

VOLUME 3, Issue 1 | SUMMER 2014

Langscape

WITH GUEST EDITOR | YVONNE VIZINA

A photograph of a woman, likely of indigenous descent, smiling warmly at the camera. She is wearing a colorful patterned headscarf, a dark vest over a brown long-sleeved shirt, and a vibrant, multi-colored striped skirt. She holds a long, thin wooden staff or pole across her body. The background consists of a rough, light-colored stone wall and a dense thicket of dry, brown brush and branches. The overall scene suggests a rural or traditional setting.

Exploring Biocultural
Approaches to Education



Langscape is an extension of the voice of Terralingua. It supports our mission by educating the minds and hearts about the importance and value of biocultural diversity. We aim to promote a paradigm shift by illustrating biocultural diversity through scientific and traditional knowledge, within an elegant sensory context of articles, stories and art.

Langscape is a Terralingua publication

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Terralingua

LANGSCAPE VOLUME 3, ISSUE 1 Exploring Biocultural Approaches to Education

THERE WAS A TIME WITH no schools—a time when nature and community were our teachers, and they taught us everything we needed to know in order to live respectfully and care for one another and for the land. We have come a long way from that. With the rise and spread of formal learning institutions, over time our concepts of “knowledge” and “education” have become less and less associated with everyday-life, hands-on, holistic experience and more and more with academic study and research—the body of systematic thought and inquiry that we call “science”.

Science and its countless applications have permeated all realms of human life. But, enclosed inside the walls of our learning institutions, compartmentalized within the silos of different, specialized disciplines, we have become insular and disconnected. We have lost sight of ourselves as a part of—not separate from and dominant over—the natural world, and as inextricably linked with all other peoples and all other species on earth in a global web of interdependence: the web of life in nature and culture that is now known as “biocultural diversity”. Because of this, we think of the environment as subordinate to the economy, rather than the other way around. And we fail to see—or choose not to see—how our activities can and do undermine the health of the planet that sustains us and the rest of life.

If we want a viable future for humanity, all that needs to change. And a key to achieving that change is transforming our approach to education. To reach a higher level of understanding, we need to rebuild integrative knowledge—knowledge that transcends disciplines, formal modes of learning, and separations between science and traditional knowledge, between science and art, between the intellectual and the emotional, sensory, and spiritual aspects of life. Looking back to go forward, we need to recover the essence of what learning was in the time before schools, and to infuse that essence into learning for the 21st century.

That is what we hope will emerge from exploring biocultural approaches to education. In this issue of *Langscape*, we take the first steps in that direction. Enjoy the readings, and if they inspire you, let us hear from you! It will take all our perspectives and all our voices to forge this new path.

Luisa Maffi, Director, Terralingua



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GUEST EDITORIAL

YVONNE VIZINA



WHEN I WAS APPROACHED TO serve as guest editor for this issue of *Langscape* on the topic of Biocultural Education, I welcomed the opportunity to facilitate some insightful commentary by a range of authors on the meaning of Biocultural Education in general, benefits to be gained, gaps and how they are being addressed, sites of success, where it has been successfully applied, and linkages to Indigenous education.

Our lives are filled with a barrage of negativity through television, social media, and day-to-day encounters with life. We often seek it out, hoping to keep ourselves informed, and in the best cases, use it to take some action for positive change. Too often, though, we don't hear about successes. Even in academic study, the press for innovation and development of transformative research and praxis is steeped in critical analysis that is by its very nature a negative process. It can be very difficult to maintain a balanced perspective that allows positive elements of other's work to shine through while still being able to note areas for improvement or adaptability to other contexts.

Yet, in my experience, guidance from Aboriginal Elders has been steadfast in imparting traditional teachings that nurture inner strength and resilience from positive thought and behavior embedded in acts of kindness, sharing, courage and respect. The works shared by the authors in this issue of *Langscape* are welcome examples of how principles of culture can be woven into teaching and learning resulting in a living tapestry of education action.

I am a Métis woman from Saskatchewan, Canada. For those who are unfamiliar with our history, Métis are an Indigenous Nation in Canada. Historically, we are biologically and culturally linked to First Nations and European ancestors from several other Nations but have our own distinct culture and language. From the early times of the fur trade era when Britain and France were competing for colonial dominance, Métis

were active in a variety of economic ventures locally or by undertaking dangerous and arduous journeys across the vast undeveloped territories of the Great Plains, woodlands, waterways and mountainous regions of the country. They played an important role in the development of this country while fiercely protecting their Métis identity that included holding to values based on traditional teachings of respect for the lands and waters of their Homeland. While using natural resources was necessary for survival, Métis People made harvesting decisions that provided for their needs, but ensured continued abundance for the future. The integration of respectful interaction with Earth's life systems as the foundation of culture has been a part of Métis worldview for hundreds of years. Maintaining and sharing this tradition has come in many forms over many generations. Personal and intercultural exchanges provided the means of learning new ways of living within familiar territories.

Today, global communication means people from diverse cultures can exchange information, learn from each other, and collaborate more than any other time in history. Formal education has provided humanity with knowledge and skills that have facilitated remarkable technologies and generated great wealth for some. But, as world governments work through the United Nations to develop the post-2015 Sustainable Development Goals, it is apparent that we have failed in many aspects to use our considerable knowledge to ensure the health of the natural world, and alleviation of human suffering of the poorest people.

It is my hope that we can use our collaborative power to improve awareness of issues and modify our behavior to reflect the universal need for a healthy environment. In my article in this issue of *Langscape*, I explore the meaning of biocultural education in the 21st century from a Métis perspective as a member of the Métis Nation, a professional educator, and advocate for traditional cultural knowledge of keeping our land, water, climate, and energy systems healthy and in balance.

In this issue of *Langscape*, contributing authors explore how language, culture, and nature are being integrated in education curricula and the reasons motivating these adaptations. A challenge for many cultural communities has been how to retain the foundations of traditional knowledges and languages while gaining beneficial elements of contemporary education. Linking traditional Indigenous perspectives with modern education, for example, requires the involvement of Elders or experienced cultural teachers and land-based activities to provide a context for learners to understand concepts within holistic worldviews. Communicating successes in biocultural approaches to education is important for knowledge exchange among global communities and facilitating advancements in pedagogy. 🌱



Biocultural Diversity Education: Toward New Ways of Learning and Caring About the Diversity of Life in Nature and Culture

LUISA MAFFI, CARLA PACIOTTO, AND ORTIXIA DILTS

Biocultural Diversity: The True Web of Life

OVER THE PAST TWO DECADES, the idea of biocultural diversity has emerged as a new, integrative understanding of the diversity of life on earth—diversity in nature and culture. This understanding has developed through interdisciplinary research bridging the natural sciences, social sciences, and humanities, as well as through increasing appreciation of the relevance of Indigenous worldviews.

The cornerstone of the biocultural diversity concept is that there is an “inextricable link” between nature and culture—in fact, that nature and culture are one, as people are not separate and distinct from nature, but rather an intrinsic part of it. From this perspective, biodiversity,

cultural diversity, and linguistic diversity are interrelated and interdependent manifestations of the diversity of life. Biocultural research has shown that, historically, human cultures and languages have developed through an intimate relationship and mutual adaptation between people and the environment—a link that is still deeply reflected in the beliefs, knowledge systems, and ways of life of Indigenous Peoples around the world. It has become apparent that diversity in nature and diversity in cultures and languages are mutually supportive, sustaining the vitality and resilience of our living planet; conversely, a loss of diversity in one domain negatively impacts diversity in the others, threatening the sustainability of life. Diversity in both nature and culture is the expression of earth’s evolutionary potential,

and serves to keep our evolutionary options open. Vice versa, losing diversity narrows our options for the future and greatly increases the risk of damage to the world's eco-cultural health. It's like losing life insurance for the planet. (For more on biocultural diversity, see: Posey 1999; Oviedo, Maffi, and Larsen 2000; Maffi 2001; Harmon 2002; Stepp, Wyndham, and Zarger 2002; Skutnabb-Kangas, Maffi, and Harmon 2003; Borrini-Feyerabend, MacDonald and Maffi 2004; Carlson and Maffi 2004; Maffi 2005, 2007; Haverkort and Rist 2007; Braun 2010; Maffi 2010; Maffi and Woodley 2010; Shrumm, 2010; Verschuuren, Wild, McNeely, and Oviedo 2010; Dold and Cocks 2012; Pungetti, Oviedo, and Hooke 2012; Maffi and Dilts 2014.)

If we fully understood and appreciated how vital biocultural diversity is for our survival and the survival of all life, wouldn't we be doing everything possible to protect and care for it as a precious, irreplaceable treasure? But we are not doing that. Research tells us that the diversity of life in all its forms is on a steep downward trend (Harmon and Loh 2010; Braun 2011; Loh and Harmon 2014). Biologists agree that we have entered the sixth mass extinction of earth's biodiversity—the first one to be largely caused by human activities. And human action is also causing a rapid loss of cultural and linguistic diversity. What we are facing, then, is a “converging biocultural extinction crisis”—and we are responsible for it.

The causes are multiple and complex, but ultimately reside in the impact of global economic, political, and social forces that, in the relentless pursuit of economic profit and unfettered economic growth, lead to unsustainable use of natural resources and to the erosion of cultural and

linguistic distinctiveness. These processes are rapidly weakening the ecological and cultural health of the planet. By destroying diversity, they are also creating a growing gap in our awareness that we continue to be inescapably interdependent with the natural world. In turn, this disconnect creates a positive feedback loop that further threatens the sustainability of life in nature and culture—the less aware we are of the “inextricable link”, the more likely we are to act in ways that contribute to destroying that link.

More than half of humanity now lives in cities, largely cut off from direct contact with nature, and in an ever-more homogenized socio-cultural environment. Meanwhile, the biocultural resilience of Indigenous Peoples and ethnic minorities, who represent most of our linguistic and cultural diversity and often retain strong connections with the natural world, is increasingly under threat. By our own actions, we are rapidly compromising the very basis of life on this planet: the biocultural life systems that sustain us and all other species on earth. The implications for human futures, and for the future of all life, are enormous. Addressing this crisis to set global society on a more sustainable course is unquestionably one of the greatest challenges that humanity faces today.

The Need for Biocultural Diversity Education

HOW DO WE MEET THIS critical challenge? As a field, biocultural diversity has sparked the development of academic teaching and research programs in North America, Europe, and elsewhere. It has also produced applications in professional and policy domains internationally, particularly

among United Nations agencies and major conservation organizations, helping shape more integrative approaches to conservation and revitalization of our natural and cultural heritage. Hundreds if not thousands of on-the-ground biocultural conservation projects are underway around the world. And the idea of biocultural diversity is attracting growing interest and concern in the media and among the general public. But the magnitude and urgency of the biocultural extinction crisis call for more.

What we need to meet the challenge is a sweeping change in human values that will make protecting and enhancing the biocultural diversity of life a primary societal goal. It is a tall order, but the hope lies in that, just as we humans have been the cause of the problem, so can we also be the source of solutions. By bringing out the many voices of humanity and the lessons that they convey, the idea of biocultural diversity reminds us that we have become disconnected from the natural environment and out of balance with it, and that there are other ways of being human that are more harmonious and in balance with nature.

Achieving this wider societal shift requires a major effort to educate people—particularly youth, the citizens and decision-makers of tomorrow—about the vital importance of biocultural diversity for our lives and for the sustainability of all life. To have a lasting, transformative impact, such an educational effort should aim to reach not just the minds but the hearts, too. It should appeal not only to our cognitive intelligence, but also to our emotional intelligence. This is a daunting challenge in itself, but one that we can seek to meet through the development of pedagogical approaches that will draw from some of our most innovative educational theories as well as from the

wisdom of Aboriginal ways of teaching and learning. The emerging synthesis will likely be an approach not only to *learning about* biocultural diversity, but also, and crucially, to *learning from* it. It is by *learning from* biocultural diversity that we can expect people to *learn to care about and for* the web of life in nature and culture.

What Will a Biocultural Approach to Education Look Like?

AS THIS EFFORT IS STILL in its infancy, it is too soon to know exactly what a biocultural approach to education might look like. But, placing the idea of diversity of nature and culture at the very core of the vision for such an approach, we can aim to formulate integrative, experiential, engaged educational methods and tools that will both reflect and stimulate a multiplicity of views of the human condition, and of our relationships with one another and with the natural world.

A number of existing pedagogical approaches can support this effort—for example, the constructivist learning approach (Jonassen 1999), in which the instructional plan provides multiple representations of reality, represents the natural complexity of the real world, focuses on knowledge construction, presents authentic tasks, and provides real-world, case-based learning environments, while fostering students' reflective practice. Constructivism is at the center of inquiry-based learning frameworks, where teachers are conceived as facilitators of knowledge construction and awareness building related to complex and real-life problems. Spurred by well-planned themes and activities, teachers promote students' choice of topics of inquiry based on individual and group interests and questions (Friesen 2009).

Biocultural diversity pedagogy also embraces the fundamental principles of place-based education (Sobel 2004). In this approach, biocultural diversity concepts and theories are connected to the reality of the local community and natural environment, with the ultimate intent of promoting student involvement in environmental action. Curriculum content and teaching are contextualized locally through students' direct inquiry about the local natural environment, thus creating a personal connection with nature. At the same time, teachers create opportunities for interaction with adult community members, conservation agencies, and local businesses, exposing students to how society interacts with the environment (Sobel 2004). Through place-based learning, students develop a personal relationship with the natural environment, understand how local communities interact with it, and develop an interest in protecting it and promoting a healthy relationship between nature and community life.

Similarly to place-based education, biocultural diversity education subscribes to the need for education to encourage children "to think as well act locally while also being aware of global issues" (Hart 1997). It also recognizes that "place is connected not only to ecology and community life but also to social struggle and resistance" (Haymes, 1995), thus embracing a critical pedagogy of place perspective (Jayanandhan 2009). If young people are to develop action aimed at maintaining, strengthening, or regenerating biocultural diversity locally (and globally), they need to become aware of the sociopolitical and socioeconomic dynamics that are endangering it. For this purpose, a biocultural diversity curriculum aims at bringing into the classroom the voices of the communities and the cultures-

-local and international--that are engaged in maintaining and strengthening biocultural diversity or are struggling to maintain it. Case studies exemplify how the biocultural web of life manifests itself in different contexts and what forces strengthen or weaken it.

This perspective combines well with the reality of the present-day classroom. A biocultural approach recognizes that today's classroom is diverse and mobile and that children from rural, urban, minority, indigenous, immigrant, and refugee background might bring with them diverse biocultural experiences and a variety of environmental knowledge systems. Following a Funds of Knowledge approach (Moll et al. 1992), a biocultural approach aims at drawing from multi-ethnic and multi-place knowledge and traditions through student- and family-centered activities, which also serve to anchor the study of biocultural diversity.

The process of developing a biocultural approach to education provides an opportunity to explore how local education processes shape and influence who we are and the ways we contribute to the knowledge base and behaviors of global society. What we teach and how we teach it differ among education systems and communities, and changes over time as societies evolve and incorporate new sources of knowledge. The mosaic of traditional Indigenous cultures and languages around the world is a source of diverse philosophies that have much to contribute to the problem-solving skills, spiritual growth, and resilience of humanity. The lessons of Aboriginal pedagogies, centered on the teaching of Elders and on hands-on, place-based learning, will also be crucial to the development of biocultural education approaches, by providing learners with a context for more holistic

Taking all these and other relevant perspectives into account, we can begin to envision some of the characteristics of a biocultural approach to education. For instance, we can anticipate that such an approach is likely to:

- Be multi- and cross-disciplinary, including biology, environmental studies, geography, anthropology, language studies, history, political studies, literature, and the arts among others
- Integrate sciences, the arts, and hands-on experiential learning, including importantly activities outside the classroom walls
- Recognize and incorporate multiple sources of knowledge and perspectives, both Western/scientific and traditional/Aboriginal
- Involve family, elders, and community in the education process, helping rebuild intergenerational transmission of knowledge and wisdom
- Be place-based and adapted to individual regions, recognizing and respecting the local environment and the cultural and linguistic diversity that exists in place, while at the same time opening up to the global dimension of biocultural diversity
- Be flexible and adaptable to the local environment and to seasonal activities, recognizing in particular that in certain regions children and youth may have customary responsibilities that should be respected and taken into account in the school calendar
- Acknowledge and accommodate the well-established finding that learning occurs best in the student's own mother tongue
- Recognize that there are different types of learners, each with their own gift, and that different forms and mediums of expression work better for different learners
- Identify and nurture each student's intrinsic motivation, and make the learning relevant to the student's own motivation
- Foster a constructive progression from concept to investigation to inspiration to action



understandings (Battiste 2002). A multiple-perspectives approach will also foster knowledge exchange among communities in today's global world.

