of three PI teacher cohorts.

Project Intersect: Mapping the terrain where cultures intersect

All of PI's participating public and tribal school teachers received stipends for their efforts and funds for securing human and material resources that respected the ethnic and cultural backgrounds of all students. PI teachers also received coaching from American Indian academics and cultural experts, often in authentic settings, such as a hike in the forest for a lesson on the sociocultural norms of gathering birch bark led by a local Indigenous crafter. Each cohort of teachers enhanced their cultural competency by participating in a weeklong summer institute and then four additional inservice workshops during the academic year.

During their training teachers were asked to value America Indian epistemologies as a way to thwart ethnocentrism and "unconscious" racism. Activities to encourage thinking critically about institutionalized White racism (Pollock, 2006) helped raise those educators' cultural awareness, sensitivity and "appreciation and respect for the Indian child...teaching characteristics that will surmount a multitude of other shortcomings" (Garcia & Ahler, 1992, p. 14). In other words, teachers were given "permission" to err when weaving the culture-based arts knowledge of local Native Peoples into respectful new lessons that focused on the relevance of such content. We were less forgiving of choosing curriculum materials that simply tack decontextualized cultural pieces that are "Indian" onto lessons that may perpetuate stereotypes and Western hegemony. PI training sessions thus challenged teachers to embrace conceptions of cultural relativism as they took on the daunting task of creating classroom environments and intelligent activities that neither devalued American Indian cultures nor the arts while marrying their study with other academic subjects (Bequette, 2009, 2007).

The authors of this chapter are White, university-based, teacher educators with over 25 years of combined experience teaching art and/or working in schools and communities with American Indian students. We observed every PI teacher's practice, acting as colleagues who could provide feedback to help participants master the culture-based teaching approach envisioned by the project's design team. While in classrooms or other learning environments (e.g., museums, busses, the natural world) we took fieldnotes, audio recorded key events and photographed students working and the art and utilitarian objects they created—from birchbark baskets and beaded pendants, to rice knockers and powwow regalia.

In addition to analyzing the baseline and post-intervention standardized test scores and attendance records provided by the schools for all participating students (some covering a three-year period), other data sources we scrutinized

[1]All surnames are pseudonyms.

before writing this chapter included Ms. Christenson and Ms. Roberts' lesson plans and the self-assessment rubrics from daily teaching and learning experiences. The latter were qualitative indicators of a teaching episode's strengths—the teacher's perceived comfort delivering cultural content and the degree to which students were engaged by authentic activities that infused cultural arts learning into many subjects.

We analyzed and isolated from the data noteworthy elements in lesson plans and transcribed overheard teacher and student discourse and reflexive writing (e.g., student journals, teacher anecdotal accounts of student engagement). When coding this information, arcane pedagogical descriptions like good, better, or best practice were circumvented by coining a new descriptor for a third, albeit theoretical, level of expertise evident in some PI teachers' practice. We call this phenomenon cultural bricolage, and describe it as teaching with critical awareness that opens up new spaces of student voice, knowledge, and discourse. This is akin to what others conceptualize as a "third" or "hybrid" space were the discourses of home and school morph into new understandings (see e.g., Moje, et al, 2004; Gutierrez, et al, 1999; Soja, 1996; Bhabda, 1994). PI encouraged teachers to develop critically charged arts lessons and pedagogy that gave children the confidence to eschew dominant culture perspectives when studying cultures; and when those cultures varied from their own, "to accept that they are merely different—neither superior nor inferior" (Garcia & Ahler, 1992, p. 30).

Teaching of this sort was at play, often unintentionally, in both Christenson and Roberts' practice when curriculum permitted different historical and contemporary perspectives of Native art and culture to critically wrestle with particular dominant discourses—those of Western schooling, of Western art and of American Indian historicization. It is important to note that we are not describing cultural bricolage as moments of assimilation, exploitation of "otherness" or instances of harmonious cultural melding. We are seeing, however, a recognizable hybrid space where Native and non-Native teachers and their students realize that what they share in common is difference, not identity. While we do not detail the conceptual underpinnings of this third space of teacher practice in our chapter, we do believe teachers elsewhere will benefit from our portraits of Roberts and Christenson and specifically how the curriculums they constructed in very different school settings opened up new spaces of possibility for building acceptance of all cultures.

Although neither teacher identified critical pedagogy as a teaching strategy of choice, the culture-based arts integration they oversaw effectively countered underlying assumptions of power, legitimacy and ethnocentrism that too often creep into the multicultural lessons of privileged White educators. Culture-based Native arts education, we argue, can bridge new knowledge and existing knowledge in ways that help learners see connections as well as contradictions between the way they know the world and the way others see the world. Roberts and Christenson became our exemplars because of the degree to which each engaged with contemporary American Indian cultural gatekeepers (e.g., resources like elders, artists, crafters, academics and tribal historians) and how success-

fully they wove that traditional cultural knowledge and other grant-sponsored professional development training received into their respective tribal and public school classroom.

Theoretical considerations: Our familiarity with postmodern art curriculum design (Freedman, 2003), multicultural arts learning (Chalmers, 1996) and how students respond to culturally responsive teaching (Gay, 2000), particularly in arts settings (Bequette, 2005), guided analysis of Roberts, Christenson and other PI teachers' effectiveness. This research is also grounded by principles of critical pedagogy (Grande, 2004; Ladson-Billings, 2001, 1995; Nakata, 2000; Friere, 1998; hooks, 1995) and literature on increasing school success for Indigenous youth using culturally responsive pedagogy (Castagno & Brayboy, 2008; Hermes, 2007, 2005; McCarty, 2002). By design the federally funded Project Intersect intervention draws from theoretical studies that espouse the social reconstructive power of art and visual culture education (Ballengee-Morris, & Stuhr, 2001; Duncum, 2001; McFee, 1995; Stuhr, 1994), and the rightness of fit of focusing on issues of social justice in teaching (Delpit, 1995). We believe culture-based arts education offers entry points for making visible American Indian cultures (Brayboy, 2003), and that tapping the non-dominant cultural capital of Native crafters, artists, and other cultural gatekeepers gives them sovereignty in deciding what cultural content is appropriate for use in their schools (Bequette, 2009).

This chapter also draws from methods of social science portraiture (Lightfoot & Davis, 1997), a genre of inquiry and means for representation of qualitative data. As a research method it blurs the boundaries of aesthetics and empiricism in an effort to capture the complexity, dynamics, and subtlety of human experience. We use portraiture in describing the work of Ms. Roberts and Ms. Christenson to document the culture of schools, the life stories of individuals, and the relationships among families, communities, and local schools.

School sites, teacher examples and culture-based lessons

Ms. Roberts' BIA reservation elementary school serves a student body that self-identifies as members of several Ojibwe[1] bands of the Great Lakes region. The particular classroom of study is a second grade with 15 students. Roberts is White, middle-aged, and taught for eight years at an urban public elementary school that served a small percentage of Native students before transferring to the tribal school three years before volunteering to become a PI teacher.

Ms. Christenson's public elementary school is one of two K-5 buildings in the rural district that borders the Reservation. She is also White, nearing retirement, and already had clocked 10 years at her school before becoming a PI

[1]We refer to the "Band of Lake Superior Chippewa" whose culture this initiative focuses on as Ojibwe (a name preferred by many tribal members) rather than use a pseudonym or refer to these Peoples with less specificity. However, the Band, Reservation name and geographic location of this tribal community's homeland and the neighboring public school district in which this research was also conducted are not specified in our text.

teacher. For reasons ranging from tribal politics to geography some American Indian parents send their children to these public schools. Seventeen percent of the district's population is Native and four of the twenty-one students in Christenson's class.

Baseline data collected from all PI teachers indicated that on average art found its way into their classrooms less than 30 minutes a week (and often only when taught by part-time arts specialists). These same teachers indicated a desire to include more art and culture in their classrooms but felt constrained to do so because it was challenging, time-consuming, and there was little financial support for resources and/or institutional encouragement for pursuing culturally responsive teaching. After joining PI and learning that simply creating new "stand alone" culture lessons was not a recommended model for change, the few teachers who still chose this route quickly realized the demands already placed on their time by accountability mandates like standardized testing left little room in the school day for additional lessons according to baseline survey data. Rather than randomly adding snippets of culture, PI teachers who found entry points where culture-based arts learning meaningfully intersected with teaching that already addressed existing standards in core subjects—that is enhanced or remediated student understanding of required content—experienced more success using this model.

Culture-based arts integration acknowledges the interconnectedness of school and home life. PI teachers who infused cultural arts experiences in this way opened up new channels of learning and communication in their classrooms and beyond in the communities from which the students come. "Better communication," according to former U.S. Senator Ben Nighthorse Campbell (1992, p. vii) "has helped to bridge the gap between Indian and non-Indian cultures" and teachers who better understand unique American Indian cultures are best equipped to help Native students overcome any "alienation or apprehension" they may feel about schools. In the context of the three schools we worked with on this arts project, bridging American Indian art and culture with the constructs of Western schooling—also deeply imbedded in the tribal school—did at times change students' attitudes, but unfortunately resulted in no completely changed classrooms.

What did change as a result of the PI intervention was the facility of some teachers to access a new third space of hybrid knowledge and experience. This is the composite space we describe as cultural bricolage wherein knowledge and discourse from the "first space" of students' home, community and peer networks is integrated with the discourses students encounter in the "second space" of more formalized institutions like Whitemen's schools. When integrated spaces can be reconstructed to form a third or hybrid space different or alternative modes of knowledge and discourses can be accessed.

Culture-based arts education therefore is more than just adding a layer of multicultural curriculum to existing school structures. Not a specific lesson plan or teaching practice, culture-based arts education can be characterized as an integrated approach for challenging traditional schooling dichotomies. It

is constant examination, thoughtful reflection and recognition of curriculum innovations that have the potential to create and sustain culturally responsive classrooms. Culture-based arts integration is one path to making school a more engaging place for Native students and a space in which to increase cultural awareness and sensitivity in all students. Although Roberts and Christenson's thematic units may appear overly simple and even idealistic, their reliance on viewing cultures from their unique perspectives required careful mapping of where culture, art and other subjects meaningfully intersect. In short, Roberts and Christenson successfully infused culture-based arts education into children's study of all subjects in the core curriculum by exploring local Native peoples "political, economic, and aesthetic histories…evident in their folkways and arts" (Garcia & Ahler, 1992, p. 28).

Ms. Roberts tribal school classroom

Roberts began her PI experience by generating a comprehensive plan for infusing Native arts experiences specific to Ojibwe cultures into her second grade curriculum. Even though she works in a Reservation school, Roberts received little encouragement or training on using culturally responsive teaching. Before PI no school sponsored initiatives or accountability measures focused on teaching Ojibwe culture in core subjects other than language lessons. Already motivated to learn more about American Indian art and the cultures of her students, Roberts knew joining PI presented a chance to do both and was eager to get started. By the end of the summer in which she attended the one-week introductory summer institute, Roberts had a comprehensive unit plan drafted and enough resources identified to begin implementing culturally responsive curriculum in early September. She was enthusiastic about her thematic approach and the project-based learning activities (see Quartaroli & Sherman, this volume) that would infuse weekly cultural study.

Life in second grade: Roberts' classroom is large with natural light pouring in from a wall of windows. The cabinets lining the opposite side of the room are sheathed in bright yellow laminate. There is a large, well-used "ABC" carpet in the middle of the blue and white tiled floor and a rocking chair nearby. Student desks are clustered in groups of two or three around the perimeter. Roberts' desk is covered with pictures colored by students present and past, their artwork often including images of and notes to Bernie, her dog. Photographs of places visited and school pictures that were gifts from young admirers complement those other visuals. Add a large water bottle, a coffee thermos from the morning commute, the always present folded scarf—thick wool in winter and thin gossamer in spring—random piles of papers, and there is little room for actual deskwork.

Since colonization the upper Great Lakes region has been home to a large population who identify with Nordic cultures, so it is not unusual for Indian families to be of mixed Native American and Nordic heritage, as the last names of several students on Roberts' class roster confirm. Roberts is also of Nordic descent and her fondness for traditional Marimekko patterns and bold designs inspired using large patterned panels of this Finnish fabric to serve as a back-

drop for the individual student photos she took to line the hallway outside her classroom.

Architecturally the Reservation school resembles a turtle, an animal of significance to many American Indians of the Great Lakes region. The building's interior aesthetic includes patterned floor tiles and painted cement-block walls that look like beaded designs. There are routines in the school day that honor Native Peoples past and present. For example, in place of bells recorded Native flute music spills from the school intercom to signal class changes. A morning assembly and prayer begin each school day (much like the flag salute does in many public schools). It would seem like the Nativecentric environment of the school would inspire greater integration of Ojibwe-based curriculum in the arts and other academic subjects. Instead there are "Indian education" specialists, extracurricular activities like beading, powwow dancing and regalia making, and a circular library with a sizable collection of historical-style Native art forms and other artifacts displayed in glass cases.

*Using culture-based art education to explore the natural world***:** Ms Roberts' curriculum plan for her PI year relied heavily on Holling Clancy Holling's classic 1941 picturebook *Paddle-to-the-Sea*. After clearing its appropriateness with two tribal elders and checking that this book was not on the "do not read" list of a website that reviews children's literature with Native content (see e.g., www.oyate.org), Roberts began planning culturally responsive lessons around this text. Place-based literacy, mathematics and science teaching about the Great Lakes watershed, the region where the students live and the setting for Holling's book, was the result. Conceptions of habitat, ecosystems, treaty rights and other issues pertinent to Native Americans were connected to state academic standards and a means for introducing Indian children to the natural world. But *Paddle-to-the-Sea* is not without flaws; for instance, White loggers refer to Native trappers as "Injuns" in the book. Acknowledging such transgressions provided teachable moments for Roberts who deployed critical pedagogy to broach subjects like stereotyping and prejudice with her second graders.

The book begins as a First Nations boy positions "Paddle to the Sea," the miniature wooden canoe he carved, to launch itself in a Canadian tributary of Lake Superior. Paddle's serpentine journey through the Great Lakes and the Saint Lawrence River to the Atlantic mirrors the flow of a vast watershed, providing Native children a window on aquatic habitats, cultures, and industries that depend on waterways from the "Big Lake" to the sea:

> Satisfied at last, the boy sat back on his heels. Before him lay a canoe one foot long. It looked like his father's big birchbark loaded with packs and supplies for a journey. Underneath was a tin rudder to keep it headed forward, and a lump of lead for ballast. This would keep the canoe low in the water, and turn it right side up after an upset. An Indian figure knelt just back of the middle, grasping a paddle. And along the bottom were carved these words: PLEASE PUT ME BACK IN WATER, I AM PADDLE TO THE SEA (Holling, 1941, p.1)

Roberts used this book to talk about ideas of journey and travel as experienced in American Indian cultures, and specifically the role that dreams play in Ojibwe migration stories. The boy says,

> I made you, Paddle Person, because I had a dream. A little wooden man smiled at me. He sat in a canoe on a snow bank on the hill. Now the dream has begun to come true. The Sun Spirit will look down at the snow. The snow will melt and the water will run down-hill to the river, on down to the Great Lakes, down again and on at last to the sea. You will go with the water and you will have adventures that I would like to have. But I cannot go with you because I have to help my father with the traps.
>
> The time has come for you to sit in this snow bank and wait for the Sun Spirit to set you free. Then you will be a real Paddle Person, a real Paddle-to-the-Sea. (Holling, 1941, p.2)

Paddle to the Sea became a vehicle for teaching art, science, math, literacy, social studies, and culture in the second-grade classroom for an entire school year. Each chapter inspired interdisciplinary teaching that intersected with the themes, ideas or locations the children read about weekly. Her lesson plans invited Native student's to critically explore their past and present lifeways:

> There are many land features, animals, lakes, and rivers (to name a few) that fit nicely into [the] intent of this curriculum for our Ojibwe [students], learning about their past, their migration. The lesson plans will include as much [cultural content] as possible for presenting, discovering, creating, and learning about their past to make sense of the present day, of where they came to settle. We will talk about why, how, what, where, and when this migration took place. We will include prediction questions that will keep them interested [in] present day curriculum i.e. for science, what would the weather be like, how many fish will they catch, how would they fish, what kind of fish would Paddle eat? Using these questions we will be able to compare and contrast life today and long ago.

Holling's character Paddle became a classroom mascot and a means for learning about Ojibwe migration and postcontact history. To further this intention, Roberts commissioned a Native artist to carve a one-foot wooden Paddle replica for her class to care for during their extended study. The students took turns holding this Paddle person during the chapter readings, docking his canoe on a desk as they completed classroom projects. Fondness for the storybook initially engaged the students' interest. The tangible form of Paddle helped motivate their weekly studies. And Roberts culture-based teaching connected Paddle, in a captivating way, to study in other subjects.

Art, culture, and interdisciplinary connections: Reading *Paddle-to-the-Sea* made possible interdisciplinary connections for both Roberts and her second graders. They explored the book's illustrated map using mathematical calculations of proportion, distance, and time to trace the route that led Paddle to the Atlantic Ocean. They used scale to recreate Paddle's journey on a five- by twelve-foot classroom map and worked with the school's American Indian art teacher to paint the landscape along this aquatic route. Students also sculpted tiny clay models of Paddle to act as placeholders on the map. These clay canoes were tools for review and to predict Paddle's rate of travel between stops. While estimating distance for each segment of the journey, the second graders anticipated the geography Paddle would witness along the way. Ideas of environment and natural resources (then and now) prompted many of the science connections outlined in Roberts's written unit plan:

> As we are reading our story of Paddle, we will explore what the natural world looked like and explore…what kinds of trees, rocks, lakes, and rivers Paddle will [see and] travel. We will learn about animals, bugs, fish, and berries. We will discuss the wind and weather conditions of traveling, i.e. winter vs. summer. Our children will understand and know the four directions. We will raise the question and examine how the Ojibwe peoples used the stars/constellations as a guide on their journeys. We will label these words in Ojibwe…[and read] story of Beaver, a prominent animal in Ojibwe cultures.

Students were also responsible for chronicling and illustrating the story of Paddle in personal journals. Doing so made them accountable for retelling and summarizing the weekly chapters, predicting outcomes, reviewing Ojibwe vocabulary words Roberts connected to the text, and completing at least one art lesson. It was through this inquiry, exploration, storytelling, and play that students' place-based learning occurred.

Guest teachers, storytellers, and local artists and crafters. Roberts worked hard to use local and regional published resources and Native personnel throughout the year. The latter were cultural practitioners—language teachers, storytellers, artists, crafters, academics—invited into the classroom to offer specific information about the region and its history. In doing this, Roberts purposefully showed interest in the Reservation communities from which the children come and respect for the cultural knowledge and arts and crafts expertise local American Indians provided. The transparency of Roberts' embrace of place-based culture education in her classroom helped validate for parents, community members, and her Native colleagues that a White outsider was willing to tap the Indigenous cultural capital of Reservation insiders.

Conversations about oral traditions and discrepancies in practices described in stories were an important part of Roberts's lesson plans:

> How did the Ojibwe peoples get here...How do we know [whether] the Ojibwe people migrated from the east? This is one theory or idea that people have studied, researched, and…archeologists found many items that belonged to and were from the Ojibwe peoples.

The students were encouraged to talk about multiple interpretations with visiting elders, storytellers who critiqued the complication of "truth" in oral traditions. Roberts was aware that these topics needed to be broached by knowledgeable tribal community members who understood oral traditions and were comfortable talking with second graders.

After the journey with Paddle: The capstone experience after reading *Paddle-to-the-Sea* was the class exhibiting their journals and art projects for other elementary students to see. An unusual walking presentation traveled from classroom to classroom, permitting Roberts' students to show favorite chapter illustrations, the Paddle replica, and recite Ojibwe words learned. For closure, and mostly for entertainment, Roberts showed the film adaptation of *Paddle-to-the-Sea* (Mason, 1966). This Canadian production retells Holling's story, using actual footage of the Great Lakes region along with dramatic reenactments of Paddle's journey. As the final credits rolled, children looked at each other and then at Roberts, before one girl asked what was on everyone's minds, "Miss R., how can a storybook that took us so long to read be such a short movie?" Their teacher's lengthy culturally connected rendition of *Paddle-to-the-Sea*, the children concluded, was a better read.

Ms. Christenson's public school classroom

Christenson occasionally taught lessons focused on American Indian cultures in her public school for ten years before voluntarily joining the first cohort of PI teachers. Having access to the human and monetary resources the grant promised could further this cultural work. Of Nordic heritage, Christenson learned a lot about the Native tribes of the region from a grandfather who was an artist and author. She worked on several other past initiatives that funded teacher curriculum development, for instance using science, technology, engineering and mathematics (STEM) teaching. However, an invitation to be part of a grant project focused on including Ojibwe art and culture in academic subjects seemed like a dream come true. Already a proponent of greater school-Indian community involvement, she frequently worked with fellow classroom teachers and children's parents who were tribal members to forefront Ojibwe cultures in activities like the school's annual powwow. Christenson thus brought a wealth of knowledge and enthusiasm to her year of PI sponsored culture-based teaching.

A love of art and culture: Christenson radiates the confidence of a seasoned teacher. In the eyes of her "kids," her familiarity with many of their families is more often than not a good thing. This insider knowledge gives her a lens through which to view the lives of her students' and the challenging circumstances many face.

From a well equipped "art station" in one corner, to the display of contemporary Native art prints and historical-style crafts that span the length of another wall, Christenson's classroom reveals she is an arts advocate and an admirer of Ojibwe art, both past and present. Since his recent passing, her grandfather's published memoirs of many journeys with Ojibwe friends are now proudly displayed in the reference library Christenson amassed over her long teaching career. That collection also includes numerous storybooks written by and about Native North American Indians and their diverse cultures. Christenson admits her teaching philosophy and advocacy for inclusion of American Indian art and cultures in public school classrooms can be directly attributed to her grandfather's life, artistry and respect for local Ojibwe lifeways.

Arguably the better of two elementary schools in a district of 2,400 students, "the school on the hill" as Christenson and others call it is an unadorned cement-block bastion perched on the highest point in town. Overlooking a riverside park and a paper mill that is happily downwind and downstream is perhaps its only aesthetic asset. She believes her building's progressive curriculum and innovative teachers make it the preferred choice of Native parents who sometimes bypass the tribal school. Her administrator is supportive and pleased with Christenson's accomplishments in the classroom, as well as the good will the community events and projects she organizes engender. Other teachers in the building respect Christenson's teaching prowess, acknowledging her successful cultural outreach efforts. However, given the demands meeting the school's average yearly progress (AYP) goals already place on her colleagues' time, she is not surprised some question whether culture-based arts integration really makes a difference. Still, Christenson has little trouble persuading some of those teachers to collaborate on short-term projects, fieldtrips or even share the costs of cultural speakers she arranges. And of the ten or so PI teachers in her building, no one has yet replicated the degree to which she integrates Ojibwe art and culture into the academic day. Fortunately after completing her PI year, Christenson agreed to mentor teachers who joined the next two yearlong cohorts of arts project volunteers.

Revisiting first contact and the fur trade: Christenson used problem based historical inquiry to scaffold students' understanding of the postcontact period of commerce between the Indigenous peoples of the upper Midwest and the French voyageurs (MacDonell, 1933). The fur trade that inspired this meeting of cultures became the catalyst for her yearlong unit on Ojibwe culture and art. She invited students to study the impact of trapping and trade, and the pros and cons of this commercial contact and cultural sharing that changed Native Americans forever. Her intent was not to gloss over the irreversible havoc colonization had on the first inhabitants of the upper Great Lakes region. Instead Christenson's fur trade unit was an opportunity for her non-Native and Native students to decide for themselves what this period of business dealings and crosscultural communication meant for them today.

An historical simulation in which students reenacted a bartering session between an Ojibwe band and a boatload of voyageurs was the culminating event of their thematic study. Costumed fourth graders "traded" items made under the

tutelage of Native crafters and Christenson, and pelts and manufactured goods brought from home for their roleplay. They demonstrated their command of relevant Ojibwe and French vocabulary, mathematics, and even rudimentary economics. This inquiry project helped reveal why voyageurs' early relationships with Ojibwe communities resulted in constructive outcomes for both cultures and intermarriage. So too would the students learn that Ojibwe people's relatively benign encounters with the French would inculcate a false sense of security that in time was shattered by other White colonizers (Gawboy, 2009). The resulting conflicts over land, resources, and self-determination, that led to genocide and vengeance were also fodder for the fourth graders' class discussions.

Interdisciplinary connections: Christenson approached the over 200 year history of fur trading in North American as an ongoing exchange of ideas not just commerce. She gathered essential information for her unit mostly from local resources, including Carolyn Gilman's (1982) *Where Two Worlds Meet: The Great Lakes Fur Trade*. This text provided a fairly balanced telling of the events that followed first contact, inspiring Christenson to write in her lesson plans:

> An example of how two dissimilar cultures establish a common ground of understanding without sacrificing their unique characteristics or annihilating one another. A novel kind of commerce ruled this land from 1600-1850. Europeans traded their manufactured goods for the furs of the American Indians. People from two different worlds met, and their goods and ideas mingled. Neither culture was ever the same again.

This emphasis on better communication to bridge the gap between dissimilar cultures also influenced the interdisciplinary lessons taught in the classroom. Christenson's class read Louise Erdrich's *Birchbark House* (2002) and *Game of Silence* (2006) for a Native youth's perspective on Ojibwe lifeways and then William Durbin's *Broken Blade* (1998) for insight on a young French Canadian voyageur's travails. Over the course of the school year the fourth graders created historical art forms like beaded pouches and necklaces, quillwork pendants, and birchbark baskets in preparation for the fur trade simulation. A Native elder who specialized in school presentations shared his knowledge of trading and his collection of goods that changed hands during this period of peaceful commerce—well crafted Ojibwe artifacts and the voyageurs' manufactured items. Students were able to see firsthand how tools and weapons from both cultures differed, another entry point for further inquiry to determine each culture's ideas and practices related to hunting, trapping, cultivating food crops. Christenson also took the fourth graders on a full-day fieldtrip to her state's largest historical museum for a fur trade class. During the visit they learned of collaboration, commerce, and cultural knowledge sharing between local bands of Ojibwe and other woodland tribes long before French speaking voyageurs appeared.

After gaining foundational information on how trade was conducted and which items were highly regarded by each culture, the students began exploring the relative value of goods and how to barter without currency. To reinforce

academic standards for math at this grade level the class created a trade chart of items ranked from most desirable (costing the most pelts) to most common (costing the least amount of pelts). After establishing an exchange rate for pelts and other items, story problems provided opportunities to practice trading. Calculating the distance each trading partner would travel with their goods to the trading post reviewed estimating and computation skills assessed on standardized tests each spring.

State science standards were addressed in lessons that studied regional geography and how it both hampered and hastened cultural contact. By better understanding the biodiversity of the region and its plant and animal life students learned why commodities like forest products, minerals, furs, hides, and birchbark attracted White entrepreneurs and settlers. Environmental science came into play when Christenson had students meet a natural resources manager from the Reservation who explained how overhunting, habitat destruction, stream erosion, and pollution changed the fauna of the upper Great Lakes watershed and how the tribe's restoration efforts addressed such issues.

The social dynamics of women's lives in Native societies and their role in trade were examined in social studies lessons. As was touring the historical site of a local trading post and being asked to consider the complex relationship between American Indian communities and the trading centers they came to rely on for commerce. Historically trading posts were sites of permanent White settlements in the upper Midwest. This new learning led the students to the bigger question of how everything they had studied about the fur trade's history had bearing on relationships between contemporary Native and non-Native cultures and communities today. Christenson's goal of increasing all children's cultural sensibility was the overarching objective articulated in the written plan for her yearlong economics unit and why she joined PI: "The raising of cultural awareness and appreciation for Ojibwe history, lives, stories, and people will improve the educational experience for all our students and help to breakdown stereotypes and prejudice."

Contemporary artists and historical art forms: Christenson's focus on the past practices of Native artisans and the role historical art forms played in early commerce influenced who from the pool of local cultural experts was invited into her classroom. She was also mindful of the importance of valuing living Ojibwe artists and introducing the fourth graders to contemporary American Indian art. Her class visited a regional art museum principally to see an exhibit of paintings created by a well know contemporary Native artist with ties to the region. The museum's collection of historical artifacts like quillwork, moccasins, birchbark baskets, and carved pipestone invited comparison with the contemporary work of Native artists the children saw exhibited—paintings, drawings, sculpture, prints, and mixed media pieces. The fourth graders were encouraged to view Native artistry as a means for cultural continuance and to understand an artists' cultural identity is often represented quite differently in historical and contemporary art forms.

