

TEACHING AND LEARNING WITH TRADITIONAL INDIGENOUS KNOWLEDGE IN THE TALL GRASS PLAINS¹

Kathleen J. Martin
Cal Poly State University
San Luis Obispo, California
USA, 93407
kamartin@calpoly.edu

James J. Garrett
Ft. Berthold Community College
New Town, North Dakota
USA, 58763
jgarre@fortbertholdcc.edu

Abstract / Résumé

This article presents the work of American Indian and Indigenous college students in the United States on a native and heritage plant restoration project at a tribal college. It supports an interdisciplinary approach to studying the natural sciences, and situates the acquisition of knowledge within Dakota oral tradition. Students learned about the grass plains environment and Dakota environmental ethics, sovereignty and values from Traditional Indigenous and Ecological Knowledge (TIK/TEK). The “plant tribes” helped their human caretakers learn important qualities of care and respect. Also included is an educational model based on the project and recommendations for the use of narrative in teaching, bridging interdisciplinary studies, and creating learning environments and developing partnerships.

L'article présente un projet de restauration des plantes indigènes et traditionnelles mis en œuvre par des étudiants amérindiens et indigènes d'un collège tribal aux États-Unis. L'article met de l'avant une approche interdisciplinaire de l'étude des sciences naturelles et situe l'acquisition de connaissances au sein de la tradition orale dakota. Les étudiants se sont initiés à l'environnement des plaines de graminées et à l'éthique de l'environnement des Dakota, ainsi qu'aux notions de souveraineté et aux valeurs exprimées dans les connaissances indigènes et écologiques traditionnelles (CIT/CET). Les « tribus végétales » ont aidé leurs gardiens humains à apprendre les importantes qualités de la sollicitude et du respect. L'article présente également un modèle éducationnel fondé sur le projet et des recommandations pour le recours à la narration dans l'enseignement, le rapprochement des études interdisciplinaires, la création de milieux d'apprentissage et le développement de partenariats.

Although multicultural education and teaching for equity and diversity are often viewed in higher education as a given across universities, in the United States in particular, the opportunity for Native and Indigenous students to learn within a more traditional educational model is often not possible. Typically, post-secondary education supports a Western ethic that includes a focus on competition and an omission of emotional and context-specific learning. Yet, as Betts and Bailey (2005) indicate, educational settings are trying to be more inclusive, and they often encourage work that is termed as “service learning” even if the significance of the concept is not fully explored. This idea is based on the ethic of “helping” not one specific to other modes and styles of learning having validity. The summer study project discussed in this article provides more than the often clichéd ideas of service or “hands on learning” and situates the discussion within an inclusive and traditional educational model. It presents a practical example of how students and faculty from two higher education institutions worked to achieve “holistic learning and teaching based on an interactive and connected understanding of the universe and all that is found in it” (Betts & Bailey, 2005, p. 418). Within this context, participants in a summer study project worked toward building connectedness, community and traditional knowledge between and among each other, as well as within the natural world. This article details the work of the students and faculty and provides an educational model of practice that may be of use to others working to implement traditional Indigenous knowledge within educational systems.

The summer study and medicine wheel garden (later named *Pejuta Wakan Oju*) project design supports an interdisciplinary approach to the study of the natural sciences that includes and recognizes the strength of knowledge contained in oral traditions, as well as Traditional Ecological Knowledge (TEK).² This knowledge base emanates from the ecology of place and experiences and memory from those places. It supports the importance of this approach by utilizing storytelling, features of the land, and the “plant tribes” for gaining knowledge (Gilmore, 1987). Critical to this assumption is the importance of interrelationships among places, experiences, memories, knowledge, and the value of implementing Indigenous forms of knowledge for assisting students in achieving their educational goals. In addition, finding ways to develop relationships with students at other colleges and universities through a “Community of Scholars,”³ as well as providing a service to the local community that fulfills the overall objectives of being of use, working collaboratively with others yet supporting individual autonomy and personal leadership, are considered significant aspects of this education model.

For one week in June 2008, Indigenous students and faculty from California and North Dakota gathered to complete a native and heritage plant restoration project in the shape of a medicine wheel at a tribal college in North Dakota. Students with an interest and background in Animal Science, Biology, Ecology, Environmental Science, Earth and Soils Science, Forestry and Natural Resources, and Range Management joined with students interested in the Humanities and Ethnic Studies to complete an 85-foot diameter medicine wheel garden filled with native plants of the plains, particularly ones used as traditional medicines and as sources of Traditional Indigenous Knowledge (TIK). Rooted in ideas that begin with teaching and learning as aspects of social worlds, observation, and relationships with other communities, the basis of TIK set the context of study to include oral and traditional narratives as knowledge for and of practice as students and faculty worked collaboratively to complete the project. The primary focus was for American Indian and Indigenous students and mentors to learn about the grass plains environment and Dakota environmental ethics and values, with the assumption of Indigenous epistemology, ethics, and philosophy.