Terralingua's Biocultural Diversity Education Initiative

MOTIVATED BY THE CHALLENGES AND OPPORTUNITIES of such an educational effort, in 2011 Terralingua undertook a project, the Biocultural Diversity Education Initiative (BCDEI), aiming to develop an integrative biocultural approach to education, and to spread awareness and knowledge about biocultural diversity in secondary schools through innovative curriculum materials. Curriculum materials are meant to:

- *Apply an integrative approach to teaching and learning about biocultural diversity*
- *Introduce students to biocultural diversity as a new and vital idea. Highlight the relevance of biocultural diversity in students' lives, in their local communities, and in the global community*
- *Develop students' critical thinking and research skills*
- *Engage students in multiple areas of academic inquiry and at multiple levels*
- *Provide the integration of biocultural diversity studies into school curricula in the form of standards-based modules that can be suitably included in a variety of curricular contexts*

Our initial focus on high-school-level education is based on the idea that youth at that stage are in a pivotal phase of their development, in which they are evolving critical thinking and inquisitiveness about the world, and are beginning to question the "status quo". The transdisciplinary

nature of biocultural diversity, which crosses over many different subject matters and brings out novel findings, patterns, and connections, is likely to awaken students' curiosity and interest, and to involve them in an engaging process of discovery. We believe that working with students in this age group will contribute to creating a new generation of committed people who will embrace the value of biocultural diversity and work to sustain it for the sake of our common future.

In the first phase of the BCDEI, we produced and tested a 10-lesson pilot curriculum module aiming to introduce the various dimensions (biological, cultural, linguistic) of biocultural diversity, the interactions among them at different scales (from local to global), the significance of biocultural diversity for human futures, the threats it is undergoing, and possible actions to counter the threats. Collectively, the pilot module addresses the following leading questions:

1. What is biocultural diversity?
2. Why does it matter?
3. What is happening to biocultural diversity worldwide?
4. Why are we losing biocultural diversity?
5. What can we do to counter this loss?

Based on that experience, in the second phase of the project we have developed a broader and more comprehensive vision for the BCDEI. On the one hand, we are taking steps to explore more in depth the nature and characteristics of a biocultural approach to education, through collaboration with academic institutions, schools, and Aboriginal communities. On the other hand, we have started working with Aboriginal and non-Aboriginal experts and partners in Terralingua's global network to co-produce original materials (including video) for real-life case studies that are

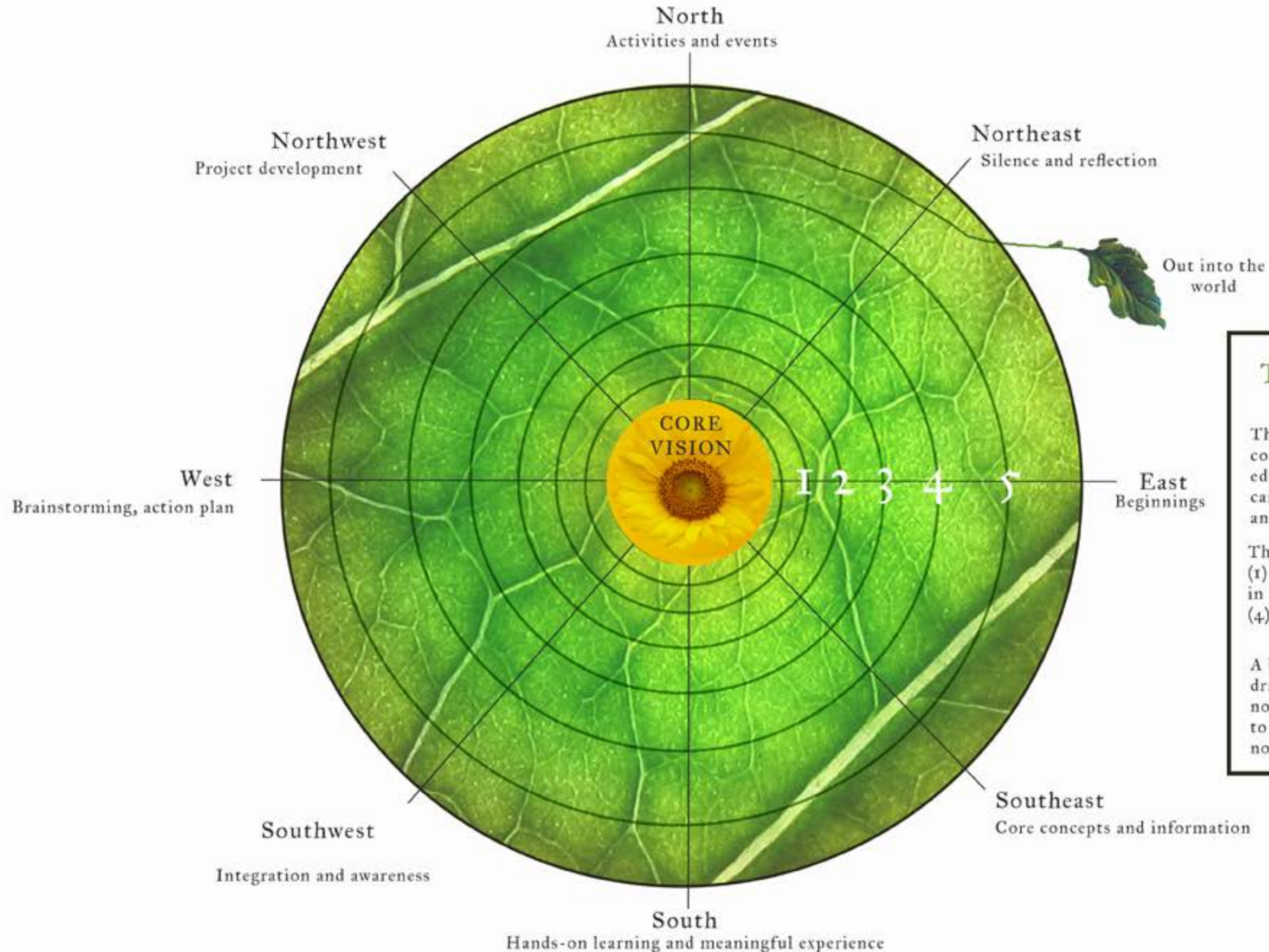


WATCH VIDEO PREVIEW AT: <https://vimeo.com/100152212>

One of the curriculum lessons in Terralingua's Biocultural Diversity Education Initiative (BCDEI) seeks to make the link between language, knowledge, and the environment tangible to students through the case of the Xhosa people of South Africa. This lesson centers on an original video produced for the BCDEI by Michelle Cocks and Tony Dold, who run the Inkcubeko Nendalo ("Culture and Nature") biocultural education program in the Eastern Cape region of South Africa. The video features Xhosa high school students enrolled in the Inkcubeko Nendalo program, who explain in their own words Xhosa traditional knowledge and relationship with the land and how these are expressed in the Xhosa language through traditional stories, idioms, proverbs, riddles, phrases, and songs. As well, the video allows the Xhosa students to share their experiences in reconnecting with their cultural and natural heritage, and to talk about the challenges and opportunities for protecting and strengthening that heritage, which is intimately related to the identity of Xhosa people. The video will also be useful for the purposes of the Inkcubeko Nendalo program, and may originate exchanges between Xhosa students and those who will be learning about (and from) them.

The Biocultural Diversity Learning Spiral

A BLUEPRINT FOR TERRALINGUA'S BIOCULTURAL DIVERSITY EDUCATION INITIATIVE



THE LEARNING PROCESS

The learning process spirals out from the core vision of a biocultural approach to education: instilling curiosity, respect and caring for all the diversity of life in nature and culture.

The spiral moves outward from immersion (1) to in-depth exploration (2), to grounding in the local (3), to linking with the global (4), to taking action in the world (5).

A biocultural approach to education will draw from both Aboriginal and non-Aboriginal perspectives and is meant to be adaptable to both Aboriginal and non-Aboriginal contexts.



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Onge father with Child. Photo ©Anvita Abbi. From BCDEI Curriculum, Unit 2, Language, Knowledge and Environment.

meant to form the core of curriculum lessons. We believe that case studies developed in this way will bring a sense of authenticity to the curriculum, reflecting the perspectives of local people on the issues that are the focus of the case studies. That sense of authenticity will be a crucial stimulus for students taking the curriculum to engage with the issues and become both intellectually and emotionally involved. Working with real-life cases may also allow for productive exchanges of ideas among youth in different parts of the world. Lessons will be complemented by extensive materials including readings, charts, graphs and maps, handouts, worksheets, glossaries, and multimedia resources and links.

The goal of the BCDEI curriculum is not only to foster students' understanding and awareness of the importance of sustaining biocultural diversity for the future of humanity and of all life, but also to encourage youth to engage in action for biocultural diversity conservation from local to global scales. For this purpose, within the curriculum we aim to provide inspiring examples of a multiplicity of real-world careers in biocultural diversity, again drawing from Terralingua's global network of colleagues and collaborators. We anticipate that, through this comprehensive approach, and by working closely with interested teachers, this curriculum will provide life-changing and career-forging experiences for many of the youth who will be exposed to it.

While we are initially targeting high school students, we also believe that, ideally, biocultural education efforts should start earlier, in fact as early as possible. To put it simply: you can't care for what you don't understand, and you can't easily understand what you don't already feel emotionally connected to. Certainly, it is never too late to develop deep appreciation and love for the beauty and diversity of life in nature and culture. And that kind of bond is what we hope to foster among high school students (and perhaps among their teachers and parents, too). But the sooner that emotional connection is established, the better. So, as the BCDEI continues to develop, a key question for us to address will be how a biocultural approach to education might be appropriately tailored to make it suitable for younger children as well. If, at a formative stage in their lives, childrens' minds and hearts can be fully opened up to the marvels of the diversity of life in nature and culture, then the hope is all the greater that, just as we humans caused the biocultural diversity extinction crisis, we will also be able to find solutions. 🌱

ACKNOWLEDGMENTS

In 2011-2014, Terralingua's Biocultural Diversity Education Initiative has been made possible by grants from the Philip and Muriel Berman Foundation, whose generous support we gratefully acknowledge.

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ROBBIE PENMAN

What Could Biocultural Upbringing Mean for Societies?

IN THIS ARTICLE I EXPLORE what biocultural education could mean – and what I believe it should mean – in terms of its social functions. If life on Earth is one body, what role should biocultural education play in it? I have chosen to look at functions because we must understand what overall changes in society we are aiming for in order to guide specific measures: the greatest social movements are always backed by grand visions. If we start out from the ultimate change we wish to see – the preservation of biological, cultural and linguistic diversity – thus defining biocultural education broadly as education that helps preserve this diversity, we may go on to explore exactly how it can achieve this. I do so first in terms of the negative model of education in “modern” societies, and then in terms of the positive model provided by education in “traditional” societies (following Jared Diamond’s usage of these two terms (2013)). Beyond this broad definition, rather than defining what I mean by “biocultural” education, I offer this article as a whole as a contribution to the definition of the term. This is one among many equally valid ways of approaching a definition of biocultural education. Readers may form their own judgement by placing this approach alongside other contributions in this issue.

Kogi river crossing in the Sierra Nevada de Santa Marta, Colombia. For more information on the situation of the Kogi people, see www.tchendukua.com. Photo © Kai Unu Pedraz

Before talking about education, we must first consider whom are we talking about educating. Are we talking about education in the developed or the developing world, in cities or the countryside, among indigenous or non-indigenous people, hunter-gatherers or farmers? Are we talking about formal education through school, usually provided by the state, or the continuous process by which children become initiated into their society? The social functions that education fulfils depend much on the society in which it takes place.

Let us deal with the bad news first: the functions of education in modern, urban societies and how they endanger biocultural diversity. The first function (that concerns us here) is to foster a national culture, to ensure obedience to the nation-state: the political function of education. This entails, by definition, the suppression of cultural and linguistic diversity. The harm it has done to minority peoples is so well documented that I will not belabour the point here. I take biocultural education to be education that is free from this political imperative, instead allowing learning to happen in the learners' own language and culture. This ideal might seem utopian when education is under state control, but there are reasons for hope. In some places the incentive of the state to ensure its citizens' loyalty has faded as international conflicts have petered out. In Western Europe, support for languages such as Welsh, Basque and Rumantsch has strengthened over decades of peace. In Chile and Taiwan, democratisation and economic development have had similar effects. Even in less wealthy countries changing political trends have led to the redefinition

of national culture to better incorporate marginalised groups, as in Bolivia and Ecuador.

A SECOND FUNCTION OF MODERN EDUCATION is that it increases the productivity of the workforce. This is linked to the nationalist paradigm above, since everyone within a state's borders is seen as a potential contributor to economic growth. It is also closely linked to Marxist theories regarding the role of education in perpetuating oppressive social structures. Even among those with the best intentions, few question that education should be a route to economic growth, or indeed that economic growth should be a people's ultimate goal. Since this function of education – or the acceptance of this as a function of education – may nowadays threaten biocultural diversity even more than nationalism, let us look more closely at how this threat is carried out. Most directly it is through the education of traditional peoples by governments, NGOs, or religious organisations. This can erode the use of minority languages, as the provision of formal education is taken as an overriding priority, and learning the dominant language is seen as essential for economic advancement. It can contribute to the loss of biodiversity by devaluing knowledge of, and respect for, the natural world and promoting knowledge directly or indirectly linked to the exploitation of natural resources. As far as uncontacted Amazonian tribes are concerned, education implemented by outsiders is usually a step to further integration into mainstream society, often bringing discrimination (sometimes violently), loss of cultural and linguistic self-confidence, health problems, and poverty. For other threatened societies, by contrast, some

aspects of modern education, such as literacy, may be crucial. Their survival may depend on “interethnic brokers who can represent their interests in greater society”.(Eriksen 2010).

What about societies that are doing the threatening, from those at the knife-edge in the Vietnamese rainforest to those of us holding the handle at a comfortable distance, scouring for the cheapest instant coffee in supermarkets? Here, too, education is key to the preservation of biocultural diversity by changing **attitudes**. At the knife-edge are the farmers expanding into tropical rainforest, who in extreme cases still shoot at indigenous inhabitants. Farther removed are the politicians making decisions about land use, tempted by grand investments. At the farthest end of the chain are the consumers of products made using palm oil or soya grown on deforested land, and more generally all participants in the fossil-fuel (and biofuel) economy. At every stage in the economic processes leading to the destruction of natural habitats and traditional societies, education has a unique power to influence people's decision-making. Those at the farthest stage may represent a special potential given that informing consumers is the path of least resistance: wealthy consumers have relatively little material interest in choosing between competing products and can be swayed to pay a little more for the good of the world, as shown by the success of Fair Trade.

ONE WAY FOR BIOCULTURAL EDUCATION to improve upon this problematic function of education is to argue that education sensitive to biocultural diversity makes more economic sense (although this means

accepting the economic growth-oriented paradigm – perhaps a more feasible approach in the short-term). This approach is perhaps most familiar as applied to the environment: economic growth should take account of environment costs, including loss of biodiversity. Culturally and linguistically speaking, under this approach we can argue that it is a false economy to provide all education in a single national language and according to the standards of national culture, when multilingual and multicultural education can lead to lower dropout rates and higher graduation rates (Nucinkis 2006). Rather than turning threatened peoples into productive members of the national and global economy, modern education often produces discontented individuals incapable of living well either traditionally or in the modern economy: “Several years ago when an Innu man went to social services or hospital and was asked his occupation, he said, ‘Hunter’. Now he says, ‘Unemployed’” (Corry 2011).

The fundamental problem with the economic function of education is this: education should not so much orient children to succeed specifically as workers in the modern economy, as orient them to succeed as living beings generally. Education, as a part of culture, fills in the gap in our knowledge left because of the high degree to which human behaviour is undetermined by genes. “Between what our body tells us and what we have to know in order to function, there is a vacuum we must fill ourselves, and we fill it with information (or misinformation) provided by our culture” (Geertz 1973). Given that education plays such a crucial role in our survival as a species, a lack

of educational diversity seems a risky evolutionary strategy for the same reason as the loss of other aspects of culture: it jeopardises mankind's great evolutionary advantage of creativity and adaptability. A monoculture of the mind, propagated in our society by relentless advertising and homogenous media output, makes us just as vulnerable as reliance on a monoculture of crops.

Let us now turn to a more inspirational model – education in traditional societies, which are also mostly indigenous, non-urban, and found in the developing world. In these contexts education helps preserve cultural and linguistic diversity because it is provided to children by the family and members of a close community, so language and culture are passed on with relatively little change from generation to generation. It helps preserve biodiversity because children are brought up to be the “best conservationists” (Corry 2011), with a huge knowledge of their natural environment and how to interact with this environment so that they use it sustainably. As far as the world's remaining traditional societies are concerned, therefore, our goal should be simply to enable traditional modes of education to continue so that languages, cultures, and knowledge of the natural world may be passed on. Achieving this is a question of defending threatened peoples from unsuitable modern education and, more generally, of guaranteeing them the choice to carry on their way of life by protecting their land and other resources.

E DUCATION IN TRADITIONAL SOCIETIES CAN help preserve biocultural diversity, not only on site within these communities themselves, but also by providing us with

ideas about education to apply to other societies. The first idea is to shift from “education” towards “upbringing”. I have put up with the term “education” so far, but in reality there is no boundary between education and everyday life in traditional societies: education is the same as the child's acculturation or overall induction into society. The use of the prestige Latinate word “education” (and “student”) versus the Germanic “upbringing” (and “learner”) corresponds to the separation between home life and formal, public life in modern society; education serves the interests of the state, upbringing those of the family. A biocultural upbringing should be integrated into everyday life and should happen through a child's home language and culture. The second idea is that the natural world should play a greater role in upbringing/education. This helps us understand the impacts of our actions and see that environmental destruction is not in our interest. Beyond considering our material interest, we are also more likely to empathise with what we are familiar with, and hence care for it. Luckily we already have important precedents in these directions, such as Steiner/Waldorf schools.