The fur trade unit offered many opportunities for students' families to be involved in classroom activities like beading, tool-making projects, and fashioning dance regalia. The spring powwow organized by Christenson's school was outreach that acknowledged cultural difference. It also was a way to connect and collaborate as a larger community of learners, as students and staff from the neighboring tribal school, including Christenson's PI colleague Ms. Roberts and many of her second grade students, attended the public school powwow.

Implications of Ms. Roberts and Ms. Christenson's culture-based teaching

Each teacher approached their culture-based arts integration from an historical perspective using different timeframes of significance to local American Indians. Having an engaging sequence of place-based (Graham, 2009; Gruenewald, 2003) activities also encouraged intentional learning transfer across several core academic subjects. In acknowledging that art and culture projects, Indian guest speakers, and meaningful fieldtrips motivated all students at one point or another, Christenson and Roberts reported these activities had an even more profound impact on a small group of other children, both Native and non-Native. These were students whose school attendance and/or behavior got markedly better on project days. Both teachers attributed this transformation to the cultural content of the varied learning episodes and the frequent presence of animated Native presenters and talented family members in their classrooms.

Evidence of new learning

Deconstructing the practice of Ms. Christenson and Ms. Roberts helps illustrate how their classrooms became hybrid spaces of possibility when teaching included the phenomenon we call cultural bricolage. That is to say, they optimized access to productive uncharted zones that lie between school and local cultural knowledge, language, and art. A classroom environment that brings art from both the community culture and mainstream school can create a safe space for integrated learning rooted in cultural understanding. We argue that these White educators were at times teaching in the critically charged space where discourses of art and culture exist from different historical and personal perspectives and from a place of new student voice, knowledge, and communication.

The 50 teachers in our study helped us recognize common factors that contributed to their success, or lack thereof, developing and delivering culture-based arts curriculum. Those women and men changed their practice only after negotiating a comfort with, awareness of, and exposure to Ojibwe cultures, mostly by accessing resources close to home. Human resources included regional artists and crafters, Indian teachers from K-12 and higher education settings, cultural liaisons already working in the schools and other culture bearers like elders and parents. The healthy budget provided by PI permitted ordering art supplies, scheduling fieldtrips, and compensating Native presenters as needed. Grant funds also provided stipends to compensate participating teachers for their off-the-clock efforts.

Although, constrained by time, those who approached the task at hand most effectively found time for conducting research, scheduling presenters, and essential face-to-face collaboration with local cultural practitioners. These teachers acknowledged that outside mentoring from both Native and non-Native PI facilitators was essential when they began transforming theories and ideas about culture-based arts learning into truly meaningful practice. In time many participants realized that they were in fact part of a larger cohort of learners and the work of planning culturally relevant curriculum could not be done in isolation. And despite some discomfort, teachers who looked outside their classrooms and schools for cultural funds of knowledge and positioned themselves as learners along with their students all experienced some degree of success. It was the collegial sharing of ideas—entry points for marrying art with academic subjects, new teaching strategies, how and where to find both material and human resources, and other information exchanges—that sustained less connected teachers. For all participants the PI experience forged lasting bonds between individuals working within the same building, the same school district, or across the few miles that separate the tribal and public schools.

On another level, when PI teachers' outreach efforts focused on culture-based arts education became more transparent, school-Indian community relations profited. Simply tapping the cultural knowledge of artists, crafters, parents, elders, and others who shared their expertise in Project Intersect classrooms may in time be an effective mechanism for engaging these stakeholders more fully with their children's education. PI was an opportunity to demonstrate how curriculum relevant to local Native cultures, with ongoing participation from those who know it best, can make learning enjoyable and school a more interesting place on many levels, for both Indian and non-Indian students.

Given the prevalence of White teachers in the workforce there is often a "wide gap" (Messing, 2005) between their life experiences and those of their students. Although this study looks at the use of culture-based arts education as a means for improving the school success of Midwest Native and non-Native students in many academic areas, there are implications for teachers elsewhere who work in classrooms with students who are culturally different from themselves. Our work is one model for addressing this cultural communication gap. We argue teachers can use similar classroom and community building strategies to create curriculum that is sustainable, culturally responsive, and critically charged.

References

Ballengee-Morris, C., & Stuhr, P. (2001, July). Multicultural art and visual cultural education in a changing world. *Art Education, 54*, 6-13.

Bequette, J. W. (2005). Renegotiating boundaries between authenticity and relevance when choosing content for an American Indian multicultural arts program. *Journal of Cultural Research in Art Education, 23*(1), 64-74.

Bequette, J. W. (2007). Traditional arts knowledge, traditional ecological lore: The intersection of art education and environmental education. *Studies in Art Education, 48*(4), 360-374.

Bequette, J.W. (2009). Tapping a postcolonial community's cultural capital: Empowering Native artist to engage more fully with traditional culture and their children's art education. *Visual Arts Research, 35*(1), 78-92.

Bhabda, H.K. (1994). *The location of culture*. New York: Routledge.

Brayboy, B. (2003). Visibility as a trap: American Indian representation in schools. In S. Books (Ed.), *Invisible children in the society and its schools* (pp. 35-52). Mahwah, NJ: Lawrence Erlbaum.

Chalmers, F. G. (1996). *Celebrating pluralism: Art, education, and cultural diversity.* Los Angeles: Getty Education Institute for the Arts.

Delpit, L. (2006, 1995). *Other people's children: Cultural conflict in the classroom*. New York: The New Press.

Duncum, P. (2001). Visual culture: Developments, definitions, and directions for art education. *Studies in Art Education, 42*(2), 101-112.

Erdrich, L. (2002). *The birchbark house*. NY: Harper Collins.

Erdrich, L. (2006). *Game of silence*. NY: Harper Collins.

Freedman, K. (2003) *Teaching visual culture: Curriculum, aesthetics, and the social life of art.* New York: Teachers College Press.

Friere, P. (1998). *Pedagogy of freedom: Ethics, democracy, and civic courage.* Lanham, MD: Rowman & Littlefield.

Garcia, R., & Ahler J.G. (1992). Indian education: Assumptions, ideologies, strategies. In J. Reyhner, (Ed.), *Teaching American Indian students* (pp. 13-32). Norman: University of Oklahoma Press.

Gawboy, C. (2009). *Transformations in the cutover: Lecture*, October 2009, Duluth, MN.

Gilman, C. (1982). *Where two worlds meet: The Great Lakes fur trade.* Saint Paul: Minnesota Historical Society Press.

Graham, M. (2009). Critical place-based art education: Community, ecology, and art making. *Translations, 18*(2), 1-4.

Grande, S. (2004). *Red pedagogy: Native American social and political though.* Lanham, MD: Rowman & Littlefield.

Gruenewald, D. (2003). Foundations of place: A multidisciplinary framework for place-conscious education. *American Educational Research Journal, 40*(3), 619-654.

Gutierrez, K.D., Baquedano-Lopez, P., Tejeda, C., & Rivera, A. (1999). Hybridity as a tool for understanding literacy learning: Building on a syncretic approach. *Harvard Educational Review, 65*, 445-471.

Holling, H.C. (1941). *Paddle-to-the-Sea.* New York: Houghton Mifflin.

Hermes, M. (2005). "Ma'iingan is just a misspelling of the word wolf:" A case for teaching culture through language. *Anthropology and Education Quarterly, 36*(1), 43-56.

Hermes M. (2007). Moving toward the language: Reflections on teaching in an indigenous immersion-school. *Journal of American Indian Education, 46* (3), 55-71.

hooks, b. (1995). *Art on my mind: Visual politics.* New York: The New Press.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*, 465-91.

Ladson-Billings, G. (2001). *Crossing over to Canaan: The journey of new teachers in diverse classrooms*. San Francisco: Jossey-Bass.

Lightfoot S., & Davis, J. (1997). *The art and science of portraiture.* San Francisco: Jossey Bass.

MacDonell, J. (1933). Diary, 6 June 1793. In C. M. Gates, *Five fur-traders*. Saint Paul: Minnesota Historical Society Press.

Mason, B. (1966). *Paddle to the Sea*, (27 min. 15 sec.). Film adaptation of H. C. Howling, *Paddle-to-the-Sea*.

McFee, J.K. (1995). Change and the cultural dimension of art education. In R. W. Neperud (Ed.), *Context, content and community in art education: Beyond postmodernism* (pp. 171-192). New York: Teachers College Press.

Messing, J. (2005). Social reconstruction of schooling: Teacher evaluations of what they learnedfrom participation in the Funds of Knowledge Project. In N. Gonzalez, L. Moll & C. Amanti (Eds.), *Funds of knowledge: Theorizing practices in households, communities, and classrooms*. Mahwah, NJ: Lawrence Erlbaum, pp. 183-194.

McCarty, T.L. (2002). *A place to be Navajo: Rough Rock and the struggle for self-determination in Indigenous schooling.* Mahwah, NJ: Lawrence Erlbaum.

Moje, E., Mcintosh, K., Kramer, K., Ellis, L., Rosario, C., & Collazo, T., (2004). Working towards third space in content area literacy: An examination of everyday funds of knowledge and discourse. *Reading Research Quarterly. 39*(1), 38-70.

Nakata, M. (2000). Foreword. In C. McConaghy, (Ed.), *Rethinking indigenous education: Culturalism, colonialism and the politics of knowing* (pp.vii-x). Flaxton, Australia: Post Pressed.

Nighthorse Campbell, B. (1992). Forward. In J. Reyhner, (Ed.), *Teaching American Indian students* (pp. vii-x). Norman: University of Oklahoma Press.

Pollock, M. (2006). Everyday antiracism in education. *Anthropology News 47*(2), 1-4.

Soja, E.W. (1996). *Thirdspace: Journeys to Los Angeles and other real-and-imagined places.* Malden, MA: Blackwell.

Stuhr, P. L. (1994). Multicultural art education and social reconstruction. *Studies in Art Education, 35*(3), 171-178.

Becoming Warriors
The Practice of Deep and Meaningful Learning

Sandra J. Wolf

This chapter presents the ways in which the social practice of education in a public American Indian magnet school in a city on the edge of the Great Plains produced a surprisingly salient and robust identification of warriorship. The Warrior identity produced at Medicine Wheel School[1] served to provide American Indian children and adults at the research site with a design for living according to community and cultural values of respect, harmony, balance and cohesion. Utilizing critical ethnographic methods, this study produced a rich array of evidence of social and cultural practices of "struggling for peace" at the school. Evidence-based methods included the collection of fieldnotes and artifacts, gathering of reflections on lived experience in ethnographic interviews and reflexive narrative maintained in an ethnographer's journal. Qualitative analysis methods produced findings that described ways that cultural productions and situated learning influenced identification and agency at the school. Highlighting the work of three seventh graders through the process of becoming junior ethnographers as they researched a history project, this chapter traces the processes through which Buffalo, Skip and Alex Hawk began their work tentatively and with ambiguity through four clearly identifiable stages to emerge months later recognized by their community as History Warriors.

In early spring of 2001, I was given an opportunity to mentor a team of three seventh graders initiating work on their History Day project, a study of events at Wounded Knee, South Dakota, in 1973. The work with the Wounded Knee in 1973 History Day team eventually became the central focus of my work in the middle school. I will discuss in this chapter the data collected during that work, and reflections about my experience with the History Day team.

Sophie, the middle school history teacher at a school I will call Medicine Wheel School, annually organizes work in preparation for National History Day, a co-curricular research project in which thousands of students in middle schools and high schools across the United States participate each year:

> National History Day is a year-long educational program that engages students in grades 6–12 in the process of discovery and interpretation of historical topics. Students produce dramatic performances, imaginative exhibits, multimedia documentaries and research papers based on research related to an annual theme. These projects are then evaluated at local, regional, state, and national competitions. (*National History Day*, 2000)

[1]The name of the school and all of the participants, except the author, in this study are pseudonyms chosen by the participants.

Co-curricular means that National History Day participation is available to every school in the United States, but participation is not typically a state or local requirement for schools. In some schools, participation in National History Day is an option; at Medicine Wheel School, History Day had become part of the curriculum each year.

In February of 2001, Sophie asked me to mentor the Wounded Knee in 1973 History Day team because the team was struggling to identify the requisite before the event, during the event and after the event sequence. I did not have particular expertise in the topic of Wounded Knee in 1973. I had collaborated with Sophie on other projects, and I was confident that I understood the instructional principles behind the History Day work. I looked forward to working with the seventh graders.

The initial goal of the three seventh graders, Buffalo, Skip, and Alex Hawk was simply to complete a class assignment. They had not aspired to develop a project that would be competitive with other projects from schools throughout the state. In March of 2001, the Wounded Knee team advanced from the local competition to the regional History Day meet. Eventually, they would present their work at the state History Day competition. As the seventh graders and I explored various critical dimensions of events at Wounded Knee in 1973, establishing cause and effect, for example, Buffalo, Skip, and Alex Hawk developed expertise and were recognized for that. Further, as they interviewed community members with memories and knowledge of that event and others in American Indian history, a salient metaphor for the intense study of that history began to emerge as warriorship within the body of knowledge acquired by the Wounded Knee team.

As all of the regional-entry teams from Medicine Wheel School worked to refine various aspects of their research and exhibit boards, the Wounded Knee in 1973 team began to draft an essay documenting the steps in the process of developing their project. In that essay they would explain their reasons for choosing their particular topic. They would also describe their research process and write an annotated bibliography of their primary and secondary data sources. On March 26, 2001, Alex Hawk took the lead in interviewing Buffalo and Skip about the origins of their work on the topic of Wounded Knee in 1973:

Alex Hawk: Why did you decide to work on a project about Wounded Knee?

Buffalo: We watched that movie about Wounded Knee in Sophie's class. It's called Lakota Woman. It just seemed to me that Wounded Knee would be a good one to choose. Then you guys came along, and I just said, "OK, then let's go for Wounded Knee." And Eagle Charge was there at Wounded Knee. He could tell us about it.

Alex Hawk: Did you think that we would take the project to the regionals?

Skip: No. I just wanted to get a good grade in Sophie's class.

> Buffalo: No, I just wanted to finish the project. (Both boys laugh.) I didn't think we would take it anywhere, but I wanted it to be a good project on Wounded Knee because my relatives were there [in 1890]. (March 26, 2001)

As Buffalo, Skip, and Alex Hawk formed the Wounded Knee in 1973 History Day team, identifying critical relationships between events in time that took place at Wounded Knee, they occupied several roles. First, they were students in Sophie's middle school history class earning class credit for completion of an assignment. Second, they became ethnographers as they engaged in processes of interviewing, gathering artifacts and interpreting meaning of the interviews and other material they collected. Third, they became representatives of the American Indian community in the city in which Medicine Wheel School is located. They comprised the only History Day team originating within an Indigenous perspective school participating in the state History Day event. As such, they received a level of public attention with which few adolescents might feel comfortable. Fourth, they formed a community of practice in warriorship as they studied the discourse and practice of adults whose warriorship was publicly acknowledged, both nationally and locally.

Warrior imagery found in media and in popular culture bears little similarity to warriorship in practice (Lave, 1996) that I found in my work at Medicine Wheel School. Warriorship in practice, as described by the participants in my ethnographic research, is an identity that may be produced by persons who are male or female. Warriors, I found, may be children, youth, adults or elders. They may be soldiers, but they may also be peacemakers. I further found that the practice of being a Warrior is not only a matter of action, but also is an issue of principles, worldview and positionality within a community.

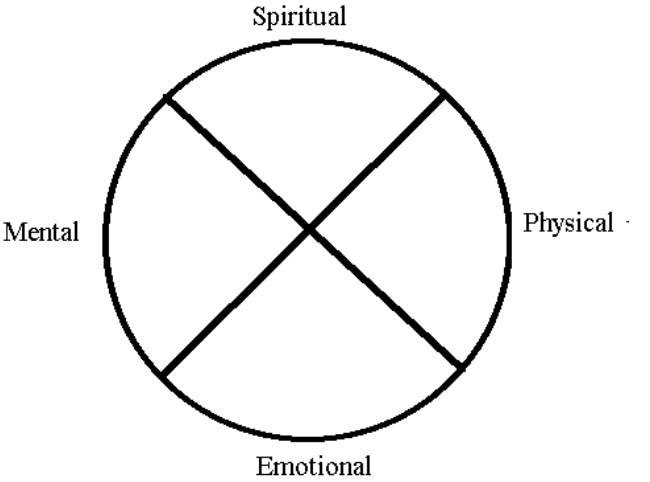
In the context of my study, I found that the production of a Warrior identity was more tightly linked to the purpose of Indigenous schooling than it was to the production of achievement. As I planned my study at Medicine Wheel School, I expected to find ways that the social practice of education in an American Indian school would support academic achievement. Instead, I found that social practice at Medicine Wheel School produced Warriors who are expected to fulfill their human potential in a variety of ways that serve the needs, values and beliefs of their community, which may include academic achievement. The purpose of school for the American Indian community in which Medicine Wheel School was located, was not a singular goal of producing high achievers, but was intended by the community to develop human beings who would support one another and have the capacity to grow into adulthood with not only skills, but also beliefs that affirm community and cultural values of balance, harmony, and cohesion.

Teachings of the Medicine Wheel

The Medicine Wheel is a visual symbol, in a broad sense, for the universe. It represents all that is. As a symbol for living as a human being, it represents those things in creation that are cyclical and come in sets of four. One such rep-

resentation is the four interconnected aspects of a human being. The four aspects of living as a true human being are the physical, the emotional, the mental or intellectual and the spiritual (see Figure 1 below). To ignore or deny the existence of any aspect of a human being is to live out of balance with the system that was designed by the Creator.

Figure 1: Medicine Wheel symbolism



The Medicine Wheel is a visual representation of pictographs and petroglyphs that take this form, and of large Medicine Wheels formations found on the ground in high places, usually made of rocks placed in a pattern on high ground. The original Medicine Wheels are linked to healing and hunting practices of early Indigenous peoples. The Old Ones placed them there.

There are over fifty thousand Medicine Wheels formations found in North America (McCartney, 1994). These stone structures and rock markings are located throughout the northern Great Plains, and are concentrated in several areas including Alberta and South Dakota. The southernmost of the stone Medicine Wheel structures is located in Wyoming.

The distinct pattern of a Medicine Wheel consists of a circular rim with spokes radiating out from the center of the circle. In stone Medicine Wheels laid out on the earth, there is often a stone cairn at the center, designed to provide a small amount of shelter from wind or rain to someone engaged in a vision quest at that place. Painted or carved Medicine Wheels are placed on prominent outcrops, or entry points to caves or other shelters, to communicate the potential for wellbeing and safety. The website of the Royal Museum of Alberta contains an array of images of Medicine Wheels found in that area, with interpretations of meaning. They exhibit a consistent pattern of the circle with lines radiating outward, and a central cairn or central orientation to the four cardinal directions (Royal Museum of Alberta, 2005).

Medicine Wheels, as symbols, represent a variety of concepts to Native people of the Great Plains. We can only speculate regarding the extent of purpose or meaning of the Medicine Wheel to those who originally created them. They are not a universal symbol for Native people, though Elders among people of the Great Plains and the northern woodlands articulate meanings that bear remarkable similarity from one First Nation, tribal, band, and community to another within the specific region of the Great Plains (Buswa & Shawana, 1992; Goodman, 1992; Vickers, 1992). In naming the school after one of the concepts embedded in the Medicine Wheel, the community intended the school to be a healing place for children. One way in which the school effected healing for children was through the production of a pro-active and agency-producing Warrior identity. The Warrior identity not only served as a metaphor for a person engaged in counter-oppression, but also served to describe the character of a person who is a true human being, fully exercising all aspects of personhood, as those are represented on the Medicine Wheel.

Physical, emotional, intellectual and spiritual contexts of the study

Medicine Wheel School is an Indigenous perspective school located in a city center on the edge of the Great Plains. The origins and history of Medicine Wheel School are well-known to students, parents, teachers and other community members who participate in learning at the school. Students regularly hear of the early struggles, the dreams and the solidarity of purpose for creation of an Indigenous-perspective school among members of the American Indian community in the urban city center in which the school is located. In the midst of intense conservative school reform efforts initiated after the publication of *A Nation At Risk* (NCEE, 1984), American Indian parents and other community members across the state were able to convince the state's legislative body that intensification and accountability measures (Berliner & Biddle, 1995) in place within state schools were contributing to, and not alleviating, the well-documented high levels of school failure and drop-out rates among American Indian youth, particularly in urban areas, leading to what has been described as a school to prison pipeline (NAACP Legal Defense Fund, 2007?; Advancement Project, 2010).

Beginning in 1985, American Indian parents and other community members challenged the state legislature and the school districts in the urban center to allow the American Indian community to make important decisions about curriculum content, staffing and organizational and governance structures. During the four-year period in which intense efforts by the American Indian community in the city sought funding for the school, an Ojibwe Elder and her husband sat in the balcony of the state legislature with a pipe in a pipe bag, always present. The ceremonial pipe had been given to the school in the city for American Indian children. Since that school had not yet been physically manifested, the pipe was held for safekeeping by the Elder. The Elder spoke to the pipe each day, promising that each day would bring the pipe closer to home.

On the last day of the state legislative session, the Elder had left the building to return home when community members ran to find her to tell her that the bill

funding the school was about to be introduced and discussed. Within hours, the bill received a close, but positive, vote and the school had passed from dream mode to creation phase in the spring of 1989. Two additional years passed as the district sought an appropriate site for the school. A lovely garden-like site was chosen, and then was soon deemed so desirable that it was appropriated by another school district program. Eventually, the district purchased space in an industrial site in the heart of the neighborhood occupied by Native families, Native health and community development agencies and near both the American Indian Center and the Peace Center operated by the American Indian Movement (AIM). During the time that the search for a site was ongoing, American Indian community leaders, primarily Ojibwe, Lakota and Dakota, met to decide on a name for the school and to develop a mission statement. Led by Elders, school district administrators and tribal representatives, the community developed in 1990 the following mission statement:

> We, the students, families, staff and community, are working together in a warm and caring atmosphere.
>
> While learning about the past, and understanding the present, we are building a bright, healthy, safe, and strong tomorrow.
>
> We seek balance and harmony, excellence and pride in ourselves.
>
> Together we are responsible for and respectful of ourselves, each other, our school, our community and our environment.
>
> We belong here and we are unique.
>
> We are created for a purpose and we are part of the circle.

While funding as an American Indian Magnet School by the state legislature did not relieve Medicine Wheel School of the burden of accountability in the form of standardized tests, much of the curriculum organized at the school was designed to support, rather than subvert, Indigenous identity. Thus, the oral history of the school's origins has served as a representation of the warriorship practice of Indigenous parents, grandparents, and other community members who have remained in active involvement within the school's daily operations.

Organized for Kindergarten through Grade Eight, the school served 400 students during the first year of operation, in 1991–1992. By the fall of 1994, student enrollment had grown to nearly 800 students. Ninety-six percent of the student body was Native, largely Ojibwe, Lakota and Dakota. The remaining student body was African American from families living near the school. Representatives of the American Indian community involved in early decisions regarding the building design had chosen the model of a Kindergarten through Grade 8 school because that model allowed older siblings of younger children to

look after the younger siblings on buses and in hallways. For some of the early families at the school, there were never fewer than four siblings in the school at any given time. American Indian teachers, staff and administrators comprised 40% of school employees. In addition, the school was home to several district-funded programs for American Indian children, youth and their families. Elders, parents, babies, toddlers and other community members not frequently seen in school buildings were present in the building on a daily basis. In many ways, aspects of the school resembled those of a pre-colonial social order upon which an educational institution in the late twentieth century was based.

When I began my work at the school, Sophie organized a naming ceremony during Reflection Circle for the seventh graders, who by that time had each returned appropriate consent and assent forms. All proper names used in the study, including Medicine Wheel School, are pseudonyms or "research names." As I have done in the past, I asked research participants to choose their own "research name" or pseudonym. For Medicine Wheel School, however, the name given to each student by their classmates would serve as their "research name" during the research process. Buffalo, a tall Lakota youth with wide shoulders, was named first. Buffalo was a good name, he agreed, and he would accept that name. Alex was given the name Hawk because he was always able to notice things that others were not able to see. His skills as a keen observer would prove useful during the research process as he and his team members served as junior ethnographers. Alex accepted the name, but asked for permission to use his uncle's name, as well, and the class agreed. Hawk became Alex Hawk. Skip was absent on the day of the naming ceremony. His classmates in the seventh grade gave him a name that represented the most significant feature of his day, which was his absence from the Circle. Thus, Skip was named. Alex Hawk and Skip are both Ojibwe. Buffalo, as I indicated, is Lakota. The young men had been classmates at Medicine Wheel School for years. Buffalo's family was one of the first to enroll children in the school during the somewhat tentative first years nine years earlier.

Several of the adults in the study objected to being asked, or being assigned, to use a research name. They told me that they were proud of the work they were doing and wanted their actual names publically used. Further, they asserted that the practice of being required to use a new name was far too reminiscent of the same practice that had originated in boarding schools generations ago. I explained that the use of "research names" would allow us all to avoid any compromise of the confidentiality of the children in the study and for that reason, all participants would need a research name. I further explained that I would also need to use pseudonyms for place names for the same reason. With that explanation, the research practice of using pseudonyms became acceptable to some of the adults in the study, and grudgingly acceptable to the others. Some adults requested, or accepted, the use of research names that reflected clan membership or resembled "Indian names" given to them by students also involved in the study. Eagle Charge, the principal, and Eagle Horse, the Bigfoot Rider, received research

names given by Buffalo. Some adult participants, including Sophie, chose names of relatives to use as research names.

All adults and children who were participants in the study are referenced with research names, and all adults and children in this discussion are American Indian. As I noted earlier, as I planned my study at Medicine Wheel School, I expected to find ways that the social practice of education in an American Indian school would support academic achievement. Medicine Wheel School was well-known for years as an academy for high-achieving American Indian students. My study was planned as a process through which I could document and interpret the ways that the scholarship of high-achieving American Indian children and youth was supported by the American Indian teachers, administrators and other adults with whom they interacted on a daily basis. I found scholarship, but in the discourse and practice of the youth and adults, scholarship was a way to achieve something else, which was service to the community in the form of warriorship. Tribal affiliations of Native adults in the school reflected those of the Native children and youth in the school; they were Ojibwe, Lakota and Dakota. Nee-Gon-Nway-Wee-Dung, Eagle Charge, Sophie, and I are Ojibwe from bands whose homelands are located across the northern woodlands and Great Plains. Eagle Horse and Moto Bloke are Lakota from Grand River.

The apprenticeship of Warriors

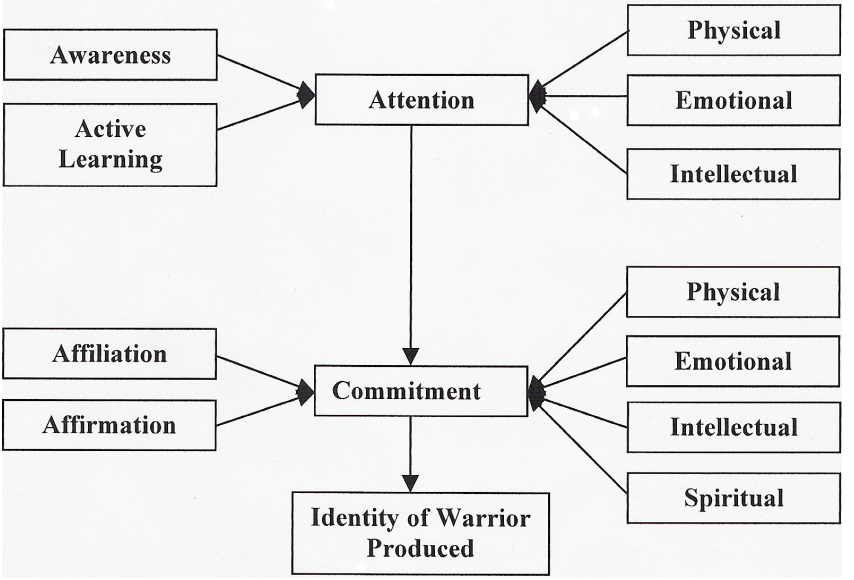
In addition to translation of tacit and explicit culture (Spradley, 1980) in order to identify specific practices and discourses of warriorship, I examined ways that membership in a community of practice of warriorship became available and desirable for Buffalo, Skip, and Alex Hawk. Therefore, I looked for "stages" (Spradley, 1980, p. 149) of increasingly committed membership that was culturally patterned, not random or haphazard. I sought to identify stages of warriorship that represented a progression that might be broadly replicated within apprenticeships for young people in similar ways to the Warrior apprenticeship experienced by the History Day team.