Framing the Study with an Elder

The *Wága can* cottonwood tree or *Populus sargentii* is important to Dakota people. This tree reflects “grandparent qualities” whose ability to create new life by multiple means of propagation is well known in Indigenous and scientific communities alike. In the early summer months, a blanket of snow in the form of cottonseed balls of fluff cover the ground if many elder trees are in the vicinity. “But besides this admirable provision to ensure the perpetuation of its kind, it has another means of propagation—the making of cuttings or slips from its own twigs. The cottonwood, alone among trees, performs this operation itself” (Gilmore, 1987, pp. 181-182). For eight students from a university in California, this was the first time they witnessed the beauty of seed dispersal by the elder cottonwoods and the remarkable traveling seeds. At a city park in Rawlins, Wyoming a number of elders line the park. Unfortunately, there is little evidence of the next generations of cottonwoods since throughout the Plains the loss of suitable habitat has minimized reproduction, but the ground is covered with seed snow. Seed dispersal and the growth of new generations of trees is dependant on a number of ecological conditions that have changed and altered, particularly since the 1950s. These changes have negatively impacted the next generations and include: the damming of rivers, stream alteration, plowing for agriculture, and livestock management.

The experience in a park in Wyoming is the beginning of a field trip

designed for Indigenous students to study the tall grass plains that began in classrooms simultaneously in California and North Dakota during the spring of 2008. Students and faculty leave California at the end of spring quarter after final exams, traveling over 1900 miles in three days by van to North Dakota to meet with students and faculty at the tribal college. Along the way, the California students continue to find more examples of cottonwoods, their methods of propagation, and characteristic features along the roads to the summer study program, something new for them, but well known to the students in North Dakota. The cottonwood, *Wága can*, became a symbolic metaphor and illuminating example throughout the field trip of Indigenous plant knowledge. Dakota and Lakota peoples understand *Wága can* as a grandparent with stories to tell of preservation and ecological conditions, and a life that is in need of support and care.

For the Dakota Nation, the cottonwood is “the symbol of fidelity, one of the great virtues inculcated by the ethical code of the people” (Gilmore, 1987, p. 183). According to Gilmore (1991), Lakota people say they “peeled the young sprouts and ate the inner bark because of its pleasant, sweet taste and nutritive value” (p. 28). Further, the Lakota Nation recognizes the central role the cottonwood tree plays within their native ecosystem.

The people understood the importance of the Cottonwood to their own existence extremely well because they too relied very heavily upon the gallery of Cottonwood forests for their survival. And, they witnessed and participated in the diverse species interplay that occurs on a daily basis in a healthy forest along the river bottom. As a direct result of this recognition of the cottonwood species’ importance to them, every year the *Lakota* invite the Cottonwood to share the most central place in their most important spiritual ceremony, the Sundance. (Garrett, 2002 p. 11)

The rustling of the cottonwood leaves, even when the air is still during the day or night, reminds people of the presence of spirits and are “the paths of the Higher Powers, so they are constantly reminded of the mystic character of this tree” (Gilmore, 1991, p. 5). The notion that plants, as well as other communities in the natural world such as mountains, animals, rivers and forces of nature, can be of nutritive use, set ethical standards for humans, and be of spiritual importance is fundamental to understanding this study. Faculty designed the project to connect the philosophy and epistemology of Plains Indian peoples with the natural world, and they worked to provide opportunities for participants to experience and investigate these connections.

Theoretical Framework

A collaborative and interdisciplinary approach to the study of environmental science and ecology, and the use of traditional narratives as texts of knowledge, is significant for learning and studying the natural world. Although discussions of interdisciplinary studies have occurred, few examine the significance for students interested in studying the natural sciences from an Indigenous perspective. And even more limited are practical experiences that combine classroom learning, concrete examples and connections to research, as well as the opportunity for students to contribute their knowledge and abilities in a useful hands-on project. Yet, “in Indian country, ecological and cultural restorations are intimately entwined and vital to the health and well-being of Native American communities. This approach requires careful observations of natural cycles and time-tested practical cultural responses and accommodations” (Martinez, Salmón, & Nelson, 2008, p. 88). This educational philosophy has deep roots in notions of collaborative and consensus-making leadership, knowledge that can be gained from the “plant tribes” and “other-than-humans,” and the importance of listening to and learning from teachers and elders.

Indigenous knowledge, typically deemed by Western science as limited to “tales” and “myths,” often is referred to as random observations that provide unreliable information. Most Indigenous communities are given “little recognition of local tribal expertise or knowledge of natural resource management and history” (Ross, Brawley, Lowrey, & Hankins, 2008). However, agricultural and plant knowledge are clearly evident in each tribes’ oral record and has been systematically practiced with principled ideas of sustainability for each land base occupied by the various tribes. This specific and endemic knowledge led to practices that maintained and supported the viability of certain plants in particular. When Western science recognizes the importance of what Indigenous Peoples have known for centuries, this is then conveyed as new knowledge just “discovered.” In most cases, the discovery of knowledge at best, “has been primarily extractive, whereby information, local contacts and other forms of assistance are provided by a host community, with little or no reciprocity. ...At worst, damaging policy decisions are made on the basis of research that is conducted without community understanding, guidance, involvement or informed consent” (Hankins & Ross, 2008, p. 240). A typical case in point is the example of the “mouse bean,” a highly nutritive and important bean collected and gathered by mice in the plains. The “bean mouse and its works are regarded with admiration and reverence by the people, and they often go out alone and sit upon the lap of

Mother Earth” (Gilmore, 1987, p.126). When the mouse gathers the beans, they collect a very nutritional bean that has been recognized and valued by Indigenous Peoples for centuries. However, the mouse bean was not recognized for its significance by Western scientists until verified by a University of Maryland botanist too late to save the bean from flooding along the Missouri River due to the building of dams (Garrett, 2002).