In modern (or modernising) societies, to which most people in the world belong, these ideas can play two roles. Firstly, they can help preserve biocultural diversity on site through the same functions as in traditional societies: they can encourage people to transmit their traditional language/dialect, culture, and knowledge of the local ecosystem. Secondly, these ideas can help preserve biocultural diversity among other communities: as learners become aware of the biocultural diversity

The first idea is to shift from “education” towards “upbringing”. ... in reality there is no boundary between education and everyday life in traditional societies: education is the same as the child's acculturation or overall induction into society. A biocultural upbringing should be integrated into everyday life and should happen through a child's home language and culture.

in their own environment, they are more likely to value it wherever else they are linked to it through economic or political processes.

One may well ask, is there anything in common across these modes of upbringing/education, from the transmission of plant knowledge in traditional societies to raising awareness among supermarket-goers? If there is a “grand vision” to both motivate believers in preserving biocultural diversity and convince unbelievers, it certainly helps to have an underlying logic or narrative. One thread that brings together education in contexts as different as a Pirahã village and a slum in São Paulo is an appreciation of the environment – physical, biological, social – and one's position in it. People who are aware of the environment they inhabit and the role they play within it are more likely to care about that environment. As the Transition Network stresses, this means not only a change in our behaviour

but a change in the way we think and feel. This is no easy task, but the vision is there for us to work towards. 🌱

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*Welcoming Schelyangang Sweka Thunderbird and Whale: Welcoming and Protection Pole.
Photo © C. Marshall*

Indigenous Principles Decolonizing Teacher Education: What We Have Learned

KATHY SANFORD, LORNA WILLIAMS, TIM
HOPPER, AND CATHERINE MCGREGOR

Teacher education programs around the world are continually undergoing change; however, fundamental beliefs underpinning the programs have not significantly shifted. They still reflect hegemonic Euro-American-centric values influenced and shaped by neoliberal discourses of hierarchical models drawing from “expert” knowledge (Battiste, 2002) where competition, individualism, and scientific research have dominated educational thinking. Individual educators have sought to bring alternative processes into their classroom practices that reflect Indigenous principles of living and learning (Little Bear, 2009; Kanu, 2011). Although there are instances of changing conceptions of teacher education programming (e.g., Clarke, Erickson, Collins, & Phelan, 2005; Smits et al., 2005), for the most part there has been little challenge to the European model of education that has existed for over one hundred years.

Increasingly, schools need teachers who are able to learn through adaptation and flexibility, engage in meaningful experiences that connect to students' social lives, collaborate and share, and use innovative approaches to develop and share materials.

Essentially, the following four areas make up initial teacher education:

- **foundational knowledge** in education-related aspects of philosophy of education, history of education, educational psychology, and sociology of education,
- **skills in assessing student learning**, supporting English Language learners, using technology to improve teaching and learning, and supporting students with special needs,
- **content-area and methods** for teaching a subject area with related knowledge and skills, and
- **practice at classroom teaching** through practicum experiences.

Conventionally, these areas compete for curriculum time in order to pass on expert knowledge to the novice teachers in form of course lectures, activities, and assignments. Knowledge is seen as objects of knowing to be retained, repeated back, and applied within an array of assignments that serve as evaluations of understanding. Students are rewarded with higher marks than peers for showing a better understanding and more effective representation of their learning. This model of teacher education results in a colonizing effect, with neoliberal discourses made manifest in public schooling through testing, examinations, and projects evaluated by predetermined standards, maintaining students' belief in the ideology of competing for the top marks and working

as individuals striving for personal success. Students re-present colonial content as evidence for their transition into the role of teacher, focusing on their individual advancement into a career as teacher, and then teaching students to learn in the same way (Giroux, 2012).

The colonizing model of teacher education is no longer sufficient for providing the education needed by new generations of learners who will be facing a world with challenges that they will not be able to address with the current approaches to education. Increasingly, schools need teachers who are able to learn through adaptation and flexibility, engage in meaningful experiences that connect to students' social lives, collaborate and share, and use innovative approaches to develop and share materials (Trilling & Fadel, 2009). Teachers need to be aware of and able to interrupt the repetitive neoliberal discourses that cut off students and their families through notions of individualism, power, and mistrust. In the 21st century, teachers need to develop strong personal and professional identities and self-confidence, and engage in programs that recognize a wide range of student backgrounds, needs, interests, and abilities based on cultural, gendered, physical, and socio-economic characteristics. Teacher education programs need to recognize the wide array of skills and knowledge that exist among their students, create program spaces to develop professional knowledge and expertise

that develops their facility, and adapt to the rapidly changing demands of the professional workplace. Rather than seeking simplistic solutions to complex problems, new educators need to embrace complexity and have the skills and confidence to call on their own expertise and the expertise of others in order to work through challenging problems and situations. Working in learning communities (Wenger, 1998), these new professionals need to share their knowledge with others in order to effectively address professional responsibilities.

We (two white Canadian females, a British white male, and one female member of the Lil'wat First Nation of Mount Currie) draw on our collective experience as teacher educators across four academic units within a Faculty of Education. Attracted to a course taught by our First Nations' colleague on Learning and Teaching in an Indigenous World, we sought to embrace the Indigenous pedagogical principles such as inclusivity, community building, recognition and celebration of individual uniqueness to inform the development of our respective courses. Lorna Williams speaks the Lil'wat language, and she was part of a team that documented the language and created learning resources for use in classrooms. She identified these principles over many years of working with learners in classrooms and discussing the ideas of learning and teaching with wisdom keepers in her community. As noted in Williams and Tanaka (2007), humankind is at a historic point that demands a culturally combined approach to curriculum reform, rejecting universal truths, which flow from the colonizer to the colonized. Instead, they suggest that we need to open up a "third space" in teacher education programs where cultural discourses can weave together,

offering alternative paths to knowledge and community wisdom.

In *Figure 1*, neoliberalism is shown as a discourse that enables the perception of reality in materialistic terms, leading to individualistic and competitive values, seeking always to be better than others, seeking dichotomous ways to be right, implying a singular "truth" that must be sought out and learned. Schooling influenced and shaped by neoliberalist discourse—valuing linear over cyclical progression, competition over collaboration, dualism over complexity, and product over process—is exclusionary and does not accommodate the learning needs of many students. It does not take into account the diversity of students in 21st century society in relation to culture, race, gender, sexual orientation, economic potential, disability, or beliefs (Giroux, 1988, 2012; McLaren, 1988; Asante, 1999). Additionally, it does not embrace learning in all its complexity, informed by culture, experience, environment, and the more-than-human world. In this paper, we will suggest the importance of embracing alternative ways of conceptualizing education for all students. Drawing on principles of Indigenous education as highlighted in *Figure 1*, we believe we can shift the ways we have maintained educational experiences for prospective teachers. In so doing, we are shifting away from a Euro-American centrism increasingly being overly influenced by neoliberal discourses.

Though not comprehensive, the intents in Indigenous teaching indicated in *Figure 1* implies that understandings can provide a lens for educators to think about different ways of connecting with learners, valuing their knowledge, and helping them to move forward successfully into the world. Euro-

WAYS OF KNOWING

Euro-American-Centrism/ Neoliberalism <i>(Predetermined curriculum)</i>	Indigenous <i>(Learner/teacher Collaboration)</i>
Prescribed learning; expected outcomes pre-determined	Learning is emergent
Teacher to student focused	Focus on students and teacher interaction
Learning happens in the classroom; classroom is quiet	Learning happens in many locations, inside and outside the school; classroom can be noisy
Knowledge is transmitted	Students construct knowledge through gathering and synthesizing information
Students work independently	Students work in pairs, groups, or alone depending on the purpose of the activity
Teacher evaluates student learning	Assessment is used in context to promote and diagnose learning
Teacher monitors and corrects students' responses	Learners are guided to find their own solutions and answer their own questions
Teachers evaluate student learning; teaching and assessing are separate	Students evaluate their own learning; teachers also evaluate; teaching and assessing are intertwined
Students are ranked according to pre-determined criteria	Students have multiple opportunitites for success and quiet recognition
Teacher chooses what is to be learned	Students have some choice of learning activities and topics
Focus is on a single discipline	Approach is compatible with multi- and inter-disciplinary investigation
Culture is competitive and individualistic	Culture is cooperative, collaborative, and supportive

Figure 1. Contrasting Euro-American-centrism influenced by neoliberal discourses and Indigenous ways of knowing.

American conventions are increasingly shaped by neoliberals, whose focus on the singular truth and the right way has stunted the growth of not only Aboriginal students, but of all students. In this paper we will suggest that teacher education can learn from Aboriginal principles that will improve education of all students.

Furthermore, as suggested by the *Accord on Indigenous Education*, “the time is right for a concerted and cooperative effort that creates transformational education by rejecting the “status quo,” moving beyond “closing the gap discourse, and contribution to the well-being of Indigenous peoples and their communities” (Archibald, Lundy, Reynolds, & Williams, 2010, p.2). However, it is important that the transformation includes all students and provides opportunities for all to think differently about the nature of education, their role as learners and teachers, and alternative ways of creating educational experiences for students. The Accord, although focused on improving educational opportunities and experiences for Indigenous students, notes that “major national studies and government commissions have called for this type of political and educational involvement” in decision-making and policy development, “and have recommended that Indigenous knowledge systems have a central position in educational policy, curriculum, and pedagogy” (Archibald et al., 2010, p.2). The Assembly of First Nations cited the Accord signed by the Canadian deans as a sign of the shift to address the under-education of Canadians about the Indigenous peoples of Canada and committing to educational change (AFN, 2012, p.15)

In addition, the Accord identifies common traits of Indigenous education, including a holistic and lifelong framework,

one that addresses spiritual, emotional, physical, and intellectual development in relation to oneself, one’s family, community, and environment. The holistic model that defines Indigenous education implies multiple and diverse strategies, considering geographical, cultural, and linguistic diversity, which adds to the complexity and richness of education, and of society and should be embraced in Canadian society (AANDC, 1998). Indigenous education draws on an organic metaphor for learning that includes diversity as an asset, creating spaces to value and nurture multiple forms of knowing and ways of being in the world. As such, Indigenous education would embrace Eurocentrism as another form of knowing rather than the form of knowing.

Decolonizing Teacher Education

OUR QUESTION IS, THEN, “how are these Indigenous principles and related pedagogies informing and being interpreted in the practices of existing teacher education programs?” In the teacher education program at the University of Victoria, Dr. Lorna Williams’ teaching has influenced how we think about teacher education, especially with several faculty taking Lorna’s classes, and we have begun to respond to the ways in which Indigenous education can provide alternative perspectives and reshape our thinking about how pre-service teachers can better prepare themselves for a teaching career. Using principles such as those listed below, which were realized by Lorna Williams (2008) in her course, Teaching and Learning in an Indigenous World, we have attempted to conceive of a program that addresses the goals presented in the Accord and to address the challenges that come with shifting our collective and individual thinking. These include the need to provide:

LIL'WAT PRINCIPLE DESCRIPTION

Kamúcwkalha

acknowledging the felt energy indicating group attunement and the emergence of a common group purpose

Celhcelh

each person being responsible for their own and others learning, always seeking learning opportunities

Kat'il'a

seeking spaces of stillness and quietness amidst our busyness and quest for knowledge

A7xekcal

valuing our own expertise and considering how it helps the entire community beyond ourselves

Cwelelep

recognizing the need to sometimes be in a place of dissonance and uncertainty, so as to be open to new learning

Emhaka7

encouraging each of us to do the best we can at each task given to us

Figure 2. Lil'wat principles for learning and teaching.

- respectful and welcoming learning environments;
- respectful and inclusive curricula;
- culturally responsive pedagogies to improve the quality of knowledge, understanding, and pedagogic skills that all educators gain;
- mechanisms for valuing and promoting Indigeneity in education; and
- culturally responsive assessment (Archibald, Lundy, Reynolds, & Williams, 2010, pp. 5-8).

These goals have challenged us all to think about what and how future teachers need to consider their role as members of learning communities, the complexities of learning,

the role of their students in learning communities, the role of past learning experiences and the influence of these experiences on their conceptions of learning and teaching. Though the Accord has been critiqued as fitting Aboriginal students into a Euro-Canadian schooling system and as not going far enough to embed Indigenous wisdom in the institution (Rasmussen, 2011), it does offer signposts for change. Wisdom keepers and institutional leaders at each site have the opportunity to define how Indigenous knowledge, wisdom, and practice will find a place in each institution, thus honouring the diversity of Indigenous peoples in Canada.

For centuries education has been structured in similar ways, but we are

now at a critical juncture in educational history—education as we have known and experienced it is serving fewer and fewer of our students, including Canadian-born students of diverse descents, students who have immigrated to Canada, able/disabled populations, and students of all genders (Ralston Saul, 2008). We need alternative voices informing ways that teacher education programs can prepare teachers to meet the needs of all 21st century learners. To that end, we have considered how teacher education programs might look if we shape them according to the principles introduced by Lorna Williams. We have considered small steps to (re)shape the program so that we can become more aware of the potentially oppressive nature of the program, recognizing and valuing experiences and cultures that differ from current norms and practices, seeking to reveal or uncover “othering” or exclusionary practices of societies and groups whom they want to subordinate (Levinas, 1969; Said, 1978), and challenging practices accepted as the norm.



Story Stick. Photo © Michele Tanaka

Lil'wat Principles

IN DRAWING EXPLICITLY ON THESE LIL'WAT PRINCIPLES highlighted and described in *Figure 2* (Williams, 2008) below, we have asked the following questions: How does the adoption of these principles shift the ways that teacher education programs are offered? How does an explicit consideration of the next seven generations to come shape experiences in the program? How can we honour others' learning before our own, and understand the importance of recognizing and following our passions? How can these Lil'wat principles come to influence decisions made about teacher education and structures that contain the program?

Figure 2 offers six key Lil'wat principles (see <https://sites.google.com/site/lulwatprinciples/home> for the appropriate pronunciation). The ideas introduced through these words offer an alternative way of thinking about teaching and learning, one that resists the colonial notions of competition, individualism, and scientific

discourse that serve to suppress uncertainty and difference. Learning to say and use these words requires hearing the words as pronounced by Lil'wat speakers rather than mediated by English pronunciation; this is respectful to the Lil'wat. The effort to read and pronounce the Lil'wat words leads to new ways of embracing and addressing the challenges of a complex world.

The principle of *Kamúcwkalha*, acknowledging the felt energy indicating group attunement and the emergence of a common group purpose, describes a different relationship between individuals in a teacher education program. Creating conditions where a group is ready to work together, to listen to one another, and speak without fear suggests a different way of knowing and coming to learn. Recognizing social community as a vital component of learning, articulating the responsibility that each person has for helping the learning community to accomplish a task with good will, and understanding that relationships—with other students, the teachers and guides, the tasks, and the community—means that students are relating what they are experiencing to previous knowledge and to others.

Building on this principle, *Celhcelh* suggests that each person is responsible for his or her own learning, for finding and taking advantages of all opportunities to learn, and maintaining openness to learning. Each person must find their place in the community, and offer what knowledge and expertise they have to benefit the communal work being carried out. Embracing this principle requires a watchful listening, an openness to listening beyond our own personal thoughts and assumptions, being always aware and conscious of our surroundings as we focus on the task at hand.

Kat'il'a is a principle that suggests the importance of finding stillness and quietness amidst our busyness and quest for knowledge. Within the increasing demands and speed in our lives, we need to seek out spaces that allow for changed pace, contemplating deeply our own experiences and the wisdom of others.

It is within alternative spaces that the principle of *A7xekcal* can be lived; enabling us to locate the infinite capacity we have as learners, to develop our own gifts and passions in a holistic, respectful, and balanced manner. *A7xekcal* enables us to value our own expertise and consider how it helps the entire community, rather than just ourselves. *Emhaka7* encourages each of us to do the best we can at each task given to us, and to be aware of how we can be helpful to others in our community. *Emhaka7* reminds us to work respectfully and with good thoughts and good hands in all we do.

However, growth and learning requires that we continually challenge our established and comfortable ways of knowing and being; *Cwelelep* speaks of the need to be sometimes in a place of dissonance and uncertainty, in anticipation of new learning. *Cwelelep* can be described as spinning like a dust storm, dislodging learners from our places of mental, emotional, and physical comfort and begin to consider ideas in new ways. When new learning is emerging for us, we can be experiencing *Cwelelep*, feeling as if we are in a dust storm.

These principles resonate with many contemporary learning theories which highlight focused, situated (Barab & Plucker, 2002), social (Wertsch, 1985) and complex (Davis & Sumara, 2006) insights on learning. As such, notions of diversity within a collective system are seen as an asset, with interactions by participants in the collective promoted to allow system-wide learning

and adaptation. In such a system, learning is based on participants' openness to ideas, and on interconnections made in personal contemplation, but also between people in the system who are drawn together by a common goal. Context then creates the conditions for persons to form a collective system, but at the same time, the context challenges the system to evolve, to exist with an element of uncertainty. Essentially, learning is seen as organic, emergent, and adaptive, continuously expanding the realm of possibility as the collective system seeks to thrive within ever changing and challenging contexts.