Awareness and active learning, two cognitive processes, are components of a larger cognitive process of attention. These processes are supported by the physical, emotional, and intellectual aspects of human learning prior to identity formation, but moving toward a particular identity. Affiliation and affirmation, two additional social processes, are components of a larger social process of commitment. The processes involved in commitment are supported not only by the physical, emotional, and intellectual aspects of human social and individual identification, but in addition require the presence of a spiritual component, as I see this learning/identification process.

In the diagram for the stages of becoming a warrior in Figure 2, cognitive processes are represented in text boxes aligned in the left column. Social processes are represented in text boxes aligned in the center column. The aspects of a human being that are employed during, and contribute to, either the cognitive processes or social processes are in text boxes in the right column. The identity

produced by this interaction of learning about warriorship, social influences of warriorship and personal choices to pursue warriorship is a Warrior Identity.

Figure 2: Stages of becoming a Warrior



In the discussion that follows, I explain the ways that the learning/identification processes represented in this paradigm were experienced and articulated by the participants in the research I conducted at Medicine Wheel School. A number of adult participants were able to articulate their own understanding about the cultural meanings of being a Warrior, and were able to either self-identify as a Warrior or were identified by others as Warriors. However, I will limit this discussion to the small group of seventh graders and three of the individuals who supported them early in the process as they worked together on the Wounded Knee in 1973 History Day exhibit. The discourse and cultural displays of Buffalo, Skip, and Alex Hawk, as well as Nee-Gon-Nway-Wee-Dung, Eagle Charge, and Eagle Horse provide a sufficient source of evidence for explicating the paradigm of "Stages of Becoming a Warrior" that I developed.

Awareness of warriorship

Awareness is the first stage in becoming a Warrior. It occurs when we begin to focus our attention on a specific aspect of a social pattern or natural phenomenon. Nee-Gon-Nway-Wee-Dung was aware, growing up in Waabaabigan, that circumstances of living and learning were not right for his people. His people were forbidden to speak the Ojibwe language. Ceremonies were banned. Schools were harsh and punitive to him and other children. As an adolescent, he began to display concentrated resistance to the social processes that he was experiencing, particularly schooling:

> I've spent a good portion of my life in jail, from the time when I was your age. I went to prison when I was only twelve years old. I went to the state training school for truancy. I didn't like school. I ran away from it. I ran away from school. And off and on, before we got the American Indian Movement going, I spent close to sixteen years of my life in jail. (Nee-Gon-Nway-Wee-Dung, March 28, 2001)

Nee-Gon-Nway-Wee-Dung's awareness of the need to resist schooling as it existed for his generation, and those of his parents, led to his avoidance of school. Since truancy is frequently the opening to the school to jail pipeline, Nee-Gon-Nway-Wee-Dung's truancy was followed by years of involvement with juvenile justice systems.

Almost a generation later, Eagle Charge became aware, growing up in the city, that injustice was occurring for Native people living on reservations, particularly at Pine Ridge. "We had heard about the activities that were going on in South Dakota" (Eagle Charge, March 21, 2001). His awareness was fostered by the growing movement of American Indian activism:

> And in the city, at the time, we had a chapter of the American Indian Movement. I belonged to that chapter of the American Indian Movement Youth. We had a drum that we would use at our meetings and other occasions. (Eagle Charge, March 21, 2001)

Eagle Charge, a university student in the city in 1973, had grown up in an environment quite different from that of Nee-Gon-Nway-Wee-Dung, who grew up on the reservation. However, the informal social and communication networks typically maintained by American Indian people (Smith & Warrior, 1996, p. 128) made it possible for Eagle Charge, in the city, to be aware of the oppressive conditions on reservations in the region, particularly at Pine Ridge, in South Dakota.

Eagle Horse, on the other hand, grew up hearing stories about the history of the Hunkpapa people of Grand River:

> So, when I was a child, I didn't have access to a lot of the same technology that we have now: television, radios, stereos, and those things. A lot of our entertainment came from sitting around and telling stories. I was able to learn a lot about this history of the reservation and how the people were affected by that history. (Eagle Horse, May 2, 2001)

He heard about the death of Sitting Bull at the hands of the U.S. federal government. He heard about events at Wounded Knee, South Dakota, when nearly 300 unarmed men, women, children, and elders were killed by the U.S. Cavalry in 1890. Eagle Charge also became aware, as a young man, of his own experience of oppression:

> In the early days, before the American Indian Movement, there were a lot of discrepancies in civil rights granted to Native American people and other people. We suffered a lot of depression and oppression. That wasn't good. It was difficult to be proud of being Indian because people believed that it was not a good thing to be Indian. (Eagle Charge, March 21, 2001)

It is interesting to note that both Nee-Gon-Nway-Wee-Dung and Eagle Charge date their description of the character of oppression on reservations in the upper Great Plains to "before the American Indian Movement" (Eagle Charge, March 21, 2001) and "before we got the American Indian Movement going" (Nee-Gon-Nway-Wee-Dung, March 28, 2001). Their awareness of oppressive conditions on the reservations occurred prior to the formation of AIM, but the formation of the Movement serves as a marker between two time periods; awareness of oppression before the Movement and social action to end oppression after the Movement was formed.

Buffalo also grew up hearing stories about the history of the Hunkpapa people of Grand River. He heard stories about his ancestors who were killed at Wounded Knee in 1890. "My uncle always told me what he knew about Wounded Knee [in 1890]. I would always ask my uncle to tell me what he knew about Wounded Knee. He knows about Wounded Knee and he told me about it" (Buffalo, July 19, 2002). Buffalo had also watched the film Lakota Woman (Pierson et al., 1994) with great interest when Sophie showed the film in class. Content of the film about events at Wounded Knee in 1973 helped Buffalo focus his interest on the topic of Wounded Knee. "It just popped into my head, once they said it in class and we watched Lakota Woman in Sophie's class. And I just started picking up ideas about it. It was Wounded Knee in 1973 [that I would study]" (Buffalo, July 19, 2002). Buffalo was working alone at this point.

Skip and Alex Hawk were interested in researching various History Day topics, but were not interested in working on a research project about Wounded Knee in 1973. They both explored a number of possible topics each, but could not decide on a topic. They were also working alone at this point. When Skip saw how interested and informed Buffalo was about events at Wounded Knee in 1890 and 1973, he began to talk about those events with Buffalo. Eventually Skip decided to work with Buffalo to develop a History Day project on the topic of Wounded Knee in 1973. Alex Hawk was still not convinced that he wanted to work on a History Day project about Wounded Knee in 1973. For that reason, he did not participate in the interview of Eagle Charge. Alex Hawk wanted to develop a History Day project about either the Battle of the Little Bighorn in 1876 or the Massacre at Wounded Knee in 1890. Finally, when Buffalo convinced him that the study of the Massacre at Wounded Knee in 1890 would be a part of the study of events at Wounded Knee in 1973, as background, Alex Hawk decided to work with Buffalo and Skip on their project.

On Thursday, March 29, 2001, Sandra interviewed all three of the team members to support their efforts to articulate their ideas and defend their thesis

during judging at the Regional History Day competition. Next, Alex Hawk decided to interview Buffalo and Skip about their reasons for deciding to study events at Wounded Knee in 1973. Those insights would be needed so that the team could complete their History Day process paper:

> Alex Hawk: Buffalo, what made you decide to study Wounded Knee?
> Buffalo: … And, my family, my uncle has always told me about the old ones at Wounded Knee and I wanted to learn more about that.
> Alex Hawk: Skip, why did you decide to study Wounded Knee?
> Skip: Well, I wasn't going to, but Buffalo kept talking to me about it, and he was really interested. He was kind of happy every time he found something on the Internet. I started reading things for him on the Internet and I just decided to go ahead and work with him on Wounded Knee.
> Alex Hawk: Thank you. (March 29, 2001)

Buffalo's interest and his movement from awareness of Wounded Knee to active learning about warriorship at Wounded Knee had drawn two others to his project. The three team members continued their work together through preparation for the Regional History Day competition:

> Sandra: How did you and your work partners, Skip and Alex Hawk, get ready for the Regional contest?
> Buffalo: We started talking about it, talking about Wounded Knee. We started telling each other our different stories about what we were reading. We started telling each other our ideas about the artifacts and what they mean. We started sharing our ideas about artifacts. (March 29, 2001)

Buffalo's awareness and interest in active learning about events at Wounded Knee were always just ahead of those of Skip and Alex Hawk, but Buffalo was also interested in sharing ideas with his team mates, so he occasionally led, but did not dominate the team discourse about their project.

Active learning about warriorship

Active learning appears to serve as the next stage in becoming a Warrior. Active learning involves movement from awareness to activity toward learning. Active learning is a function of personal agency to a greater degree than awareness, although both involve choices to some degree. Nee-Gon-Nway-Wee-Dunginitiated this stage of his warriorship when he chose to engage in active learning about warriorship at Wounded Knee when he decided to read about the history of oppression of American Indian people:

> There was a book out at that time. It was called *Bury My Heart at Wounded Knee*. It was written by a guy named Dee Brown. And every-

> where it was on the top best-selling list. Very little, in the world, was known about Indian people before that. (Nee-Gon-Nway-Wee-Dung, March 28, 2001)

He remembered what he had read and when a decision was needed at Pine Ridge in 1973, Nee-Gon-Nway-Wee-Dung chose Wounded Knee as the site of the planned occupation by AIM, the Oglala traditional leaders and other activists.In addition, prior to the occupation at Wounded Knee, he organized active learning on the Pine Ridge reservation about circumstances on the reservation. He did that in order to learn directly from those most affected by those circumstances:

> So we sent word back to this medicine man at Pine Ridge to tell the people that we were coming on the 25th, and that we would hold two days of hearings. We wanted to take affidavits. And that's what we did.
>
> So, on the 25th of February in 1973, we came from all over to the reservation. We gathered at a little place called Oglala, on the Pine Ridge Reservation. And we had two days of hearings there. People would come up and tell us things. We made it clear that we didn't want to hear rumors. We didn't want to hear funny stories. We wanted to hear the truth. We wanted affidavits, we wanted witnesses. We had affidavits. In two days, we had over fifteen individual accounts of brutality, rape. (March 28, 2001)

At the end of the two days of hearings, Nee-Gon-Nway-Wee-Dung was challenged by an elder woman sitting in the back of the room where the hearings had been held. She challenged him to take swift action and not simply return to the city to think about things while additional murders and rapes were taking place on Pine Ridge. At that point, he began to actively plan and mobilize AIM in anticipation of the occupation at Wounded Knee. His experience at the hearings and his exchange with the elder woman led him to an understanding that he shared with Buffalo, Skip, and Alex Hawk, that "the women are Warriors, too. In fact, they are our Warriors. They are our Warriors" (Nee-Gon-Nway-Wee-Dung, March 28, 2001).

Eagle Charge also decided to read about the history of oppression of American Indian people. While his early awareness of the role of warriorship in opposition to oppression was the result of direct and experienced oppression of others, Eagle Charge became aware that he had inherited subtle historical forms of oppression and deculturalization:

> I had read a book called *Bury My Heart at Wounded Knee*. This book was a history of the American Indian people written by American Indians. It was a sad historical story. When I read it, I was seventeen years old. I cried at nights, reading it, because of the horror that had been inflicted on Indian people throughout history… (March 21, 2001)

Eagle Charge's awareness of the sad historical story of American Indian people became focused when he began reading about the specifics of deculturalization and extermination policies in Brown's landmark 1970 text.

Eagle Horse actively learned about the Big Foot Rides from Grand River to Wounded Knee, South Dakota, while he was teaching mathematics at the tribal college on the Grand River reservation. He supported the students and others who wished to participate in the Rides by providing horses and gear for the Riders from the college:

> I was working at a community college on my reservation, and we sponsored five riders to go down to Wakpa Heta to participate in the ride. Originally, the Bigfoot Ride started from the Pa Kola Reservation, south of Grand River. Five of our students wanted to participate in that, so we pooled some money. We got them some horses and they were able to go down to Wakpa Heta and participate in that ride. We did that in 1985. (Eagle Horse, May 2, 2001)

Five years after learning about the Big Foot Rides and supporting them materially, Eagle Horse became a Big Foot Rider when he rode on December 15th and 16th in 1990.

Buffalo, Skip and Alex Hawk at various points decided to learn more about events at Wounded Knee in 1973; they read books and excerpts from books, including *Bury My Heart at Wounded Knee* by Dee Brown (1970), which was loaned to them by Eagle Charge. They searched for information on the Internet. "Sandra: What were the first steps that you took in researching your History Day topic? Buffalo: We found artifacts and readings. We did a lot of reading. We looked up a lot of things on the Internet" (Buffalo, July 19, 2002). Eventually, the Wounded Knee in 1973 History Day team would come to read dozens of pages of text in book chapters and web pages, In addition, they viewed films. Skip would often read to Buffalo and Alex Hawk since he was the strongest reader and had the least patience for the miscues of the others.

Affiliation with Warriors

Affiliation proved to the next stage in becoming a Warrior. Affiliation is the first step toward commitment. As noted in the discussion above, commitment requires the additional resource of the spiritual component of human being, as well as the physical, intellectual, and emotional. The spiritual component of human being allows us to see the unseen, give to others what we have, in some cases, not been given, and exercise hopefulness. Affiliation requires taking a stand, standing for something or with someone. Nee-Gon-Nway-Wee-Dung participated in the formation of AIM as a young man in the city in the late 1960s. He is firm in his conviction that the Movement was formed as a Warrior Society, not as a militant group, as he asserted to Buffalo, Skip, and Alex Hawk during their interview with him. "I know who I am. I know what the Movement is. The Movement is a Warrior Society. Our elders look at us that way, as a Warrior Society, free of

alcohol, free of drugs, fighting for what is right" (Nee-Gon-Nway-Wee-Dung, March 28, 2001).

At Wounded Knee in 1973, Nee-Gon-Nway-Wee-Dung affiliated not only with other American Indian activists, but also with Lakota traditional leaders and elders:

> Buffalo: Was there a medicine man there with you at Wounded Knee in 1973? If so, did he tell you stories?
>
> Nee-Gon-Nway-Wee-Dung: At that time, we had a young man named Leonard Crow Dog. He was a spiritual leader. He was very powerful man; in fact, he was a prophet. He could actually prophesize things that were going to happen, two days from now, a week from now, six months or a year from now. He was also a healer.
>
> And we had another man named Wallace Black Elk. He was one of the distant relatives of the famed Black Elk. They conducted ceremonies all the time, all the time. And of course, we had a lot of storytellers there. They told stories of what happened at Wounded Knee in 1890, and how we had to protect the women and children, and how to conduct our behavior. They guided us. We listened to our elders. We listened to our medicine men and spiritual leaders. (March 28, 2001).

The affiliation with Oglala traditional leaders and elders was important because the affiliation made unlikely the possibility that Nee-Gon-Nway-Wee-Dung, Eagle Charge and the others engaged in warriorship at Wounded Knee could be dismissed by the press, by the U.S. federal government, or by the American public, at least in Indian Country, as a band of hoodlums or unruly dissidents.

Eagle Charge joined the AIM Youth group in the city in the early 1970s, just before the occupation of Wounded Knee in 1973. As a young college student and member of that youth organization at that time, he was learning how to sing and sit at a drum. When Eagle Charge heard the call to go to Wounded Knee in 1973, he decided to go there because of his affiliation with AIM:

> Buffalo: What made you want to go to Wounded Knee in 1973?
>
> Eagle Charge: Well, it was the idea of the American Indian Movement. AIM was a real part of my life. I think that some people during that time of their life will join the Army or join another part of the armed forces, like the Marines or the Navy. But I was a member of AIM already, and I felt that I was a part of something. Being a part of AIM was really my inspiration. We were going to go and fight injustice…. That's really what drove me. (March 21, 2001).

Eagle Charge made the transition from being a young university student in a youth group to a front-line Warrior through his affiliation with Nee-Gon-Nway-Wee-Dung and the others who also heard and heeded the call to go to Wounded

Knee in 1973. Eagle Charge decided that he was willing to risk his life for his belief that injustice could not be ignored and unchallenged (Eagle Charge, March 21, 2001).

Eagle Horse affiliated himself with warriorship when he made the transition from supporter of Big Foot Riders to an active participant in the Big Foot Ride in 1990. After years of supporting other Big Foot Riders, Eagle Horse decided to participate in the 1990 ride as a Rider:

> I rode in support of the belief in healing the generations. That was the basis of how this ride evolved. Also, I wanted to be part of the group of Grand River Sioux people who were riding, because Grand River is where the original ride started. So, I rode for two days. (Eagle Horse, May 2, 2001)

Eagle Horse rode during the first two days of the Ride, from December 15th to December 16th, in 1990. Eagle Horse also traveled to Wounded Knee to welcome the other Riders when they arrived at the Wounded Knee gravesite on December 29th, 1990. He experienced bitter cold during the time that he participated as a Big Foot Rider:

> Skip: What did you think about while you were riding?
> Eagle Horse: Well, I thought about the mission of the Ride, and I thought about the plight of the people who had been on the march, the ride, 100 years ago. I prayed while I was riding. At times, I visited with other riders. At times, we just rode in silence. We tried to be a part of the surroundings. (May 2, 2001)

Eagle Horse spent many hours riding in silence thinking about the hardships that his ancestors had experienced in their struggle to remain alive and remain Lakota. He was, thus, able to affiliate himself with Warriors, and warriorship practices, of past generations.

Members of the Wounded Knee in 1973 History Day team initiated their affiliation with Warriors and warriorship when they began the process of interviewing adults who had already established themselves as Warriors. Each time the young ethnographers interviewed an adult, they gave that person tobacco, as a ceremonial gift, to show that they had come in a good way and that whatever they took away from the interview, they would use in a good way. The giving of tobacco thus formalizes a relationship between people and binds them together in common purpose. Just as Eagle Horse symbolically affiliated himself with his ancestors during the Big Foot Ride, Buffalo, in particular, felt that he grew closer to his ancestors as he continued the study of Wounded Knee in 1973:

> Studying Wounded Knee, I can go back for a time and get to know my culture and my ancestors. I can learn about my culture and how they did things a long time ago. You can get to know your ancestors from a long

> time ago, to know how the Indians grew up before us. You can get to know how it was in the time of our ancestors. (Buffalo, July 19, 2002)

Both Nee-Gon-Nway-Wee-Dung and Eagle Charge had shared with Buffalo, Skip and Alex Hawk that their belief in life after death and the potential for reunion with departed relatives had strengthened them as they considered the consequences of their decision to go to Wounded Knee in 1973 (Nee-Gon-Nway-Wee-Dung, March 28, 2001; Eagle Charge, March 21, 2001). It may be that Buffalo's reunion with his departed relatives as he studied events at Wounded Knee in 1890 gave him the strength to take the lead in articulating the thesis, background, and implications of the Wounded Knee in 1973 History Day project at the regional competition. "First, I saw Buffalo pointing first to the Medicine Wheel, then to the timeline, and then to several of the maps on the exhibit. He was nodding his head and smiling at the judge, and the judge was smiling back. I knew then that things were going well for them" (Personal Communication, Sophie, March 31, 2001). The project advanced further to the state competition after the well-defended project was first chosen to advance from the local to the regional competition.

Affirmation of warriorship

Affirmation is the last stage in becoming a Warrior. Affirmation is part of an induction process, of entering into a particular community of practice. Affirmation requires commitment to change. Affirmation of changed Indigenous social and personal identity frequently takes the form of gift-giving, such as that which takes place for tribal college graduates when they receive a feather for graduating from college. Their identity has changed and they are no longer a student. They have touched the enemy and have become a Warrior (Personal Communication, His Horse is Thunder, May 8, 2003). Nee-Gon-Nway-Wee-Dung was given an eagle feather because he had risked his life numerous times in the interest of what he believed must happen for Indian people. Eagle feathers are typically given to commemorate a significant deed. In addition, he was given an Indian name that he uses today. Nee-Gon-Nway-Wee-Dung currently directs the Peace Center located blocks away from Medicine Wheel School. He has continued to serve his people in Indian Country (Nee-Gon-Nway-Wee-Dung, March 28, 2001)

Eagle Charge was not given a material gift at Wounded Knee in 1973. He was given increasing responsibility for protecting the leadership of AIM at Wounded Knee. He traveled with the leadership wherever they went. He carried and used a gun:

> I think that my role was to be on the lookout, to be a security person. I always felt myself to be a bodyguard to the leadership. Whenever they moved somewhere, either to Rapid City or Oglala or the Badlands, I went with them. I traveled with them. I kept a lookout. I kept a lookout for people who would try to harm them. So, in that respect, that's how I participated at Wounded Knee in 1973. (March 21, 2001)

Eagle Charge was also given responsibility for leading small groups of other young people outside of the perimeters of the occupied area of Wounded Knee on forays to secure food and other supplies. Affirmation of Eagle Charge's warriorship came to him in the form of increasing responsibility for the direction, safety, well-being and even the lives of others at Wounded Knee in 1973. After his participation as a Big Foot Rider in 1990, Eagle Horse was given a red jacket with embroidered words that say, "Big Foot Rider:"

> Skip: How did your experience as a Bigfoot Rider influence your feelings about yourself as a Leader or as a Warrior?
> Eagle Horse: Among the people who rode from my reservation, there were people who did some fundraising. They bought everybody who rode a Bigfoot Rider jacket. I have that jacket today. It's red with an emblem on the back of it that says, "Bigfoot Rider." I cherish that jacket. People, when see me wearing it, give me the thumbs up sign. Although I didn't ride the whole ride, I was definitely proud to be a part of the ride. (May 2, 2001)

Wherever he goes when he wears that jacket, people acknowledge Eagle Horse and let him know that they appreciate what he did when he participated in the Big Foot Ride.

After the state History Day competition, Buffalo, Skip and Alex Hawk earned honors from the local university and from the state historical society for the quality of their work on the Wounded Knee in 1973 History Day exhibit. They also earned honors from their own community at the Honor the Children Powwow held at Medicine Wheel School on May 17, 2001. They were given a variety of gifts from community members. The Medicine Wheel drum played an honor song for them. Skip, Alex Hawk and their families danced in a circle around the drum. Then, students and other community members came forward to shake hands with Skip, Alex Hawk and their families. Further, students and other community members formed a line of dancers behind Skip and Alex Hawk, and their families, to share in the act of honoring the young people. At this time, Buffalo was no longer in the city. He had traveled to Grand River with his family after the death of a family member.

A reporter from a local American Indian newspaper interviewed Skip and Alex Hawk. A story about the Wounded Knee in 1973 History Day exhibit and about the three seventh graders appeared in the newspaper *Native News* (May 30, 2001) the following week, with a photo of Skip and Alex Hawk:

> **Honor the Children Pow Wow at Medicine Wheel School**
>
> Medicine Wheel School was founded in 1990 as a public magnet school emphasizing American Indian cultural heritage. At first, the facility drew its students largely from the surrounding south-central

neighborhood which has long been a center of Lakota and Ojibwe settlement in the city.

As neighborhood demographics have changed in recent years, the population at Medicine Wheel has reflected a growing diversity. There is currently a mix of American Indian, African American, Ethiopian and Somali students. At Medicine Wheel School, all students receive instruction in Lakota and Ojibwe language and culture. In addition, all courses utilize what principal Eagle Charge calls an "American Indian perspective," which promotes living in harmony with the human community and the natural world.

During the May 17 Honor the Youth Pow Wow at Medicine Wheel, the school honored role models from within the school. Three Medicine Wheel youth were celebrated for their work in documenting and analyzing events at Wounded Knee, in South Dakota, when the town was seized by followers of the American Indian Movement (AIM) on February 27, 1973. AIM and local Oglala Lakota (Oglala Sioux) of the Pine Ridge Indian Reservation opposed Oglala tribal chairman Richard A. "Dick" Wilson. The occupiers controlled the town for 71 days while the United States Marshals Service, the U.S. military and government officers, including the FBI, cordoned off the town. AIM and local Oglala Lakota (Oglala Sioux) of the Pine Ridge Indian Reservation, who opposed Oglala tribal chairman Richard A. "Dick" Wilson, seized the town of Wounded Knee. The U.S. military and government officers, including the FBI, surrounded Wounded Knee the same day.

The seventh grade youth from Medicine Wheel School have spent months interviewing elders, local educators, and others who were present at Pine Ridge in 1973. "We tried to interview the FBI guys but they wanted to frisk us and would not let us take pens into the building or take notes. We have to take notes so we can use the exact words of the eyewitness. Sophie wouldn't let us go to the FBI Headquarters. She did not want us to be treated like thugs" said Alex Hawk, with animated enthusiasm. "I wanted to go anyway. We can take care of ourselves," he added.

During the annual Honor the Children Pow Wow, school officials and community members presented gifts to Alex Hawk and Skip. Gifts for Buffalo, who is with his family in South Dakota after a death in the family, will be transported by Mato Bloka, the Lakota language instructor at the school.

"These young man are courageous, to take this project on. There are still hard feelings about those events," noted community elder Nee-Gon-Nway-Wee-Dung. "We've given them some sweetgrass and tee shirts, but they have given important knowledge to this community."

The Wounded Knee in 1973 History Day exhibit was placed in the Medicine Wheel School Media Center as part of a permanent collection of resources for

younger students who would, in coming years, develop a History Day exhibit. Copies of videotapes of Buffalo, Skip and Alex Hawk completing interviews with Eagle Charge, Nee-Gon-Nway-Wee-Dung, Mato Bloka and Eagle Horse were also placed in the Media Center along with printed copies of interview transcripts.

I would suggest that the phases of becoming a Warrior do not always happen in a strictly linear manner. Elements of each phase may happen concurrently with other elements of other phases. For example, when Eagle Charge began his active learning about warriorship by joining the AIM Youth group, he was also affiliating himself with warriorship of emerging American Indian activists prior to the occupation of Wounded Knee in 1973. Thus, when the call went out, his affiliation with AIM also offered him an opportunity to advance his active learning about warriorship in a concrete experiential way as a security person for AIM leadership. He also participated in active learning about the full exercise of Indigenous spiritual practice at Wounded Knee before he was fully aware of those practices (Eagle Charge, March 21, 2001).

Eagle Charge's initial decision to affiliate with AIM influenced his opportunities for learning, in a general sense, about not only historical oppression of Indigenous people, but also about the capacity for resilience in the face of that oppression. What he learned at Wounded Knee in 1973 further confirmed for him the necessity for him to engage in warriorship in his own community and according to his own capacity. As a result, he has become a prominent American Indian educator in the city (Eagle Charge, March 21, 2001).

The stages of becoming a Warrior that Buffalo, Skip and Alex Hawk passed through replicated, in many ways, the stages described in discourse by Nee-Gon-Nway-Wee-Dung, Eagle Charge and Eagle Horse. In addition to the four clearly identifiable stages, I believe that there were several key features of the experience of the History Day work that served to produce warriorship in Buffalo, Skip and Alex Hawk, including the significant uncovering and application of historical memory on the part of the junior ethnographer and their supporters. Alertness to injustice fades as historical memory fades. My nephew keeps a small plaque on a wall in his home that says, "Our strength is in remembering." Some people will say that historical memory has the power to allow us to remember events that we have not directly experienced. We indirectly experience those historical events through the oral tradition. We maintain Indigenous history through storytelling. In any event, Buffalo, Skip, and Alex Hawk shared the indirect experience of events of significance to their personal and social identity as Indigenous youth as they participated in the learning and telling of oral and written history of events at Wounded Knee in 1890, 1973, and 1990. Their direct experience of warriorship took place when they stood next to their exhibit and piece-by-piece on three occasions defended their thesis and their assertions about events in American Indian history to judges who were university professors of history in the city.

Learning within the context of critical consciousness

In large measure, National History Day had become a kind of rite of passage for adolescents at Medicine Wheel School. Students anticipated the beginning of the process with enthusiasm. They spoke of the History Day activities throughout the course of the year. Each topic that was studied in Sophie's history class brought new possibilities for interesting History Day projects. With rare exception, the topics that were chosen by each History Day team reflected the emerging social and critical consciousness of adolescents.

In addition, the structural features of the National History Day research and knowledge construction processes encouraged critical consciousness because the emphasis on the use of primary sources that are uninterpreted, with limitations on secondary sources (already interpreted) required students to do their own thinking about truth, power, and the implications of events in history. Without being able to rely on secondary sources and the historical interpretations of others, students engaged in History Day research were not vulnerable to the influences of cultural values and misinformation often present in secondary sources such as history texts (Loewen, 1995). Such secondary sources might also contain biases that would, if taken as fact, serve to colonize the research process for Indigenous students. Further, the limit on the number of words of student-written interpretation that was allowable tended to support the learning style of Indigenous youth for whom photos, maps, drawing, symbols, and diagrams truly speak for themselves.