Traditional narratives contain not only knowledge about the natural world, they also serve to develop understanding of self and community, sustain and increase knowledge over time, and connect with others across generations. As suggested by Betts and Bailey (2005), Native and Indigenous learning emanates from a “connected understanding of the universe and all that’s in it” (p. 418). As a matter of history, “Indian people learned from the herbs and plants and from their life experiences in both physical and metaphysical reality” (Fixico, 1996, p. 35). Respect is given to this knowledge and it contains multiple levels of understanding that is preserved as important to the people in the future. In fact, the knowledge and “traditions of the tribes can be a significant source of information for modern science” (Deloria, 1995, p. 206). Indigenous peoples learn and study other living entities to gain knowledge of the world and this knowledge is then shared with humans who have no more importance than animals, plants, forces of nature, or any other component of the world. Indigenous communities reflect this philosophy through an emphasis on community in which each member is an equal part of the system as opposed to an emphasis on individuality, which places human individuals above others and above community.

Oral tradition and storytelling remains an effective means of teaching and learning in Indigenous communities, particularly regarding traditional values and philosophy (Cajete, 1999). Wolfley (1998) notes, “creation stories, songs, prayers, and traditional ecological knowledge and wisdom teach us to visualize and understand the connections between the physical environment, the spiritual values that create and bind a tribal community, and the social welfare of a community” (p. 293). In one example, the *hokshi 'chekpa wahca* “twin-flower” or “prairie smoke” (Figure 1) blooms early in spring and is symbolic of the reawakening of life on the prairie. “Little bellybutton in full bloom” is the literal translation of the name of this flower, and the name may be interpreted as the birth of another growing season intimately attached to the earth. This flower is the first to emerge in spring and signals the coming of warmer weather. It calls the other flowers awake (Gilmore, 1987, p. 28). A Dakota story relates:

This flower shows friendliness to humans by nodding their heads in the chilly spring wind, showing their smiling faces



Figure 1: Photograph of *Hokshi 'chekpa wahca* “prairie smoke” taken at the International Peace Garden, Canada – USA, <http://www.peacegarden.com/sights.htm>. Photograph courtesy of Kate J. Martin (2008).

and saying, “Good morning.” But the people passed them by unheeding. The flowers became abashed at this indifference, and so nowadays, still feeling friendly towards the people in spite of such rebuffs, they bashfully turn their heads to one side as they nod and call their kindly greetings in their low sweet voice. (as cited in Gilmore, 1987, p. 206)

This story provides environmental knowledge and information about changes in the weather and the plant itself. It indicates the social role this flower plays in connecting to other communities, and demonstrates a way for humans to act toward each other, as well as to other plant communities. We see the way “stories are reflections, more than a simple educational process, rooted in a deep sense of kinship responsibility, a responsibility that relays a culture, an identity, and a sense of belonging” (Cavender Wilson, 1996, pp. 7-13). Each flower, plant and human has a place and a responsibility.

A goal of faculty organizing the summer study was to provide an educational project for American Indian and Indigenous students that fulfills the ethics of reciprocity and responsibility vital to communities. A project of this nature was deemed necessary for students’ educational success and for the continuation of traditional knowledge. Further, simultaneously encouraging educational achievement in the sciences and increasing knowledge of traditional ethics and philosophy is a way of completing practical study within a framework that values Indigenous

knowledge. Although making explicit connections to learning educational settings for American Indian and Indigenous students is becoming somewhat more recognized as critical for teaching students, achieving educational equity often remains a significant challenge for Indigenous students. For many Indigenous students as well as faculty, educational experiences are marked by isolation with the exception of a few peers or colleagues who understand the interdisciplinary and connected nature of their work, ethics, and efforts. In classrooms, discussions of American Indian epistemology, philosophy and ethics, particularly regarding the sciences, ecology, and the environment, and issues of sovereignty over natural resources, seldom occur. Academically capable Native and Indigenous students often drop out of school because their needs are not being met, while others are pushed out because they protest how they are treated in school (Capriccioso, 2005). For those students who remain to pursue their educational goals, few opportunities exist that provide the benefits of community-based learning from Indigenous perspectives. Incorporating philosophical principles such as respect, reciprocity, relevance, and responsibility are significant components of this learning (Kirkness & Barnhardt, 2001). The tribal college summer study project works to address these issues and is best captured in a statement made by Tewa educator Howard T. Rainer at the American Indian Graduate Center conference in 2006: "We must endeavor to help those that can help others in the future."

Mentorship is a critical aspect of this project since students seldom encounter a senior American Indian or Indigenous faculty member or scholar in their educational career. Therefore, the opportunity for undergraduate and graduate students to meet with senior Indigenous scholars and faculty provides opportunities for all to see, hear, learn and study, and work together to gain important knowledge and understanding from traditional perspectives and narratives of the "plant tribes."

Summer Study Project Design and Participants

The design of the summer study was based on four areas considered significant by the authors of this article: Indigenous knowledge, interdisciplinary study, collaboration, and practical experience. First, Indigenous knowledge must necessarily frame the effort in the areas of respect for spiritual relationships, an American Indian and Indigenous system of education that promotes research, and most importantly a curriculum centered on Dakota traditional culture. The second area, interdisciplinary study, acknowledges the need for the use of Dakota language and narratives for providing important constructs within an environmental study that also values and respects the importance of land

and place. The first two areas must work in concert with the third and fourth areas, collaboration and practical experience. In these areas, valuing a collective process that respects participants' knowledge and contributions within a practical learning experience is critical for learning. Further, the experience must include knowledgeable elders and scholars for connecting and encouraging participation and demonstrating learning.