Implementation of Lil'wat Principles

THE IMPACT ON OUR TEACHER EDUCATION PROGRAM has been both subtle and explicit. At first glance, the program seems similar to the one that was offered one or even two decades ago. However, shifts can be seen and felt in the way the program is offered, the ways in which students' contributions to the program have been recognized and valued, and the ways in which Indigenous ways of knowing have become integral to the overall program.

Learning and Teaching in an Indigenous World: Transformational Course Experiences

ONE OF THE MOST OBVIOUS INFLUENCES has come from Lorna Williams' course Learning and Teaching in an Indigenous World.. The course has had numerous iterations, beginning with a course that, in 2005, transformed our conceptions of learning and caused multiple dust storms. Lorna's proposal of a course in which

Indigenous ways of knowing would be learned through carving a pole was received with trepidation and doubt. However, when completed, the course changed the ways of thinking for many people, including students, faculty, and community. Drawing on all of the Lil'wat principles identified above, Lorna's course modeled shared expertise (across multiple *teachers*, from within the student body, and from community members). It also opened up spaces for undergraduate and graduate students, and faculty to learn together in a common space in respectful and reciprocal ways. This course provided spaces for acknowledgement of cultural traditions, for valuing of multiple sources of wisdom, and for deep respect for generations of expertise. All members of the Pole Carving course were responsible for their own learning and for the learning of the group, as they assisted with the carving and the documenting of the learning that occurred during the course, and after the course was completed. Following iterations of the course (Earth Fibres; Storystick; Canoe Carving; Stewardship) continued to create *Cwelelep*, but also strong *Kamúcwkalha* or group attunement and energy, *Celhcelh* as learning emerged in different ways for all members of the community, and *Emhaka7* as respectful engagement was shown throughout.

As the Learning and Teaching in an Indigenous World courses developed, room was created in the program for another course, EI TELNIWT and Indigenous Education, to enable all students to be introduced to alternative conceptions of learning through Indigenous principles, as well other optional courses such as Indigenous Epistemologies, History of First Nations, Métis, and Inuit Education in Canada, and CENENITEL TW TOLNEW: Helping each other to learn. This course



Thunderbird and Whale: Welcoming and Protection Pole. Photo © Michele Tanaka

introduces an Indigenous world of learning and teaching through hands-on practical activities integrated with theoretical and academic goals. Experiences are offered in the principles of traditional Indigenous ways of teaching and learning such as mentorship and apprenticeship. Respectful practice, community engagement, and personal responsibility help learners develop insight into Indigenous pedagogy while working alongside community knowledge keepers, elders, and artists clearly demonstrating the infusion of Lil'wat principles.

Alternative Practicum

A SECOND SHIFT IN THE TEACHER EDUCATION PROGRAM was the introduction of an alternative practicum experience, recognizing that learning can occur in multiple locations and situations, and that many members of a community can be teachers. As pre-service teachers seek out alternative sites in which to pursue their understanding of teaching (from the land, from elders, or from culturally diverse locations) they often find themselves in uncomfortable places (*Cwelelep*) where many of their values and beliefs are challenged. They find themselves needing to exhibit watchful listening and *Emhaka* as they do the best they can in a new and challenging situation.

Inquiry Courses

A THIRD SITE WHERE LIL'WAT PRINCIPLES have influenced the teacher education program has been in the inquiry-based learning courses. In the spirit of *Celhcelh*, all students are responsible for their learning as they select topics of significance to their development and seek out ways to develop further expertise in that area. Through opportunities to make choices about the focus of their learning, students

are developing their own personal gifts and expertise in connected and relevant ways (*A7xekcal*), and becoming engaged in issues of personal and professional interest, need, and relevance. Instructors become more deeply aware of the competence, ability, and passion of each of their students about significant issues; they share their understandings, develop existing expertise, and challenge existing theories and practices related to teaching and learning. Through opportunities to select and explore issues of personal and professional relevance, students in the program have followed their passions to create curricular resources, and to research.

In some curriculum courses that have traditionally focused on examinable content, with students reading, remembering and recalling textbook-based material in exams and papers, instructors shifted their assignments to offer a more contract-based grading system. Essentially, if a series of mandatory assignments—engaging in discussion forums, annotating scholarly work, completing personal blogs on course experiences, and participating in field experiences—were done to a professional level, the student received a B+ grade. All assignments had detailed criteria with examples available of previous assignments completed by students. To achieve a grade of “A,” students were expected to complete a proposal template for an extension assignment that would contribute to their peers and their own learning. This shift created an expanding curriculum where students proposed assignments and negotiated the parameters for the assignment with the instructor based on the course materials. Students then worked on assignments where they invested in their own passions (*Celhcelh*), but also where they created something that would benefit their

peers (*A7xekcal*), in their present class but also in subsequent classes. Extensions ideas drew from a wide set of experiences such as curriculum resources, YouTube videos on course content, assessment strategies piloted in local schools, field trips, inquiry projects, and workshops. Even when assignments were passed, several students indicated they intended on editing them based on instructor feedback before uploading them to their electronic portfolios. As one student commented after receiving feedback on her extension assignment:

“Thank you for your feedback on my teaching behaviour analysis assignment...I will resubmit an updated version to be used as an example for future classes in the new year” (Student, personal communication, Mar 22, 2012).

Electronic Portfolios (ePortfolios)

WITHIN OUR TEACHER EDUCATION PROGRAM an ePortfolio practice has been implemented that enables students to identify learning that relates to provincial standards that they have to address to be certified as a teacher. The ePortfolio enables students to develop and utilize technology skills learned in the program as well as create a reflective resource from which to draw when applying for teaching positions. As noted by Hopper and Sanford (2010) the ePortfolio has evolved as a mode of collecting evidence of deep and meaningful learning about the teaching profession. Students gather a range of artifacts, recollect the meaning behind each of these learning artifacts, and reflect on their significance to themselves and to the enhancement of their profession. Through a wide array of alternative modes showing evidence of learning, i.e., photographs, artwork, physical engagement, voice, or multimodal representations, students

are enabled to demonstrate evidence of their learning, to take pride in the individuality of their work that becomes part of the community’s understanding, and to share their learning with a broader community of learners. The diverse ways of representing their knowledge connect to others’ learning artifacts and create a more holistic understanding and demonstration (Hopper, Sanford, & Bonsor-Kuki, 2012). Electronic portfolios also offer an alternative to traditional hierarchical assessment practices that often serve to fragment learning and alienate students from their own learning. Through the development of a rich array of learning artifacts, students take greater responsibility for their learning and recognize the relationships between different learning experiences in courses, outside experiences, and practicum experiences, making connections where none existed previously. Electronic portfolios break down barriers between students, drawing on *Kamúcwkalha* in order to engage with each other respectfully, sharing personal insights on theory and practice, but also on their reforming ideas on learning. These insights told diverse stories of becoming a teacher. The ePortfolios create a place for *Celhcelh* where students become more attuned to their own learning. As one student commented as she completed her teacher education program:

“I had a conversation with a colleague about the ePortfolio, and I said, “Here, I think it’s beneficial because now it’s my choice, like what do I want to share and what do I want to think back and reflect on?” That’s the power of ePortfolio because rather than telling, it’s like putting the power in the other person’s hand, in the learner’s hand.” (Student, personal communication, April 5, 2010)

This shift from being told to taking responsibility for one’s own learning resonates with the core ideas within both *A7xekcal* and *Celhcelh* principles.

Learning From Students

THE LIL’WAT PRINCIPLES OF TEACHING AND LEARNING have enabled us to recognize gaps in the teacher education program and provide alternative spaces for student voices to emerge. The Underground Curriculum, a non-course created and offered by students in the program to offer opportunities for students to explore issues not addressed well enough in the program, was supported by teacher education personnel. Recognizing that teacher education programs are located in institutional frameworks that do not embrace change rapidly, both students and faculty sought to create alternative spaces to grow and nurture learning. These alternate learning spaces enabled *A7xekcal* as students explored issues of personal significance to them and their peers; they enabled *Cwelelep*, both through alternative spaces and challenging topics brought to light. Students who became involved in educational programs of Sea Change Marine Conservation Society experienced learning very differently as they engaged with children in hands-on learning with physical activities such as rowing, explorations on the beach, and learning from traditions of local First Nations communities. Alternately, students who chose to experience education in a Ugandan orphanage learned about cultural traditions and values, about teaching multi-age groups in spaces with very few educational resources, and ways to create innovative tools and strategies. Community among the students, and with a broad range of community organizations, developed through recognition of others who had the same interests and needs, providing

new locations for new conversations that respectfully engaged in the work of becoming teachers.

Embedded Teacher Education Practices

IN ADDITION TO THESE SIGNIFICANT FEATURES, other characteristics of the teacher education program resonated with the Lil’wat principles. In many cases, students were organized in cohorts, giving them the opportunity to develop relationships with a group of colleagues over a year, rather than working with different people in each course. Students were offered a full day in the middle of the week for connecting, reconnecting, and reflecting, freeing them from formal commitments such as courses. This day allowed students to breathe deeply, to choose further learning opportunities, and to connect informally with their peers. Support was given to the Education Students’ Association to create their own professional opportunities through invited guest speakers, participation in professional conferences, or creating informal support groups. A significant learning experience in the teacher education program is the professional seminars, developed to provide spaces for meaning making with elders and peers, for connecting collaboratively rather than competitively, to develop relationships, and to engage in *Kamúcwkalha*.

Many individual instructors created learning opportunities that resonated with the Lil’wat principles. This was especially the case for instructors who took Lorna’s course, engaging in the Aboriginal principles as a member of the class. In many cases, the students were offered opportunities to work in groups, allowing them to share the work and their knowledge, and to provide each other with support and encouragement. For example, one instructor revised his course



Braiding sweetgrass. Photo ©Michele Tanaka

outline to focus on three core principles advocated by Lorna Williams (2008) within the learning and teaching in an Indigenous world course. As he stated:

“To encourage students’ collective identity, shared learning and co-operation, the rules of engagement in the course were given as: (1) put the learning of their peers before their own learning; (2) create work that will benefit seven generations to come; and (3) find their own passion in course content and use it to energize the community.” (Instructor, personal communication, Sept. 2011)

These “rules of engagement” allowed ideas of *A7xekcal* (own expertise helps the entire community beyond ourselves), *Emhaka7* (encouraging each to do best we can in a task), and *Celhcelh* (responsible for own learning and seeking learning opportunities). He found that these simple rules resulted in the students developing a sense of collective identity and personal support for each other’s learning. The course used a school-integrated approach to learning where some lessons were taught in a local school by the university instructor in collaboration with the schoolteacher and then gradually with the students (Hopper & Sanford, 2008). This experience created the *Kamúcwkalha* idea where there was a common felt energy indicating group attunement and the emergence of a common group purpose around learning to be a teacher within a school. As one student commented within her personal reflection:

“Dr. H. told us on the first day of class, “Focus on the learning of your peers.” At first, I was kind of confused by this... learning, I thought, was something of a personal activity. But through peer assessment and teaching, I came to recognize just how important it is to focus on the learning of your peers - a huge part of personal growth comes from

working with others and doing what you can to support their learning. This is especially true for teachers!” (Student, weekly reflection, November, 8th 2011)

Use of electronic forums, such as MOODLE, (a free, open-source learner management system for producing modular internet-based courses; see http://docs.moodle.org/23/en/About_Moodle) enables shared learning for not only the current class but also for future generations of students. Sharing enables students to take pride in their work, work more diligently on their projects, and collaborate more richly. Students were afforded opportunities to represent their learning in many diverse ways, including orally, visually, and through physical enactments, demonstrating the value of diversity of skills and talents. Artifacts such as button blankets, story sticks, and canoe paddles have become valued as evidence of learning. These types of learning artifacts have also influenced how other forms have become more accepted, such as video journals, student-developed workshops for their peers, student-generated websites, podcasts, and blogs, to name a few.

In addition, while many of these activities were not created with the Lil’wat principles in mind, they resonate with each of the principles, suggesting a powerful and significant connection that needs to be clearly articulated throughout the program. It is through the clear articulation of Indigenous principles that we can come to value more explicitly the learning conditions created in classrooms and in programs. The wisdom of our Indigenous colleagues can return us to appreciation of spaces that engage in collective and human learning endeavours, providing culturally responsive teaching with intention and purpose. The humanity of teacher education can be revitalized

and reconceptualized through Indigenous principles such as those shared by Lorna Williams.

Providing a Day of Stillness

WEDNESDAYS PROVIDED A DEPARTURE FROM DAYS filled with scheduled classes and seminars—no classes were scheduled, and students were invited to use the day to their best advantage. Drawing on the principle of *Kat’i’la*, we sought to create spaces of stillness and quietness amidst students’ very hectic programs and lives. Students were able to get together informally to create networks and community, attend workshops of their choice, go on field trips outside of the scheduled time-table, or they were able to use the time for quiet reflection and contemplation. Taking time to breathe deeply, to connect to the world around them, and to regain a sense of balance are important aspects of learning and teaching, although often disregarded in conventional teacher education programs. Too often we view time not filled up with courses and other work with suspicion, and our reaction is to add more—*Kat’i’la* reminds us that we need balance in order to act with wisdom and professionalism. Wednesdays were one such space, in the middle of busy weeks, that enabled students to find that.

Conclusion

THROUGH OUR WORK IN SHAPING EXPERIENCES for pre-service teachers, we have come to realize the effort required to shift our conceptions and practices. Those of us working with Lorna, attempting to provide experiences that are more inclusive for our students, have had to challenge our own “tried and true” beliefs and assignments. We have also had to face challenges from our students who have not always appreciated the dissonance that has been introduced into their lives. We have been challenged by

administrative structures and expectations requiring compliance with policies created from Euro-American-centric traditions and values.

As we have become aware of the untenable limitations of the structures and rules within the education system, we have created alternative approaches and descriptions of student learning activities. However, we have also been challenged to model the principles that we are espousing, living in tension, ourselves, returning repeatedly to examine what we are doing and what our motivations are. We have had to resist the desire to return to the familiar and comfortable—both for our students and for ourselves—and have persisted in living in *Cwelelep* that place of uncertainty in which new learning emerges.

Through these tensions have come visions of new possibilities as we create conditions that support the wisdom of Lil’wat principles. Working with the students to acknowledge the limitations of previously exalted approaches to becoming a teacher, we have challenged ourselves to conceptualize alternatives. We accept the need for apprehension in our learning as we realize the importance of disruption if we are going to address the needs of our students and their right to learn in complex environments. The examples shared above have enabled a shift, but we still all struggle to live in the tensions of change as we reshape our practices and shift our pedagogical realities, embodying the transformative potential of struggle.

Indigenous principles offer new ways to think about teacher education—embracing alternative spaces, creating moments of stillness, creating dust storms to challenge complacency, generating common purpose, recognizing our responsibility for each others’ learning in respect and balance, and employing watchful listening as we can.

Schools and teacher education have long been tools for colonizing, suppressing, oppressing, or objectifying learners, particularly Aboriginal peoples but in some sense all learners. In this paper, we have shared how we have tried to create a new way to think about creating learning conditions that appreciate the strengths of all, develop confident and strong teachers/leaders who are aware of context, place, spaces for learning to emerge and grow. We believe we are moving in the right direction, but also know there are many more steps to take as we deepen our understanding of why changes need to be made and how Indigenous principles can assist us to walk new paths. 🌿

ACKNOWLEDGEMENTS

Originally published online in *In Education* Vol. 18 No. 2 (2012), at <http://ineducation.ca/index.php/ineducation/article/view/61/547>. Reprinted with authors’ and publisher’s permission under Creative Commons.