I observed with great interest that each of the limits set for History Day exhibits, for example, on size, number of words, and character of evidence were viewed as an interesting challenge to the middle school students at Medicine Wheel School. Those challenges were seen as a puzzle to be solved, not as a barrier. In addition, the solution to the puzzle was not seen as unavailable to the students working on their History Day projects. The students all knew the rules. They also knew that the rules were equally applied to all participants across the city, the state, and the nation. There were no trick questions and no exceptions to the rules. While the process of construction of the History Day projects was rigorous, the process was also fair.

The pedagogical features of their work in completing History Day projects at Medicine Wheel School provided students with an opportunity to function within a Freirean framework, in a sense. Members of oppressed groups, the American Indian and African American students at Medicine Wheel School, came together to critically reflect on the source of their oppression by using "coded existential situations," or artifacts in the form of primary source documents, to articulate "generative themes" (Freire, 1997, pp. 77 & 87) that served as their central and secondary theses. Through the process of forming and framing their arguments within events in history, the middle school students supported their own praxis needs and the praxis needs of others, including classmates, family members, and members of the school district and university history faculties.

While the History Day projects produced at other schools in the district and state may have been technically accurate in regard to use of sources and limitations on ready-made interpretation, the critical pedagogical features of

the work produced at other sites were not the same as those represented in the work produced at Medicine Wheel School. Each of the History Day exhibits that advanced in 2001 from the local level at Medicine Wheel School to the regional competition addressed some aspect of oppression, which was typical of History Day projects produced at the school in the past. That was not the case for projects produced at other schools, as I observed. At the regional level of competition, technologically-based theses and American/patriotic themes were prominent. The invention of the railroad, the telephone, and the telegraph, for example, were cited as Frontiers in History in projects from other city, region, and state projects. In addition, the impact of federal laws such as the Homestead Act, for instance, was explored as a Frontier in History that allowed immigrants to the United States to settle in the American West. A handful of feminist projects and projects featuring issues of religious persecution, however, represented articulation of anti-oppressive values similar to those addressed in projects originating at Medicine Wheel School.

Sophie was aware of the implicit disadvantage that students from Medicine Wheel School faced in the judging process for History Day projects. "Other schools bring projects that might or might not present issues of oppression, but our students always do what seems like an 'in your face' kind of thesis to the dominant culture judges," Sophie pointed this out to me as we were waiting for the judging to take place at the Regional meet. "Our students aren't always evaluated as having a balanced approach, but we keep trying, and they keep improving. Besides, just the experience of being judged is good for our students," she asserted. "They need to learn how to use words to defend their ideas. They have good ideas. This is good real-world practice for them" (Personal Communication, Sophie, March 31, 2001).

Just as I had understood, when told by one of my dissertation (Wolf, 2004) committee members, that a dissertation is always about the writer or some issue in the writer's life, I believe, in large measure, that middle school students at Medicine Wheel School selected topics that were about their own lives in some way. For that reason and others, it was difficult for some of the Medicine Wheel School students to find "balancing" evidence. Though they sought such input, Buffalo, Skip, and Alex Hawk did not find anyone from the U.S. federal government who would freely speak to them about events at Wounded Knee in 1973. They had planned to build a balancing argument based on a thesis that the FBI agents at Wounded Knee were just ordinary people doing a job that they were assigned to do.

Other seventh graders at Medicine Wheel School who had developed History Day projects exploring historical events such as the Holocaust in Germany and the My Lai Massacre in Vietnam, for example, also had difficulty forming a balancing argument about those events. The students reasoned that some events in history present such egregious wrongdoing that a balancing argument cannot be formed. Those events are the ones to which students at Medicine Wheel School were drawn. They tended not to explore events related to modernization or what might be seen as the development of progress, such as the invention of

television or frozen food, as other students across the city elected to explore. Students at Medicine Wheel School typically gravitated toward issues of social justice involving oppression and abuse of power. Consequently, they often fared less well in competition than their peers across the city when the Native students could not, or did not, develop a counter-balancing argument.

Conversely, the young researchers from another city school who presented the creation of a transcontinental railroad system as an important pro-national Frontier in History presented not only a balancing argument and, in fact, a counterbalancing argument. Yes, they argued, the creation of the transcontinental railroad had cut the vast buffalo herds of the Great Plains in half and decreased their size as breeding patterns were disrupted. In addition, the railroad mechanized the mass slaughter of the remaining herds as buffalo hunters fired on the herds from the safely of railroad cars. But social progress was inevitable and those events ultimately led to the signing of treaties with the Lakota, Cheyenne and other nomadic tribes. The youngsters from a neighboring school argued that the loss of the buffalo required the tribes to seek other food sources and the treaties provided the tribes with the means for securing farming land and implements needed for farming. Farming provides a much more stable source of income and food. Their balancing argument made perfect sense from a colonizing perspective, but served to diminish the personhood of both the buffalo and the people of the Plains tribes who hunted them and considered the buffalo to be older relatives.

As I read the text on the exhibit board of the railroad project team, with the young team members standing nearby waiting to answer questions, my face must have flushed because Sophie leaned over, touched my arm, and said softly, "Remember, they're just kids." I nodded, thanked the students for their hard work and went on to the next exhibit. Later, I suggested to Sophie that we should have placed the Wounded Knee exhibit next to the railroad exhibit and the two exhibits could have balanced one another since the Wounded Knee exhibit featured a black and white photo of the dead bison to which the other students referred in their railroad exhibit. In their Wounded Knee exhibit, Buffalo, Skip and Alex Hawk had argued that the creation of the railroad served as a contributing historical event leading to the massacre at Wounded Knee in 1890. They asserted that the Hunkpapa people of Grand River and the Minniconjou Lakota from Wakpa Heta traveled on foot, on horseback and in open wagons in December of 1890 seeking refuge at Pine Ridge. They were hungry and knew that there were U.S. government rations available from Red Cloud's people, the Oglala. Under the authority of Big Foot, who was Sitting Bull's younger half brother, they had gone seeking food. They had not gone to Pine Ridge seeking trouble, but the U.S. Seventh Cavalry could only see them as a threat and they were killed. I cannot imagine what prize or what recognition might have induced the Wounded Knee History Day team to present a balancing argument in favor of the decimation of the bison on the Great Plains. Doing so would have been contrary to the ethics of their warriorship, which required them to respect and value the lives of their older relatives.

The salient metaphor of warriorship has emerged in texts and other discourses since that cultural production first began to take shape and significantly influence my work and the work of the Wounded Knee in 1973 History Day team. Most recently, one of my graduate students at Lakehead University had included the words of Chief Dan George in a forward to her thesis. As she began to read the words to me, she smiled and said, "You'll like this" (S. Bebonang, Personal Communication, July 6, 2008):

> There is a longing in the heart of my people to reach out and grasp that which is needed for our survival. There is a longing among the young of my nation to secure for themselves and their people the skills that will provide them with a sense of worth and purpose. They will be our new Warriors. Their training will be much longer and demanding than it was in olden days. The long years of study will demand more determination, separation from home and family will demand endurance. But they will emerge with their hands held forward not to receive welfare, but to grasp the place in society that is rightly ours. (George & Hirnschall, 1994, p. 91)

The young people will be our Warriors. In some cases, they already are our Warriors. Indigenous scholarship is the path that young people will take to exercise and display warriorship. That is a path that they must take. The issues facing Aboriginal communities at the end of the first decade of the 21st Century will require not only expertise in Western science and economics, but will also require a kind of wisdom that, up to now, has been displayed by few Western thinker. Those of us in the position to influence the direction of Aboriginal schooling and the education of American Indian children and youth must see that all possible opportunities are set in place for our young Warriors to begin their path to warriorship through the practice of deep, sustained, and meaningful learning of Indigenous history, science, languages, and social sciences including the study of the social dynamics of peace-making and conflict resolution.

Though Buffalo, Skip and Alex Hawk were not at Wounded Knee in 1973 and or carry a gun or packs of food as other young Warriors did back then, in 2001 they carried a video camera, a tape recorder, and several still cameras. They also carried paint and rubber cement for their History Day exhibit. In addition, they brought (and read) dozens of books. They studied, they wrote and revised,and revised again. Through the four stages I have described above, they became History Warriors. It was good to be at Medicine Wheel School and to do the History Day work with them. I thank you for reading the words of Buffalo, Skip, and Alex Hawk and the words of those who nurtured their warriorship. *Gakina Indinawemaaganag. Mitakuye Oyasin.* All my relations.

References

Advancement Project. (2010). *Test, punish, and push out: How "zero tolerance" and high-stakes testing funnel youth into the school-to-prison pipeline*. Re-

trieved Feb. 12, 2010 at http://www.advancementproject.org/sites/default/files/publications/01-EducationReport-2009v8-HiRes.pdf

Berliner, D., & Biddle, B. (1995). *The manufactured crisis: Myths, fraud, and the attack on America's public school.* Reading, MA: Addison Wesley.

Brown, D. (1970). *Bury my heart at Wounded Knee: An Indian history of the American west.* New York: Henry Holt.

Buswa, E., & Shawana, J. (1992). *Nishnaabe bimaadziwin kinoomaadwinan: Teachings of the medicine wheel*. West Bay, ON: Ojibwe Cultural Foundation.

Freire, P. (1997). *Pedagogy of the oppressed.* New York: Continuum.

George, D., & Hirnschall, H. (1994). *My heart soars*. Surrey, BC: Hancock House.

Goodman, R. (1992). *Lakota star knowledge: Studies in Lakota stellar theology.* Mission, SD: Sinte Gleska University.

Lave, J. (1996). The practice of learning. In S. Chaiklin & J. Lave (Eds.). *Understanding practice: perspectives on activity and context* (pp. 3-32). Cambridge: Cambridge University Press.

Loewen, J. (1995). *Lies my teacher told me: Everything your American history textbooks got wrong*. New York: Touchstone.

McCartney, M. (1994). *The last of the medicine men.* Las Vegas, NV: KLVX-TV.

NAACP Legal Defense Fund and Educational Fund, Inc. (2007?). *Dismantling the school-to-prison pipeline.* Retrieved Feb. 13, 2010 at http://www.naacpldf.org/content/pdf/pipeline/Dismantling_the_School_to_Prison_Pipeline.pdf

National History Day. (2000). *National History Day student contest guide*. College Park, MD: University of Maryland.

NCEE (National Commission on Excellence in Education). (1984). *A nation at risk.* Washington: U.S. Department of Education.

Pierson, F. (Director), Kerby, B. (Writer), Berner, F. (Producer), & Geiogamah, H. (Co-Producer) (1994). *Lakota woman: Siege at Wounded Knee* [Film]. Atlanta, GA: Turner Pictures.

Royal Albert Museum. (2005). *What is a Medicine Wheel?* Retrived February 18, 2010 at http://www.royalalbertamuseum.ca/human/archaeo/faq/medwhls.htm

Smith, P.C., & Warrior, R.A. (1996). *Like a hurricane: The Indian movement from Alcatraz to Wounded Knee*. New York: The New Press.

Spradley, J.P. (1980). *Participant observation.* Fort Worth, TX: Harcourt Brace.

Wolf, S. J. (2004). *Warriorship in practice: Identity and learning in an American Indian school.* Unpublished doctoral dissertation, University of Colorado, Boulder.

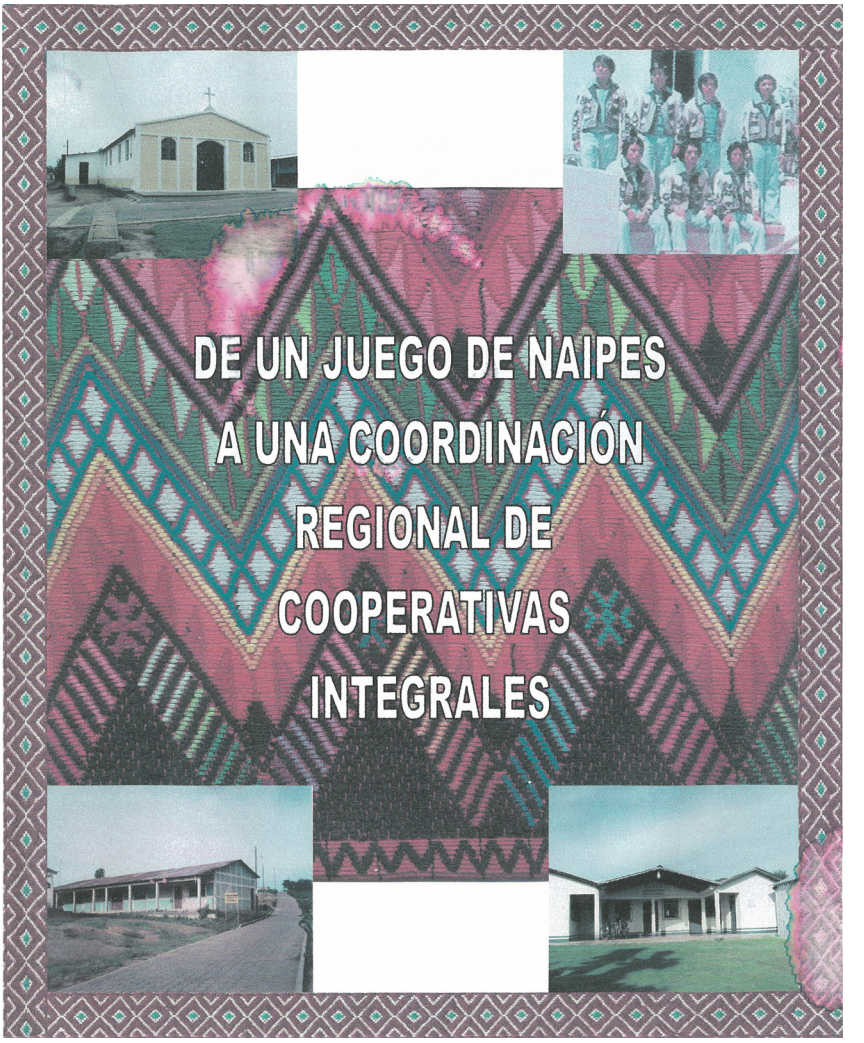


Figure 1: Cover of *Juego de Naipes a una Coodinacion de Cooperativas Integrales* (From a Card Game to the Coordination of Integral Cooperatives). Guatemala City, Guatemala: PRODESSO.

Panimatzalam's Voice of Transformation: An Indigenous Mayan Writing Project for Youth Activism

Matt Oppenheim

This chapter tells the story of how a group of young Mayan teachers in the village of Panimatzlam, Guatemala, utilized indigenous research to write a book that engages youth in the culture, spirituality and community development of their village. Led by shaman Domingo Quino-Solis, the process began with a Mayan ceremony. The book is an example of Freire's critical pedagogy fused with indigenous cosmology, offering student activities to participate in creating the future of their community. In the article, these teachers speak about the profound impact of the process on their lives. Lessons learned contribute a concrete example of indigenous research in practice and ways to engage indigenous youth in the social and economic development of their communities.

I would like to tell an inspiring story of how a group of young educational activists in a small Mayan community in Guatemala utilized Linda T. Smith's (2001) indigenous research to create educational curriculum to keep middle school students engaged in the cultural, spiritual and economic development of their community. This story has two goals. The first goal is to present the curriculum book as an example of how to engage indigenous youth as activists in their own communities. The second goal is to present the inquiry and book process as an example of indigenous research. In the final reflection session about what the participants learned from the process, I foreground the voices of two leaders, Sandra Rosalia Quino-Juracan and Rebecca Elizabeth Xinico-Quino, from the young leaders movement ADJIMA (Asociación de Desarrollo Integral de la Juventud Maya—The Association of Mayan Youth for Integral Development). In this way, I hope that this article presents a way for teachers to speak directly to other teachers concerned about similar issues and projects.

The 102 page book titled *De un Juego de Naipes a Una Coordinacion Regional de Cooperatives Integrales*, which translates "From a Game of Cards to a Regional Coordination of Integral Cooperatives," is written in Spanish (See Figure 1 on page 140). Its four chapters focus on: (1) The historical development of the country, including the brutal thirty year civil war; (2) The history of the village of Panimatzalam, from its founding to the development of regional systems of cooperatives and indigenous schools; (3) More recent community development projects in the village, and (4) The process and themes of community development and the Mayan Sacred Calendar or *El Cholqij' o*. This book is currently being shared with a network of indigenous middles schools (ACEM—Associacion de Centros de Educacion Mediano—The Association of Centers for Mayan Middle Schools) across the country, and various indigenous education organizations in Guatemala. The author of this article is also pursuing grants to publish the book for use throughout Guatemala. It is an example of critical pedagogy, where students are actively engaged in activism in their com-

munities, while learning about their culture, philosophy, history and the process of community development.

Mayan youth in Guatemala, like many indigenous youth in the United States and around the world, are leaving their communities, cultures and languages. In Guatemala, young women enact *disvestido*, literally changing their indigenous dress for European clothes, to fit into the world of the Guatemalan capital in order to survive.

A 30 year US backed brutal civil war, ending in 1996, left 250,000 indigenous Maya murdered, with nearly the same number left homeless (Lovell, 2001). Communities were devastated and thousands are still landless. Interreligious conflict and vigilantism still reign outside the capital. However after the Peace Accords of 1996, a vibrant Mayan activism has inspired a movement of indigenous education throughout the country. This movement began working with the UNESCO (United Nations Educational, Scientific and Cultural Organization) funded CNEM (Consejo National de Educacion Maya - the National Council for Mayan Education), a national movement to develop indigenous curriculum throughout the country. Local indigenous education organizations engaging in this movement sprouted across the country fueled by a movement of young teachers. While this movement focuses on Pan-Mayan curriculum reform, many Mayan education activists find that it fails to engage youth in activism in their own communities and cultures, where it counts the most. They feel that education activists in the capital have another agenda than helping Mayan students where they live. In the words of Mayan shaman, Domingo Quino-Solis, the main facilitator of the present indigenous research and book project:

> The specific institutions that are responsible for the education drive at the national level lack updated educational documents which are relevant to the present juncture, and they utilize imported educational materials with cultural approaches completely different from those of the Mayan people. This has been one of the reasons in the description of the book that its objective is to be an educational material, which will be for the service of the young Mayan and non-Mayan students at the middle school or secondary level, and for the adults who, in one way or another, receive formal or informal education in their advanced age. (Quino-Solis, et al., 2006, p. 10)

The story of ADJIMA

In the village of Panimatzalam, a movement of young Mayan professionals began taking the lead in both the educational and community development process. This movement is called ADJIMA (Asociación de Desarrollo Integral de la Juventud Maya—The Association of Mayan Youth for Integral Development. Antecedents of this organization began three generations ago with young leaders creating the community's first cooperative. Later, they assisted landless families in obtaining their own land. Two generations later, other young leaders created ACEM, a network of nineteen middle schools. For quite awhile now,

youth obtaining university degrees and certificates from indigenous leadership institutes have returned to the region as leaders in ADJIMA, becoming local accountants, managers, technical and agricultural experts and teachers. One of their main projects is the creation of Mayan primary schools (*Basicos*). Today, ADJIMA covers a network of many villages near the original community of Panimatzalam. They view their work in ADJIMA as both teachers and young professionals as the same project and they focus on keeping Mayan students engaged in the development of their communities while at the same time learning values of their Mayan culture, history, spirituality and language.

The present project is largely a result of ADJIMA's participation. In this article the voices of these young leaders are presented, reflecting on the impact of their inquiry and personal transformation through writing a book about the village's history. The story of ADJIMA is also integrated into the curriculum book itself.

The inquiry team: the *Asemblea*

The research team was called the *Asemblea* (The Assembly), consisting of three members of ADJIMA in addition to Quino-Solis and myself. Felix Noé Mátzar Calel taught at the indigenous technical institute entitled *Chilam Balam* (named after an ancient text of Mayan history and philosophy). He was trained as a car mechanic and served on the village *Consejo* (town council – from now on referred to its name in the village: COCODES - The Council of Community Development) as well as being on the board of ADJIMA. Sandra Rosalia Quino-Juracan was the secretary of ADJIMA, a teacher at Chilam Balam and a teacher at the community Basico (Mayan primary school). Finally Rebecca Elizabeth Xinico-Quino taught at the ACEM school in the nearby community of Santa Cruz, was Coordinator of Civic Action in Panimatzalam, the president of ADJIMA and a coordinator of tourist guides. Each participant choose to wave their right to anonymity in my dissertation that I am currently writing because they were proud of the work they had done, and wanted to use the book as a way to work with other Mayan communities.

Elizabeth Xinico-Quino gained a renewed sense of purpose from her work on the book:

> After the process that we have arrived at in this work, it has strengthened me and given me the courage to share all about my culture wherever I may be, because undoubtedly there exists many other aspects of my culture that I have lost. (Quino-Solis et al., 2006, p.15)

She also felt a specific duty in her role as teacher of Mayan culture:

> The production of the book was a further motivation for me not to remain as I am, but I have to work arduously in the aspects of my culture and new forms like how to make education an instrument of change for the new generations. (Quino-Solis et al., 2006, p. 16)

Rosalia Quino-Juracan emphasized the inquiry and the book's value in reclaiming culture that had been lost, as well as its use for youth to contemplate and reflect upon in taking action. She echoed Xinico-Quino's belief that the book would create a new movement of solidarity amongst Mayan youth:

> This document will help us so that the youth, children and the population in general may know, redeem and practice the values that our ancestors have taught us and in this way, create an environment of solidarity which can elicit valuable contribution from the institutions that support Mayan Education. (Quino-Solis et al., 2006, p. 16)

My own background

As for me, I am a grateful beneficiary of the work of this community. Most of my adult life has been dedicated to community transformation through community-based research. I also believe that education reform and community development are the same project. As part of a spiritually based social activist organization, PROUT or Progressive Utilization Theory (Sarkar, 1992), I seek to develop a society in harmony with the environment. PROUT stresses movements for regional self-reliance within a global network of cooperation. This organization has found success in founding large eco-city projects and training in the development of cooperatives in rural area. It opposes free market capitalism by promoting people-based economies. I realized that my own organization needed liberation from a Western-based research paradigm. That was the initial impetus that led me to the work of T. Smith (1996) and John Heron.

First arriving in Guatemala in 2003, I stayed with friends and then began a quest to find an indigenous community that would work with me. Meeting with leaders of CNEM, they suggested that I work with ACEM, stating that it was one of the most dynamic indigenous education networks in the country. Hitching a ride with the ACEM director, we ended up in his home village of Panimatzalam. Then Domingo Quino-Solis invited me to stay in his house. Our first discussions were magical, both of us sharing a passion for community transformation.

Panimatzalam is approximately four hours from the capital city and near the regional capital of Solola. It is about forty minutes from the tourist city of Panijachel on the shores of magnificent Lago Atitlan (Lake Atitlan). Panimatzalam retains many of the qualities of a traditional Mayan village, comprised of many milpas or household plots of land, collective work projects, Mayan shrines, and annual cultural and spiritual festivals. Inhabitants are also indigenous Kiche or Kachiq'el (two of the twenty-three Mayan language groups) speakers, yet it is also a village in the modern world, especially regarding its successful community development projects, such as agricultural cooperatives, schools that teach bilingually in Spanish and native languages, radio stations, a community bank and village Consejo or council (COCODES)

Quino-Solis echoed my interest in hosting an inquiry that represented the active voice and involvement of village members. He was also interested in a book that told the story of historical transformations in the village. This is really

a story of the community taking ownership over the process and the creation of the book. I returned home sick soon after the book research process began.

The Indigenous inquiry process

Like many indigenous peoples this story involves brutality enacted upon the community, yet also tells the story of a dramatic triumph in developing a strong, autonomous village. The inquiry process and book challenge modern day indigenous youth to learn from their ancestors. It is a call to action that has become the legacy of young leaders in this community for several generations.

The inquiry and curriculum book are very much in the emerging paradigm of indigenous education as espoused by Cajete in *Igniting the Sparkle* (1999). Cajete emphasizes the indigenous ontology of holism, interconnectedness, sense of timelessness, oneness with the natural world and problem posing education. However the present project is also very different in offering concrete activism and skills to involve youth in the economic and community development process of their village. I argue that this additional focus in offering youth a realistic future is critical to keeping youth at home as well as committed to their communities and cultures.

In our earliest discussions I asked Quino-Solis about the Mayan way of storytelling. He told me that Mayan tradition is always to share stories that take the listener to beginnings—the beginning of the cosmos, the beginning of the place called Panimatzalam and the stories of ancestors and elders that teach life lessons.

The research team would move from house to house, interviewing elders about the history of the community. Periodically team members would come together, sharing what they learned and revising goals and objectives for the inquiry. Then they would compile the information for the book and then write it.

Quino-Solis own story played a vital role in inspiring the process. With a Catholic religious education that opposed his own cultural heritage, he was repulsed when told by his new aunt-in-law (also a Mayan spiritual guide) on his wedding day that it was prophesized that he would become a Mayan spiritual guide or shaman. He dismissed the idea as witchcraft and carried on with his life. However, other Mayan spiritual guides would not leave it at that. They frequented his house on their travels through the region and often invited him to nearby ceremonies. One time Quino-Solis acquiesced to attending a large gathering of spiritual guides when he was pressured by a group of them who took him to Mayan shrines cross the country to begin his education as a shaman.

One night he escaped and ended up in a near fatal accident, the scars of which still tell the story. During this time, a particularly kind shaman frequented his bedside, encouraging his recovery and offering healing herbs, which he eventually accepted. He began to sense a power that was neither Catholic nor Evangelical in origin, but something from his deep past. In Quino-Solis' own mind, his tremendous suffering was leading him to surrender to Ajaw, the Mayan concept of the Great Creator.

With this background as a Mayan leader, he was able to unite Catholics, Evangelicals and traditional Mayans in a common movement for the future of their community. He helped introduce formerly antagonistic Christians to the true story of their cultural and spiritual roots. He was also a teacher and leader in the newly indigenous education movement and a mentor to young leaders in ADJIMA. Some might find these roles mutually exclusive, but it was the very syncretic nature of these contradictions that made him an effective leader, negotiating between his deep spiritual and cultural roots and the influences and impacts of Western culture. It is much like Farella's dialogue with a Navajo medicine man in *Wind in a Jar*:

> There is one community with a lot of medicine men, one that is always referred to as traditional by those who know about such things, where I had the following conversation over and over again: Are you a medicine man? Yes. Do you believe in the traditional religion? Yes. Are you a Catholic? Yes. Native American Church? Sometimes. Well, which is it, traditional, Catholic or peyote? Yes. (1993, p. 12)

Quino-Solis and I traveled the countryside, brainstorming ideas for our project and learning about one another. I witnessed his work, both as a regional shaman and as a community activist. For both of us there was an inspiring synergy amongst our spiritual philosophies and experience of activism. He would tell me about the stages of development in the village's history, and the process for our project took shape. We then developed a PowerPoint presentation about our proposed process that would be presented for approval to COCODES. They enthusiastically adopted the project and suggested that a member of the board (Matzar-Calel) join the team. It was then presented to several members of ADJIMA to attract their participation. We discussed the work of Paulo Freire and critical pedagogy, as well as aspects of Mayan culture, history and spirituality.

Notions of John Heron's *Collaborative Inquiry* (1996) in developing an emergent and organic inquiry that includes cycles of action and reflection and Linda Tuhiwai Smith's *Decolonizing Methodologies* (2001), which integrates indigenous worldviews and cultural processes inspired the process. The inquiry would integrate Mayan cultural and spiritual processes into a set of stages that would result in a truly indigenous inquiry and the production of the curriculum book.

The Mayan blessing ceremony

The six of us (The three young activists; Quino-Solis; his son and I) walked through Quino-Solis' *milpa* (family agricultural field) and into a stand of pine trees. We then entered a timber-lined hut...his altar. Quino-Solis formed a circle of sugar, drawing criss-crossing lines within the circle, with each point signifying one of the four directions. In reporting this ceremony I refer to the film documentation of the process as well as a detailed description of the same ceremony that is present in the region of Solola from Molesky-Poz's *Contem-*

porary Maya Spirituality: The Ancient Ways Are Not Lost (2006). This book is an extensive ethnographic and emic (insider's) account of the world of Mayan mysticism throughout the region of Solola, the same region where my PhD dissertation takes place. Molesky-Poz, after years cultivating relationships with Mayan shamans, offers in-depth accounts of specific mystical processes within the context of Mayan community life. As such, it is perhaps the most reliable source of cotemporary Mayan practices in Guatemala.