The idea for the summer study project emerged out of a series of conditions. First, the project was purposefully developed with the idea to improve the tribal college campus and provide support for the community in North Dakota. The idea was to contribute to the community's well-being with access to native plants and traditional knowledge about their use. It also was designed to maximize the capacity building of Indigenous and tribal college students to work together in addressing environmental and social concerns. The long-term collegial relationship between Drs. Kate Martin and Jim Garrett, and the existence of the *Community of Scholars: Gatherings of American Indian and Indigenous Students and Mentors* facilitated the project and assisted in its development.

Community of Scholars (CofScholars) was co-founded in 2006 and grew out of a desire to provide mentorship for American Indian and Indigenous students whose recruitment and retention at major universities in California has been declining since the end of affirmative action policies in 1998. The CofScholars mission is "to develop a community of scholars for the support and mentorship of Indigenous high school and college students through the encouragement and participation of American Indian and Indigenous elders, mentors and scholars" (CofScholars, mission statement, 2006). It provides opportunities for scholars to share their knowledge and experience within a community in which all participants can act as mentors, as well as benefit from collegial relationships. CofScholars sponsors three gatherings a year and facilitates special projects, such as the summer study that is the focus of this article.

In October 2007, Martin and Garrett began discussions and planning for the summer study project, and in December 2007, they met in North Dakota with the tribal college president and other faculty to discuss the possibility of the project. Although tentative at the time, in the months following the December meeting, they each worked to fulfill necessary pre-planning and organization at their institutions. An underlying assumption of the project was that participants would work collaboratively, but that tribal college participants would hold primary responsibility for design, management, and maintenance of the garden, while California participants would provide their labor and meals for all

participants for the majority of the week. Faculty would provide the framework for further research, study, and evaluation of the project. In North Dakota, Jim Garrett sought authorization and input from the college president, tribal council, students, and community to create and plan the garden. He worked to recruit students by offering college credit and paid internships, and he acquired the necessary materials including plants, rocks, soil and tools with resources from private donations and federal grants. In addition, he invited guest speakers and planned field trips for the group.

In California, Kate Martin sought another faculty member for participation, and Dr. Lynn Moody joined the group. Students were recruited to apply to the program from the *Community of Scholars*, the campus American Indian Student Association, American Indian Science and Engineering Society, and the university departments. Funding was solicited and secured from the departments and the Colleges of Liberal Arts and Agriculture to provide transportation, lodging and meals for all participants. In March 2008, student acceptance letters were mailed, and students enrolled in a four-unit fieldwork course during spring quarter with work to be completed from June 16-27, 2008, one week in North Dakota plus five days of travel from California.

The Medicine Wheel Garden

Completion of the summer study project and what became known as the medicine wheel garden was achieved through what was described as an “exceptional collaborative effort” (faculty participant). The three faculty members and thirteen students, twelve women and four men, represented Anishinabe, Dakota, Klamath/Modoc, Laguna Pueblo, Diné, Niitsítapi (Blackfoot), and Lakota Nations, and Indigenous peoples of Mexico. The tribal college participants included Jim Garrett, a Lakota faculty member with a Ph.D. in Rangeland Ecosystem Science, and five Native students completing an Associate of Arts or Associate of Science degree in the Humanities or Natural Resource Management. The California participants included seven American Indian and Indigenous and three non-Indigenous students and faculty. The faculty members have doctoral degrees in Earth Science and Education, and the eight students included two incoming juniors studying Forestry and Natural Resources, three recent graduates with a Bachelor of Arts or Bachelor of Science degrees in Ethnic Studies, Animal Science and Biology, and three masters and doctoral degree students in Earth & Soils Science and Native Studies.

The summer study project goals were to: 1) develop collegial and supportive relationships; 2) gain ecological knowledge from Dakota sto-

ries and narratives about the tall grass Plains; 3) combine study of the physical sciences with the humanities; and 4) complete a native and heritage plant restoration project to benefit the tribal college and community. To achieve these goals, all students and faculty participated in learning and educational opportunities prior to the week in North Dakota with class meetings and an extensive reading list including three primary texts: Deloria's *Red Earth White Lies*; Gilmore's *Prairie Smoke*; and Van Bruggen's *Wildflowers and Grasses of the Northern Plains*. In California, students attended five class meetings of two-hours in length during the spring quarter. These meetings provided the opportunity to develop relationships among participants and gain knowledge of Dakota history and the Plains environment, including earth and soils and native plant life of the forbs and grasses. At the tribal college, students grew native plants from seed and tended them in the college greenhouse, purchased them from local nurseries, prepared the soil, and assisted in the collection of soil and rocks. They also worked to clear and mark an 85-foot diameter space for the garden with the correct directional orientations for east, west, north, and south. This preparation was critical for maximizing the time when all participants gathered in North Dakota for one week in June to work toward the creation of the garden.

The Medicine Wheel Summer Study Project

On 16 June 2008 at 5:00 A.M., the California participants climbed into a university van and one passenger car and drove for the next two and a half days, stopping to camp for one night in Theodore Roosevelt National Park (TRNP). While driving along the interstate near Sundance, Wyoming to the park, a bald eagle flew directly over the car and van and seemed to look inside at the occupants before flying off. At the TRNP campsite, a cottonwood tree hung high above the picnic table, again with few younger generations in sight. During breakfast, some participants talk about waking in the middle of the night to rain, but it was the leaves of the cottonwood not rain. The tree is approximately 40-feet tall with one branch that ends abruptly with a large hole (Figure 2). Mother and father woodpecker are going in and out of the hole to feed their babies. The California group arrives at the tribal college at 5:30 P.M. on June 18 and is hosted to dinner prepared by the five tribal college students at the home of Dr. Garrett.