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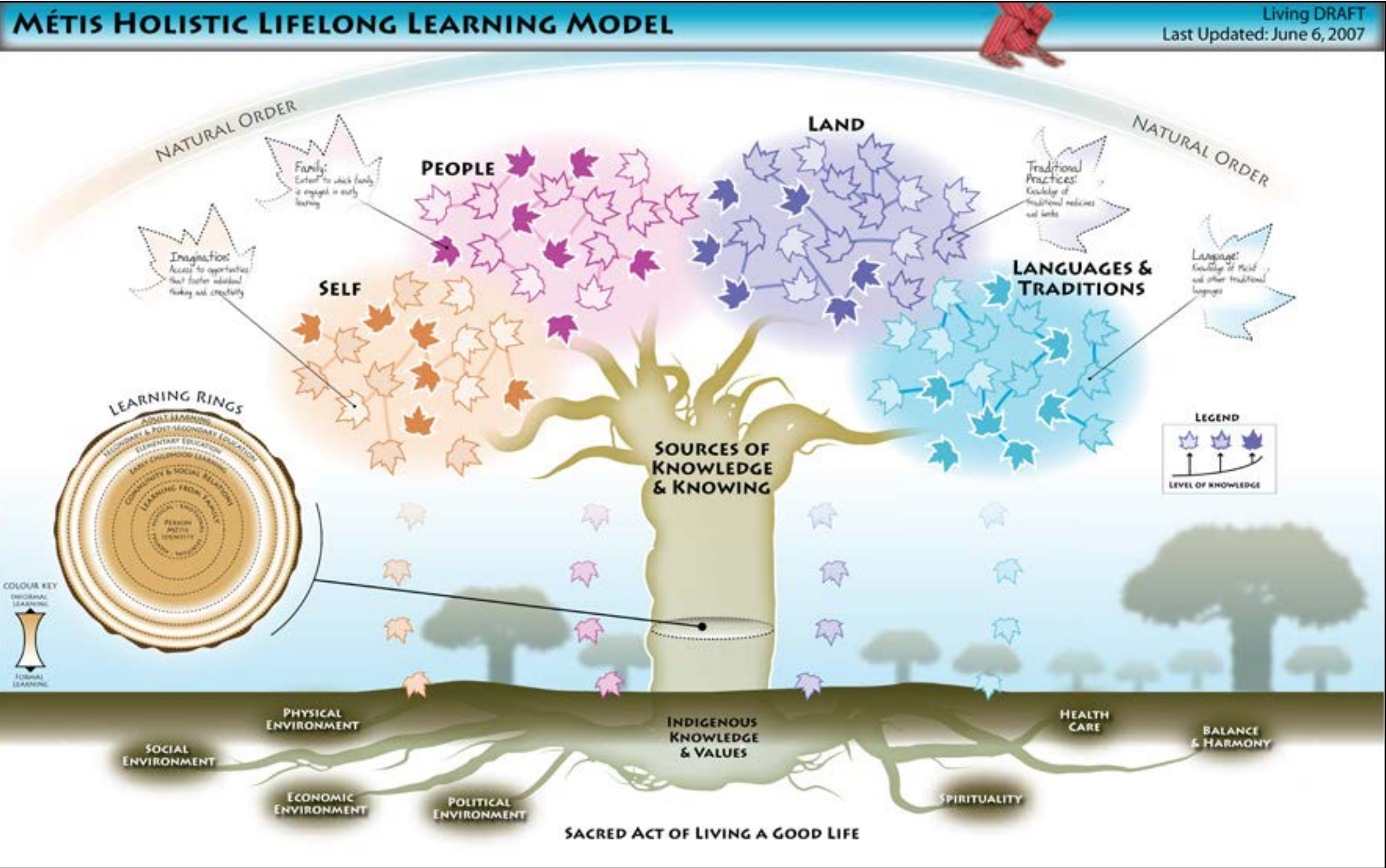
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Biocultural Education: Métis Life in the 21st Century

YVONNE VIZINA



THE TOPIC OF BIOCULTURAL EDUCATION is particularly salient to me because I have spent many years working to understand how traditional Aboriginal knowledge can become a foundation for teaching and learning in formal education systems. I specialized in Biology as a high school teacher and linked traditional Aboriginal cultural teachings to the concepts and topics within the biological sciences.

In Saskatchewan, Canada, provincial education policy has supported the inclusion of First Nations and Métis perspectives in curriculum for decades. Most subject areas have a good variety of resources and experienced educators to share and build Aboriginal content into teaching. In the sciences, however, there were virtually no professional resources to use. So, I drew on my own knowledge, trusting that the traditional knowledge imparted to me over the years by Saulteaux, Cree, Dakota, Nakota, Dene, and Métis Elders would bring my students to a broader understanding in the study of biological sciences.

In 2010, I completed a Master's Degree in Education doing research with Aboriginal communities in NW Saskatchewan on the



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Photo © Yvonne Vizina*

topic of Métis Traditional Environmental Knowledge and Science Education. I explored the meaning and application of traditional knowledge in the formation of what might be understood as a biocultural approach to science. That is, in exploring how traditional knowledge based in profound respect for life, and the elements that facilitate life, could be shared with the academic community. Before embarking on further studies, I returned to work for my Nation on national and international environmental issues.

As part of the UN International Indigenous Forum on Biodiversity, collaborating across cultures and languages brought me new experiences and insights

from South and Central America, Africa, Russia, Asia, the Pacific, and other locales. Globally, Indigenous and local communities face many of the same challenges as Aboriginal Peoples in Canada in loss of land access and associated disruptions to traditional livelihoods, languages, and ability to transmit ancestral culture intergenerationally through traditional means.

Yet, despite the pressures of such things as industrialization and urbanization, there are sites across the world where individuals and small groups of people are doing remarkable things in defense of Indigenous cultures. Indigenous Nations gain exposure to these activities through some communication

Taking a holistic approach to understanding the natural world can facilitate a greater understanding of the importance of diverse cultures and languages in expressing how people have adapted to life in their particular territory.

networks and periodic participation but we lack global networks of collaboration that can facilitate professional development and interfaces with traditional knowledge holders for education, cultural exchanges and long-term capacity-building within Indigenous communities.

The urgency in addressing global biodiversity and human well-being is dependent on advancing education, meaningful relationships, and the creation of spaces that allow the cultures to create and integrate new knowledge that illuminates the meaning and purpose of ancestral knowledge. This can happen in any discipline but is particularly important within those that can bring scientific and Indigenous communities together on equitable footing to find mutual successes in overcoming common challenges.

My current PhD studies at the University of Saskatchewan's School of Environment and Sustainability have had me immersed in the examination of international community-based conservation, international conservation and Indigenous decision-making, and traditional knowledge and customary sustainable use of biological diversity. With my background in education, over the next year I will be working with Dr. Marcia McKenzie from the College of Education to

advance an examination of how Aboriginal post-secondary institutions are integrating sustainability issues and how we might strengthen national and international collaboration. The Sustainability and Education Policy Network is an exciting new collaboration within Canada that is examining K-12 and post-secondary education practices in relation to policy with a view to developing innovative processes and contributing to a more sustainable future for all of us.

Whether one works in formal education systems or not, it is useful to learn, or remind ourselves, of why enabling diverse cultural views in education is important. Learners who are alienated from their family and community value systems can face monumental struggles in reconciling what they learn in formal education if it has no connection to their lived reality. Educators who bring learners to understand such things as Indigenous history and resilience, traditional and contemporary gender issues, and the importance of critical thinking skills can greatly enhance the lives of their students. Indigenous students who take pride in their identity and develop leadership skills are preparing to take their own place as Elders in the future. What students learn during the early years of their lives has a great bearing on the future



Métis festival held in Northern Saskatchewan at Palmbere Lake where regional residents gather to camp together, share in traditional cultural activities, discuss regional issues, and also most importantly celebrate Métis families, culture and kinship. Photos © Yvonne Vizina

health of their families and communities. Acknowledgement of cultural identity and inclusion in education is not only a responsibility of educators but also a right of learners.

A biocultural approach to education is the inclusion of cultural knowledge about life within pedagogy and curricula. Traditional Indigenous language and cultures emerged within groups of people from ancestral teachings and experiential knowledge needed to thrive in particular areas. For Aboriginal Peoples in Canada, the diversity of First Nations, Métis, and Inuit cultures means there are also diverse solutions to developing educational curricula meaningful to those students. Coastal and northern peoples have different knowledge from those who live on the prairies or elsewhere. Inclusion of traditional Aboriginal cultural knowledge within education can benefit both Aboriginal and non-Aboriginal learners because it encourages developmental learning with their own local ecology, social issues, and economic processes. Familiarity with sacred areas, local plant and animal life, relationships among human and non-human individuals and communities, cyclical patterns of weather, energy systems, water systems, and land vitality are basic insights important to all residents of an area.

Taking a holistic approach to understanding the natural world can facilitate a greater understanding of the importance of diverse cultures and languages in expressing how people have adapted to life in their particular territory. Holism is often attributed to Aboriginal cultural perspectives, but in reality holism is a paradigm inclusive of multiple perspectives and knowledges. A holistic approach in Aboriginal culture means

paying special attention to relationships among elements of life. Past research carried out with First Nations, Métis, and Inuit resulted in the development of three holistic models reflecting how the respective groups viewed important aspects of cultural life-long learning. In the case of Métis, important elements of education include: self, people, land, language and traditions as important sources of knowledge and knowing. Métis people believe learning has important roots in social, physical, economic, and political environments, as well as in spirituality, health care, the degree of balance and harmony, and Indigenous Knowledge and values. Developing an understanding of multiple components of life helps orient Métis individuals and communities to ensuring traditions are respected and carried forward through time for the benefit of future generations, but also so there is an ability to consider challenges and benefits brought by contemporary life. Métis, like other Indigenous cultures around the world, are part of a global community that is shaped and influenced by local and global conditions.

Human population has now exceeded seven billion and is expected to reach eight billion by 2024 and over ten billion by the end of this century. As our numbers increase, there is growing pressure on the natural world to provide food, clean water, and services that will enable healthy lives. Over 2 billion people on Earth live in poverty, without adequate access to basic necessities of life such as food and health care. Their struggle for survival depends not only on their own ability to live in contexts often beyond their control but also on the choices of lifestyle made in developed wealthy areas of the world.

Over 50% of the world's population now lives in urban centres. In some areas of the world, 80%-100% are urbanites. The increasing human concentrations in cities has many benefits for day to day life, but also alienates people from learning about the natural world through intimate and personal experiences. Traditional Indigenous cultures are based on the knowledge and experience of their territories built through intergenerational transmission and personal experience. As more people migrate to cities, educators need to find new and innovative ways of helping learners make connections between their urban lives and the natural world.

Although many Indigenous people continue to live in rural and remote areas, many now live in urban settings. In developed worlds, including Canada, Aboriginal people faced with poverty and sometimes life-threatening living conditions often migrate to urban centres where there is more opportunity to provide for their families. Unfortunately, this initiates a cultural disconnection from land and traditions that can have long-term negative implications on identity and well-being.

Bringing education to life with cultural knowledge requires having access to traditional teachers and natural settings. To accomplish this, educators must have the support of policy-makers and curriculum developers that are willing to establish a foundation for building relationships with Aboriginal communities. As education has evolved, we have come to understand the severe damage that results from alienating children from the culture, traditions, and languages of their community. Aboriginal communities in Canada, whether Inuit, First Nation or Métis, hold profound respect for the natural world within their

respective cultural teachings. Harvesting practices required extensive knowledge of plants and animal habitat, behavior, and purpose to exercise the right amount of use and restraint. Developing skills and wisdom reflected in the maturing behavior of learners requires regular and ongoing experiences with the natural world. In the same way as acquiring fluency in language is a building process requiring immersion on a regular basis, so too does acquiring an understanding of Aboriginal cultural traditions.

The values educators hold about the purpose of education help determine what is taught and how it is taught. In formal school settings, meeting curriculum requirements is a necessary commitment of classroom educators. Within that context, educators strive to comply with heavy demands for content achievement in standard areas, preparing learners for their progression to adulthood. But as time goes on, it has become more apparent that, in our globalized world, there is an urgent need to ensure all learners have an understanding of the need to ensure ecosystem health and human resilience in the face of rapidly changing climate conditions resulting from human activity. The changing environment is out-pacing curriculum revision bringing a challenge and an opportunity for educators to link traditional knowledge with contemporary knowledge to achieve outcomes contextualized to local settings.

Education is meant to provide learning opportunities for learners that nurture their potential within complex relationships and responsibilities to self, family, community and Nationhood. Contemporary education is based in formalized policy whereas traditional education is based in cultural values and ethics. Saulteaux Elder Danny Musqua teaches that an Aboriginal person

who has little or no regard for the natural world is said to exist as a 'shadow' driven by the desire for material gains. These people have lost the foundation of their cultural reality. They have faded to live within an illusion of external rewards, seeking pleasure and fulfillment by means that are destructive and damaging to themselves, other people and the Earth. At all stages of life, it is possible to return to traditional values and ethics. Learning, or re-learning, basic tenets of culture can bring relief to the human spirit and life into focus.

Merging traditional and contemporary education does not diminish the importance of learning in depth the roots of traditional culture or in helping learners become accomplished in specific academic areas of study. Like ecosystems, learning requires diversity to foster richness and abundance. Encouraging learners to become active in learning from local community members and fostering their leadership skills are essential for intergenerational transmission of cultural knowledge. This requires getting out of the classrooms and having access to learning experiences important to the community. Participation in cultural ceremonies helps educators and learners alike understand tradition and the mysteries of the unknown. Building friendships and relationships among diverse culture groups is necessary for cross-fertilization of knowledge and problem solving. Ultimately, individuals have an opportunity to nourish their own lives and learning journeys as they discover their own personal areas of expertise.

Over the past ten years in Saskatchewan, the provincial government has made good progress in revising science curriculum to include First Nations and Métis perspectives. Committed researchers, educators, Elders and other Aboriginal community members

Merging traditional and contemporary education does not diminish the importance of learning in depth the roots of traditional culture or in helping learners become accomplished in specific academic areas of study. Like ecosystems, learning requires diversity to foster richness and abundance.

have made this possible through working together on a variety of projects and holding a common belief that inclusion of Aboriginal perspectives is important for all students, not just Aboriginal students. An exciting new resource of the Saskatoon Public School Division made available to the public in June 2014 is an e-book by Dr. Glen Aikenhead entitled *Enhancing School Science with Indigenous Knowledge: What We Know from Teachers and Research*. This resource provides both practical and theoretical insights on culturally responsive science teaching, connecting with Elders and cultural teachers, challenges and benefits from real teacher experiences, culturally valid assessment, and a host of other key topics. Learning from the practical experiences of educators is an important part of incremental growth for policy and praxis.

Evaluation in learning must be also consistent with the form of education provided to students. Formal education based on established curriculum uses multiple methods of evaluation. Indicators pointing the way to eventual desired outcomes are available to help measure progress. In a similar way, traditional cultural skill building is evaluated based on the learner's ability to achieve understanding and application of traditional knowledge. As learners demonstrate readiness, traditional

teachers give them more responsibility and trust. Corrections are offered if mistakes are made, because the learner is seen as having reached an important juncture of growth. Above all, evaluation in traditional culture is based on the need for each individual in a community to become a good human being that contributes to the well-being of others.



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Interactive Learning about Biocultural Diversity: University Students Engage Tribes

JEANINE PFEIFFER WITH COSTANDINOS BAKOUROS, CRAIG CANNON, MARINA CHISLETT, TIEN PHAM, TREVOR RAFF, CONRAD SASINSKI, AND PALAK SHAH

Diversifying our approach in studying biocultural diversity

IN DR. PFEIFFER'S SAN JOSÉ STATE UNIVERSITY CLASS *Nature and World Cultures*, students focus on the evolution, conservation, and revitalization of biocultural diversity by focusing on two key questions: (a) What are the reciprocal and dynamic relationships between cultures and the environment? (i.e., how does each influence the other?); and (b) How do socio-cultural and historical factors influence and/or change an individual's or a group's relationships with their surrounding environments?

During the semester-long course we examine works representing different viewpoints, professions, socio-economic classes, spiritual traditions, educational backgrounds, and geographical regions. We read and hear the words of anthropologists, ecologists, journalists, naturalists, Native scholars, historians, indigenous peoples, poets, activists, museum curators, immigrants, prisoners, filmmakers, and conservation organizations, comparing the authors' narratives with our own experiences and insights.

By the final exam, students are exposed to over fifty cultural groups via Netflix films, indie documentaries, and YouTube videos; instructor podcasts and lectures; prose and poetic and scientific readings; and case studies from the Terralingua-Earthscan 2010 text, *Biocultural Diversity Conservation - A Global Sourcebook* by Luisa Maffi and Ellen Woodley.

Since 2012 students in the class have partnered with Native Californian tribes and tribal communities to complete semester-long group projects on biocultural diversity. Student projects examine the dynamics of nature-culture connections and issue including sacred sites, language revitalization efforts, water rights, endangered culturally significant species, and traditional lifeways. Students have produced tribally-approved micro-documentaries, published articles in the national newsmagazine *Indian Country Today*, and completed applied projects of cultural relevance. Students also receive extra credit for attending tribal events, the American Indian Film Festival (in San Francisco), public protests organized by tribes advocating for environmental and cultural justice, Californian Indian

Tiny pine needle coil basket made by the instructor, as part of her hands-on training to better understand Northern California biocultural diversity. Photo ©: Jeanine Pfeiffer.

conferences, and museum exhibits featuring Northern California tribal history and art.

Investigating real-life examples of biocultural diversity

BACK IN THE DARK AGES of the *Nature and World Cultures* class (i.e. pre 2007), students completed standard term papers on cultures randomly picked from around the world. Students completed papers on their own, and the papers had no life or usefulness beyond the class. That was until the day the instructor began checking in

with students regarding their familiarity with California biocultural diversity – native species and Native cultures. The students' responses inspired her to completely restructure the syllabus.

As student Costandinos Bakouros relates: "Professor Pfeiffer actually said, on the first day of class, 'Who here knows someone, or has talked to someone of Native American descent?' Of the forty students in the class, only about two students said they had. It shocked the whole class. It was very apparent that day that [our group projects]

symbolized something more than words. They inspired cultural awareness and overcoming the ignorance we have towards people who resided in California way before any of us did.”

In the current incarnation of the class, students form groups of 3 to 5 people during the first week of the class and define a group project topic that links a Native California tribe or tribal community with a specific aspect of nature. Group topics explore California biocultural diversity: culturally significant species, habitats, or ecosystems, Native languages, and cultural traditions. The projects investigate the cultural evolution of a Native Californian group in relation to a specific aspect of nature, from centuries ago to the present. Projects have studied the Pomo and traditional basketry, the Hoopa and the Klamath River, the Yurok and the salmon, and Winnemem Wintu and Ohlone sacred sites.