We all gathered around Quino-Solis, who was dressed in a traditional Mayan turban, ceremonial shirt and blue cortas (traditional short pants). He then began chanting as he formed a circle of sugar on the earth, and then streamed a line of sugar, dividing the circle in quarters, from east to west and north to south. He placed his ceremonial bundle at his side. The narrative of the ceremony from Molesky-Poz continues:

> Red flowers in the west, yellow flowers in the south, white flowers in the north. They scattered handfuls of green pine needles around the circle of sugar, softening the ground. Kneeling around the hearth, [the Ajq'ijab' (Kiche name for shaman began] to spiral the ensarte discs (pine resin), round and round sun wise until they filled the circle. [He] planted a thin green candle and then a blue one in the center of the hearth, circled the candle couplet with laurel leaves, and then ocote (pine kindling). (2006, p. xiii)

Later, I ask Quino-Solis what the importance of various colors were for the inquiry process and the book,

> As for colors, color red, is immersed in the ideas, knowledge and wisdom of each person who gave their input in the process of the book. The color is black implies the energies of grandmothers and grandfathers which were invoked in the ceremony and held in the process of the book. The color yellow is linked to three generations who have given life to the community Panimatzalam. Implicit in white is the path that the three generations passed in arriving at the social condition that is currently lived. The color green is immersed in the growth of the sacred corn that is part of the everyday life of the Mayan people. (Quino-Solis, 2006, pp. 33-34)

Then the shaman continues, offering the narration of Mayan cosmology; the creation story; mention of key Mayan heroes; supplication to the Great Creator and the forces of nature, and recognition of the ancestors:

> In the name of the Heart of the Creator of the Wind, in the in the name of the Heart of the Creator of Fire, in the name of the Heart of the Creator of the Earth, we give thanks to you that you work with us. You, Creator, you planted us, raised us, and you make us, work us. So, we

> give thanks to you, Creator. Thank you for all of this, all you did, all you do. Thanks for all your work. You, the one who made the road, made the mountain, who created the trees. You, the one who created all the animals of the world. You made the road for the rivers, the ones who live in the house, the ones who live in the mountains. You create all the trees, all the weeds, all the animals who take care of the mountains. You create the air, the clouds, the wind. You make the farther and the closer. You worked on it; you put your seeds on it. You created it; you worked on it. And we remember those who niver give thanks to what you made. For all of your children, who never remember you, we wish that you wouldn't place any sickness on them. Don't abandon them....
>
> Ixmucane, Ixpiyacoc, Junajpu, b'alanke, B'atz' [names of Mayan heroes]. We're here. Those who call you, these really pray, really beg you in the night of the darkness, in the day, in the sun, in front of the stars, in the wind, in the drizzle, in the mists, in the thunder, in the rocks, for all those in this sacred cave [altar]. These are the words that the ancestors gave us. And that's how it started when the light hadn't come yet, when it was not clear....
>
> Heart of Heaven, this is how our ancestors talked with the people. This is what the *Pop Wuj* says, "You are the Creator, Former. Don't leave us. Give us ancestors forever." (Molseky-Poz, 2006, p. xiv)

Then Quino-Solis recounted the 20 nawales (roughly translated as "vital energy" or vital force"—discussed in greater detail when presenting the curriculum book), that make up the Mayan Calendar; comprising 260 days in total. Each nawal represents aspects of Mayan cosmology for particular days. Reviewing these serves as a basic teaching and initiation into the philosophy of the Mayan worldview. All of human expression and that of the created universe is related to one of the 20 nawales of the calendar. This is the lens through which Mayan peoples frame and interpret their actions in the world. By discussing these nawales, we are able to understand the ontology of the inquiry. Each individual's relationship with other people in the village is impacted by the knowledge of their personal nawal. The way to understand who these people are today and the ancestors of the past, and why they developed the community as they did is related back to the nawal that identifies their particular qualities and potential. In village life, discussion of individual nawales is the comparable to discussing the formation, development and manifestation of individual potential as in any culture.

Quino-Solis then waved smoke over the head of each person after which each participant lights two candles and places them on the altar. I repeat the final closing from the text of Molesky Poz:

> Pay attention to what I am saying.... These are the words of our grandparents. The day comes, and we have to go back, they say. And they went back where the day ends. We are going back and we'll be

> saying bye, bye. We'll have to say goodby to our houses, to our land. We're going back to where we came from. These are the words that our granparents left, that we're remembering and mentioning now. (2006, p. xvi)

At the end of our ceremony with Quino-Solis, each participant helps spread out the ashes from the fire, until what is left merges into the large blackened spot that greeted us when we first entered the shrine. From this somewhat brief review of a two to three hour process, we glimpse the importance of the ceremony and Mayan ontology, epistemology, axiology and practice.

Back in Quino-Solis' house we brainstormed ideas about the inquiry process and the duties that each participant would take. The two female teachers, Quino-Juracan and Xinico-Quino, would conduct the bulk of thecommunity interviews and meetings in order to narrate the history of the village. They would also collect legal documents, letters and data about the history of Panimatzalam and the country of Guatemala. Matzar-Calel would focus on acquiring graphics, photos, charts, political cartoons and illustrations that portrayed both the history of the village and that of Guatemala.

After this, Quino-Solis asked participants to brainstorm the major topics of the book. They mentioned economic, political, cultural, spiritual, agricultural, educational and ecological themes of the community's history. Then Quino-Solis wrote down the major events in history that he encouraged the participants to investigate. These included the formation of the first cooperative, the movement to acquire more land for the community, the impacts of the civil war, the development of the networks of cooperatives; the development of ACEM and the founding and development of Chilam Balam and projects such as ADJIMA.

From this point on, participants were actively holding interviews and meetings with elders and participants in various organizations, as well as researching documents about the village's history. They were also gathering parables and stories about Mayan culture as well. They would return to Quino-Solis house each week to share what they hard learn and to start organizing the chapters of the book.

This story of community development begins when three brothers keep their winnings from a card game and buy consumer goods to sell to the community. This began the first cooperative. The following year, several more youth join in and a youth movement is born. Next was the phase when members began to outline, compile and finally write the curriculum book. All the information from interviews, discussions, investigations, the collection of documents and illustrations came together as the participants assisted in the organization and writing of the book.

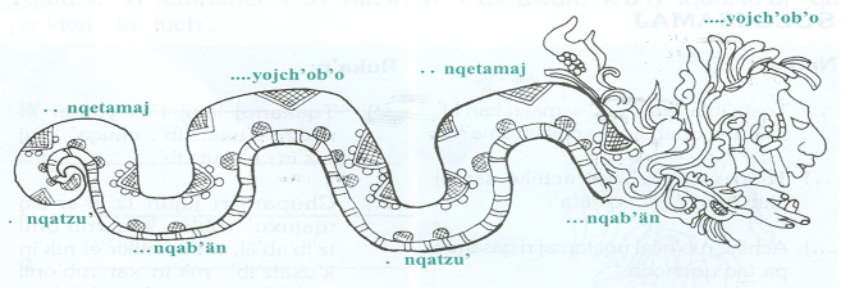
Review and analysis of the curriculum book

The book cover (See Figure 1 on page 140) is filled with a variety of colorful weaving patterns like ones you would find on a local huipila (woman's traditional

blouse). The pattern and colors of each pattern then form borders for each chapter. There are also photos of the Bella Vista Cooperative, the first cooperative; the headquarters of CORCI (Coordinacion Regional de Cooperativas Integrales - The Regional Coordination of Integral Cooperatives); the village church, and a photo of the first group of youth leaders. Many pages have clip art images; cartoon drawings of political and community events; photos of events; key people in the village's history; community buildings, and Mayan symbolic art.

Quino-Solis later explained the meaning of the "Plumed Serpent" and its importance to the inquiry and to the book. Inserted at the very end of the book (See the stylized Mayan serpent in Figure 2 below) it indicates a sense of Mayan spiritual mission that is referred to again and again by members of the Asemblea To Quino-Solis, this is about addressing the importance of Mayan ontology of the past, present and future in the process of integral development and in the process of the research and production of the book.

Figure 2: The Plumed Serpent



The head of the serpent is represented in *Yojch'ob'o*, signifying "to think of the past to strengthen the present as a way to improve the future." This word appears again on top of the second curve of the serpent. The first curve in the upper body, termed Nqetamaj and appearing again towards the end of the tail signifies "to understand the past, the present, and the future." In the lower part of the body and repeated in the first lower curve and at the end of the tail, *Nqatzu* signifies "to see the past, the present and the future." The final curve, *Nqab'am* situated at the bottom of the head and again in the second bottom curve, signifies "taking action, taking into account the past, to strengthen the improvement of the future" (Quino-Solis, 2006, p. 40).

The text of the book is an example of critical pedagogy. Founded by Paulo Freire (1995) and best explained in his *Pedagogy of the Oppressed*, critical pedagogy is a strategy of teaching that asks the reader to reflect upon and challenge their own life experience and then to take action about issues that concern their daily lives. Freire, through his Spanish language classes, showed students illustrations of their present exploited lives, often in the form of drawings of people in harsh factory conditions. Then he would show them illustrations of people in idealized lives, living a pristine life in harmony with nature and in harmony with one another. In his teachings he would then ask them to take action in opposition

of oppression and to achieve the goals of these idealized dreams. When asked about the impact of Freire upon the book, Quino-Solis stated:

> That which concerns the pedagogical studies of Paulo Freire, to this point, has a certain impact on this book. During my studies at the University, we have utilized educational materials focused on popular education, educational invoking, as an element of support in the search of integral development of the communities. (Quino-Solis, 2006, p. 35)

The book follows Freirian imagery and the problem posing dialectic that follows as well. The first two chapters chronicle the exploitation of the rural Maya by a succession of corrupt politicians, religious figures and the influence of the U.S. government and U.S. multinationals. It also refers to the Freirian process of conscientization as a major theme of community development. To the authors, this term refers to villagers identifying and fighting the cause of exploitation, and then awakening to the power of their own participation in shaping their futures: "To invite, convince, encourage, and make people understand the importance of their participation in the meetings scheduled in the communities, that is called conscientization" (Quino-Solis, et al., 2004, p. 89).

With each revelation of exploitation, the reader is asked about how these experiences impacted village life in Panimatzalam. By engaging students in how the wider political specter also impacts their owns lives, it follows Freirian practice by asking what the life of the exploited feels like. In this case students are asked what it would have meant to their elders to experience exploitation.

The critical response is illustrated in subsequent chapters, which chronicle the development of the village. They cover the initial organization of the village, the development of the first cooperative, the development of religious unity, and the emergence of the regional integral development movement (CORCI) and the movement for Mayan Middle Schools (ACEM). Within each chapter, and especially at their end, students are asked to reflect upon the experience of the progress and transformation of the village and how this impacts their own choices in life. As each chapter proceeds, students are challenged to act in greater levels of engagement to create a future in a participatory and collective manner that benefits everyone in the village.

In the introduction it is stated that students would be challenged to action through the text, and this is emulated at the end of each chapter through a section titled *Manos de Obra* or "Hands to Work" (also translated as "handy work"). The image of a seated Mayan scribe (left), signals this discourse. This is the inquiry team's engagement of youth again in a Freirian process and the impetus to act upon what is learned in their daily lives. Regarding the importance of Manos de Obra in the book, Quino-Solis stated:

> The questions direct the youth to solve problems, that are planted after studying each chapter, which is described in the work featured in the Mayan icon, title 'Hands to Work' that the students are able to realize

> in the educational annals or after them. The methodological strategy of group and individual work planted in hands to work is for much practice and success, but, depending on the responsibilities of the learners. (Quino-Solis, et al., 2006, p. 7)

The beginning of the first chapter is dedicated to dialoging with youth and setting the tone to entice youth into action:

> Esteemed young people, I am very glad to be with you with the hope that this meeting may strengthen you to learn about the arduous work of our ancestors who lived in this place of land where we were born. (Quino-Solis, et al., 2004, p. 1)

Later folkloric tales teach parables and call students to action. The authors also use metaphors from Mayan life, especially those that are central to Mayan worldview, such as the significance of corn, and importance of elders:

> I invite all of you to start a journey on the path where our history has passed, which is like the mountain ranges of our mother earth, some high, some medium-sized and other of flower heights.... Certainly, you are left to ponder how much to contribute your grain of corn, and that way allow the continuation of the integral development of our communities our fathers desired so much. (Quino-Solis, et al., 2004, p. 1)

And further, from an insert on the first page:

> The ancestors of the community remembered in each gathering that the youth are the future leaders of our development. For the same reason, they need to take responsibility for collective work, from fifteen years of age, so that they understand how to live together, and how to participate with their elders, and in this way the seed of unity will not die. (Quino-Solis, et al., 2004, p. 1)

The introduction of the reader has philosophical stances that are presented as values or principles that pervade the history of the village:

> It can be said that what helped them (our fathers) to achieve the social development of our community is the respect, the will, the love and the unity amongst all, without any discrimination and as a result our community exists as it does today. (Quino-Solis, et al., 2004, p. 2)

The geopolitical situation: The October Revolution, 1944–1954

The October Revolution section tells the story of the democratic and agrarian reforms enacted under the leadership of President Dr. Juan Jose' Arevalo. The period from 1944-1954. This was an era of economic abundance throughout

the country and especially for the campesino (peasants). There were local banks established and incentives for small farmers. Networks were developed for export products. However, rich European land owners and US corporations, afraid of losing their land, funded a movement of violence and brutality (Quinto-Solis, et al., 2004).

This is an important national backdrop from which light is shed on the movement for the integral development of Panimatzalam. After forming the first cooperative, the military stole the goods sold there, forcing the cooperative to close for two years. During this time there was widespread kidnapping and murder by the military within and surrounding Panimatzalam. The bodies were buried in clandestine cemeteries. After two years, their burials were exhumed and those killed were given a burial in the Panimatzalam cemetery. At the end of the chapter is a memorial to and list of those slain, "as a reverence to them and a reminder to those of us who are fortunate to read this text" (Quino-Solis, et al., 2004, p. 10).

The pedagogical purpose of the book is re-emphasized at the end of this section, with the authors suggesting that "it is important that you share your knowledge in class, with the objective of sharing what you have learned in the first part of the text." Then students are encouraged to read on as a special task, with a reminder that it may cause sorrow as they learn about the brutal violence supported by the government and perpetrated by the military against thousands of rural Mayan people.

The next section titled "The Bitter Fruits of 1970–1996" is a chronicle of the infamous thirty-year Civil War. During this time military forces used the excuse of fighting a largely fictitious guerilla army to subdue and enact genocide upon indigenous Mayan peoples. Village members hid in the nearby mountains. Family members were killed and their bodies never returned. Work ceased and people stopped traveling out of fear: "The corpses of dead people were scattered along the roads of the country, with missing arms, eyes or tongue, a sign that they were brutally tortured. From Panimatzalam to Panajachel the tortured lay on the road." Then there is a special message to students by the authors to personalize this narrative in a style of storytelling:

> It was truly years of much pain, terror, fear and insecurity. Some of the people alive today were also included in the black list of death, but thanks to the protection of AJAW and Mother Nature, death was not permitted to touch us. That is how I could relate these experiences and if I am able to tell you another experience at some other opportunity, I will with much pleasure. (Quino-Solis, et al., pp. 16-17)

At the end of this chapter students are asked to review "what touched your heart the most." Students are then asked to form groups of six in order to begin a reflection and investigation activity. They are asked to write about:

- What was the cause of the internal war?
- What changes occurred after the signing of the Peace Accords in 1996?
- Who benefited by these Accords?
- Why do schools not teach the real meaning of revolution?
- Investigate the history of education in other countries where revolution has been experienced. (Quino-Solis, et al., 2004, p. 18)

Finally students are asked to develop their own text of history in order to develop a plenary—an interactive session within their groups.

The next chapter leads us through the story of the founding and initial functioning of the village. This begins through the early stages of community organization, to the first cooperative and ending with the founding of Chilam Balam (the indigenous technical institute). Next comes the defining story for the collective development of the village. It is the story repeated often of how a group of four brothers were playing cards in the corridor of the school led to the formation of the first cooperative. This occurred in April 1965. After winning at least 100 *Quetzals*, one brother asked the other three to contribute the same amount of money. This brother would then sell fruits, vegetables, candies and biscuits during Holy Week. These goods were sold for a total of 800 *Quetzals* and a total profit of 400.

To the authors, this was an exciting breakthrough, where the benefit of the spirit of collective work and unity began to evolve. More meetings were held in the community, and more youth continued to join the enterprise:

> At this point Quino-Solis and Juan Morales Quino; two original members of this young leaders group, created a vision for the long-term development of the cooperative. The goal would be to expand our cooperative in the coming years to generate jobs for the members and leave in inheritance a better future for our sons and daughters. (Quino-Solis, et al., 2004, p. 33)

After this, the authors ask students to rest from the story of the village and listen to a Mayan parable. They entreat students to listen and learn from the stories of their grandfathers, told while gathering around a fire:

> When grandparents narrate something, it is always with educative values as they wish for their children to be obedient, responsible, educated and good workers, so that they may know how to make one's living when they become adults. (Quino-Solis, et al., 2004, p. 39)

The parable tells the story of a lazy son who would daydream all day, and then answered yes to his father when asked him as to whether his work was progressing. One day the boy spied a turkey buzzard and grew jealous of the care free life that the bird seemed to have; easily getting food, not doing work, not tiring,

and not having to change clothes. The buzzard plucked his feathers and put on the clothes of the boy, at the same time that the boy took off his clothes and put on the feathers. In this way, they exchanged lives. Soon the boy was repenting his plight, having to eat dead carcasses to survive. One day, however he thought that the smoke from a mountain indicated the cooked carcasses of animals. Diving down, he realized too late that the smoke the he thought was from a cooked animal was really a mountain fire. Thus he met his demise. The obvious lesson for the reader is that nothing is gained through lethargy; they are to take this story and compare it with the lives of the founders of the village.

I quote the Manos de Obra at the end of this section, again a didactic tool for action and reflection in full detail:

> Young students, you have realized bit-by-bit, step-by-step, shoulder-to-shoulder, how the inhabitants of Panimatzalam have achieved progress and transformation for the benefit of all. Now, please analyze and make comparisons of this legend with the life of the first dwellers of Panimatzalam:
>
> (1) Make a description of how the idea of organizing themselves came about to the first inhabitants of the community
> (2) Make an investigation about the perspectives of Panimatzalam in the coming years from old people
> (3) Make a description from your readings done up to this point of the second chapter - what touched you most and how the people of the community related to each other?
> (4) What concerns should the residents of communities address in regards to collective projects. (Quino-Solis, et al., 2004, p. 41)

The next challenge in the book was that most of the residents of the village were tenant farmers. They worked the land under contract from an owner that managed land throughout the country. The problem was that whether crops were successful or not, farmers had to pay the same amount for renting the land. If they could not pay, the farmers were forced to work extra time on the farms owned by the same owner on the South Coast as payment. The result was a great deal of suffering due to low wages, deprivation of housing, lack of treatment for diseases and lack of education for children. On these plantations up to two hundred people slept in a single large hut.

For the book's authors another major step towards the goal of integral development was the purchase of land formerly owned by *Ladinos* by the village of Panimatzalam for the landless community members. With this step, families were able to quit their near slave jobs on the coastal plantations. The farm contractors, who preyed upon family weaknesses, disappeared and every family could then provide for their own food security.

Seeing the political conflicts that often short circuited projects in surrounding communities, the members of Bella Vista Cooperative met together to form a regional network of agricultural cooperatives. Aware of the development of

cooperatives in villages in the region of Panimatzalam, members met to discuss ways for other cooperatives to coordinate their work together.

The next major step in the development of the community was to begin to send youth to three indigenous leadership institutes; one in nearby San Andreas Semetabaj; one in city of Santiago on the shores of Lake Atitlan, and an additional one in the ancient capital of Antigua. While hundreds of thousands of indigenous Maya were leaving their communities, desperate to find work in the capital or in U.S., this new group of educated professionals returned to Panimatzalam as public accountants, rural teachers and managers in local and neighboring cooperatives and community businesses. Soon, these educated youth had formed their own organization, the Association for the Integral Development of Mayan Youth (ADJIMA), and were adamant about starting a school for professional education in the community.

At this, we come to the close of another chapter. As in other chapters, there is a personal note to students about using the knowledge learned from their readings, and there is a *Manos de Obra* narrative, calling students to reflect upon what they learn and take action. The note to students begins:

> Very good, my dear students. I think that you have taken much experience from the wide and narrow paths, and for the short and long paths that you have crossed in the journey of the projects for collective integral development that are described in this valuable educational text. (Quino-Solis, et al., 2004, p. 59)

Students are then reminded that the purpose of this document is not merely for reading; it is for carrying forward the "frontiers of our work." They are invited to reflect and comment with their friends in a way that will help them to build an understanding to carry forward with their mission: "that has been entrusted to you from the Heart of the Sky and the Heart of Mother Earth" (Quino-Solis, et al., 2004, p. 60).

As in the previous chapter, there is a moral parable attached to the end of the chapter that brings to vivid life the exploitation that families experienced at the coastal plantations and the story of unity and collective work that brought the community forward in its progress. This story is of Isabel, a fictional character, who is much like the children of Panimatzalam whose families had to travel to the coastal plantations as indentured laborers. She had no change of clothes, and there was hardly any food. Her mother hid green bananas in her shawl to give her. Isabel promised to help her mother earn money if they stayed at home. In the afternoons, after her work in the fields, she studied to become an organizer in community development. She worked in the community, "organizing the people, training and educating them about ways to avoid returning to the coastal plantations, telling her own story as an example" (Quino-Solis, et al., 2004, p. 61).

The Manos de Obra after this story, as in other chapters, invites students to reflect upon the contents of the chapter. Again, students are asked about what touched them most about the history of the development of Panimatzalam. Sug-

gestions are made for the youth to begin to engage the community in a number of community programs, including cultural nights; community forums; photographic exhibitions and radio programs. Students are reminded to plan activities strategically with clear methods, contents, time schedules, and responsibilities. They are encouraged to solicit the support of their companions in order to carry out projects in a "dynamic and participative way." Then they are minded to develop presentations that carry a message that catches attention and "gets through to their life" (Quino-Solis, et al., 2004, p. 64).

The beginning of the following chapter gives a quick review of the development of four public schools; the developments and improvements of the Bella Vista Cooperative; the founding of CORCI, The Regional Coordination of Cooperatives; COCODES, the village council; and the Union y Fuerza de Mujeres (the Union and Strength of Women) discussed previously. Then a more recent women's organization founded in 1999 is introduced that runs an academy for women's economic development, teaching hairdressing, sewing, and typing. There is a second corn mill in this building and here also women produce fabrics for export. There is also further elaboration of the work of ADJIMA, also mentioned earlier in the book. This organization has grown to include both professional and non-professional youth and also includes those working in schools in the region of Solola. Their participation in primary schools in the region has inspired a greater number of youth to continue their education at CHILAM BILAM.

The following chapter is a purely pedagogical text, teaching the stages and processes of community development through a personal sense of activism. It begins with the story of Rigoberta Menchu Tun, the winner of the Nobel Peace Prize, as an example of a leader who paved the way for others. She spoke out about the suffering of Mayan people and drew international attention to their cause. Readers are minded to learn from these leaders and to follow in their footsteps, and according to the authors, changes in communities have to occur, and for this reason participatory action is encouraged, inspiring new ideas and changes that support integral development. What is left is to learn "what and how to act for the benefit of those living in a specific place" (Quino-Solis, et al., 2004, p. 85).

Readers are then given a comprehensive vision—a set of values and principals, a respect for Mayan spirituality, a plan of action, a nexus of services and a coordination of organizations that defines integral development:

> When, in a given community, there is sufficient food, land for cultivation, a decent house to live in, schools for children to study and other basic diversified educational centers; if there are higher education schools, educational centers with practical and productive workshops, sports fields, community assembly halls, health dispensaries and low cost medicines available to the people, potable water for consumption as well as respect for the rights of people, equality for all, and where every man, woman, youth and child are organized, we refer to that as

> integral community development**.** In addition, if we can count on an updated education, which takes into account the different cultures of people, according to the region, all inclusive, free from class, religious or any other discrimination; an education that fosters unity, respect of mother nature and the harmonious practice amongst all as brothers and sisters within a cosmographic horizon, that I call integral development. (Quino-Solis, et al., 2004, pp. 85-86)

Next comes themes of integral development, as processes essential to the success of the above vision. The first theme is that "communities are changing, they are not static." We are told that community life has a rhythm of changes; changes in population, culture, language, dress, script, work, climate and spirituality. Those responsible for change are responsible for accommodating for these rhythms. With sensitivity to diversity in age, social status and the participation of women, and moving from the family to the group, community, region and nation, "inculcate an education with social meaning for life's formation" (Quino-Solis, et al., 2004, p. 86).

The second theme is to "break the paradigm of silence." This is to change the situation of people who have been silenced due to the "fear, terror, divisiveness, exclusion and extreme poverty" from the 36 years of civil war. Community activities inspire people to share their stories and to stand up against continued exploitatation. Added to this are the dogmatic preachings of religious and cultural doctrines that have been inculcated in people by the exploiters to cultivate passivity. Examples include: "Blessed are the poor for theirs is the kingdom of heaven, "Seek the things from above and not those of the earth" and "Why should we organize ourselves when Christ is already coming?" (Quino-Solis, et al., 2004, pp. 87-88). These and similar doctrines are heard often in public squares, in meetings and at religious activities. People manipulated by those in power often refuse to attend community meetings because they consider this a sin.

The third theme is carrying out conscientization meetings. Conscientization meetings for the authors have the goals of addressing solutions for socio-psychological problems. In meetings, people challenge the dogmatic preachings mentioned above that relegated people to poverty, and realize that there are no distinctions based on class. The challenge is then for people to work in unison and to collaborate in contributing their ideas for future generations.

As mentioned at the beginning of the book, the way to conscientization is: "To invite, convince, encourage and make people understand the importance of their participation in the meetings scheduled in the communities, that is called conscientization" (Quino-Solis, et al., 2004, p. 89). The idea is to help people to overcome their negativities, by explaining the benefits of working together. A saying from the *Popul Wuj* (the ancient book of the Maya) is then quoted to emphasize the goal for all to move ahead in unison: "that neither two nor three lag behind, all are united to continue ahead" (Quino-Solis, et al., 2004, p. 87).

The next theme is "Organize to educate." The idea here is to gather people together, producing a collective strength that rises above the individual, where

every individual has something to contribute. The educational aspect of this theme is show youth and children through personal example with the "object of making them learn how to work in community, and to manage collective projects for the benefit of those living in communities" (Quino-Solis, et al., 2004, p. 89).

Once a collective effort begins, then basic steps in organizing need to be followed, deciding who forms part of the organization, who leads it, what resources exist, what the objective is and where it will function: "We refer to all this process as organization and capacitation" (Quino-Solis, et al., 2004, p. 89). The authors draw an analogy with the work of ants, bees and others: They are well-organized, have their own responsibilities, and work unselfishly for the collective good, able to move large piles of earth overnight through collective work. At the end of this section, students are invited to take action based upon was learned in the chapter. Students are asked to review their purpose for being born; which is unveiled in their particular nawal (vital force tied to particular calendar days).

Following this is another message to students challenging them to review what they have learned throughout the entire text, and what they have put into practice. Students again are admonished not just to read the text, but also to put into practice what they have learned in their communities:

> Dear students, I invite you to take up the great challenge of those great people whom we owe much for what we are enjoying nowadays. They brought nothing with them of what they labored upon this earth, before taking birth in this world.
>
> From mother earth they (the ancestors) learned everything that they did for the good of humanity. If this is so, think about and investigate yourself: why did your parents beget you, what mission do you bring upon earth, and towards where are you going, as one who doesn't know where he/she is heading is lost. Before making your corresponding work we propose that you read attentatively the specific contents of the 20 nawales of the Sacred Mayan Calendar, which will help you a lot. (Quino-Solis, et al., 2004, p. 95)

***El Cholq'ij'o* Calendario Sagrado Maya: The Mayan Sacred Calendar**

Finally, there is an explanation and description of the full Mayan calendar, called the *Cholq'ij'o*. Considering that the sun, the moon, the stars, and earth and the people are all interconnected, it is important to consult the calendar in daily life, which elaborates the forces of nature and the twenty nawales which are the vital energies that pervade life. I continue with my dialogue about the calendar begun earlier in this article with information from the text. Each day is associated with a particular nawal; which tells us when it is suitable to carry out the wide variety of activities in the daily life of Mayan people, from commercial activities, to planting and harvesting, or celebrating marriage. Each of these life forces describes the character and traits of the people born on those days. The translation and meaning of each of these were passed down from the oral traditions

of "our grandmothers and grandfathers" as well as from Mayan spiritual guides. Reading over and contemplating each nawal reveals an elaborate philosophy of life, which is the Mayan worldview. It also reveals the variety of human traits, values and ethical principals that make each person a leader in their own way. There are three nawales to take into account with each person, including the day of conception, birth, and the avocation of the person (determined by shamans).