Day One: The next morning, work on the garden begins at 9:00 A.M. with a tour of the college for the California participants and a PowerPoint presentation of the preliminary garden design, plan of work, and the source of the design. By 10:30 all participants, with the exception of tribal college students who have a morning summer class, are viewing



Figure 2: Photograph of *Wága can* “cottonwood” taken at Theodore Roosevelt National Park, North Dakota. Photograph courtesy of Kate J. Martin (2008).

the proposed garden site and beginning preliminary work. After one hour, the first row of rocks that will define the four quadrants of the garden has been laid. The group breaks for lunch of soup, *wojapi* “fruit pudding”, and frybread provided by the tribal college. Many of the college faculty and staff attend. After lunch, when the actual physical work of the garden begins, a respected elder of the community blesses the construction of the garden. Then, the entire group continues working for about two and a half hours when an assessment of the progress is made. From the beginning of the outdoor work, everyone assumes a role and takes responsibility for a task(s). One of the tribal college students is surprised at the amount of work that is accomplished on the first day and comments, “I didn’t think so much would happen so fast.” A student from California comments that seeing “the vision come to life really seems to send a feeling of pride and acceptance through the people of our group.”

The group decides to quit work at 3:30 P.M. since some of the methods for creating the garden need to be redefined and the weather is prohibitive. Most of the participants have limited or no experience building rock walls, and there is evidence of physical fatigue in all participants due to the heat and humidity, which is coupled with low energy due to altitude change and travel for the California participants. We decide to reconvene on Saturday since Friday is designated for a field trip to the International Peace Garden on the North Dakotan and Canadian border.

Day Two: All participants attend a field trip to the International Peace Garden beginning at 8:30 A.M. and returning to the campus by 5:00 P.M. We meet at the California participants' lodging, and tribal college students arrive together. They tell us that on the way they saw two golden eagles sitting on a telephone post together. The first stop of the day is a visit to the Anishinabe Learning, Cultural, and Wellness Center at Turtle Mountain Community College before going to the Peace Garden. We eat a picnic lunch by the lake. This "is a beautiful and symbolically powerful site nestled between Belcourt Lake to the North and a natural wooded area that surrounds the lake. The Center consists of 102.5 acres of spectacular natural beauty & ponds, with Ox Creek running through the area" (Turtle Mountain Community College, website). After lunch, we proceed to the International Peace Garden. During the field trip, students from the two groups begin to intermingle and walk together in smaller groups, showing particular interest in the native plant gardens. On the way home, the group decides to have a "Family Day Dinner" on Sunday with the participants, their extended families, and invited guests.

Day Three: Saturday June 21, National Aboriginal Day in Canada, is the first full day dedicated to working in the garden and participating in educational activities.⁴ The day begins with a prayer and organizational meeting to talk about what happened on Thursday, discuss corrections to the design, and provide a practical demonstration of how to construct the rock walls. With this opening, the day's work proceeds quickly and the initial phase of the four garden quadrants is completed. A communal lunch in the log house is the first formal opportunity for participants to more explicitly share something of interest about themselves. In the evening, the Spirit Lake tribal historian presents a lecture on "Dakota Dance Halls," Dakota language, ceremonial practices, and cultural values. The lecture is informal and convenes in the college's log house area with comfortable chairs and sofas.

Day Four: Although some participants designated Sunday as a "day of rest," at least in the morning before church as one participant from North Dakota indicated, yet no one "rests" and everyone shows up at 9:00 A.M. ready to work. It seems as if no one wants to miss out on the progress that is being made. The day again begins with prayer and an updated discussion of the garden design. Some participants suggest a change to the design that would complete the four garden beds with a rock wall, add another gravel path, and increase the garden size so that additional beds outline the circle and more plantings could be completed in the future.

Tonight the "Family Day Dinner" features Indian Tacos and frybread made cooperatively by students. One of the busiest tribal college stu-

dents, a father and grandfather, makes a huge batch of sweet dough that can be used for frybread and biscuits. Some tribal college students are disappointed since they wanted to do all the preparation for the dinner, and a discussion helps to address these feelings. About thirty adults and ten children attend the dinner hosted by Dr. Garrett, whose large backyard and deck with picnic tables set up by the tribal college students accommodate everyone. This is a significant dinner during the week since all participants are present and more intimate discussions between the two groups of participants take place. In the evening there is a presentation about the rising waters of Spirit Lake from a faculty member at the tribal college and Spirit Lake resident.

Day Five: Work begins at 8:30 A.M. and this may be the hardest day in the garden since the tasks are labor intensive. A prayer and group meeting again begin the day. The soil for planting must be raked and cleared of debris. It is suitable for planting and was donated to the college for the garden project, but has rocks and sod netting that must be raked and removed. Interestingly, some participants choose to do this task primarily and continue with dedication until it is finished. Another task involves laying the gravel for the paths, and it must be evenly distributed by wheelbarrow and tractor and spread to a depth of about six inches along all the paths. Again some participants take responsibility for accomplishing this task, including assisting the tractor driver with directions and keeping other participants out of the way. The remaining participants lay and build the rock walls and fill in the soil where it is needed. Finally, a layer of clean topsoil is spread and raked over the four garden beds. After this process, the garden is watered and ready for planting the next day. By 1:30 P.M. the work is completed and some participants visit the nearby Sully's Hill National Game Preserve as a short field trip.