To increase the relevance and positive impact of the students’ work beyond the university, each group project culminates in a format accessible to the general public: a YouTube video, a Wikipedia entry, an online (Open Access) article with a newsmagazine, or a public event – all subject to approval by a tribal representative. Students have thirteen weeks to meet this relatively ambitious goal. Each stage of the project is broken down into a separate phase, with deadlines carefully timed throughout the semester. During the first weeks of the semester, each group submits abstracts and outlines that are reviewed by the entire class in real time during the course’s weekly webinars. In subsequent weeks, collaborative literature reviews are completed before the group pulls together the first drafts of their project narrative.

According to Costandinos: “The great part about this class is that the professor lets the groups turn in three versions of the project. Version one is the roughest of all: she gives her full attention and input to this version in order to help make any major changes and/or [address] problems in the research. In the second version, the project information should look a little bit clearer, and if any input is needed, the professor suggests specific changes. After this the peer-review process of the project starts. Each person is asked to pair up with someone, either in their group or out of their group, in order to get others’ revisions or helpful remarks on one’s writing, grammar, and ideas. Once this is done, the groups should have a well-developed idea of what the project is going to look like. But before this happens, like any respectable person would do, the draft narrative must be sent to a cultural representative of the California tribe the group chose to focus on. Once approved the final piece is turned into the professor and the micro-documentaries get posted to YouTube, the Wikipedia entries get updated, and the articles sent out to publishers. It is a long process, but a rewarding one in the end. This structure is what makes this class so unique and great.”

Collaborative projects – challenges and rewards

FINISHING A MULTI-STAGE, COMPLEX PROJECT in coordination with other students and in consultation with a cultural representative within one semester is no easy task. In completing their group projects, students face a series of real-world challenges including:

- Defining a feasible topic and finding sufficient resources to research the topic

- Agreeing to a work plan and balancing the effort amongst all the group members

- Conducting 100% of their communications virtually (the class is web-based)

- Keeping on task and on deadline

- Making positive contact with a cultural representative willing to work with them

- Completing a high-quality, culturally-approved product before the semester runs out

Students agree it takes a lot of self-commitment to do a group project, especially within an online course where students never meet one other. With 3 to 5 members in the group communicating primarily by email (instead of face-to-face meetings), it is easy to have miscommunications or misinterpretations of ideas. As one student confessed, “We had to call out each other several times during the project, or push each other to meet the deadlines. Sometimes I felt pretty nervous when the deadline was getting close and we didn’t have our final draft yet.”


Inevitably, tensions emerged between “leaders” and “slackers” in the group, with some students using their relative unfamiliarity with different technologies as excuses to avoid doing the work or for being late in meeting deadlines. One student recommended a more participatory approach to all project activities: “I would have much appreciated it if every aspect of the work – i.e., writing the narrative, contacting cultural representatives, publishing the article, uploading the video, or editing a Wikipedia page – was spread among the members as evenly as possible. By doing so we could possibly turn a ‘technologically challenged’ person into a ‘technologically able’ person.”

Yet a collaborative approach also has its advantages. Student Conrad Sasinski notes: “An individual approach to this project would be completely overwhelming. This way, it enables each student to lead, contribute, and grow in their own way – but also together. Two heads are always better than one, and five are better than two. In a real-life situation, you would not be working on a project like this by yourself. This class empowers you to learn how to interact with people and include their ideas in your own psyche. The structure and design [of the project] are geared to enable students to dig deep and use their critical thinking, communication, writing, reading, researching, planning, teamwork, and leadership skills. These factors are what make it such an invaluable project. The way in which it was synthesized chronologically from initial ideas, to developing theses and conclusions, to formatting and rendering articles for upload onto the World Wide Web not only teaches students the work involved in publishing online, but also that collectively, they can make a difference in the world.”

According to student Craig Cannon: “A collaborative approach allows all members of the group to bounce ideas between each other, and then produce the best possible solution. We are able to brainstorm and form stronger ideas before breaking off to create our individual portions.” Students also agreed that the group project helps prepare one for the real world outside of academia.

Interfacing with cultural representatives

CULTURAL APPROVAL OF THE GROUP’S FINAL VERSION of the project is required by the instructor. Although students are encouraged to begin contacting cultural



SJSU Nature & World Cultures

by DrPfeiffer • 7 videos • 54 views • 1 like • 1 hour, 25 minutes

Microdocumentaries made by AMS/ENVS/HUM 159 Students as part of their group projects.

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WATCH THESE VIDEOS AT: <http://youtu.be/LZOEKMHitg?list=PL1Stmqz-WdIO8TP2QAbvSvy3qglgtwZR>

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7



Winnemem Wintu and the Salmon (9:48 minutes, 2012):

Winnemem Wintu Video (8:44 minutes, 2012): Group Project on Winnemem Wintu and raising of the Shasta Dam

The Cultural Revival of the Ohlone: Transformation of the Ohlone’s Religious Beliefs (36:47 minutes, 2012)

AmahMutsun (9:46 minutes, 2012): In this Microdocumentary, we are introduced to the Amah Mutsun and given a brief history of their culture and people. The primary focus is on their efforts to revive their traditions, culture, and to shed light on their partnership with UCSC in creating the “Relearning Garden”. This partnership is key to introducing their historical

Ohlone Revival of the Wetlands Crafts (2:55 minutes, 2012): The project seeks to reiterate the importance of the wetlands and marshes as a cultural and ecological keystone to the present and past generations of the Ohlone. We wish to showcase the efforts being made to revive the various arts

Help the Wintu Save Their Home (12:52 minutes, 2012):

Pomo 2 (4:04 minutes, 2012): Pomo Indians and current basket weaving trends.

representatives as soon as they have chosen their project topics, some groups inevitably have more success than others. Following guidelines spelled out in the course syllabus by previous classes, students are encouraged to act as cultural ambassadors, treat all communications professionally, loop the instructor into their email exchanges, and try not to get frustrated if it takes multiple tries to get a response back. In the case of one group, the students attempted to contact eight representatives over a period of several weeks and only received a response from a single person. Tribal staff readily admit to being overwhelmed with work, and many tribes are still developing their institutional capacity.

Student Marina Chislett shares: “I think one of the most difficult challenges one may face in executing this project is working with cultural representatives. This was one thing Professor Pfeiffer discussed with us from the beginning of this course and was something we continued to learn throughout it. In many cases and class discussions, we came to learn how indigenous people worked with many researchers sharing their history, knowledge, practices, and beliefs – where the end result was far from pleasant for their people. In some cases this meant overtaking [their] land after discovery of valuable resources; in other cases it led to amazing medical discoveries, but with no accreditation to the knowledgeable tribal members. Experiencing reluctance from a tribe isn’t uncommon given their history of previous outcomes.”

In the best-case scenarios, students became scholar-apprentices to a tribal staff person and managed to complete a project of direct use to a tribe or tribal community. This was the case for a 2013 student group whose joint work with a Chumash tribe was

of such high caliber the tribal staff person recommended their work be included with the tribe’s archival entry to the Smithsonian Institution.

In the worst-case scenarios, students are candidly informed by the cultural representative that their work contains too many errors – despite being directly based on primary sources in the literature – and is denied approval. In this instance, the students are given a powerful lesson in the unending frustrations Native groups face with inaccurate, stereotypical, and misleading representation.

Marina comments: “While anyone can gather information online, the requirement of validating the information with a tribal representative ensures that all our information is factual and that their culture is being portrayed accurately. This is something our group actually experienced firsthand with the Yurok Tribe. In our original version of our narrative, we mentioned that the Klamath Salmon Festival was a Yurok tradition that held cultural importance. Our representative informed us that was untrue: although the Yurok host the event, it is actually aimed at tourists and had less significance than we initially thought.”

Improving our approach

ACCORDING TO STUDENT CONRAD SASINSKI: “The class is well thought-out, chronologically and ideologically. As the class progresses, you learn more about biocultural diversity, and as you gain knowledge you are able to include that in your project.” To succeed with the assigned project, students must be able to draw clear connections between culture and nature, something many of them hadn’t consciously done prior to taking the class. As implied by the course title, nature and culture are often

seen as separate entities. When we embrace the term biocultural diversity, however, we see that the two are inextricably linked, and the loss (or conservation) of one is directly linked to the loss (or conservation) of the other. In the words of student Tien Pham, “When more people appreciate biodiversity and the variety of cultural groups, biodiversity will have a better chance of surviving and tribal groups will have a better chance of preserving their cultures.”

Overall, students agreed that the group project is definitely a challenge, one that pushes students to go explore and deepen their understanding about the world. As one student testifies, “Going outside of the university walls allows students to gain cultural knowledge of cultures other than his or her own. The process of learning from an outside source not only influences a student academically, it ultimately changes the student’s perspective of culture and his or her own way of living.”

More importantly, for students attending a California State University, gaining deeper familiarity with the First Nations who occupied the land- and seascape provides students with a new set of eyes to interpret the world around them. The instructor encourages her students to constantly ask the question “Who was here first?” when visiting State and National Parks, driving along State highways, and commuting through urban areas. In another student’s words: “Students need to develop an understanding of their country’s history and the people that lived here before it was even a country. They need to realize that higher education is a tool, but it’s not the end-all cure-all explanation of the universe.”

According to one student: “It would be much more beneficial to meet in person

with the tribe members and see what they are working on – this would not only inspire the students, but help them write.” Another student, Trevor Raff, appreciated the virtual effort of seeking knowledge firsthand outside of the classroom: “Because a book can only tell one so much I feel it’s hard to really appreciate something for what it is unless you observe it with your own eyes. I also was taught at a young age to question authority and go out and seek the truth for myself. I feel it’s crucial for all to learn about the Native Americans and all of the knowledge they have to offer that you really literally can’t find in books.”

Direct, one-on-one interactions with Native Californian tribes and tribal communities requires instructors and students to make an extra, and in some cases, extraordinary effort. Most tribal reservations and Rancherias are geographically isolated: the average San José student would have to drive at least four hours (round-trip) to reach the closest land-based tribal group. To overcome this distance, the instructor relies heavily on films, video clips, podcasts, and online guest speakers; yet when students are able to make the trip – oftentimes a group of students will carpool to an event – they are delighted to have made the effort.

Biocultural diversity is best understood through lived experience: by hearing personal testimony, by participating in a hands-on event, or by getting to know a practitioner. In this *Nature and World Cultures* class, students are given every opportunity to do so, on all counts. In most cases, according to post-class student evaluations, it is a life-changing event.



FURTHER READING

Dr. Pfeiffer’s YouTube Channel: <http://www.youtube.com/user/DrPfeiffer>
Indian Country Today news articles by San José State University students:
Tule River Tribe Knows Basket-Weaving Is Interwoven With Cultural Identity
<https://indiancountrytodaymedianetwork.com/2013/08/07/tule-river-tribe-knows-basket-weaving-interwoven-cultural-identity-150779>
How Archie Thompson Saved the Yurok Language
<http://indiancountrytodaymedianetwork.com/2013/08/16/how-archie-thompson-saved-yurok-language-150910>



Pomo Basket- Pacific Grove Museum of Natural History By Daderot (Daderot), via Wikimedia Commons



Ancestral campesino ways of teaching-learning are based on respecting and harmonizing with their landscape and deities. Their values and knowledge have allowed the regeneration of their cosmovision. Evaristo Lliuya's family hilling potato furrows. Evaristo Lliuya's family. Sector Atocpampa, Comunidad Campesina Túpac Yupanqui, San Miguel de Accho District, Huaraz Province, Ancash Region, Peru. Photo © PRATEC 2010

COMMUNITIES NURTURING THEIR SCHOOL:

A **Bio**cultural Approach to Education in the Peruvian Andes

GRIMALDO RENGIFO, TIRSO GONZALES AND KARINA COSTILLA



Asociacion de Maestros Interculturales de la Region Ancash (Association of Intercultural Teachers, Ancash Region, Peru). Native Seed Exchange among Primary Schools, Baños La Merced, Carhuaz, Ancash, Peru. 2013. Teachers: Nancy Bojorquez Rojas, Ana Chavez Fortuna, Abila Romero, Wenceslao Rosario, Eyda Tarazona Vilchez, Miriam Vitorio, Marcela Isla Berrospi, Enma Bojorquez Rojas, Sisy Loli Fortuna, Antonio Caushi Alvarado, Martin León, Soledad Cuizano, Grimaldo Gomero, Doris Osorio, Edda Colonia, Yovana Salazar, Willmer Mallqui, Karina Costilla. Photo © PRATEC 2010

Introduction

DON RIGOBERTO TICONA JIMÉNEZ – a peasant farmer from the community of Chachacumani, Juli, Puno, Peru – untied his ritual bundle containing a diversity of seeds from his family’s latest harvest and uttered: “This is my Paya Yatiwi [two kinds of knowledge].” Along with a rich variety of native potatoes, his bundle also included some hybrid potatoes and non-native grain crops.

That was at the opening ritual for the final workshop of Phase One of the Children and Biodiversity Educational Program (C&B) that Proyecto Andino de Tecnologías Campesinas (PRATEC, or Andean Project for Peasant Technologies) conducted in the period 2002-2007. The workshop took place in Lamas, in the Upper Amazon region of San Martín, and was attended by some fifty people including rural teachers, parents, community elders, participating members of the seven Nuclei for Andean Amazonian Cultural Affirmation (NACAs), and PRATEC.



Seed Exchange among primary schools. Primary school kids, peasant community members, Baños La Merced, Carhuaz, Ancash, Peru. Photo © PRATEC 2013

The story

THE C&B PROGRAM DID NOT AIM AT SCHOOL REFORM. It could not, since its experience as an NGO consisted in a six-year program (1995-2000) on agrobiodiversity conservation with farmer communities, built on a previous (and continuing) effort based on the production of a wealth of booklets documenting indigenous agricultural practices. Realizing that such practices could only be understood within the cosmovision of the culture in which they were hosted – one of the centers of origin of agriculture, possessing the highest cultivated biodiversity in the planet – PRATEC, invited by a local university interested in incorporating Andean agriculture in its teaching, undertook the task of unveiling the theoretical bases that underpin those practices. This initiative led to an annual postgraduate course, oriented to university teachers, on Andean peasant agriculture and culture (1990-1999).

While the course did not achieve its aim in the university, it had the unexpected effect of stimulating a number of its graduates to follow the lead of the two community-based



Teaching writing and reading departs from strengthening the native language orality. Readings are culture-context related. Narratives are based on their reality within a loving environment and intercultural trust. Children in reading area. Instituto de Educacion Inicial, District of Quinranca, Comunidad Campesina Tupac Yupanqui, District of San Miguel de Acco, Huaraz Province, Ancash Region, Peru. Photo © PRATEC 2011

organizations that, along with PRATEC, nurtured the NACA family in the late 1990s. Starting with the first group of six NACAs, they carried out a program on the revitalization of Andean peasant agriculture with the objective of improving productivity based on the regeneration of traditional practices. PRATEC's initial findings led to recovery of the following: 1) biodiversity (seed vitality through exchange); 2) mutual aid through ancestral communal work modalities like *ayni* (cooperation among families) and *minka* (community labor); and 3) rituals and festivals to invigorate the relationship with deities – especially with *Pachamama* (Mother Earth).

Thus, when PRATEC'S rural educational program started in 2002 with the support of TDH-Germany and funds from the German Ministry of Cooperation and Development (BMZ), PRATEC could count on a sizable sample of indigenous know-how (over 2,500 technological booklets). This was the result of PRATEC's initial effort in documenting knowledge formation in the Andean communities, as well as the collective reflection in successive versions of the annual course. But for the task at hand, the most important asset

There had been a remarkable change in the perception of the Andean rural families regarding the role of the school and the value of their own knowledge. The communities were not demanding the elimination of the school, but its transformation – cooperating with the teachers in order to meet three urgent tasks: 1) restoring respect in community life; 2) learning to read and write in Spanish; and 3) restoring the “*oficios*” (or *campesino* skills like pottery making, weaving, healing, native cooking, music, dance, agriculture and husbandry, etc.) – that is, the traditional know-how that enables a community member to “pass life”, to live well.

was the readiness of the experienced facilitators of the community groups that formed the NACAs to explore the uncharted territory of knowledge transmission. Given this background, the program was undertaken by the community to nurture the school, and our initial explicit aim was to contribute to the incorporation of local knowledge into the school curriculum, involving parents and community elders in school activities.

The activities of the first phase (2002-2004) led to the recognition that the official Bilingual Intercultural Education Program (Educación Intercultural Bilingüe, EIB) made use of native languages for the transmission of modernist contents, and that rural teachers had not been trained to incorporate local knowledge in the school curriculum. Losing the role that the communities had accorded them as authorities for cultural mediation, they had become the transmission belt of an urban-based top-down process of cultural assimilation. The parents' association controlling teachers' attendance was the telling indicator of a relationship gone sour.