Next to each of these life forces in the text is the symbol or glyph of the nawal that helps form the symbols of the Mayan alphabet. Rather than going into the details of each one, below is a sample of five of them to show what they mean and how they are applied in life:

- *Batz* means monkey or thread. This is the life force of arts and textiles, and it is a propitious day of activity, finalizing or breaking off an affair. People born on this day are sculptors, engravers or musicians. The positive traits of people born on this day include being positive, intelligent, friendly and reserved. The negative traits include anger, unbelieving, aggressive and ambitious.
- *Ix* signifies the Jaguar. This is the nawal of nature and Mayan altars. It is a propitious day for requesting physical and mental strength. The positive traits are being valiant, reserved and having good health. The negative traits being enamored, lazy, unbelieving and seeking pleasure.
- *No'j* signifies idea or wisdom. It is the life force of intelligence, and is a propitious day for requesting wisdom, talent and good thoughts. The positive traits include: good ideas, good imagination and the quality of investigation. The negative qualities include being enamored, vain, unbelieving and vicious.
- *Toj* signifies offering, payment and rain. This is the nawal of the four lords of fire, indicating a day for settling and paying off debts. The positive traits are being trustworthy, visionary, pleasing, and sensing foreboding. The negative traits include being lazy, ambitious, a sinner, destructive and fragile.
- *Keme* signifies death and the master of darkness. This is the nawal of all types of death, and is a propitious day for requesting death to stay away or to grace the dying with peace. The positive traits are to have wisdom, wealth and to be a protector or philosopher. Negative traits are being prone to slander and diseases and being enamored and domineering.

At the end of this chapter is the final *Manos de Obra*. As in other chapters, students are asked to reflect upon what they learned and to take specific action from what they learned:

> Have you read the entire educational text? Very good, a lot of congratulations from myself. Have you put into practice what you have learned

> from the book while. . . in the diverse pages? If not, think and analyze that it is not enough to read the text for the reading's sake. Do something so that on you may become a better leader and a better professional. Demonstrate to the humanity that you have the capacity but you don't have to shout it to the four winds, and it is necessary too show your example, and by doing so, you will gain the confidence of your fellow beings. Now investigate why and for which purpose there is so much talk about community development....
>
> Investigate when and why people turn to be leaders according to the Sacred Mayan Calendar. Form groups of four or five people and make a newspaper mural putting down or pasting newspaper clippings with drawings that represent the types of existing leaders. (Quino-Solis, et al., 2004, pp. 100 & 102)

Students are then encouraged to develop plans for their activities, stating objectives, program and contents of tasks, taking into account that the work of the whole is greater than the sum of its parts. Then there is a personal parting note to students:

> Well, as you know everything has a beginning and an end. These have been the experiences and knowledge that has been achieved through the year, which I hope, may be of much use for you to share with your parents, friends and other associates.... the Heart of Heaven and the Heart of Earth permit to grant us some more years of life and the possibility of sharing with you arising one more time, it will be one more opportunity. (Quino-Solis, et al., 2004, p. 102)

At the bottom of this last page is the Plumed Serpent referenced at the beginning of the book discussion. Its curves are metaphors for phases in the inquiry and book process, for example, "to understand the past, present and future" and engaging in action, "taking into account the past, to strengthen the improvement of the future" (Quino-Solis, et al., 2004, pp. 101- 102).

Final reflection

Approximately one year after the first draft of the book was completed, I phoned Quino-Solis to ask him about how reflection was utilized in the inquiry. He reported back that the team would often meet to discuss their experiences during the process. The team also kept meeting after the completion of the book, because their consciousness had been raised through the process, and they wanted to continue to apply ideas learned in the inquiry. One concrete outcome was that they began working together to develop a fruit tree cooperative with students in ACEM schools. They were putting their knowledge of community development into practice through a pedagogy that engaged youth in real world work. In this sense I can report, that because of the book and the inquiry, youth were indeed engaged in developing the future of their community.

Following are the answers to reflection questions posed by both Quino-Solis and myself by Quino-Solis and two of the leaders from ADJIMA (Quino-Solis, et al., 2006). A key question begins this section, "What inspired you to become involved with the book? In answer, Quino-Juracan addresses a very personal mission of the value of the teachings of elders and the lessons of history to the future of youth:

> My inspiration was imagining the importance of the ability to redeem our history and shape it into a document that really benefits the community of Panimatzalam as well as the educational community at the municipal, regional and national levels. The compilation of all the facts will help us to appreciate our elders and redeem values that lamentably have been lost nowadays, which will help our young women and men, children, and all the people in general to contemplate upon, considering the book as a document of our Mayan culture. (Quino-Solis, et al., 2006, p. 11)

Quino-Solis mentioned the value of the book as a tool to teach not only in Panimatzalam, but other villages in the region of Solola the important processes that shape identity and transformation:

> Personally, the idea arose for the publication of a book, which can serve as a documentary compilation of the historical process of the Panimatzalam community, wherein the processes of organization, identity and culture, development, transformation, and the present conjunctural situation are immersed. It will be a valuable patrimony of the community of Panimatzalam and an example for different villages of the diverse departments that form the Guatemalan State. (Quino-Solis, et al., 2006, p. 2)

Asked about how the Mayan blessing ceremony made them feel, Quino-Juracan and Quino-Solis echo each other that before undertaking any significant enterprise, it is a custom to ask the permission of AJAW (God), and then to ask for strength and support to obtain the objectives of the work. For Xinico-Quino, it is a way to communicate with the Supreme Being. Quino-Solis added a more specific response about the meaning of AJAW, the way in which AJAW will support their work, and the specific benefits this will have for the book:

> In the Mayan civilization, before beginning any work, you always need to invoke AJAW, the spirit of the ancestors, and the energy of our mother earth, as a medium to request strength, knowledge and effective functioning of our sensorial bodies; [and] active participation of the investigators and interviewees to obtain the objective of what one proposes, specifically, the publication of the book. (Quino-Solis, et al., 2006, p. 19)

A second question, also rewritten by Quino-Solis, asked, "What is the impact of the Mayan calendar book" (Quino-Solis, et al., 2006, p.19). Xinico-Quino responded that the important support of AJAW brings a spiritual presence throughout the book process:

> Inside the Mayan culture, the practice and value of spirituality is fundamental in all that is felt, and [it] is not only at the beginning of activities, but also during the process that has already occurred many times, certain improvisations that one also consults to AJAW (God) and the nawales of our ancestors to set our path for the most part of the development of the work and thus successfully until the finish of the planned work (Quino-Solis, et al., 2006, p. 24)

For Quino-Solis there is a broader importance of the ceremony to the success of the book. Grounding the book in a Mayan ceremony brings a heightened sense of importance and commitment from the community. We get the sense that the book would not have been a truly "Mayan" enterprise without the ceremony:

> The impact of the Mayan Ceremony, in the process of the work done in relation to the investigation that was required for the publication of the book, was very important. One can notice palpably the impact, that at the time of visiting the families they did not limit themselves in providing certain information. The elders and leaders became interested in the book, and they emphasized immediately that the book is the patrimony and the cultural wealth of Panimatzalam. (Quino-Solis, et al., 2006, p. 5)

He then gave a concrete example of the way in which the ceremony brought a greater participation from the community and more specifically from CO-CODES:

> When we held the community meeting to present the initial data and draft of the book, the Community Council of Development (COCODES) contributed their ideas to improve the same. The positive contributions of the Council and Elders, along with the active participation of the community demonstrate that the celebration of the Mayan Ceremony has and will have its impact in the process and conclusion of the book. (Quino-Solis, et al., 2006, p. 11)

Xinico-Quino mentioned the importance of the medium of oral traditions through parents, and adds that living in the midst of other cultures includes additional responsibilities. Quino-Juracan and Quino-Solis emphasize the importance of working from the impetus of elders—it is due to them that customs and traditions continue. It is also they who help new generations assimilate new knowledge.

Another question addressed the Mayan process of inquiry that was applied to the book. Quino-Solis phrases this question as "What was the Mayan process [of inquiry] before producing the book?" (Quino-Solis, et al., 2006, p. 20), From the answers, I would rephrase the question to be one of how a Mayan process of inquiry was applied in the production of the book?

Quino-Juracan repeated her previous statement about the importance of seeking the support and acknowledgement of AJAW "who is the owner of all from whom protection, strength, understanding are requested?" (Quino-Solis, et al., 2006, p. 20). Then she mentioned the importance of seeking the ongoing approval, support and comment from COCODES, which is made up of representatives of all the committees of Panimatzalam and represents the authority of the village. Xinico-Quino specifically mentions Paq'uch, which translates as a sense of mutual support and solidarity:

> Within the Mayan culture, a purely integral task is practiced in the midst of the family, with the objective that all work is completed with success and within the community—that work is done in a reciprocal manner, which the Mayan people call Paq'uch. That means work amongst everyone and in this way a good result is achieved and done in less time; practicing a value of Mayan culture that is solidarity and mutual support. (Quino-Solis, et al., 2006, p. 16)

Quino-Solis echoed Xinico-Quino:

> In the Mayan culture, to begin any type of work, whether spiritual, material or physical, there exist certain disciplines that one needs to respect, which are derived ever since the conception of our ancestors. The initial process always takes into account the Mayan ceremony, as an alternative of invoking the energies of our ancestors, and in this way, obtain without any problems the success of the work planned (Quino-Solis, et al., 2006, p. 5).

Quino-Solis' voice in recognizing the authority and role of COCODES was also more active. With the following passage we gain great insight into the essential role that this body plays regarding all projects in the community, and this certainly impacts the process of the inquiry and the book:

> The meeting with the Council of Elders, that has been transformed into a new organizing effort as the Council of Community Development COCODES, which is the highest body of the community, is where the realization of any investigation is planned. They are the ones who give information about the development of the program to be implemented.... Thereafter, the investigation team went to carry out the group, individual and organizational interviews. The finished investigation is presented once again to the Council, who gives approval as to whether the writ-

> ten facts are true or if it is better to modify them. Then it is submitted again after having made the changes and corrections recommended by the Council and in this way proceeds with the formal description of the work realized or planned. (Quino-Solis, et al., 2006, p. 15)

Quino-Juracan related the question to a very personal sense of mission and especially her role in helping youth to embrace and feel pride in their culture:

> As a former student of a Mayan educational center, it has raised my consciousness to value our culture because it is one of the surprising cultures due to its values, customs and traditions that have produced great personalities in our lives. And I am inspired to contribute a little so that other young people may find satisfaction with their identity that they may be proud of wherever they go, along with the practice of our values, customs and traditions. (Quino-Solis, et al., 2006, p. 11)

Xinico-Quino expressed the urgency for people to practice the essential values of their culture with pride for their roots. In this way all people will be able to contribute to insure the life of their culture. Quino-Solis returned to the abiding mission that he brings to all of his responsibilities as a Mayan priest as well as a leader of the community development process in the village and the process of transformation for the entire country:

> My experience within the process of Mayan Education and the continuous practice of Spirituality, as the fundamental base of the Mayan Worldview, has infused in me a mission and a great challenge to continue supporting the community in the field of education; specifically the youth, as future architects of the collective transformation of the communities of diverse municipalities that form the departments of the southwest of our country. (Quino-Solis, et al., 2006, p. 3)

Quino-Juracan reported,

> During the process of interviews with the members of the community, we learned the importance of solidarity and support of each one of the community members; as everyone possesses information or a story of great importance. When cooperation exists we can achieve the objectives that we intend to achieve. (Quino-Solis, et al., 2006, p. 13)

Xinico-Quino noted,

> I learned the histories of our people; the wisdom in the thoughts of the elders, only that no one has been interested to collect, write and shape them into a document as the patrimony of the author and of the community. (Quino-Solis, et al., 2006, p. 16)

Finally, Quino-Solis added the question "What was the process to support liberation, intellectually, culturally and spiritually?" (Quino-Solis, et al., 2006, p. 14). He answered it in a very personal way regarding his own path of liberation:

> In the process of my personal academic formation and in the discovery of my vocation, I have come to realize that every person brings with himself certain talents that move him/her to exercise his/her mission among fellow beings. Thus, inquietude was engendered in me to reveal in broad daylight what I feel, what I achieved by studying and what inspired me to produce the book. All these are immersed within spiritual, cultural and intellectual liberation, which has made me feel content and joyful after finishing a valuable project for future generations. (Quino-Solis, et al., 2006, p. 4)

Xinico-Quino talked about an inner drive of inspiration, understanding the work of community and its own development, and "witnessing people that love their community, [that were] desirous to see its transformation and progress" (Quino-Solis, et al., 2006, p. 21). Quino-Juracan spoke of the initial phase when Quino-Solis sought out participants who were professionals, both in the realm of education as well as leaders in the community's process of community development. Quino-Solis is specific about the importance of the personal skills as well as the motivation and maturity of potential participants:

> Regarding the organization of the work team, first we analyzed the profile and responsibilities that people needed to do, the willingness to complete a collective work, the mastery of our mother tongue, the personal development to carry out the interviews, the ability to transcribe data, the clarity in the presentation of questions and answers, etc (Quino-Solis, et al., 2006, p. 11)

The next set of questions dealt with how and to what extent the inquiry process and book production engaged youth in the creation of their future. A second concern was to understand to what extent the process focused on the process of community development? In answer to the question, "What is your objective for writing this book?" Quino-Juracan mentioned the book's value as an educational tool for youth to contemplate the values of Mayan culture. For Xinico-Quino it's purpose is for youth to learn about the real accounts of history. To Quino-Solis as the major author and the facilitator of the process, he again lamented the lack of publications that addressed the struggle of specific communities. This was one of his driving reasons for beginning the book in the first place.

Quino-Solis was also more elaborate and specific about the purpose of the book for youth. One of the driving purposes of the book for Quino-Solis was to address the problem in existing educational materials, which are neither relevant to this phase in history (when youth must create the future of their communities), nor relevant to Mayan culture in general:

> At present, in the social sphere, the specific institutions that are responsible for the education drive at the national level lack updated educational documents which are relevant to the present juncture, and they utilize imported educational materials with cultural approaches completely different from those of the Mayan people. This has been one of the reasons in the description of the book that its objective is to be an educational material, which will be for the service of the young Mayan and non-Mayan students at the middle school or secondary level, and for the adults who, in one way or another, receive formal or informal education in their advanced age. (Quino-Solis, et al., 2006, p. 2)

Xinico-Quino answered that the book offers a new vision and a new methodology for the future. Quino-Juracan concluded,

> This document will help us so that the youth, children and the population in general may know, redeem and practice the values that our ancestors have taught us and in this way, create an environment of solidarity which can elicit valuable contribution from the institutions that support Mayan Education. (Quino-Solis, et al., 2006, p. 11)

Quino-Solis added,

> The utilization of the book for young students is for them to know, understand, practice and take to themselves, from a humanitarian social life, which is inclusive and non partisan, a work with an integral and collective approach based on Mayan Culture, that will contribute to the life of the youth as professional protagonists of social change in the community of Panimatzalam, and within the scope of action of the CNEM and ACEM as governing bodies of Mayan Education at the national level. (Quino-Solis, et al., 2006, pp. 2-3)

Xinico-Quino mentioned the importance of teachers as educational advocates and the importance of the book as a tool for future generations. Quino-Juracan repeated the importance of the book in redeeming history and social values at all levels of education that have been lost, which will help youth and all people to use the book to contemplate upon. She suggested that youth themselves be involved in creating documents based upon similar actions from the book to "Motivate the youth about the importance of shaping important deeds into documents that may serve as evidence of support for the educational centers" (Quino-Solis, et al., 2006, p. 21).

Xinico-Quino stated that youth will benefit from the book as they learn about the process of community development in the village. Quino-Juracan again emphasized the importance of imparting the community development theme of unity and solidarity when engaging youth:

> As a teacher of education I am fortunate to be able to share ideas with children and youth and make them understand the importance of redeeming values that we have lost as well as to encourage the solidarity and unity, respect and cooperation to achieve work efficiently. (Quino-Solis, et al., 2006, p. 14)

Finally Xinico-Quino stated that youth will benefit from the book as they learn about the process of community development in the village.

In answer to my question, "What are the important themes for the book?" participants repeated many of the same convictions that are mentioned in other sections. After all, the way that people are engaged, the way that culture is addressed, and the way that solidarity developed in the village are all focused upon an abiding philosophy that pervades history. To Quino-Juracan these themes were illustrated through the persistence of unity and solidarity that are reflected in the history of the development of cooperatives. She also mentioned the lessons learned from the Guatemalan Civil War. She believed that learning itself is a major theme, and as with Quino-Solis, that suffering can bring additional insights. Xinico-Quino emphasized the theme of transformation itself, and the development of the various forms of organizations, which are exemplary for surrounding communities and other regions of the country.

As when narrating the story of the community's transformation, Quino-Solis referred back to the importance of the formation of the original cooperative, which was based upon the winnings of a card game by three brothers. To Quino-Solis, this step was a great leap in consciousness that formed the groundwork for future change: "the cooperative organization was transformed into a coordination of organizations with the institutions working in the surrounding communities" (Quino-Solis, et al., 2006, p. 7).

In another statement, Quino-Solis echoed Quino-Juracan's emphasis on learning from the suffering from the Civil War. Transformation here is the community's ability to persist and continue to develop and transform, even in the face of death and the ransacking of cooperatives:

> Another of the important theme described in the book are the consequences of the internal war we experienced personally that remind us of the human losses we have suffered. These are political situations of social exclusion imposed by the governments in power, which did not permit the impoverished population to come out of the difficult situation that they encountered. At the time of the internal war, our companions and members were kidnapped and killed and our cooperative organization ransacked. Nevertheless, they couldn't extinguish our organization. (Quino-Solis, et al., 2006, p. 9)

A final question, asked by Quino-Solis was "[What are the] important values of being a member of Panimatzalam?" (Quino-Solis, et al., 2006, p. 19) elicited similar responses to the comments above. Participants mentioned the importance

of the "Practice of unity and democracy;" "Collective and Integral Work" "Practicing the value of work in our life;" "Tolerance in difficult situations of daily life;" "Abiding by the counsels and advices of our elders;" "Community participation in various projects," and "Conservation and practice of the traditions and ancient customs of our community" (Quino-Solis, et al., 2006, p. 12).

Conclusion

What lessons were learned that can be passed on and what does the work of ADJIMA especially have to offer other young indigenous educators and community activists? It is clear that while young indigenous teachers gain a great deal from formal training at universities and indigenous institutes, it is imperative for them to rejoin their communities as young leaders, and that they are inducted into the process of indigenous community development as well as into their own cosmology and spiritual processes. This sets up the process to engage youth in their communities. It is essential that youth are engaged in action throughout their learning in order to maintain their sense of commitment. When challenged by the pull of urban environments, youth that are fully engaged in the development of their communities have more to gain by staying at home.

It is critical that indigenous peoples lead their own processes of inquiry and research attuned and driven by their own indigenous identities. While outsiders may act as partners in such a process, it is imperative that community members take over the creation and facilitation of the process. In this way neither language, nor culture, nor activism is usurped by well-meaning, yet potentially destructive outsiders driven by their own academic agenda.

Those passionate about the work of Linda Tuhiwai Smith (2001) will realize that the process of indigenous research in Panimatzalam is one of the first such projects to be carried out in an indigenous community. In the recent book, *Handbook of Critical and Indigenous Methodologies* by Denzin, Lincoln and Smith (2008), it is lamented that while many academics are inspired to write about and reflect upon indigenous research, there is a lack of research that brings about this process in practice. Yet, there is strength in this message. Perhaps it is at times best that teachers share their experiences with one another, without the lens of the academic to filter their experience.

I want to recognize the contributions of Domingo Quino Solis in the preparation of this article and his guidance in the project as well as the involvement of Rosalia Quino-Juracan, Elizabeth Xinico-Quino and Felix Noé Mátzar Calel as active creators and participants. I regret that I alone wrote this article, especially since I left during the process. At the same time it acknowledges that teachers busy teaching and activists busy building their communities have little time to write articles such as this one. The proof and value of their work is seen in the youth that they work with, the creators of the future. However I do hope that I can play a role in assisting those involved in the project with networking and connecting with others with similar passions.

References

Cajete, G. (1999). *Igniting the sparkle: An Indigenous science education model.* Skyland, NC: Kivaki Press.

Denzin, N.K. Lincoln, Y.S. & Smith, L.T. (2008). *Handbook of critical and Indigenous methodologies*. Los Angeles: Sage.

Farella, J. (1993). *The wind in a jar*. Albuquerque. University of New Mexico Press.

Freire, P. (1995). *Pedagogy of the oppressed*. New York: Continuum.

Heron, J. (1996). *Co-operative inquiry: Research into the human condition.* Thousand Oaks, CA: Sage.

Lovell, G. W. (2001). *A beauty that hurts: Life and death in Guatemala*. Austin. University of Texas Press.

Molseky-Poz, J. (2006). *Contemporary Maya spirituality: The ancient ways are not lost.* Austin: University of Texas Press.

Oppenheim, M. (2010). *Panimatzalam's voice of transformation: A case study of an Indigenous Mayan writing project, focused upon Indigenous community development*. Unpublished doctoral dissertation, California Institute of Integral Studies.

Oppenheim, M. (1999). Transformation in a school-based family center: The Pacoima urban village. *Practicing Anthropology, 20*(4), 5-9.

Quino-Solis, D., Quino-Juracan, R.S., & Xinico Quino, R.E. (2006). *The Asemblea. Final Reflections: From a Card Game to A Regional Network of Integral Cooperatives.* Unpublished manuscript.

Quino-Solis. (2006). *Questions About the Process of the Book: From a Game of Cards to a Coordination on Integral Cooperatives*. Unpublished manuscript.

Quino-Solis, D., Quino-Juracan, R.S., & Xinico Quino, R.E. (2004). *De un Juego de Naipes a una Coodinacion de Cooperativas Integrales* (From a Card Game to the Coordination of Integral Cooperatives). Guatemala City, Guatemala: PRODESSO. Quotes translated by Acarya Bhaktaprananda Avt. with assistance from Matt Oppenheim.

Sarkar, P.R. (1992). *Proutist economics for a new era.* Calcutta: Ananda Marga Publications.

Smith, L.T. (2001). *Decolonizing methodologies: Research and Indigenous peoples.* London: Zed Books.

Glossary

ACEM: Associacion de Centros de Educacion Mediano Associacion de Educacion Mediano—Association of Mayan Middle Schools
ADJIMA: Asociación de Desarrollo Integral de la Juventud Maya - The Association of Mayan Youth for Integral Development
Ajaw: God or The Great Creator
Asemblea: Assembly. In this case the name of the inquiry team
Basico: primary school in Guatemala
campesino: peasant
El Cholqij'o: The sacred calendar of the Maya
CNEM: Consejo Nacional de Educacion Maya—The National Council of Mayan Education
CORCI: Regional Coordination of Integral Communities
COCODES: Council of Community Development (Panimatzalam's town council)
cortas: traditional short pants of Mayan men.
Consejo: town council
Chilam Balam: The ancient text of original teachings. Also the name of the indigenous technical institute in Panimatzalam
Council of Elders: Local council in Panimatzalam that advises the committees and cooperatives of the village of Panimatzalam
disvestido: The act of taking off traditional clothing to be accepted into the social life of the capital: Guatemala City.
huipla: Mayan women's traditional blouse
Kachiq'el: One of twenty-three Mayan language groups
Kiche: One of twenty three Mayan language groups
Manos de Obra: Handy work
Milpa: Mayan household land, including nearby agricultural fields.
PROUT: The Progressive Utilization Theory—A philosophy and strategy of social change towards a sustainable and equitable society (Founded by P.R. Sarkar)
Paq'uch: "Solidarity" in Kiche or Kachiqu'l or the way that Maya work towards the common good.

Heightening Awareness and Strengthening Relationships: Implications of Public Policy for Aboriginal Students, Communities and Teachers

Lorenzo Cherubini & John Hodson

This paper presents a qualitative analysis of an innovative project that brought together two school boards, principals, teachers, an Aboriginal Education and Research Centre, the respective Aboriginal communities and a team of researchers in the Province of Ontario in Canada. The data are the result of seven community forums held across the coterminous Catholic (separate) and public school districts where the community and the educators discussed public educational policies related to Aboriginal education. Using grounded theory analysis, the researchers identified three areas of concern: Aboriginal students' cultural authenticity, teachers' professional capacities and improving relationships. Coming from the voices of the Aboriginal community was the idea that each of the three areas further teachers' understanding of Aboriginal students' needs and preferences. We conclude with a discussion how educational policy and different ways of thinking can affect teacher education practices and the identities of teachers themselves.

Aboriginal[1] students attending publicly-funded and provincially-governed schools in Ontario, Canada, have traditionally under-achieved in comparison to the mainstream students in terms of academic achievement (Robertson, 2003; Statistics Canada, 2003). This reality at least partially contributes to the high levels of poverty and the socioeconomic and socio-historic marginalization of Aboriginal peoples across Ontario and Canada (Freiler, 2008). Given that almost

[1]Readers should not be deceived into believing that the use of the all-inclusive word "Aboriginal" signifies or implies any form of generic, one-size-fits-all approach to the realities of Aboriginal academic achievement in Ontario schools. On the contrary it must be recognized that the Anishnabe, Haudenosaunee, Inuit, Métis, Mushkeygo and Nishnawbe-Aski peoples that call Ontario home are highly diverse in their cultures, languages, values, beliefs, histories, contemporary realities and aspirations. If publicly funded education of Aboriginal peoples is to evolve to the point where it serves Aboriginal individuals, families, communities and nations it will depend on teachers, principals, Boards of Education and Faculties of Education engaging with Aboriginal peoples in a meaningful and respectful way that builds localized responses to academic achievement for the betterment of Anishnabe, Haudenosaunee, Inuit, Métis, Mushkeygo and Nishnawbe-Aski children and youth. Likewise the distinction of non-aboriginal does not accurately reflect the diversity within that community and may incorrectly establish a binary within the minds of the reader. This chapter acknowledges that colonization is not a reality of Aboriginal peoples alone. Instead, colonization continues in contemporary times and limits all peoples.

50% of Aboriginal peoples in Ontario 15 years of age and older have less than a secondary school diploma (Aboriginal Education Office, 2007), it is fair to suggest that public educational institutions have not supported Aboriginal peoples as they regain the primacy of their cultures, languages and knowledge systems that were severely threatened by colonization (DeGagne, 2008).

In attempt to reconcile the achievement gap for Aboriginal students and to more meaningfully engage them in public schooling practices and curriculum, the Ontario Ministry of Education (OME) created policy documents related to Aboriginal education that are currently being implemented across the province. These documents declare the injustices of colonial educational practices suffered by Aboriginal peoples and articulate a series of goals and strategies for public school teachers, schools and school boards to provide Aboriginal students with a more contextually relevant and culturally-supportive educational experience. Among the policy initiatives, the OME proposes that Aboriginal students voluntarily self-identify themselves in order for teachers and schools to better distinguish their unique needs and offer culturally-sensitive classroom programming for the over 50,000 Aboriginal students enrolled in Ontario public schools.

Given the emergence of the policy documents and their potential impact upon the landscape of Aboriginal education for teachers, students and Aboriginal communities, two large urban-based school boards in Ontario, Canada, participated in an innovative program intended to heighten mainstream teachers' awareness of Aboriginal students' cultural, social and epistemic understandings in order to improve the relationships between teachers, Aboriginal students and Aboriginal communities. As a result, the school boards hosted the Aboriginal community in a series of consultations. The boards of education recognized the general sense of distrust that exists between many Aboriginal communities and public school teachers, owing mainly to the legacies of exploitation whereby Eurocentric interests suppressed and betrayed Aboriginal peoples' sociocultural and linguistic traditions (Patrick, 2008). The two public school boards participated in this unique research project because they recognized the importance of transparent communication practices and mutually-supportive relationships between teachers, schools and Aboriginal communities (Wotherspoon, 2007). To their credit, they perceived the genuine disconnect between the intentions of educational policy to improve the learning of all students regardless of their cultural background, and its actual implementation for Aboriginal children across Ontario. By meaningfully engaging with Aboriginal communities, these school boards and their respective teachers approached Aboriginal parents in a context that was conducive to Aboriginal paradigms (Spence, White & Maxim, 2007; White, Spence & Maxim, 2005). Similar to other fields, such as health and law, the mainstream educators participated in this unique endeavor underscored the necessity to offer comprehensive and accessible community-based forums as a means of sustaining dialogue between the policy objectives and proposed school-based and teacher-driven practices, while listening to the concerns of the people who are most effected by the OME policy (see Hunnisett & Sault, 1990; LeMaster & Connell, 1994; May & Moran, 1995; Ross & Ross, 1992).