During the day a lunchtime discussion regarding the evening's planned lecture generates some misunderstandings and tension for the group as two eagles fly overhead. Students suggest attending a drum group in the evening; however, an invited speaker, a Lakota riparian restoration specialist, has arrived from South Dakota and is scheduled to present at the same time. Jeff Mortenson has come from Cheyenne River Reservation in South Dakota to discuss with the group his family's forty-year prairie restoration project on their ranchlands. Jeff's father, Clarence, has received numerous national awards for his lifelong achievement. After hearing the students' concerns, the faculty decides to adhere to the original schedule, especially when there is an invited guest who travelled a long way and is prepared to speak. During the evening's presentation in the log house, students are impressed with the presentation

and heard to say that they “would like to ask so many questions” of the speaker. They are inspired by the discussion; even those with backgrounds in the field of restoration note the important information the speaker conveys. The evening ends a little abruptly at 9:00 P.M. due to tornado warnings. The next day, the speaker will make suggestions for planting the four quadrants in the garden.

Day Six: Today’s work starts a little later than other days, not until 10:00 A.M., since most participants are tired from the long previous day and planting is the only remaining task. Last night’s speaker advises the group, particularly the tribal college student who has been responsible for gathering the plants and caring for the ones in the greenhouse, on the quadrants that the plants will like the best. Together they create a chart of the plants for each quadrant and the new seedlings and plants are set out based on the chart. Another idea behind planting them in specific quadrants is that when the written descriptions and plant labels are ready for the garden the plants will be in places where they might be found in their natural habitat. For instance, forbs that prefer the north-facing slopes will be placed in quadrants with a north-facing aspect. A number of the plants can be found in all locations, and they are evenly distributed among the four beds. The tribal college student leading the planting senses the reticence of other participants who look at the plants and wait for instruction. She tells everyone, “Put them in anywhere. It should look natural, not planned.” The excitement of finishing this project is evident as *Wahchanga* “sweet grass,” *Hokshi’chekpa wahca* “prairie smoke,” *O’zhi’zhi’tka* “wild rose,” *Ican’pehu* “purple cone-flower,” *Wahcanga iyechcha* “sweet clover,” *Wahuwapa-kichi wahca* “blazing star,” *Pezhi-hota Blaska* “wild sage,” and a variety of other native forbs and grasses are put into the garden. We finish early and there is free time in the afternoon for relaxing or sightseeing.

Day Seven: All participants meet in the garden around 10:30 A.M. to take pictures of what was accomplished, water the plants, and look at the garden one more time. The tribal college provides a farewell lunch with a variety of meats, salads, potatoes, and cake and ice cream. The separating of these two groups of students and faculty moves many of the participants who have formed collegial bonds during the past week.

The tribal college students are given the responsibility of naming the garden in the coming weeks since it belongs to the community and the college. They decide on the name *Pejuta Wakan Oju* “Planting Sacred Medicine(s),” and Figure 3 presents a photograph of the completed garden. They also assume the responsibility of caring for the plants and garden, and during the coming weeks will collect and spread several layers of mulch to protect the young plants. Even though some of the

plants are very young seedlings, only a few “pass away”; most thrive in the new garden. By late August, the students and Dr. Garrett have gathered and planted an additional two truckloads of native plants for the expansion of the garden and the development of the outer garden beds. In the future, they will create labels for the plants with corresponding descriptions of the Dakota name, taxonomic name and traditional uses. The goal is to provide a garden that demonstrates and teaches Dakota plant knowledge, provides traditional people access to these significant plants, and grows and expands with each new group of students and community members that assumes responsibility for the garden.



Figure 3: Day 6 the completed Medicine Wheel Garden, named by the tribal college students *Pejuta Wakan Oju* “Planting Sacred Medicine(s),” North Dakota. Photograph courtesy of James J. Garrett (2008).

Summary and Results

Between 19 June and 25 June 2008, sixteen individuals worked together to complete the medicine wheel garden, meet for lectures and meals, and travel to the International Peace Garden and other parks in the area. The group spent approximately twenty hours working in the garden over five days. Approximately thirty hours were designated for meal times and evening lectures and discussions. In addition, participants had approximately twenty hours of free time to spend caring for their families, sightseeing, or resting.

Through a strong vision for the project developed over nine months’ time, it was easy for faculty and students to concentrate on the physical, collaborative, and interpersonal dimensions of the project and achieve the goals originally set out by the authors. Without exception,

participants indicated it was a unique and significant educational opportunity. A California participant voiced her feelings and those of others by saying,

Taking part in the summer study program has changed my life. I am so thankful for the relationships I built with the people not only at the tribal college but also with the people from [California]. Throughout our entire trip, we as participants were able to exchange our words of knowledge and experiences to create a constant active learning environment. Having access to the immense amount of knowledge eased my insecurities about the program. I was exposed to the Western approach to soil and plant sciences and also was able to hear more effective non-Western approaches to prairie restoration. This trip elevated my consciousness as a human on this planet.

The results of the medicine wheel garden project were evident in three specific areas: physical, affective, and effective.

Physical Results: The participants completed an 85-foot diameter medicine wheel native plant garden, with gravel walkways wide enough to support wheelchairs, and four raised garden beds, as well as initial preparation for additional planting beds in an outer circle. Photographs documenting the construction process of the garden were collected in a repository and tribal college students created a GIS 40" X 40" poster. Advanced planning, accurate calculations, and effective use of raw materials to complete the initial phase and the construction phase helped to facilitate and complete the effort. The provision of meals, accommodations, and transportation for all participants provided a smooth transition between periods of work and relaxation that facilitated community building.