The program components regarding food sufficiency were instrumental in making evident that there persists in agrocentric Andean communities an educational culture oriented to the life-long formation of a community member – imparted through his/her participation from early childhood in family, community activities, and in the exercise of positions of authority. At the same time, the program revealed the reasons behind the community-school divide: schooling was part of the ongoing rural development process initiated by the 1969 agrarian reform that profoundly transformed the Peruvian countryside. We understood that as the educational system aligned itself with the state's push for agricultural modernization brought by the reform, it was complicit in producing the visible obstacles to *Sumaq Kawsay* in Quechua and *Suma Jakaña* or *Qamaña* in Aymara (living well, good living): loss of native seed diversity in their fields; the pollution of soil and water caused by chemical fertilizers and pesticides; the erosion of inter-generational respect and knowledge transmission; the



Elaboration of the agrofestive and ritual calendar to incorporate local andean knowledge in the curricula. Teachers working on agrofestive and ritual calendar. Location: Urpichallay, Marcará, Carhuaz, Ancash, Peru. Teachers: Soledad Cuizano, Zoila Suarez, Jose M Rosales, Alejandra Olivera, Margarita Mellisho. Photo © PRATEC 2012

dissemination of religious fundamentalism; and thus, the weakening of community bonds. Teachers were now officers of a state intent on industrial development based on food produced with the Green Revolution package: knowledge generated outside the community, credit that bought “improved” seeds, chemicals, and agricultural machinery.

The conversations with teachers during the program’s first phase proved crucial to bridge the divide with their schools’ communities. Most of them had a vivid recollection of the community education received in their early years from their grandparents and elders; thus the majority were willing to start making *chacra* (agricultural field) with the students, with help from their parents, as part of the school program. The elaboration of the communities’ agrofestive calendar became a popular and useful tool to build a common ground for collaboration, valuing the meaning of the Andean tradition of *Sumaq Kawsay* / *Suma Jakaña* or *Qamaña*.

In the first semester of 2004 there was consultation with the participating communities asking them about the kind of knowledge they felt their children should learn – the community’s or the school’s? “Both!” was the unanimous answer. Doña Agripina Morel, a Quechua from the community of Cotahuacho, Andahuaylas, Apurímac explained why: “*Our children leave school and do not know how to read and write and their respect has been lost. They leave with University certificates and there are no jobs.*”

There had been a remarkable change in the perception of the Andean rural families regarding the role of the school and the value of their own knowledge. The communities were not demanding the elimination of the school, but its transformation – cooperating with the teachers in order to meet three urgent tasks: 1) restoring respect in community life; 2) learning to read and write in Spanish; and 3) restoring the “*oficios*” (or *campesino* skills like pottery making, weaving, healing, native cooking, music, dance, agriculture and husbandry, etc.) – that is, the traditional know-how that enables a community member to “pass life”, to live well.

Iskay Yachay / Paya Yatiwi

THE PROGRAM’S SECOND PHASE (2005-2008) sought ways to attend to what we understood was the communities’ demand for *Iskay Yachay* (in the Quechua language) / *Paya Yatiwi* (in Aymara), “two kinds of knowledge”. The NACAs incorporated new lines of activities with the communities and teachers who volunteered to explore the multiple challenges of nurturing biocultural diversity.

A first line of activities involved linking the nurturance of agrobiodiversity with the food eaten by children in their homes and the school. A state program aimed at rural schools had substituted the school lunch that students traditionally shared with the individual consumption of industrial snacks.

The increased participation of parents in fostering the inclusion of local knowledge in school curriculum led to dialogue with the local state educational establishment presently implementing a national policy for bilingual intercultural education.

The main emphasis in this phase was to form teachers as cultural mediators in the regeneration of the Andean Amazonian communities’ educational culture. The challenge was to gather a contingent of teachers committed to basing their teaching on local knowledge and making the school complement and enhance the community’s educational culture through with the contributions of scientific and technical knowledge to *Sumaq Kawsay* / *Suma Jakaña* or *Qamaña*.

By cultural mediation we understand the nurturance of the cultural diversity existing in our places. This implies respect for the multiple and changing ways in which different peoples live the world they dwell in. It is the teacher’s privilege to promote, in the classroom and elsewhere, the dialogue among diverse cognitive traditions. Her/his challenge is doing it in

the midst of colonization, expressed through an official education system aiming at the local application of standard global methods, instead of being locally pertinent. Pertinence in education, in our view, is at hand: it is local and has all to do with *Sumaq Kawsay* / *Suma Jakaña* or *Qamaña*.

To mediate means not to place oneself in the middle of diverse traditions to arbitrate among them, but to start nurturing one's own tradition in order to attain the capability of nurturing others and letting oneself be nurtured by them. This implies a basic knowledge of the cosmovisions at play in the classroom without attempting to accommodate one tradition within the other.

Mediation is a daily challenge for the teacher since, regardless of her/his awareness, the reasoning in the curriculum s/he develops leads her/him to assume that the goal for the students to attain is the abstract apprehension of their life world. Even if s/he speaks Quechua, Aymara or another native language, her/his training has made her/him privilege abstract reasoning as the means and end of even bilingual intercultural education.

The Teacher Formation Diploma course that PRATEC organized with a local university, combined workshops for reflection on subjects related to the Andean and the modern Western cosmovisions, with fieldwork on the communities' educational culture consisting of the collection of knowledge and practices and the elaboration of the agrofestive calendars. Over six months there were three workshops with a duration of ten days each. Teachers were presented with some twenty different topics on *Iskay Yachay* for reflection and debate, exploring the application of their conclusions to their activity. This program demanded the elaboration of a curriculum to facilitate the creation of a shared discourse of the Andean life world and the cosmovisions underlying modern science and technology. The fieldwork was aimed at making the teacher adept in listening attentively to the community. What is the science behind the assertion "You have your science and we have ours" as one expression of the equivalence of all kinds of knowledge?

Most of the participating NACAs promoted the formation of autonomous teacher networks, capable of formulating proposals at different levels of the educational establishment.

On orality / literacy

THE REFLECTION AND DEBATES WITHIN the ongoing decentralized program revealed a major stumbling block in the literacy/orality divide. This divide has led us astray, we feel, in our explorations of how to deal with teaching reading and writing as practical skills. Our idea was that literacy has as prerequisite the affirmation of the child in orality, that if his/her oral skills are respected and strengthened, then literacy can proceed. Orality expresses the educational culture of the community, and our exploration of the forms in which literate culture could be incremental, adding to instead of replacing it were still based on bridging the divide of oral/literate mentalities. The experience of the rural libraries in Cajamarca is an inspiration for alternatives because, according to coordinator Alfredo Mires Ortiz, "[It] has taught us a literacy..., born of the capacity for nurturance of the *campesinos*. Around the stove, once dinner is over, all huddled together, and by the candlelight a child reads. The parents, grandparents and elder brothers scarcely know that the "o" is round. The child

who is just learning, reads haltingly, the others listening and looking at the lines where the tiny index walks. 'I did not know how to read, but I learned looking at my son reading.'" *Campesinos* learn to read as they learn to nurture plants: looking at how it is done in the proper moment. Learning to read and write along with science seems to require a willing vital community that values its oral and literate life worlds.

What next?

IN OUR VIEW, DON RIGOBERTO'S *Iskay Yachay* / *Paya Yatiwi* "two forms of knowledge" can be taken as a global call for radical cultural plurality from our central Andes, in which the communities' biocultural approach to education should be considered a modest but certain foundation for *Sumaq Kawsay* / *Suma Jakaña* or *Qamaña* in our only planet, Earth. 🌱

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In its original Quechua meaning, sumak refers to the ideal and beautiful unfolding of the planet, while kawsay means "life", a life with dignity and plenitude. The ancestral sumak kawsay sees people as an element of Pachamama, or Mother Earth. As such, unlike other paradigms, the contemporary "right living", inspired by indigenous tradition, seeks a balance with nature in the fulfillment of [human] needs ("taking only what is needed", with an aim to endure), over and above mere economic growth.



Reawakening Biocultural Heritage through Art

ART CORPS

IN THE REMOTE HIGHLANDS OF GUATEMALA, teachers and community members are learning new ways to recover ancient Maya K'iché knowledge. Art often gets sidelined in education and development approaches and is regarded as a luxury that only an elite few can pursue, especially when daily survival is a struggle. ArtCorps, a nonprofit based in Ipswich, Mass., USA, has discovered that reawakening our innate creativity promotes human development, plays a critical role in reclaiming indigenous wisdom, and supports communities to respond more effectively to the complex social and environmental challenges we face.

Extreme levels of poverty, immigration, and deforestation are some of the factors that threaten the continuation of the Maya K'iché language and harmonious coexistence with nature. These threats are exacerbated by a generational breach across language, technology, geography, and consumer culture – making the need for the conservation of ancestral knowledge and practices more important than ever. The communal forest is at risk and further

jeopardized by land disputes. Grandparents barely speak Spanish and their grandchildren don't speak K'iché. Teens look steadily to a country in the north, “The States” as they call it, where many of their fathers have been for years.

As Totonicapán's Maya K'iché elders continue to age, they fear collective memory loss. There is no systematized version of how and why to manage the forest in a state of ecological equilibrium, and the rich tapestry of stories and practices that have protected the world's largest remaining stand of endangered Guatemalan fir trees are neither collected nor recorded.

Over a two-year period, ArtCorps partnered with EcoLogic Development Fund and 48 Cantons of Totonicapán to collaboratively design and implement an arts-based approach to conserve the biocultural heritage of the Maya K'iché and cultivate the leadership of their youth. EcoLogic works to empower rural and indigenous peoples to restore and protect tropical ecosystems in Central America and Mexico. Partner organization, 48 Cantons,



Artisan potter Juan Agapito Vázquez and his mother María Vázquez with bas-reliefs fresh from the kiln, Xolsacmalja, Photo © Art Corps 2013



CDRO staff, community leaders and teachers make Purpose Masks in ArtCorps' Creative Leadership training, Totonicapán, Photo © Art Corps 2014

is a centuries-old Maya-Quiché governing body responsible for managing the natural resources of the villages surrounding the Los Altos de San Miguel Forest. Our collaborative project, “Awakening a Culture of Conservation,” set out to document indigenous knowledge and revitalize traditional conservation practices by developing the biocultural stewardship skills in youth, harnessing their creativity to educate and engage their communities.

Wisdom of the Rocky Hillsides

THIS COLLABORATION WAS INFORMED BY a community research project, designed and implemented by ArtCorps artist Isabel Carrió, which documented the oral histories of the elders and their relationship to the land. *Wisdom of the Rocky Hillsides*, a bilingual (Spanish-Maya K’iché) book was written and illustrated by students who documented Mayan environmental stories by interviewing their grandparents

and utilizing diverse illustration techniques.

The stories were collected by attending the weekly *Pixab* or Council of Elders and interviewing the grandparents of the children involved in the project. The stories told were about the ways of the Maya K’iché people, called *Ajaw* or Creators of the mountain and water, including traditional customs to care for the forest and teachings about the nature of interdependence between human beings and the earth.

The young people researched topics at the intersection of community development and natural resource management such as reforestation, indigenous conservation practices, recycling and waste management, natural disasters, and community engagement. For the illustrations, the children experimented with a variety of techniques and visual mediums such as sketching in the woods, shadow drawing, collage, stamp-making, and photo montages. They spent time in the San Miguel Forest to listen to the sound of the firs and pines – smell them, touch them, and draw them. This experience allowed the children to develop a deep connection to the forest ecosystem in which they live and express that feeling through their artwork.

Wisdom of the Rocky Hillsides was published and launched during Green Week 2013 to celebrate the achievement of the children, teachers, and collaborators. Copies of the book were distributed to local schools and libraries and exhibited internationally. In addition to the preservation and dissemination of ancestral language

and wisdom, the project also resulted in increased confidence, imagination, and critical thinking among the children; in turn, their teachers learned innovative processes that can be used to creatively engage their students.

Recycled Art Murals Reclaim Public Space

ANOTHER ARTS-BASED PROJECT SET OUT to transform the abandoned town plaza of Totonicapán through the creation and installation of giant mosaics made out of recycled plastic bottle caps. Twenty-two young Maya K’iché women and twenty young Maya K’iché men from the Xolsacmaljá high school ArtCorps group led this revitalization effort. They began by studying traditional weaving patterns as an inspiration for the design of the murals. At the same time that they examined their cultural values in creative workshops, they also generated collective visions for their community. By representing their ideal futures in the murals with the discarded bottle caps they collected from their streets and neighbors, they transformed garbage into eye-catching and inspiring messages of hope. This process allowed the youth to put their dreams on public display and recover a sense of place in the urban streets and local biosphere they call home.

As a part of the mural unveiling, the youth also performed a play that led the audience to reflect on the causes and effects of pollution and littering. Through theater, the murals, and public dialogue they motivated the community to think of ways to creatively solve this problem. One teen explained the main reason for these public activities: “In the main plaza of Totonicapán, there was a very old and beautiful park full



Mosaic murals from recycled plastic bottle caps depict the dreams of youth leaders from recycled plastic bottle caps, La Union Park, Totonicapán, Photo © Art Corps 2013

of trees where many birds lived. I remember how the birds used to sing at dusk. This park no longer exists and now all we see are ugly panels and a lot of dust. Our efforts are aimed at raising awareness about this situation, as a call for those in charge of urban development to prioritize green spaces and recreation areas for the well-being of residents.”

The giant 80 by 90 foot mosaics were put in place, covering the rusty tin panels and filling the plaza with color and beauty. Upon seeing the installations, passersby showed their curiosity and stopped to congratulate the youth and collaborators. One could hear exclamations of “Look how you made use of garbage!” “Look how you took advantage of what we throw out!” and “How beautiful—I was tired of seeing those ugly panels.”

The admiration and comments from the people confirmed that beyond transforming the main street of Totonicapán, this initiative raised awareness about the importance of environmental conservation, renewed appreciation for the role young

people can play as leaders, and reawakened the spirit and pride of a community.

Clay Sculptures Revive History of Public Baths

ARTCORPS ALSO FACILITATED A **SCULPTURE** mural project in which 12 women artisans and 25 children designed and created bas-reliefs from clay which were installed on the outside wall of the historic public baths in Totonicapán. The project was informed by the group's research about the thermal baths, which date back to 1855, and incorporated traditional pottery techniques from the region to emphasize their cultural heritage.

Stepping into the thermal baths takes you hundreds of years into the past. This iconic spot represents a source of strength for the community, where families have soaked together, babies have received their first bath, and the elderly have soothed their aches and pains in the sulfur-infused waters for generations. The participants used the clay sculptures to represent ancient customs for bathing that are still in use today including the symbol of a boat which signifies the men's designated bathing area; the *pashte*, a natural sponge; and the *wacal*, a small container used to hold water.

Through these community art projects and installations, community members experienced how creative methods can be used to build leadership, explore different perspectives, reclaim traditional memory, and create a shared vision. Thousands of residents and visitors have viewed the public exhibits, raising awareness about the value of their biocultural heritage. Passersby often stop to observe and touch the sculptures, taking in their textures and teachings in multiple ways. After participating in the mural project, some of the youth resolved

not to immigrate to the North in search of a better life, and instead plan to create the futures they dreamed of at home in the highlands of Guatemala.

ArtCorps' Integral and Arts-Based Approach

THE ROLE ART PLAYED IN **STRENGTHENING** the relationship between generations, honoring historical sites, valuing natural resources, and preserving cultural identity was unprecedented in Totonicapán. Research in the realm of biocultural neuroscience (*see <http://embodiedecologies.moonfruit.com/home2/4579673629>*) supports this finding by demonstrating that learning experiences which combine sensory, linguistic, cultural, and ecological approaches can result in improved ecological literacy and natural resource management.

Numerous studies and reports indicate that creativity is emerging as a key leadership characteristic in the 21st century due to the need to generate innovative solutions and adapt quickly to the multiple crises we face. Research reveals that highly creative individuals exhibit leadership by challenging the status quo, taking risks, experimenting with new approaches, and examining alternative ways of solving problems. Highly creative people also focus on future possibilities, think in terms of what if or what might be, and are adept at inspiring others to participate and take action.

In order for community leaders and teachers to continue cultivating creative leadership within the Totonicapán region, ArtCorps was asked to train the 38 newly elected community representatives at the start of their one-year term on the 48 Cantons natural resource management

council as well as a group of 25 Totonicapán teachers and 10 community leaders of an indigenous-led environmental stewardship organization.

ArtCorps' trainings in Creative Leadership for Social Change provide community leaders and educators around the world with new ways of engaging individuals and groups through a variety of creative facilitation methods that cultivate multiple intelligences, critical thinking, and collaboration. ArtCorps has developed a holistic methodology that nurtures creativity and impacts the four key development areas necessary for long-term change to take root: psychology, culture, behavior, and systems. Based on integral theory, ArtCorps equips leaders and educators with arts-based tools and strategies that build creative capacity by folding these four key areas into three dimensions of the human experience: **Individual Empowerment** (psychology and behaviors), **Community Development** (relationships and culture), and **Systemic Change** (social, political, economic and ecological systems).

On the individual level, arts-based processes allow participants to reflect on their life journeys and validate their struggles and dreams through metaphor. Creative expression provides a powerful vehicle for participants to deepen their core values, think in new ways, affirm their social identities, identify strategies to overcome fears, and access their deepest sense of life purpose in order to move more boldly in the world.

On the community level, creative methods create a space for participants to play together, share stories, take risks, resolve conflicts, and collaborate in ways that strengthen relationships and trust. Versatile processes also help to promote diversity, equality, and the inclusion of all voices in the community from children to

elders. The shared vision generated by an artistic representation helps a group establish a collective purpose, along with a sense of belonging and responsibility to one another.