Background

There are two policy documents that recognize Aboriginal students' unique learning needs and the factors that contribute to their engagement in mainstream school cultures. The 2007 *Ontario First Nation, Métis and Inuit Education Policy Framework* (hereafter the *Framework*) discusses Aboriginal students' epistemic and sociocultural traditions in light of the historical injustices that have had multi-generational consequences (Castellano et al., 2000; Hill & George, 1996). The *Framework* calls upon school teachers, principals and school boards' senior administrators to become more informed of Aboriginal students' traditions and to provide more culturally-responsive learning environments (p. 7). By becoming more aware of Aboriginal students' cultural traditions and history, teachers will be better equipped to represent Aboriginal students in classroom and school-wide practices. According to the *Framework*, these strategies will translate into a heightened sense of student engagement and in turn close the achievement gap between Aboriginal and mainstream students. The *Framework* in fact complements the literature that suggests that publicly funded schools have a key role in terms of establishing inclusive communities as a result of their dual function as both a civic and learning institution (Canadian Association for Community Living, 2005).

A second policy document, *Building Bridges to Success for First Nation, Métis and Inuit Students* (2007) focuses on school board policy development for voluntary and confidential Aboriginal student self-identification. Aboriginal self-identification is justified on the grounds that teachers can center their attention on those areas related to literacy and numeracy where Aboriginal students excel and struggle; in turn, teachers and schools will be better positioned to develop curriculum-focused programs, interventions and resources to improve Aboriginal students chances for academic success.

In response to these policy initiatives, two school boards hosted a series of public forums to honor the voices of the Aboriginal community, to better inform teachers of Aboriginal students' needs and to assist classroom teachers to work more successfully with Aboriginal learners (Mooney, 2000). By bringing issues related to educational policy to the community, the intent was to use the forums as a means to positively affect the relationship between mainstream teachers, government policy, Aboriginal communities and Aboriginal students (Lawrence & Gibson, 2007). Community forums that are tailored to exchange information and sustain dialogue can also assist in reducing the suspicion that many Aboriginal communities have for formal educational practices and policies that have traditionally used standardized test results (as biased instruments based on Eurocentric curriculum) to report on the lack of Aboriginal student achievement in public schools (Ontario Federation of Indian Friendship Centres, 2005). The predictable low scores further problematize and pathologize Aboriginal children (Bishop & Glynn, 1999) and situate the "deficit" within Aboriginal peoples not with schools. Consider, for example, that like the predicament for Native American students in the United States of America, perhaps a similar and equally dubious predicament can be applied to Aboriginal students in Ontario:

> Perhaps the greatest danger facing Indian education at the beginning of the twenty-first century is the push for outcomes assessment, state and national standards, and the associated increased use of high-stakes testing in all facets of education. (Reyhner & Eder, 2004, p.11)

By evoking the capacities of the Aboriginal communities and teachers in response to the OME's initiatives, then the possible implementation of such policies can be conducted in a respectful spirit and thereby reduce the historic misunderstandings between Aboriginal learners and mainstream teachers that have had adverse effects to say the least (Cornell & Kalt, 1992).

Method, data collection and participants

Seven Aboriginal community forums were conducted across two large coterminous school districts in southern Ontario. The two school districts have a total of approximately 59,000 students enrolled in their elementary (K-8) and secondary (9–12) schools. Their jurisdictions include 11 municipalities in Ontario with a population of nearly 500,000 residents and spanning approximately 1,600 square kilometers. Informational flyers indicating the times and locations for each community forum (offered in November and December 2008) were distributed to all students enrolled in these school districts. In addition public service announcements appeared on the local cable television station and on radio as well. Of special interest was the spontaneous community promotion through various online social utilities. Each forum was conducted according to a similar agenda: a general welcome by school board officials, an introduction of OME and Aboriginal Research Centre staff, the respective teachers and teacher-consultants, a presentation of the respective documents by the OME representatives, a drumming ceremony, dinner, small group discussion and opportunities for community members to record their observations and concerns of the documents and their respective discussions. The forums were purposely scheduled within 30 days of each other in order to provide community members with adequate time to consult and sustain discussion (Brascoupe & Mann, 2001).

The attendees at each community forum had the opportunity to write their reflections, observations, questions or comments on notes in response to five questions:

(1) Before the Forum tonight how aware were you of the Ministry of Education's Aboriginal education initiatives?
(2) What resources (material or people) would you like to see made available to teachers, schools and a school board to improve your child's learning experience?
(3) What types of programs would you like to see implemented in the schools and by the school boards?
(4) What concerns do you have about how this data will be used by the school boards, the OME and by standardized testing?
(5) Other questions or concerns?

The data were collated and professionally transcribed.

A community forum was hosted in each of the regions serviced by the school boards. We ensured that the site of each forum represented the boards' geographical regions in order to get a representative sample from each community. This approach was reflective of Stake's (2000) notions of inter-cultural and experientially-oriented approach to local community responsiveness. In total, 170 people attended the community forums. The highest number of persons attending one forum was 45, and the lowest was 10.

Data analysis, findings and observations

In the tradition of grounded theory, the responses that were grounded in the data conceptualized the direction of the analysis (Strauss & Corbin, 1990). Grounded theory is a systemized process of distinguishing an inductive discussion about the relationships that emerge from the data (Charmaz, 1983; Jacelon & O'Dell, 2005). The research team investigated these relationships cyclically, as initial codes were collapsed into more abstract categories and eventually into theory. Through constant comparison, categories were compared for common themes and relationships (Glaser & Strauss, 1967). The respective properties of each category were identified (Glaser, 2005; Chesler, 1987). The selective coding process distinguished key categories considered to be fundamental to the conceptual framework that the grounded theory is founded upon (Cherubini, 2007). As Strauss (1987) explains, the categories are woven throughout the data, provide a link between themes and their properties and move the theory forward as the data analysis proceeds.

Three categories emerging from the data: "Aboriginal cultural authenticity," "teachers' professional capacities," and "improving relationships." The excerpts cited throughout the paper are considered representative responses of the community's voices. The references that follow the participants' contributions indicate the session where the statement was recorded.

Aboriginal cultural authenticity

Grounded in the data was community members' perception that Aboriginal self-identification policies related to public education are superficial means of recognizing the identity and diversity of Aboriginal students in Ontario. Community members cited time and again the need for public school teachers to provide curricular resources that one participant described as, "factual Native history books and resources [instead of] interpretations" (Session A; from hereon Sn _). The community reiterated throughout the course of the forums that school children and youth have to be privy to "history books that reflect the history of all Aboriginal people of Canada and Ontario" (Sn B). The community considered it imperative that the request for Aboriginal peoples to self-identify be complemented by what some individuals described as authentic "education about political issues [such as] land claims and residential schools" delivered to all mainstream teachers and students (Sn B). The mainstream curriculum, according to the community, would be enriched by, "Native studies courses [that]

offered at a wider range of high schools" (Sn D). The community expressed their perspective that a self-identification policy would be more credible if it was accompanied by curriculum support and other initiatives to ensure "accurate curriculum," the proper "teaching of Aboriginal studies," and more "Aboriginal teachers" in public schools who could provide culturally-authentic pedagogy (Sn B). Attendees were concerned about the relative unavailability of Aboriginal "storytelling, music, performances [and] Native books by authors available to all school levels" (Sn C). Emerging from the data was the pervasive sense that Aboriginal community members wanted OME policy initiatives to be substantiated by culturally-authentic teaching practices in mainstream schools.

In order for Aboriginal students to self-identify, the voices of the community suggested that Aboriginal youth need to be able to first identify with the culture of their classrooms and schools. Teachers, thus, need to provide learning environments that are more culturally-authentic in terms of incorporating "Native language teachings [and] the Thanksgiving address in Mohawk, Cayuga, and Seneca" (Sn A). The community recognized the importance of, as one participant stated, "Having Aboriginal languages taught by Aboriginal people" (Sn A), so that Aboriginal students could better identify with their respective sociolinguistic traditions. Equally clear was the community's request for "cultural programs centering on language, arts, and stories" (Sn B). Expressing their belief on behalf of others at a community forum that was particularly well-attended, one attendee stated, "I would like to see a program brought forward for Aboriginal students where they can get in touch with their cultural roots" (Sn C). The community expressed an acute awareness of the difficulties that Aboriginal students experience in public schools in terms of identifying with well-intentioned teachers who generally practice more traditional learning models and deliver a mainstream curriculum. The community observed that these teachers often interact with Aboriginal students from a misinformed and under-educated perspective (and in most cases, at no fault of their own). Consistently throughout the community forums attendees stressed the need for not only "classes with Aboriginal content" as the curricular emphasis, but for culturally-authentic "support services in each of the schools" to provide Aboriginal students with similar resources and supports that are available to the mainstream population (Sn D).

In a similar vein, community participants emphasized that in order for Aboriginal youth to properly identify with their sociocultural and epistemic traditions, the teachers need to appreciate the importance of their having access to culturally-authentic spiritual guidance in public schools. Consistent throughout the community forums, participants voiced the necessity to equip schools with, as one individual succinctly stated, "Elders for our youth" (Sn F). Through the teachings of "the Elders and traditional people" (Sn E), the community emphasized that Aboriginal youth could be more connected to their ancestral and spiritual histories and feel more affirmed and comfortable in their identity. Participants considered Elders as the means to teach Aboriginal youth that their "history is living" (Sn A) and that it has a critical role in the manner in which Aboriginal students perceive themselves as Aboriginal peoples and as students in Eurocentric

educational institutions. These institutional norms related to formal education have not historically respected Aboriginal students' cultural authenticity and in fact have created rather adverse consequences in terms of how Aboriginal students identify with mainstream public school teachers and classrooms. Having access to the Elders and traditional peoples, Aboriginal youth can learn from a most authentic perspective about "the history of what happened to their parents and grandparents…for the purpose of knowing where they came from" (Sn F). Grounded in the data was the strong impression that Aboriginal identity need to be meaningfully included within the mainstream teaching practices in order for teachers to better relate to Aboriginal students.

Teachers' professional capacities

Just as community members advocated for cultural authenticity to foster Aboriginal students' sense of identity in light of the OME's policies, so too it was suggested that professional development for teachers needed to be formalized in order for them to better understand Aboriginal students' sociocultural traditions and epistemic preferences. Typical of other suggestions, some participants called for "teacher-sensitivity training" (Sn C) in various professional development initiatives to heighten the awareness of Aboriginal traditions as well as differences that exist across the various territories represented by their students. These suggestions included teachers' "respect for cultural protocol" (Sn B) and implied that teachers and administrators should honor students' absences for "cultural leaves [such as] the longhouse ceremony without the student being seen as truant or being penalized in any way" (Sn A). The community believed that if the OME's policies were going to further Aboriginal students' sense of identification for who they are in relation to their public school experiences, then teachers themselves have to become knowledgeable about Aboriginal "experiences which identify the ways of harmonious living with all [Aboriginal] relations" (Sn E). Participants were adamant that the objectives of the self-identification policy had to represent more than stratifying data on provincial external standardized tests to identify Aboriginal students' strengths and weaknesses in literacy and numeracy. In many instances the community suggested that teachers' knowledge of Aboriginal learning preferences had to translate into teaching strategies that honored Aboriginal student identity. One community member's testimony of a classroom experience where the mainstream teacher's presumed ignorance served to perpetuate racial prejudice was especially convincing:

> During my years of schooling I have only self-identified once. Reason being: a teacher centered me out and started asking questions about my culture. The class had a mini-discussion about how it is not fair that Indians get to hunt and fish for free without a license, and that they do not have to pay any taxes. (Sn F).

Such a lack of awareness as expressed at the forums, often extends into actual pedagogical practice. The forum attendees stressed that for mainstream teachers

to properly address Aboriginal students' learning styles they need to develop the capacities to "understand and identify [Aboriginal youths'] learning styles and have the means to promote learning in a way that creates a craving for more from the student" (Sn A).

Emerging from the data was the strong sense that the Aboriginal community wanted teachers to become aware of Aboriginal epistemologies and to use them in their curricular and extra-curricular practices. For some community members this means the inclusion of "traditional teachings [for Aboriginal students] by actual doing" (Sn E). For others, it means providing "visual learning programs" (Sn A) whereby students can explore knowledge more holistically. In a number of instances participants cited the benefit of mainstream teachers developing the professional capacities to deliver "hands-on teaching [and instructional strategies to enhance] observational knowledge" (Sn D). In doing so, Aboriginal students can better identify with pedagogical practices that will, as one community member described, "Enhance children's experiences" (Sn B). Particularly novel were the suggestions in various community forums that public schools should offer "credit courses that are not based on the traditional Eurocentric measurement of success" (Sn E) that typically further marginalize Aboriginal students through biased epistemic practices. One individual's suggestion, in many ways typical of others, advocated for "cultural training for teachers on a regular basis" (Sn C) to sustain their awareness of how mainstream curricular and content practices have prejudicial implications for Aboriginal student achievement. It was interesting to note the community's hesitation towards a one-time professional development in-service for teachers; instead, they collectively insisted that professional development needs to be sustainable for it to have relevance to teachers' practice and eventually to Aboriginal student learning. One individual stated, "I would like every teacher in the district to learn about Aboriginal culture. This training should [occur] many times at first until all teachers are culturally competent. Then it should be followed up yearly" (Sn A). There were a variety of suggestions on how to develop teachers' professional capacities, ranging from "more professional development" (Sn D) to "more teacher training using only Aboriginal instructors and guest speakers" (Sn F).

In all of the suggestions for enhancing teachers' professional capacities, however, the Aboriginal community expressed their awareness of Eurocentric educational practices that have traditionally favored Western knowledge and epistemologies at the peril of Aboriginal sociocultural and sociolinguistic worldviews (Barsh, 1997; Battiste, 2002). In turn, forum attendees also suggested in a number of different instances that "the best resource is people" and that the hiring of Aboriginal persons as teachers (and school administrators for that matter) would in fact provide what many participants referred to as, "cultural experiences" (Sn B) to enhance both staff and student knowledge. By having what was often referred to as "Aboriginal teachers teaching Aboriginal studies" (Sn D), best practices defined as delivery models that are in tune with Aboriginal students' learning styles can be made available to all teachers. According to participants, even mainstream teacher professional development initiatives,

such as differentiated instruction, would "have an Aboriginal perspective" (Sn A) given the interactive learning techniques of Aboriginal teachers who must themselves be innately familiar with and possibly the products of Aboriginal epistemic traditions and practices. Ultimately, the forum voices resounded with the sentiment that the OME's policies are perceived as non-sustainable if they in fact are not meaningfully inclusive of broader and yet more poignant issues such as developing the professional capacities of classroom teachers and school principals.

Improving relationships

The third category grounded in the data sustains the previous two categories and implies that the success of the OME's Aboriginal Education policies will in large part be determined by the extent to which the meaningful engagement of the Aboriginal community improves the relationships between Aboriginal students and teachers. Participants stressed, as one individual stated, that the school boards and classroom teachers have to facilitate "more positive interactions with respect to [Aboriginal peoples'] culture" (Sn A). Reciprocal engagements between Aboriginal communities and educational institutions could highlight for Aboriginal students the significance, for example, of "basket-making, drum-making, Native music and dance" (Sn C), among other traditions, for their formative identity development. The community was, however, skeptical of the school boards' intentions to hold public forums for the purpose of disseminating information and superficially accounting for the opinions of the community. They were suspicious of mainstream intentions to identify and distinguish Aboriginal students in the public reporting of provincial standardized test scores. Many in the communities openly questioned, "Will our children be treated differently?" (Sn E). Throughout each of the community forums, participants' awareness of the historical implications of colonial exploitation was glaringly evident. Characteristic of other comments was this individual's statement: "My concern here is that the government may use this information to take even more away from our people…. I am concerned that this information will somehow be used to hold back Aboriginal success even more than before" (Sn C). Others questioned the OME's motives for Aboriginal self-identification in the first place: "Will the data be used by anyone who could use it against Aboriginals? EQAO [Education Quality and Accountability Office in Ontario] numbers can mean anything" (Sn A). Still others were far more candid in expressing their distrust and suspicion: "I would be concerned with the use of the statistics. Hopefully it would not be used as some sort of tracking method…. Just another statistic [for] discrimination [and] stereotyping" (Sn E). For the community it was of paramount importance that the OME's self-identification policy not be another means of exploiting Aboriginal children and further stigmatizing them as incapable learners. They made clear that such recourses would serve to merely worsen the relationships between teachers, Aboriginal students and Aboriginal communities. Community members voiced their strong concerns with, as one individual stated, "Who [will] have access to the data? How and or will this information be shared [and] used in

conjunction with standardized testing? What's the process to change standardized testing to make it more applicable to Native students?" (Sn D).

To address this sense of mistrust and to foster better relationships, therefore, community members suggested that the schools and teachers' commitment to engage with Aboriginal students and their communities had to include, as one individual stated, "cultural activities to build self-identity and self-confidence" in Aboriginal students (Sn B). This was a key consideration expressed consistently throughout the community forums. By genuinely engaging with Aboriginal communities, Aboriginal parents expected "to have a voice in this process [of self-identification] as it moves forward," and as another individual rhetorically questioned, is "the Aboriginal community going to be engaged to determine the success of the implementation of the framework?" (Sn A). In the absence of such engagement between communities, schools and teachers, participants wondered if the process is pre-determined to perpetuate Aboriginal student marginalization in public education. One individual asked, "Will history repeat itself and [will we have] the same delivery model by different people?" (Sn E). By not engaging with Aboriginal communities, the concern remained that,

> Native kids [will continue to] clique behind their Native identity [even] to the point of exclusion and segregation. I am afraid that this project [self-identification] may provide an opportunity for that to happen. This needs to be beneficial so that Native students can have their space. (Sn A)

The community insisted that the interests of the children have to take precedence over all political and institutional decisions, at the risk of further damaging what the community identified as an already fragile relationship between teachers and Aboriginal students.

Among the most significant questions raised by the Aboriginal communities that strike at the heart of what it means for mainstream teachers to be engaged with Aboriginal learners came from this individual: "Can we live and educate one another without having to be seen separately?" (Sn C). In this context, the community wondered what it takes to be a bi-epistemic educational system wherein the issue is not one of certain cultures being asked to self-identify but rather of offering and honoring culturally-responsive epistemic practices for students in the spirit of nurturing relationships. Implied in this central question is the fundamental element of genuine engagement for Aboriginal community members. Community members are understandably cautious about government initiatives that request Aboriginal peoples to identify and yet have little indication of their willingness to genuinely engage in a mutually-beneficial relationship. Until that time when mainstream educators are willing to challenge what some community members referred to as, "predisposed meanings of education [and] ideas of success" (Sn B), the relationship between mainstream educational institutions, teachers and Aboriginal communities will continue to be marked by suspicion; as a result, this will inhibit the potential for improving relationships. The community voiced

their willingness to "build bridges with solid foundations from the ground up" (Sn E), but needed to know that teachers were making a sincere commitment to engaging with the community. By making a genuine effort to engage with Aboriginal communities, schools and teachers must honor, as one participant explained, that "self-identification is an inward journey [and that the mainstream] should be respectful of one another as to how she/he may wish to be identified" (Sn F). Genuine relationships with the community, as voiced by the membership themselves, can be improved only through culturally-responsive contexts.

Shifting school culture to close the credibility gap

What has been described by Aboriginal participants in the seven community forums can only be understood to be the requirements for a holistic educational shift that is system wide. The caveat being that, in order for Aboriginal students to self-identify the Aboriginal community needs to be able to see themselves authentically reflected within the educational experience. Or, as one forum participant observed, only a systemic shift "will help to get children and families more comfortable with the idea of self-identification" (Sn B). A pre-requisite to a Self-Identification Program that closes the credibility gap, creates a level of trust and encourages Aboriginal families to identify their children is a shift in school culture.

This credibility gap is evident in the many expressions of "Mistrust and Suspicion" that permeated much of the participant dialogue. Participants were candid in asking, "What benefit will my children receive from self-identifying? Why self-identify?" (Sn B) and "What are the students saying about self-identification? At what age would…they…say whether or not they self-identified?" (Sn E). But these issues of "Mistrust and Suspicion" are most evident when Self-Identification was connected to standardized testing: Participants stated: "I don't believe the ID program and the standardized testing should be the same or implemented with each other. Self-ID should not be associated with standardized testing" (Sn B). Another individual claimed that, "All the information taken can be used against Aboriginal youth" (Sn C). While a different community member wrote about the potential to, "Manipulate numbers. Youth centered out in class/school – Racism against Native students." (Sn C).

It must be considered that the *Framework* identifies the need to collect "reliable and valid data" to measure Aboriginal students' progress. The first goal of the *Framework* addresses high-levels of student achievement that includes a performance measure to gauge "the significant increase in the percentage of First Nation, Métis, and Inuit students meeting provincial standards on province-wide assessments in reading, writing, and mathematics" (2007, p.11). While this renewed focus on Aboriginal peoples' educational experiences is long overdue, there seems to exist an inherent conflict of expectations; more specifically, the "reliable and valid data" identified by the OME as baseline performance indicators for Aboriginal students are in fact high-stakes external and standardized assessments that have unsavory implications in their relative cultural inaccessibility. Such baseline data is based on Eurocentric principles of teaching, learning and

student assessment. While the OME's intent may be noble, the selected means to track student achievement is suspect (Cherubini & Hodson, 2008). The research into improving literacy programs for Aboriginal students underscores "a willingness to use appropriate assessment tools to monitor student learning and program effectiveness" (Bell, 2004). External assessments based largely on a standardized colonially-influenced curriculum would seem to merely perpetuate the bias that typically favors students from the dominant culture. As Bishop and Glynn (1999) observe "the beneficiaries will be those most like the ones who designed and implemented the system" (p. 11).

The literature is equally emphatic about the unique learning needs of Aboriginal students that necessitate a transformation and genuine commitment to culturally sensitive pedagogy that includes diverse assessment and evaluation strategies to support Aboriginal students in mainstream learning environments (see, e.g., Toulouse, 2006). Given these, it would appear that province-wide external assessments are invalid interventions in terms of charting Aboriginal student achievement and connotate a Eurocentric cultural relativism that fails to account for the epistemological, cultural and spiritual schemata of Aboriginal learners. Externally imposed student assessments can be perceived by Aboriginal worldviews as inimical, puerile and disproportionately representative of the privileged mainstream epistemology that exists in provincially-funded schools (Cherubini, Hodson, Manley-Casimir, & Muir, in press). The language of standardized assessments, according to the literature, often tends to favor mainstream learners at the expense of marginalized pupils (Bishop & Glynn, 1999; Giroux, 1992, p. 220; see also Giroux, 2003, 2004).

The *Framework* defines student academic success in Eurocentric terms that quantifies knowledge acquisition and literacy development by criterion and norm-referenced test scores. This appears to be contradictory to some of the other components of the *Framework* document that directs school boards to "support teachers in adopting a variety of approaches and tools to teach and assess Aboriginal students more effectively" and schools to "develop awareness among teachers in the learning styles of First Nation, Métis, and Inuit students" while employing "instructional methods designed to enhance the learning of all Aboriginal students" (p. 12). The *Framework* document reflects the literature that attests to Aboriginal students' learning preferences towards holistic education, visual organizers, reflective learning and the active engagement in collaborative tasks to complete assignments (Hiberg & Tharp, 2002). Aboriginal students learn best, according to Gamlin (2003), by first-hand experiences with the learning activity and by being engaged in the learning process (see also Corbiere, 2000). The document favors a language experience approach to Aboriginal student learning that includes practical applications that have contextual relevance to students' life experiences. It recognizes the deterministic cultural influences that distinguish Aboriginal student learning from the mainstream population that have translated into larger social, cultural, and educational consequences. The language of the Policy employs frames of references that convey immediate significance for all stakeholders.

However, given these calls to meaningfully incorporate Aboriginal epistemology and culturally appropriate activities into the public schools and individual classrooms, combined with the mandate to "teach and assess" Aboriginal students in more cultural and linguistic sensitive ways (Policy Framework, 2007, p. 12), one cannot resist the question of how the use of standardized provincial tests (considered by the OME as valid and reliable data to measure Aboriginal student achievement) reflects the literature that discusses Aboriginal student success. There appears to be a fundamental disconnect between the re-conceptualization of teachers' pedagogical and assessment practices in mainstream schools to account for Aboriginal learners' predilections, and measuring student achievement by the imposed western colonial paradigm of standardized testing. While the OME's commitment to support policy development in light of Aboriginal linguistic and cultural tradition is commendable, as is their objective to foster intercultural dialogue between school communities, there remains a glaring inconsistency of how the provincial student assessments will reconcile Aboriginal students' learning inclinations to perceive concepts from whole to part, to have sufficient time and culturally sensitive resources to reply to the respective questions, and to engage in group work in non-threatening learning environments that respect their physical, emotional, intellectual and spiritual selves. The matter is further confounded when one considers that Aboriginal students are less than optimally successful in following the standardized provincial curriculum:

> The provincial curriculum does not allow First Nation students to learn in their own language or learn their own history in a meaningful way… nor does it accommodate a rate of learning that is consistent with their individual learning styles. (Anderson, Horton & Orwick, 2004, p. 8; see also *Coalition for the Advancement of Aboriginal Studies*, 2002)

The external provincial assessments will, however, be used as performance measures for Aboriginal student learning according to standardized grade and age appropriate benchmarks that are in themselves standardized concepts that function in a mainstream educational system based on age-grade progressing that is incongruent with Aboriginal children's learning styles. One need only point to the literature that identifies the consequences of employing standardized tests as measures of student learning in respect to Aboriginal students in northern Canada. The low test results are used by some to indicate that Aboriginal students have inferior intelligence and cognition capacities (see Davis, 1982; Mueller et al., 1896).

In the policy initiatives already discussed it is acknowledged that curriculum needs to correspond to the particular identity of Aboriginal students if it is to have a meaningful and sustaining influence on their learning (see, for example, Curwen-Doige, 2003). The school environments that best foster Aboriginal students' identity honor their distinctiveness as peoples (Gamlin, 2003; van der Wey, 2001). Formal education that is culturally informed and authentically

incorporated into students' learning experiences augment the positive identity of Aboriginal students (Battiste, 2005; Toulouse, 2006).

Furthermore, *Building Bridges to Success* facilitates for public school boards the process of developing policies for voluntary, confidential Aboriginal student self-identification to garner the self-declared "accurate and reliable data in order to assess progress towards the goal of improving Aboriginal student achievement" (p. 7). The OME, in March 2006, requested the Education Quality and Accountability Office (EQAO) to report on the achievement of Aboriginal students based on the six school boards who had a self-identification policy as a result of a provincially-funded pilot project. In turn, school boards were encouraged by the Assistant Deputy Minister for French-Language Education and Educational Operations to "work directly with the EQAO to finalize plans for the separate reporting of results for First Nation, Métis, and Inuit students" (p. 8). Given the widespread implications of using external standardized assessments as reliable and valid data, and the conceptual disconnect between standardized tests and experiential learning and assessment strategies aligned with Aboriginal students' learning needs, the request for Aboriginal peoples to self-identity themselves apart from mainstream learners, and the OME initiative to separately report Aboriginal students' standardized test scores, seems antithetical to the spirit of thoughtful and respectful inclusion expressed in the various policy frameworks. Aboriginal peoples are being asked to voluntarily self-identify themselves so that a mainstream branch of the government (EQAO) can publish and disseminate the results of Aboriginal students' achievement on standardized assessments that are exclusively emblematic of colonial measures of academic success. It is potentially grossly exploitative to the identity of Aboriginal learners to have the reporting of their test scores segregated from the same mainstream learners with whom they share a publicly-funded education. The enthusiastic initiatives on the part of the OME and the Aboriginal Education Office to have cross-cultural representations of Aboriginal language, culture, and epistemology risk being perceived as hallow and self-indulgent to mainstream practices of public accountability. Seeing that the results of standardized test scores are typically lower for marginalized and under-represented Aboriginal students, the separate reporting of test results can be considered a self-referential protocol whereby mainstream student performance indicators are no longer statistically anchored by Aboriginal cohorts of learners. Of significant interest and profound irony, the Dominion Bureau of Statistics cited over 81 years ago the misleading comparison of Canadian literacy statistics in comparison to other nations, and stated:

> it is very clear the illiteracy of the Indians ought [sic] to be considered as a thing apart from the rest of the population…[for] taking the illiteracy of the population excluding Indians [would result in] a more accurate description of the true situation. (1926, p. 38; as cited in Stewart, 2006, p. 1003)

In some respects, the OME's initiatives can be perceived as an extension of the same Eurocentric bias and exploitation of Aboriginal epistemology, language, and

culture that has been historically chronicled. The ambiguous dualities between the expressed intent and practices presented in the various policy framework documents imply overtones that are symptomatic of the colonial treatment of Aboriginal peoples in this province and country.