Affective Results: The success of the project was dependent on students and faculty coming together as a group. Although participants were reticent and shy in the beginning, collegial relations developed between and among students and friendships were evident by the end of the week. The physical activity of working together on a project to accomplish a goal, combined with the recognition that completion of the garden project was "a very real possibility" from the first day's efforts, influenced students' relationships positively and spurred their desire to participate. Attention to affective responses and interpersonal dynamics during the project helped participants to work through feelings and facilitate personal relationships so that all remained committed to the project and continued to feel as if they were integral and important to its completion. This included talking about the idea of caring for

others in the group by paying attention to their physical needs. Showing compassion became something that participants did automatically for each other.

Combining the work with community meals and a “family day” brought the two groups closer. As noted by one participant, it also was important for “reinforcing the values and goals of the whole trip – maintaining traditions and preserving culture through the natural world.” The dinner worked to address the needs of the tribal college students by demonstrating concern for their families and responsibilities. Supporting the value of children and grandchildren, as well as including them as part of the project and letting them see what their family members were doing as students in college, was important to them. Field trips and invited speakers provided opportunities for participants to visit and learn from each other, share personal experiences and challenges, and discuss more intimate feelings and concerns.

Effective and Logistic Results: Sufficient preparation (accumulation of raw materials, meal planning, transportation and logistical planning) provided more time for concentration on interpersonal dynamics and work processes once on site. This, coupled with adaptive management strategies, established an open forum for everyone’s ideas on how to accomplish the task. The ability of all concerned to contribute to ongoing changes and modifications in the plan, as well as willingness of faculty to adapt on site, was critical to this success. At times, faculty needed to make overriding decisions. However, unique to the garden project was valuing the skills, knowledge, expertise, suggestions and ideas of each participant. As noted by Dr. Garrett, “The strength of the garden came from the diversity of its creators.” The summer study and garden project provided an exceptional context for decision-making and leadership in a cooperative environment. Consensus building on the development of a common garden concept facilitated completion, and participants maintained flexibility in the project and were open to negotiated changes and suggestions. A factor in this was the use of American Indian and Indigenous educational models of “hands on” and “learn by doing”; it was an opportunity to hear about the project, have demonstrations of what needed to be done, see it taking place, and work to complete the project together, while valuing the contributions of each participant.

An important outcome of the medicine wheel garden project was the creation of a model for the development of other collaborative projects such as this. Figure 4 presents an educational model that details significant design areas and elements that helped to maintain high levels of commitment and responsibility from all participants. These are reflected

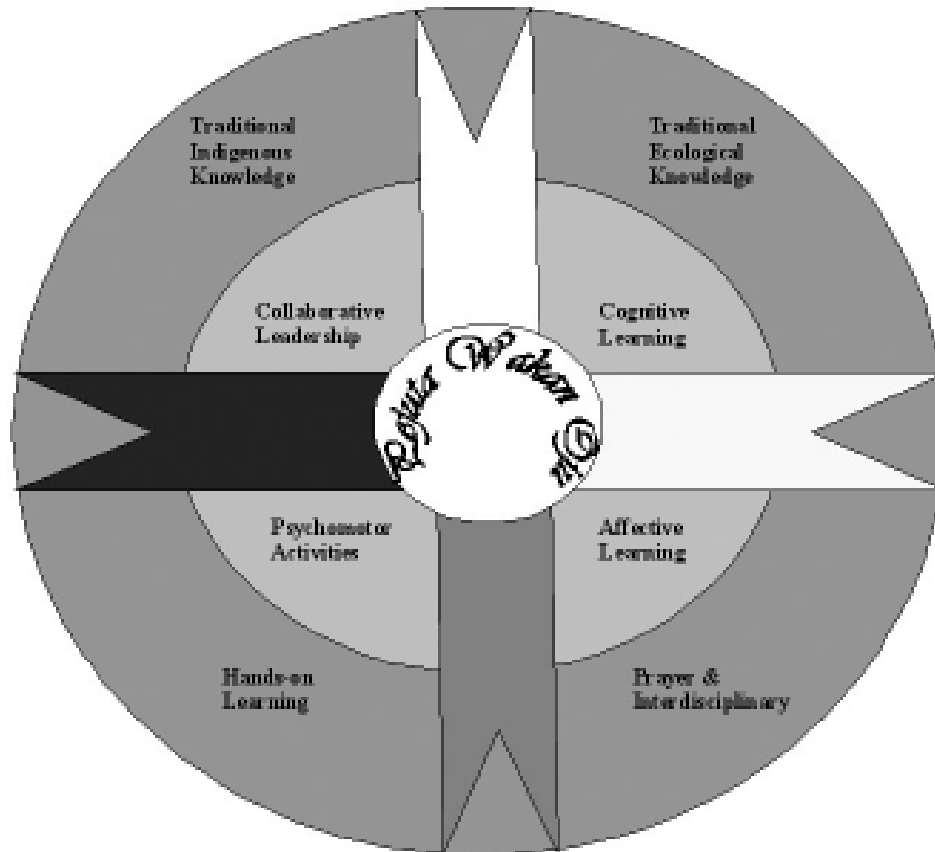


Figure 4: *Pejuta Wakan Oju* “Planting sacred medicines”: An educational model for the Medicine Wheel Garden Project.

in the concentric circles of the actual garden and in the model. It also provides insight into the elements that were consciously addressed in the project design by faculty in the early planning stages. It began with the area of traditional ecological knowledge as the basis for study and work. However, it was the participants and all their efforts working together that made the project successful and helped to illuminate the inner areas of the medicine wheel. The combination of cognitive and affective learning with physical activity situated within a context of traditional ecological knowledge (TEK) created a multilayered learning environment. As Battiste (2008) identifies, “Indigenous people’s epistemology is derived from the immediate ecology; from people’s experiences, perceptions, thoughts, and memory including experiences shared with others; and from the spiritual world discovered in dreams, visions, inspirations, and signs interpreted with the help of healers or elders” (p. 499).