On the systemic level, participants use drawings, songs and skits to critically analyze the structural conditions and root causes of their problems and explore how to have more meaningful impact in the systems in which they live—social, economic, political and ecological. They learn how to strategically apply arts-based tactics to leverage systems change by strengthening campaigns, generating more empowering narratives, and implementing sustainable alternatives to existing systems.

ArtCorps has discovered that arts-based integral pedagogy empowers local groups and communities to blend traditional and contemporary perspectives as a means to safeguard ancient wisdom as well as foster innovation. As the Guatemala Maya K'iché in Totonicapán test and model these new creative approaches, they are seeding the conditions for a thriving ecosystem where everyone is encouraged to participate in its care. They have truly exemplified the power of art to harvest the wisdom of tradition in order to shape a new path forward. 🌱

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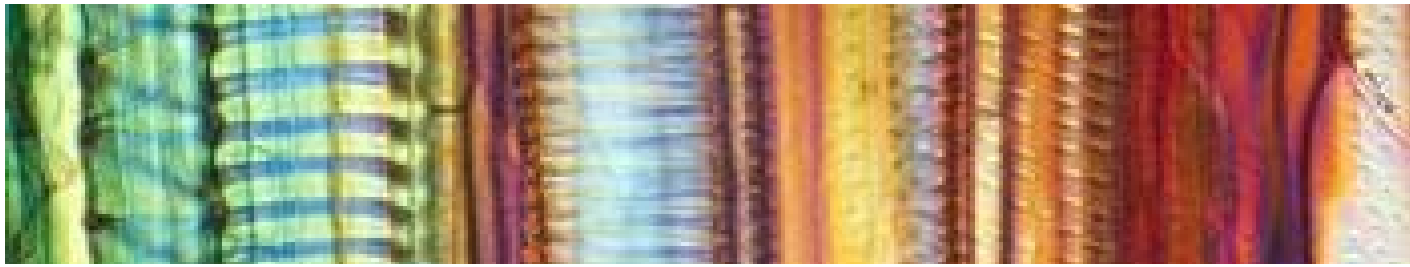
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Ancient Teachings, Contemporary Learnings: Interviews on Aboriginal Education

HOW DID TEACHING AND LEARNING TAKE PLACE IN TRADITIONAL COMMUNITIES, in the days before the imposition of the Western model of education—a model that encloses children and youth within the four walls of the institution called “school”, separating them out from nature and community, closing them off from cultural identity and intergenerational flows, suppressing mother tongues, denigrating traditional knowledge and values, and pushing students into the homogenized no man’s land of Euro-Anglo-centric, urban-centric acculturation and biocultural disconnection?

Several articles in this issue of *Langscape* have a great deal to say about this. But we also wanted to ask a few Aboriginal wise persons some specific questions, zeroing in on this topic. Our Tsilhqot’in (British Columbia, Canada) friend and collaborator Linda Smith kindly circulated our questions to her network, and three Aboriginal women generously took time to respond: Hishinlai’ (Kathy Sikorski), Gwich’in Athabaskan, Alaska Native Language Center, University of Alaska, Fairbanks (Alaska, USA); JoAnne Moiese, Williams Lake Indian Band, Secwepemc (Shuswap) Nation (British Columbia, Canada); and Barbara Derrick, Professional Artist, Xeni Gwet’in (Nemiah Valley) Tsilhqot’in. We are very grateful to all three for their insights.

Our leading questions were: **1.** *What were the traditional ways of teaching and learning in First Nations societies (before the influence of western society in general and of western schooling in particular)?* **2.** *How did Elders impart lessons and wisdom about how to live respectfully with one another and with the natural world?* **3.** *How did Elders teach about being connected with and caring for the land?* **4.** *How did Elders transmit traditional knowledge, values, beliefs, and practices?* **5.** *What was the role of stories, songs, dance, ceremonies, apprenticeship, learning by doing, moving through the landscape, etc., in imparting those lessons and wisdom?* Our respondents variously chose to either answer each question in turn, or address the gist of the questions in a single answer. For consistency, in the following we provide the answers without repeating the questions. (Luisa Maffi)

Hishinlai’ (Kathy Sikorski): Elders grew up on the land, and from a young age boys and girls played with and/or made, as a form of practice, miniature versions of tools needed for gender-appropriate roles, such as hunting, fishing, taking care of animals, etc. They also observed these activities from the time of childhood, and then when they had observed and practiced their skills over some time, they replicated what had been observed with guidance from the experts of tools necessary for survival or everyday living. Once the boys or girls had sufficient skills to use the real tools, then they were old enough to partake in subsistence activities. It is out on the land that the young men and women learn how to respect and care for the land, just as it had been for thousands of years.

Lessons and wisdom that the elders possessed about how to live respectfully with one another and with the natural world were imparted through learning to respect the social norms of the culture, and also understanding how to behave and treat nature through songs and prayers. These were learned from our ancestors, and were subsequently passed from one generation to the next. Traditional knowledge, values, beliefs, and practices are all-encompassing traits, and are transmitted throughout one’s daily life. They are transmitted intergenerationally through hard work ethics, which is a necessary part of surviving in one’s environment.

Stories, songs, dances, and ceremonies all had a purpose that contributed to meaning in life, lessons, giving thanks, and knowledge of values and beliefs about appropriate behaviors. Place-based learning is rooted in Indigenous cultures; it encompasses all facets of a community—their culture, values, beliefs, etc., which are then imparted to all those whose identity evolves from that type of learning.

JoAnne Moiese: Traditional learning was not a step-by-step learning process. It was learning through experience. The young people would sit with the elders or resource people to help with whatever task needed to be done. The elder/resource person would then just start doing the task. The helper would be given a task to do. As the work went on, the student would listen to stories that the elder/ resource person had to share. These stories in a roundabout way would be connected to the work that was being done.

The student would have to listen carefully to see the connection. The connection might happen that day, or it might be realized at a later date. The elder/ resource person would not clearly say: “The meaning is... or the protocol is...”. They would use different everyday phrases. Questioning of the elder/ resource person was usually not done. If there had to be questions asked, then they would be short and not too many. It was more practical hands-on learning with one-on-one instruction or demonstration.

Barbara Derrick: Every lesson a child learns comes from the role-modeling of the parents and grandparents: “see how I’m doing this, watch, now you try”. Although I wasn’t brought up on reserve, my mother took my late brother and me during the summer to Xeni. My Atsoo (grandmother) was so patient! Her patience rubbed off on me. In my teen years, if I wasn’t hanging around with older adults, you could find me with the elders learning. (I also learned from non-native Elders. I sought their peaceful and knowledgeable souls out to help ground me and keep me focused.) There wasn’t such a thing as completing something fast! In my own life I have lost our ancestor’s meditated pace of the morning hours, which have changed into a lifetime “rush hour”. I was told I couldn’t learn anything in a rush, that I needed to stop and look, listen and smell

what is going on in life. (Practicing their teachings has saved my life on more than one occasion!) My grandmother's and my mom's answers to my questions frequently started with, "They say...", and a story about someone would be told. In today's classrooms, "teaching outside of the box" is a fad. Yet, I see our elders don't have expensive rooms, furniture or documents for the transfer of knowledge. Just the earth, seasons and whatever item is closest to them at the time. I've helped clean fish and pack wood—it's all part of what is next.

Past Western society has programmed our children to be judgmental, deceptive and perfect according to the academic rules. Our cultural morals and values have been replaced with a model that doesn't work with most learners in a school system! I am intrigued by the term "experiential learning". Elders have been teaching in this fashion for thousands of years! Western society's school systems have long been led by the "talking heads", or professors/ teachers giving long lectures about something. The system appears to be relearning how to connect with its students in the world of academia.

My first teacher was my Atsoo. I remember failing grade one because if someone in my class coughed, I got it. I spent huge amounts of time in bed from tonsillitis. I can remember a couple of times visiting my Atsoo and family in Onion Lake when I got tonsillitis so bad my throat felt like it was swelling shut. The second time my grandmother told me to wait for her while she went into the bush. When she came back she had a couple of pine branches in her hand. She set out to make a tea while I went to lie down again. When she gave me a cup of this tea it was so ebony black and gross! I pinched my nose and drank it quickly! Next day, swelling and fever gone and I was up and

running around playing tag with my cousins. She and all the elders I have learned from take only what they need from the land... no more, no less.

I heard my grandfather Jimmy used to transport fish from one creek to a dying lake. A year or so later, the lake was filled with fish. Another elder said to me, "Raise your nose to the wind, you can smell the medicines and identify them." He was right, raising my nose upwards enabled my eyes to note the clouds...if the clouds were hugging the tree line it was going to rain. Elders knew when, where and how to harvest from the earth for their homes and comfort. There was traditional knowledge, for example wood was placed six feet away from the house because of mice. It was our responsibility as humans to respect animals and insects. Lastly, when we are canning in August, flies would swoop in from outside and pile up on the ceiling. An elder said to me: "Do you know why they do this?" I thought about it for quite some time and shrugged. "The protein from the food is transported to the ceiling through the steam and the fly is doing its job by collecting it with its feet." I was so impressed! Common sense isn't common—it has to be taught through the old ones.

The elders I have learned from were always, always doing something. If I came for a visit, I helped them finish their chores. Elders love to visit and chat up a storm. Some were quiet, and shared their knowledge by getting you to help them. When I wanted to hear stories I brought a translator with me (I don't know my language) and loved hearing about what they learned. They were always insightful, and wise about their life's dealings. All the elders that taught me how to do a task then left me to do the rest on my own. I remember 95% of my experiences were more like this example: "Here's the drum... tap

it like this... tap... tap... tap... Good luck, you'll do great!" He left me standing there to go up in front of 200 people. I remember my legs shaking so badly, but he was right, I did great!

Through my own experience of apprenticeship, stories, songs, dance, and learning by doing/moving through the landscape were essential. I learned the differences between ceremony songs, as to berry songs. As to hunting etc., each of the songs had a rhythm, remember my talking about energy? The elders taught me that I needed to be able to distinguish the differences. The Prairies people have round dances in the winter, and powwows in the summer. Elders reminded me that they didn't want to be noted as perfect! I was confused when I started out 25 years ago. I didn't know

"I was told I couldn't learn anything in a rush, that I needed to stop and look, listen and smell what is going on in life."

what an elder was! I assumed they were 65 +. In the Ojibwa community 56 is eldership because it is aligned with the four principles of life. The elders told me, "Ceremony is life and learning". I listened to the stories because within each was a lesson and my answers. While an elder told a story we could be moving through muskeg. I would not only have to listen to the story but keep my focus on the medicines picked, or how the elder moved through different terrain.

We have lost our traditional male and female circles. The elders were able to impart their wisdom in "traditional law" through these circles. Expectations of how we carried ourselves were shared through different community functions. Women, the Sioux elders called Wiyan, or "little Creator", were

esteemed by the men because they were the only ones who could give life besides the Creator. Both men and women were able to respect each other through the separate circles. I used to think the old teachings were about segregation but really the distinction between male and female had to be there first to teach "respect of ourselves." Today, men are running women's water circles, and women running sun ceremonies. The elders told me one needs to know the difference in the "energies" before a person can switch roles. Lessons like these were taught in ceremonies. A woman learned about water, the songs, the medicines etc., as the men learned about their roles in their ceremonies. The most important teaching is "correction." My generation has learned to fear "punishment" from "force"

because of residential school effects. The male's power is "discipline" not "force". When the teachings are "forceful" they condemn and hurt loved ones. Discipline doesn't chastise or hurt the one learning, it is an honest critique to help one change their course at that given moment. Women have the gift of "life" and "nurturing". My elder says too much woman power means too much nurturing and no one wants to do anything. If we learned to work together, respect male/female energy within ourselves first, our relationship to the opposite sex and life, we would have a connection to the earth again. The elders also taught through clans. Everyone had a gift, everyone had a choice. There was no such thing as "perfection", we were all perfect with a job or gift on our journey. 🌸



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Terralingua Ubuntu: a space for Terralingua members and friends to come together as a community, connect, and work together to sustain the biocultural diversity of life. ¶ From the word *ubuntu* in the isiXhosa and isiZulu languages of South Africa: 1. humanity or personhood, achieved through interconnectedness with other people and community; 2. an African philosophy of humanism, grounded in the notion that human identity and dignity arise out of respect, concern, compassion, generosity, and reciprocity toward others--family, neighbors, ancestors, community, and the human race at large.

Become a Terralingua member, and join a vibrant worldwide network of biocultural diversity supporters and champions. Our new membership system offers several options, so that all can join and share their voice. Members receive our news, can enjoy our elegant magazine *Langscape*, participate in our discussion forum, receive discounts on our publications, and more.

. nature . language . culture .

Langscape

Magazine

LANGSCAPE VOLUME 3, ISSUE 2 WINTER 2014

Guest Editor | Gleb Raygorodetsky

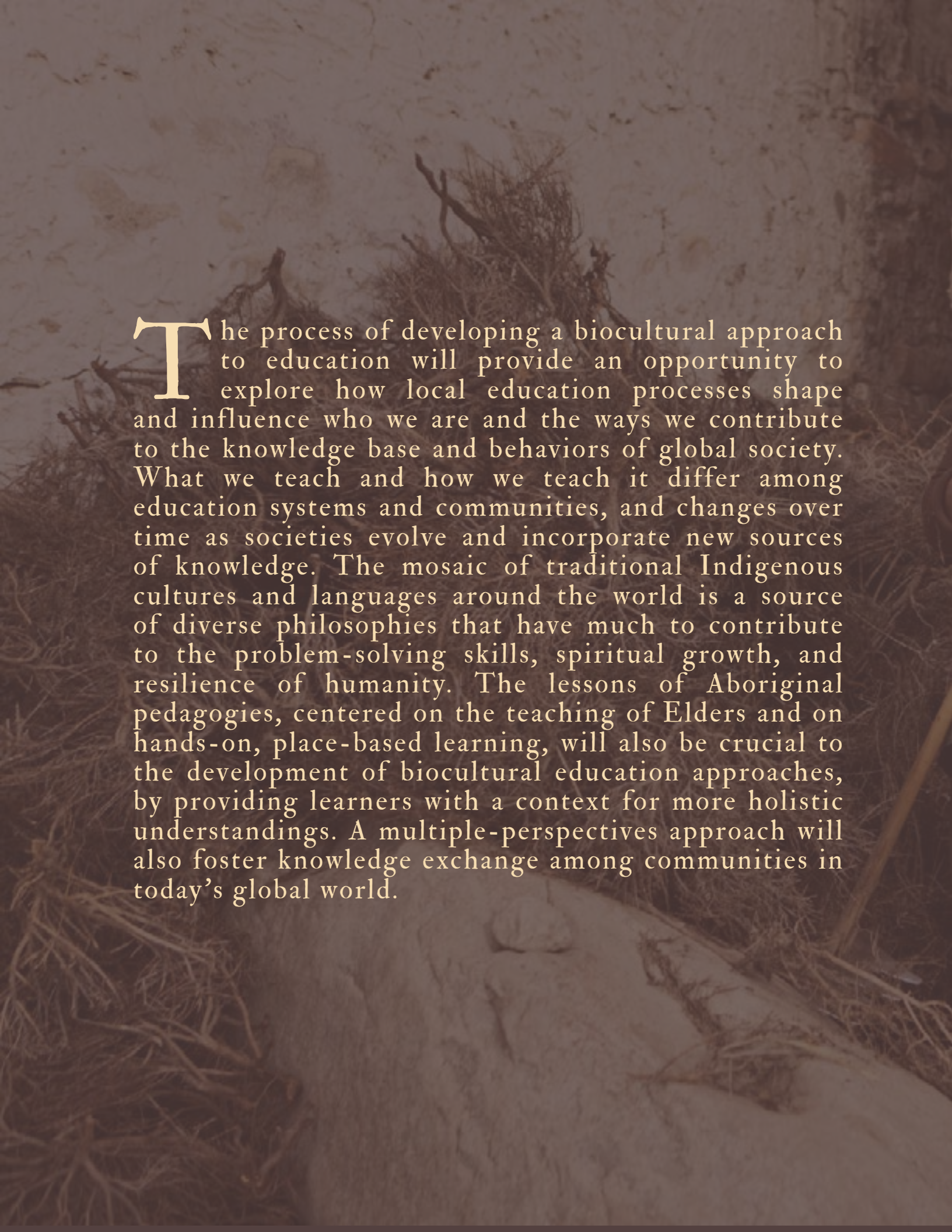
Biocultural Diversity and Climate Change Adaptation

Call for Expressions of Interest COMING SOON

We welcome articles, interviews, case studies,
poetry, expressions of art and photographs.

<http://www.terralinguaubuntu.org/Langscape/home.htm>

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The process of developing a biocultural approach to education will provide an opportunity to explore how local education processes shape and influence who we are and the ways we contribute to the knowledge base and behaviors of global society. What we teach and how we teach it differ among education systems and communities, and changes over time as societies evolve and incorporate new sources of knowledge. The mosaic of traditional Indigenous cultures and languages around the world is a source of diverse philosophies that have much to contribute to the problem-solving skills, spiritual growth, and resilience of humanity. The lessons of Aboriginal pedagogies, centered on the teaching of Elders and on hands-on, place-based learning, will also be crucial to the development of biocultural education approaches, by providing learners with a context for more holistic understandings. A multiple-perspectives approach will also foster knowledge exchange among communities in today's global world.