This is not to deny the fact that the *Building Bridges to Success* policy document recognizes the importance for Aboriginal families to be aware of the presentations of the data from external organizations in regards to Aboriginal learners' achievement. These reports, according to the document, "tend to bring attention to low student achievement, and can have a negative effect on First Nation, Métis, and Inuit students and communities" (p. 13). The language is tentative and inexplicit as it relates to this most significant caveat that strikes at the core of Aboriginal peoples' identity as learners. The document assures that personally identifiable data is protected from the public domain, although on the same page explains that EQAO and the OME will disclose the reporting of information (including EQAO standardized test results and course completions) on "Aboriginal student achievement at an aggregate level" (p. 15). The request to have Aboriginal learners voluntarily identify themselves in effect subjects them and the results of a culturally and epistemologically biased performance measure to public and mainstream scrutiny. In these instances, positions of power and social agency are inequitably represented. As Giroux and McLaren (1992) suggest, "we have failed to develop a comprehensive understanding of language, identity, and experience and their relation to the broader power-sensitive discourses of power, democracy, social justice, and historical memory" (p. 8). Does this not serve to propagate a history of educational, cultural, and societal stratification that has threatened the very identity that these Framework documents claim to be recognizing and advocating for in mainstream public schooling? It would seem that the forum participants have good reason to be distrustful of this initiative.

There is anecdotal information that suggests that several boards of education across the province, prompted by concerns expressed by the associated Aboriginal community, have recognized the inherent epistemic conflict that is central to the validity of standardized testing. Those boards and communities are attempting to develop testing that is both culturally relevant and epistemically accurate to the children in their schools.

Implications for teacher education

Over the last decade numerous mainstream researchers (Hajioannou, 2007) have identified classroom environment and the interpersonal relationships that exist within those environments to be fundamental to academic achievement. It would seem logical and reasonable to suggest then that it is the teacher who has the most influence to shape and promote an environment that is conducive to positive interpersonal relationships by modeling that interaction to their students. And yet that theoretical knowledge rarely informs a practical application of how that might occur. That is to say, this simple understanding does not change teacher education in such a way as to disrupt the educational statistics of Aboriginal academic achievement in this province. In this instance there is a

distinct separation between what social science inquiry demonstrates and how that research might be enacted in both teacher education and in the classroom.

Bent Flyvbjerg (2001) urges us to restore social science to its rightful position as a practical intellectual activity aimed at clarifying the problems, risks and possibilities we face as human beings and societies, and at contributing to social and political praxis (p. 4). If there has been one consistent and relentless open wound on the Canadian body politic it is the continued and persistent reality of Aboriginal peoples. The study that underlies this chapter is an attempt to use social science research to disrupt the circle of oppression at a critical point in an individual's development by changing those who have a significant influence, teachers.

Each year Brock University's Pre-service Department organizes a Social Issues Day attended by teacher candidates. For the past four years the Brock University's Centre for Aboriginal Research and Education has participated in that event by engaging various Aboriginal community experts as presenters to expose teacher candidates to some of the critical issues relevant to Aboriginal education. By necessity, the focus of the day is limited to creating immediate awareness of critical Aboriginal learning needs and realities, and expanding the candidate's toolbox to address them. Participating candidates hear from an Aboriginal keynote speaker for part of the morning and choose from a number of Aboriginal focused workshops offered in the morning and the afternoon.

Sixty percent of the 189-primary/junior and junior/intermediate teacher candidates attending the 2006 Social Issues Day completed a short survey that described their experience of the day (see McGean & Bowering, 2006). This study was intended to present a reflexive snapshot of the learning experienced by the teacher candidates who in less than a year would be working with Aboriginal children in their classrooms. Analysis of the collected data demonstrated three dominant themes:

1. Participant(s) identified the need for more time, knowledge or resources to gain a better understanding of Aboriginal education.
2. Participant(s) indicated an increased awareness and sensitivity to issues affecting Aboriginal people.
3. Participant(s) recognized that the workshops had created a greater understanding of the challenges that Aboriginal people face.

It is the voices, reflected in the words of those teacher candidates that are the most poignant:

- I think presentations like this are important for teachers. I would like to learn more about how we can help and integrate Native culture into our classrooms.
- I have learned to bring respect into the classroom and be sensitive to the different cultural needs of the children.
- I really enjoyed being able to question in an environment that understands our lack of information. I have a better understanding of the

> cultural beliefs and values of Aboriginals. I also feel better equipped to embrace the students and be compassionate and understanding.
> - I have always thought of myself as an accepting person but this workshop certainly opened my eyes to the ways I can further my acceptance. Also the various traditions that will certainly benefit me as an educator.
> - It was worthwhile to share some of this information and at least get the "antennae up" for what we may see/encounter in the classroom. (McGean & Bowering, 2006, p. 20-22)

Those voices not only speak of an appreciation for the experience, but, also, expose a serious deficit in pre-service teacher learning easily recognized by those participating candidates that, left unchecked, will continue to contribute to the educational realities of Aboriginal children and youth.

Although some work has been done in Faculties of Education to address Aboriginal educational needs in teacher certification, so much more work is required to decolonize teacher education in Ontario, Canada, and beyond. The recent Framework released from the Aboriginal Education Office, Ontario Ministry of Education (2007) states that achieving the goal of higher levels of Aboriginal student achievement depends in part on an overall strategy that "builds capacity for effective teaching, assessment and evaluation practices" (p. 11). To that end, the Ministry will "encourage faculties of education and colleges to further enhance the knowledge and skills of teacher candidates and teachers in the field to better prepare them to work with First Nation, Métis and Inuit students, including students with special education needs" (p. 11). To begin that process requires a re-conceptualizing of teacher identities in a very different way.

Re-conceptualizing teacher identities

Teacher candidates come to the teacher education arena with a significant educational biography that is their teacher identity. Britzman (2003) suggests, "That by the time a person enters teacher education, she or he has spent approximately thirteen thousand hours observing teachers" (p. 27). It is from that observed experience, that educational biography, that teacher candidates create their own teacher identities, or as Britzman puts it:

> They [teachers] bring to teacher education their educational biography and some well-worn and commonsensical images of the teachers' work. In part this accounts for the persistency of particular worldviews, orientations, dispositions, and cultural myths that dominate our thinking and, in unintended ways, select the practices that are available in educational life. (p. 27)

It is difficult to identify another profession where each successive generation of practitioners shares such a vast observational knowledge of the profession they are entering. This is a staggering and, yet, mostly unconscious legacy that

teacher candidates carry. That being the case, it would seem reasonable to suggest that this legacy must also be devoid of any meaningful reflection of Aboriginal content and that what does exist reflects, at best, a neutral understanding and, at worst, a disturbing legacy.

To change the educational experience of Aboriginal children and youth in public education in Ontario, Canada, and beyond, requires, in part, changing the experience of pre-service and in-service teacher education in such a way as to articulate and simultaneously disrupt those educational biographies. This can be achieved by instituting three decolonizing initiatives.

First, the next generation of pre-service teacher education in the province of Ontario should rely on the personal exploration of the educational myths that underlie teacher candidate's unconscious biographical legacy to realize how it shapes teacher practice. This is a sustained process that promotes a constant and active realignment of self through the exploration of self in an effort to counter the disharmonious mythologized teacher that is a direct result of her/his experience of education. Breaking from that dominant and unconscious understanding of how to teach is contingent on breaking from what the dominant society privileges as the correct intellectual heritage, positivistic philological scholarship, and humanistic pedagogy. Hernstein Smith (cited in Britzman, 2003) writes that, "the former posits neutrality in its supposed separation of fact from value, while the latter attempts cultural maintenance in preservation of selected traditions" (p. 57). To achieve this demands a radical reconfiguration that abandons the intellectual tradition that contextualizes and dominates the entire education discourse and the subsequent adoption of a culture based tradition of teacher education.

Second, we recommend that all Faculties of Education in the province of Ontario and elsewhere should implement two mandatory courses, one dealing with Aboriginal education, as well as one presenting history and contemporary issues. Furthermore, both courses should be taught by culturally grounded Aboriginal educators who are demonstrably connected to their communities. Both courses should connect teacher candidates to Aboriginal peoples through the meaningful representation of local communities, Elders, history, treaties, and literature, and reflect both the local and provincial realities.

Finally, even the most cursory review of the existing in-service education developed by various provincial ministries of education and other agencies demonstrates (see Alberta Education, 2006; Saskatchewan Education, 2000) an almost singular focus on 'how' educators teach in the hope of shifting their practice in favor of Aboriginal children. In many ways the endless concentration on the 'how' has reduced teacher education and teaching to a very menial level where one generation passes on the tricks of the trade and the well worn(out) ideas that effectively extend the colonial project into our classrooms. Britzman would shift that focus by asking us to identify 'what' is it that educators do and 'why' do they do it. Britzman asks us to consider the power of teacher biographies to shape teaching practice and it would seem that it is those biographies that are the starting point of education reform. Only when teachers have a conscious understanding of 'what' they privilege, and by extension, 'what' they penalize

in their teaching, and 'why' those dynamics exist, is there the possibility that the educational experience of Aboriginal children will evolve. It is an ongoing process of healing that continuously asks: As teachers, who are we becoming? And in what ways does that 'becoming' further the cause of Aboriginal self-determination in Ontario classrooms and by extension a socially just Canada?

Building an understanding of the complex narratives of Aboriginal youth can only occur through an equally complex dialogic process. This dialogue transcends the usual approach that focuses on the 'how' to teach in favor of a deeper, richer interaction that asks teachers to reflect on the 'what' and 'why' of their biographies to reveal to them 'how' they are created, and 'how' those biographies privilege a particular worldview, orientation, and disposition, or promote certain cultural myths in their classrooms. In other words the dialogue has to speak to the rational minds of teachers, to abandon the usual lists of do's and don'ts in favor of beginning a discussion along Aboriginal cultural lines. It is an approach that reflects the belief that teachers are inherently dedicated to the academic achievement of all students and because of that dedication would be willing to look inward first before they look outward.

Conclusion

Increasing numbers of Aboriginal children will traverse this complex and highly nuanced educational landscape that is punctuated by the historic and contemporary expressions of colonialism in a daily parallel journey with teachers that too rarely intersect in a positive manner. It is as if Aboriginal children stand on one side of a gaping chasm at the bottom of which runs a thundering river of colonialism that has eroded the very bedrock of Aboriginal lives, carving through cultures, languages, spirituality and families for over 400 years; a chasm that threatens to sweep each successive generation away if they attempt to traverse that torrent of colonialism, of misunderstanding, of unrecognized ignorance, and of epistemic privilege. All the while teachers and schools stand on the opposite side singing, exhorting, demanding, minimizing, wholly unaware of the perils that Aboriginal children confront every day.

Gradually, almost imperceptibly the pressure to cross over for fear of leaving themselves behind becomes too great. Some literally fall to their deaths and are swept away. Others instinctively recognize the dangers and walk away, rarely able to reconcile the tension between their instincts and the dominant myth of schooling as a positive force. With time that tension gradually turns inward and the possibility of self-determining one's life from within an epistemic heritage changes into something else. Very few successfully descend into that canyon and swim across those rapids, but when they arrive on the other side they are no longer themselves: the journey has a cost that reshapes epistemologies and wipes away languages and cultures. Truly the landscape of public education in this province is littered with Aboriginal dead, the walking spiritually wounded, and those who are fundamentally changed by their journey.

References

Alberta Teachers' Association. (2006). *Education is our buffalo: A Teachers' resource for First Nations, Métis and Inuit education in Alberta.* Author: Edmonton, Alberta.

Anderson, D., Horton, L., & Orwick, S. (2004). *Aboriginal teacher education: Issues for First Nations communities.* Prepared for the A.T.E.P. Advisory Committee.

Barsh, R. (1997). The epistemology of traditional healing systems. *Human Organization, 56*(1), 28-37.

Battiste, M. (2002). *Indigenous knowledge and pedagogy in First Nations education: A literature review with recommendations.* Paper prepared for the National Working Group on Education and the Minister of Indian and Northern Affairs Canada (INAC). Ottawa: Indian and Northern Affairs Canada.

Bell, D. (2004). *Sharing our success: Ten case studies in Aboriginal schooling.* Retrieved Dec. 9, 2010 at http://saee.ca/upload/021.pdf

Bishop, R., & Glynn, T. (1999). *Culture counts: Changing power relations in education.* London: Zed Books.

Brascoupe, S., & Mann, H. (2001). *A community guide to protecting Indigenous knowledge.* Ottawa, ON: Department of Indian Affairs and Northern Development.

Britzman, D. P. (2003). *Practice makes practice: A critical study of learning to teach.* Albany, NY: State University of New York Press.

Canadian Association for Community Living. (2005). *A national initiative on inclusive education.* Retrieved Dec. 9, 2010 at http://inclusive-education.ca/resources/documents/cacl_nat_education.pdf

Castellano, M. B., Davis, L., & Lahache, L. (Eds). (2000). *Aboriginal education: Fulfilling the promise.* Vancouver, BC: UBC Press.

Charmaz, K. (1983). The grounded theory method: An explication and interpretation. In R.M. Emerson (Ed.), *Contemporary field research* (pp. 109–126). Illinois: Waveland Press.

Cherubini, L., Hodson, J., Manley-Casimir, M., & Muir, C. (in press). "Closing the gap" at the peril of widening the void: Implications of Ontario Ministry of Education policy principles and Aboriginal education. *Canadian Journal of Education.*

Cherubini, L. (2007). Un impianto originale per un progetto di grounded theory: Una riflessione critica. *Encyclopaideia, 21*, 101-118.

Cherubini, L., & Hodson, J. (2008). Ontario Ministry of Education policy and Aboriginal learners' epistemologies: A fundamental disconnect. Canadian *Journal of Educational Administration and Policy,* Issue #79.

Chesler, M.A. (1987). *Professionals' views of the dangers of self-help groups: Explicating a grounded theoretical approach.* Center for research on social organization, Department of Sociology, University of Michigan.

Coalition for the Advancement of Aboriginal Studies. (2002). *Learning about walking in beauty: Placing Aboriginal perspectives in Canadian classrooms.* Canadian Race Relations Foundation: Toronto.

Corbiere, A. I. (2000). Reconciling epistemological orientations: Toward a wholistic Nishnaabe (Ojibwe/Odawa/Potowatomi) education. *Canadian Journal of Native Education, 24*(2), 113-119.

Cornell, S., & Kalt, J. (1992). *What can tribes do? Strategies and institutions in American Indian economic development.* Los Angeles, CA: American Indian Studies Centre, University of California.

Curwen Doige, L.A. (2003). A missing link: Between traditional Aboriginal education and the western system of education. *Canadian Journal of Native Education, 27*, 144-160.

Davis, H.J. (1982). *An evaluation of the Canadian Tests of Basic Skills testing program presently carried out in the Yukon Territory, Canada*. Unpublished doctoral dissertation. University of Oregon.

DeGagne, M. (2008). Administration in a national Aboriginal organization: Impacts of cultural adaptations. *Canadian Public Administration, 51*(4), 659-673.

Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again.* Cambridge, UK: Cambridge University Press.

Freiler, C. (2007). Building inclusive cities and communities. *Education Canada, 48*(1), 40-45.

Gamlin, P. (2003). Transformation and Aboriginal literacy. *Canadian Journal of Native Education, 27*(1), 2-6.

Giroux, H.A. (1992). Language, difference, and curriculum theory: Beyond the politics of clarity. *Theory into Practice, 31*, 219-227.

Giroux, H.A., & McLaren, P. (1992). Writing from the margins: Geographies of identity, pedagogy, and power. *Journal of Education, 174*(1), 7-30.

Giroux, H.A. (2003). *Public spaces, private lives.* London: Rowman & Littlefield.

Giroux, H.A. (2004). Cultural studies and the politics of public pedagogy: Making the political more pedagogical. *Parallax, 10*(2), 73-89.

Glaser, B.G. (2005). *The grounded theory perspective III: Theoretical coding.* Mill Valley, CA: Sociology Press.

Glaser, B.G., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine.

Hajioannou, X. (2007, June). Bringing the background to the foreground: What do classroom environments that support authentic discussions look like? *American Education Research Journal 44*(2), 370-399.

Hiberg, R.S. & Tharp, R.G. (2002). *Theoretical perspectives, research findings, and classroom implications of the learning styles of American Indian and Alaska Native Students*. ERIC Clearinghouse on Rural Education and Small Schools. Retrieved on Dec. 9, 2010 at http://www.ericdigests.org/2003-3/alaska.htm

Hill, D., & George, P. (1996). *Native learning styles: An assessment tool.* Owen Sound, ON: Ningwakwe Learning Press.

Hunnisett, S.F., Sault, E.K. (1990). *Native Aboriginal children's perceptions of drinking in a northern Canadian town.* Paper presented at the Kettil Bruun

Society for Social and Epidemiological Research on Alcohol, 16th Annual Alcohol Epidemiology Symposium, Budapest, Hungary.

Jacelon, C.S., & O'Dell, K.K. (2005). Case and grounded theory as qualitative research methods. *Urologic Nursing, 25*(1), 49-52.

Lawrence, R., & Gibson, C. (2007). Obliging Indigenous citizens? Shared responsibility agreements in Australian Aboriginal communities. *Cultural Studies, 21*(4-5), 650-671.

LeMaster, P.L. & Connell, C.M. (1994). Health education interventions among Native Americans: A review and analysis. *Health Education Quarterly, 21*, 521-538.

May, P.A., & Moran, J.R. (1995). Prevention of alcohol misuse: A review of health promotion efforts among American Aboriginals. *American Journal of Health Promotion, 9*, 288-299.

McGean, S., & Bowering, M. (2006). *A quantitative/qualitative retrospective of 2006 social issues day.* St. Catharines, Ontario: Brock University, Tecumseh Centre for Aboriginal Research & Education

Mooney, G. (2000). The values of public health: Hopefully not a final word. *Australian and New Zealand Journal of Public Health, 24*, 116.

Mueller, H.H., Mulcahy, R.F., Wilgosh, L., Watters, B., & Mancini, G.J. (1986). An analysis of WISC-R Item responses with Canadian Inuit children. *The Alberta Journal of Educational Research, 32*, 12-36.

Ontario Federation of Indian Friendship Centres and OFIFC-GREAT Initiative. (2005). *Literacy as a barrier to employment: Addressing the literacy needs of Aboriginal people in Ontario.* Toronto, ON: Author.

Ontario Ministry of Education. (2007). *Building bridges to success for First Nation, Métis, and Inuit Students.* Toronto, ON: Aboriginal Education Office.

Ontario Ministry of Education. (2007). *Ontario First Nation, Métis, and Inuit Education Policy Framework.* Toronto, ON: Aboriginal Education Office.

Patrick, R. (2008). Perspectives on change: A continued struggle for academic success and cultural relevancy at an American Indian school in the midst of No Child Left Behind. *Journal of American Indian Education, 47*(1), 65-81.

Reyhner, J., & Eder, J. (2004). *American Indian education: A history.* Norman, OK: University of Oklahoma Press.

Robertson, H. J. (2003). Decolonizing schools. *Phi Delta Kappan*, *84,* -553.

Ross, J., & Ross, J. (1992). Keep the circle strong: Native health promotion. *Journal of Speech-Language Pathology and Audiology, 16*, 291-302.

Saskatchewan Education. (2000). *Building communities of hope: Best practices for meeting the learning needs of at-risk and Indian and Métis students.* Author: Regina, Saskatchewan.

Spence, N., White, J., & Maxim, P. (2007). Modeling educational success of First Nations students in Canada: Community level perspectives. *Canadian Ethnic Studies, 39*(1/2), 145-167.

Stake, R. (2000). Case studies. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Statistics Canada. (2003). *Aboriginal peoples' survey—Initial findings: Well-being of the non-reserve Aboriginal population.* Ottawa, Canada: Author.

Stewart, S.C. (2006). First Nations education: Financial accountability and educational attainment. *Canadian Journal of Education, 29*, 998-1018

Strauss, A. (1987). *Qualitative analysis for social scientists*. New York: Cambridge University Press.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Toulouse, P.R. (2006). *Supporting Aboriginal student success: Self-esteem and identity, a living teachings approach*. Retrieved Dec. 14, 2010 at http://www.edu.gov.on.ca/eng/research/toulouse.pdf

Van der Way, D. (2001). Exploring multiple serendipitous experiences in a first nations setting as the impetus for meaningful literacy development. *Canadian Journal of Native Education, 25,* 51-69.

White, J., Spence, N., & Maxim, P. (2005). *Social capital and educational attainment among Aboriginal peoples: Canada, Australia and New Zealand.* Policy Research Initiative Social Capital Project Series, (66-81). Ottawa, ON: Government of Canada.

Wotherspoon, T. (2007). Teaching for equity? What teachers say about their work in Aboriginal communities. *Education Canada, 47*(4), 64-68.

William G. Demmert, Jr. Biographical Sketch
1934–2010

William G. Demmert, Jr. (Ed.D. Harvard Graduate School of Education, 1973) served as an adjunct professor of education at Western Washington University from 1992 to 2008. Professor Demmert is one of the original founders of the National Indian Education Association.

Dr. Demmert was the first U.S. Deputy Commissioner of Education for the U.S. Office of Indian Education, in the Department of Health, Education, and Welfare; Served as the Director of Education for the Bureau of Indian Affairs; held the position of Commissioner of Education for the State of Alaska; and served as a member of Clinton/Gore Council of Education Advisors, and member of the President-elect Transition Team. Professor Demmert served as a member of the Independent Review Panel created by the U.S. Congress to undertake a national assessment of Title I, of the Elementary and Secondary Education Amendments (ESEA), and other federal programs in the U.S. Department of Education, 1995-2001. He was appointed by the U.S. Department of Education (along with former Secretary of Education Terrel H. Bell) as co-chair of the Indian Nations At Risk Task Force and served as the primary writer for the Indian Nations At Risk Task Force Report published in October 1991, by the U.S. Department of Education.

As part of his university duties, he worked with the RAND Corporation on a review of the research literature on the education of Native America, an analysis of the National Assessment of Educational Progress (NAEP) data targeting Native American students and the Longitudinal Study of Early Childhood education. In addition, he worked with the Northwest Regional Educational Laboratory as a partner on a proposed National Study of Indian Education which included a review and assessment of the quantitative research available on the influences of language and cultural programs on the education of Native American students; a feasibility study on whether such a study is possible to carry out; and the design of such a study.

Dr. Demmert's international activity is extensive and includes serving the chairman for the Steering Committee for the Cross-Cultural Education Seminar Series in the Circumpolar North. In this capacity he serves as a co-chair of a coalition of the Ministers of Education in northern nations and has helped plan and implement a series of education seminars in Norway, Sweden, Finland, Greenland, Russian Federation, Alaska, Nunavut Territory, Northern Quebec, and the Yukon Territory in Canada. These seminars focus on ways to improve educational opportunities for indigenous students in the far north. Most recently Dr. Demmert has worked with the Ministry of Education in Greenland as an international advisor and consultant for their school reform effort in elementary and secondary education, as well as in restructuring their university system.

He also served as a principal investigator, in partnership with the Northwest Regional Educational Laboratory (NWREL), Portland, OR; the Center for Research on Education, Diversity, and Excellence (CREDE), UC Berkeley; the Educational Testing Service (ETS), Princeton, NJ; the Haskins Laboratories, New Haven, CT; Kamehameha Schools, Hawaii; Arizona State University, and seven school programs in a project designed to develop and test curriculum based measurements (CBMs) as a way of monitoring student progress among Native students in a select number of schools that use the Native language as the language of instruction, and a culturally based education program.

Contributors

James W. Bequette is assistant professor of art education in the Department of Curriculum and Instruction at the University of Minnesota. He teaches graduate-level teacher education courses, and researches the effectiveness of culturally responsive curriculum using local Indigenous arts and culture knowledge to reinforce/remediate Native and non-Native student learning in core subjects. He taught K–12 visual arts courses for 15 years in a public school district with mostly Indigenous students.

Lorenzo Cherubini is an associate professor in the Faculty of Education, Brock University (Canada). The focus of Professor Cherubini?s research is on Aboriginal education and policy analysis and is supported by the Social Sciences and Humanities Research Council of Canada (SSHRC). Over the past 17 years he has taught at the secondary school level, served in the roles of guidance counselor, department chair of English, and school administrator in the elementary and secondary school panels.

Pauline W. U. Chinn, a professor of Curriculum Studies, University of Hawai‘i at Mānoa, first taught place-based science to high school students in Plants and Animals of Hawai‘i. Her current work with translators and scientists enables 1834-1948 Hawaiian newspaper articles to be read by a wider community and incorporated into teacher education and curriculum development.

Willard Sakiestewa Gilbert is an enrolled member of the Hopi Tribe and professor of Bilingual/Multicultural Education in the College of Education at Northern Arizona University (NAU). He has served as a faculty member, researcher and administrator for the last 24 years at NAU. His expertise is in curriculum and instruction, bilingual/multicultural education, and Indian education. He was the 2007–2008 president of the National Association for Indian Education and recipient of the President’s Award from NAU.

John Hodson is Haudenosaunee (Mohawk) and member of the Turtle Clan, and Assistant Professor in the Faculty of Education, Brock University. He has worked in Aboriginal education at the college, university and community level in Ontario for over 15 years. In addition, he is a member of a number of circles and associations dedicated to Aboriginal teacher education/research, and has co-authored, published and presented 20 articles related to the subject.

Kelly Hrenko an assistant professor of art education at the University of Southern Maine. Her research focuses on arts infusion, visual literacies, and culture-based pedagogies.

Louise Lockard, B.A. University of California Santa Cruz, M.A. Northern Arizona University, Ph.D. University of Arizona, teaches courses in Bilingual Multicultural Education at Northern Arizona University. She works with teachers of Navajo language to develop curriculum and materials.

Matt Oppenheim is an applied anthropologist focusing on participatory research. His passion is working with communities, especially Indigenous communities, to create schools that engage students in community transformation. He is a researcher with the Prout Research Institute. Oppenheim teaches at uni-

versities and works with Albuquerque Schools in the Research, Development and Accountability Department. His special projects include cultural proficiency, Indian education and service learning. He can be contacted at oppenm@earthlink.net

MaryLynn T. Quartaroli is the project director for the NEXUS Math/Science Program grant at Northern Arizona University. Her specialties include science education, Native American and adult education, program evaluation, and assessment. Previously, she was a visiting assistant professor of Teaching and Learning and senior research specialist for the University's Institute for Tribal Environmental Professionals. She is a co-editor and chapter author for two textbooks on research in education and the social sciences.

Jon Reyhner is a professor of Bilingual Multicultural Education at Northern Arizona University. He taught and was a school administrator in schools serving American Indians for over a decade. He has written extensively on American Indian education and Indigenous language revitalization and served as a commissioned author for the Indian Nations at Risk Task Force. His most recent books are *Indigenous Language Revitalization, Education and Language Restoration* and *American Indian Education: A History*. He has edited seven books on Indian education, written over forty book chapters and articles and has given over a hundred workshops, presentations, and speeches at regional, national, and international conferences.

Frederick M. Sherman is an enrolled member of the Navajo Nation, and is of the Zuni Edgewater Clan born for the Bitterwater Clan. He holds two undergraduate degrees from Southern Utah University and Northern Arizona University - Biology/Botany and Environmental Science, respectively. Frederick has worked in both informal and formal environmental educational settings: an Interpretive Park Ranger with the National Park Service, an Instructional Specialist at Northern Arizona University, and an Instructor with Navajo Technical College, Department of Environmental Science and Natural Resources. Bilingual (Navajo/ English) environmental education was provided. He currently works as a Senior Environmental Specialist with the Navajo Nation Environmental Protection Agency in environmental regulatory compliance, permitting, enforcement, assistance, and rulemaking.

Navin Kumar Singh is a doctoral candidate in Curriculum and Instruction at Northern Arizona University (NAU). He has a Master's in Education from Tribhuvan University, Kathmandu, Nepal, and earned a second Master's in Teachers of English to Speakers of Other Language from NAU.

Sandra J. Wolf is an assistant professor in the Faculty of Education at Lakehead University, in Thunder Bay, Ontario. She currently teaches Aboriginal Education courses and graduate Indigenous-perspective research methods and foundations courses. She also teaches elementary education courses within the Aboriginal Honours Bachelor of Education degree program that she helped to create. Sandra has been a classroom teacher and administrator in schools and educational programs for Native children and adults for 30 years.