The project also benefited from the second layer of components presented in the model. Shared leadership and a spiritual component supported the group and blessed the garden through prayer by a respected elder of the community. Attention to interpersonal dynamics, feelings and relations helped to demonstrate to all participants that they were valued and important. Care and concern for participants when difficulties arose, coupled with the spiritual component to the program, paid attention to both the physical and emotional needs of participants by taking care of each other. From this, participants felt comfortable taking leadership and assuming responsibility for the difficult tasks of preparing the garden for planting. Once these tasks were completed, a sense of accomplishment as an active member of a project was evident from all participants, including some additional members of the college community who joined in to help with the planting.

Further, the hands-on learning and “learn by doing” concepts increased knowledge of the plants and facilitated the building of the raised beds, particularly for those not familiar with landscape construction. These included: displaying visually in a PowerPoint presentation what the garden would look like; illustrating the concept with hands-on demonstrations; and finally having participants actually perform the work. Integral to this process was the opportunity for all participants to assume some form of leadership based on their demonstrated expertise and/or sense of responsibility for completing the tasks of the project, as well as to make individual decisions about what tasks they wanted to work on.

Conclusions

The medicine wheel project completed a “circle of knowledge” in a very real presentation of *Pejuta Wakan Oju* that utilized Traditional Indigenous and Ecological Knowledge (TIK/TEK) as the basis for teaching and learning. Further, in the future the garden will be used to continue to teach American Indian students and community members about Dakota traditional naming and uses of native plants in the Great Plains. On the fieldtrips and during the lectures, participants made connections with what they were doing in the garden, as well as what they were seeing. At the International Peace Garden, participants enthusiastically examined the native plant section, particularly the large amount of *Wahcanga* and *Hokshi'chekpa wahca*. Invited speakers provided knowledge and expertise that guided and inspired participants. The presentation by the riparian restoration specialist and assistance with the planting of forbs and grasses in the garden quadrants most suited to these “plant tribes” were highly valued by all participants. Finally, when con-

necting to land with activity and caretaking actions, we might suggest that the plant tribes themselves helped their human caretakers to understand these qualities and relate to each other in respectful and significant ways.

As the California participants return home, an eagle acknowledges their passing. Now, the tribal college participants will continue to see to it that the garden grows and develops as they take active responsibility for its expansion and maintenance. The *Pejuta Wakan Oju* project was used to guide and illustrate the interconnectedness and interdisciplinary aspects of our work. It symbolically reflects these powerful connections in the areas of traditional ecological knowledge as valuable and important knowledge, and physical activity that helps to create opportunities for learning not just abstract ideas, but a place in the real world to see evidence of concepts and effort. Coupled with these elements is the ever-present spiritual qualities of the world and importance of work that contributes to the well being of others.

Like the *Wága can* “cottonwood” that is home and provides life and service to so many as an elder, the garden project served multiple goals and provided multiple opportunities for learning. The goal of developing collegial and supportive relationships between two groups of Indigenous students and faculty occurred as they listened to each other and worked together to achieve an educational endeavor. They formed a collaborative team that negotiated changes and adapted to circumstances within the context of Dakota traditional narratives and knowledge of the environment and natural world. In the end, the project left a garden for the college and the community to use to continue to teach others about the native plants of the Great Plains and Dakota uses for them. And, like the *Hokshi'chekpa wahca* “prairie smoke” flower that greets humans with a slight bow of the head, all will remember this project and smile slightly when they meet again.

Notes

1. Earlier versions of this article that addressed spiritual and educational practice respectively were presented at the American Academy of Religion 2008 annual conference in Chicago and the American Educational Research Association 2009 annual conference in San Diego.
2. See for example the work of Marie Battiste (2008); Carl Wilmsen, William Elmendorf, Larry Fisher, Jacquelyn Ross, Brinda Sarathy and Gail Wells (2008); and Charles Menzies (2006).

3. This study brought together students and mentors from the tribal college and the California University within the *Community of Scholars: Gatherings of American Indian and Indigenous Students and Mentors*. This organization was founded in September of 2006 and has provided mentorship for students in high schools, community colleges and universities. Co-founded with the California Indian Education Association, the University of California Santa Barbara and Cal Poly State University, San Luis Obispo, it has provided mentorship for about 200 American Indian and Indigenous students, with approximately fifty students graduating from their institutions. For further information on the organization, contact Dr. Kate Martin at Cal Poly State University, San Luis Obispo, kamartin@calpoly.edu.
4. This was an unplanned, but fitting coincidence.

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Acknowledgments

With grateful acknowledgment to the tribal college and university students and faculty who helped to make this project possible, and to those who assisted with manuscript revisions: Margaret Azure, Anthony Cavanaugh, Gabriela Garcia, Jessique Ghezzi, Serra Hoagland, Amy Keate, Laure Dauphinais, Lavella Thompson, Rodney Martin, Marilyn Notah-Verney, Cailin O'Meara, Terra Plumley, Craig Stubler and Dr. Lynn Moody.

As well, the authors are most grateful for the thoughtful editing of the reviewers of the manuscript.