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ABSTRACT

This paper reviews books and research papers concerned with Indigenous science knowledge and its integration into school curricula and describes current efforts to bridge Western and Native science. "A Yupiaq World View: Implications for Cultural, Educational and Technological Adaptation in a Contemporary World" (Angayuqaq Oscar Kawagley) documents Yupiaq practices in a fish camp and how they relate to science education in Yupiaq schools. "Look to the Mountain: An Ecology of Indigenous Education" (Greg Cajete) presents a science curriculum development model reflecting Native philosophy and culture. "The Foundational Values of Cultural Learning" (Kallen M. Martin) describes the Ahkwesahsne Science and Math Project, which bases curricula in Iroquoian traditional oral literature and Aboriginal number systems. In "Lighting the Seventh Fire," F. David Peat, a Western physicist, chronicles his awakening to Indigenous science knowledge and its spiritual aspects. Peat sees advanced mathematics as a common language that crosses cultures. "Red Earth, White Lies: Native Americans and the Myth of Scientific Fact" (Vine Deloria, Jr.) critiques Western science's narrow worldview, which disregards alternate explanations of reality and promotes racism. "Redefining Science Education for Aboriginal Students" (Madeleine MacIvor), "Bridging Native and Western Science" (Pam Colorado), "Indian Givers" (Jack Weatherford), and "Whose Science Whose Knowledge" (Sandra Harding) address curriculum development, the relevance of Indigenous science to environmental concerns, and Indigenous contributions in medicine and agriculture. Super Saturday, a summer project of the Saskatoon Tribal Council and the University of Saskatchewan, is based on a Hawaiian model. Na Pua No'eau included teacher, student, and parent activities that integrated Native Hawaiian culture, language, handicrafts, history, and knowledge of the sea and sailing. The Saskatchewan project incorporates Western science, Indigenous knowledge, and Native building design. (SV)

Indigenous Knowledge in the Sciences and a Practical Application in the Super Saturday Project

For the Canadian Indigenous and Native Studies Association
May 28-31, 2000

by Priscilla Settee

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Several articles, research papers and books, have been written by Indigenous scholars about the Indigenous science knowledge base of Indigenous peoples. While the knowledge base is growing, more research is urgently required, especially to help future students and youth get a sense of the wealth of knowledge which exists within their communities. This paper reviews some of those books and then describes current projects that attempt to overcome the problems identified.

Indigenous Knowledge

A Yupiaq World View: Implications for Cultural, Educational and Technological Adaptation in a Contemporary World by Angayuqaq Oscar Kawagley examines some of the cultural and educational implications when two cultures meet. This study takes place in a remote Yupiaq village in southwestern Alaska. More specifically the study is of the Yupiit Nation and its school system. Kawagley, a Yupiaq, documents Yupiaq practices in a traditional fish camp and how those practices relate to science education in Yupiaq schools. Kawagley utilizes participant-observer research methods, a common method for data gathering. Kawagley describes the Yupiaq World view as a cognitive map for making sense of our world where care is given for maintaining balance between the human, natural, and spiritual realms, thereby creating a sense of harmony.

Kawagley uses a tetrahedral metaphor to represent the interrelationship among humans, nature, and the supernatural in the Yupiaq world view. A delicate balance is maintained through constant

communication between the three realms. Kawagley chose as his research setting the Yupiaq fish camp, community and school. He calls the fish camp a cornucopia of traditional and modern technologies. Kawagley feels that it is a mistake to exclude ordinary people whose experience comes from common sense, casual empiricism, or thoughtful speculation. Through his study Kawagley shows the process his people used in order to make a good life for themselves and their community.

Kawagley examines all aspects of production within the research setting. How weather is predicted how fish is obtained, prepared, and stored are considered. The Native diet and plants which are used for medicine and healing are also considered. Kawagley examines old and modern technology such as transportation and aids for food production. All are considered applications of Indigenous science and technology. He concludes that Yupiaq people survived by asking questions, observing, experimenting, memorizing, applying data, and using available resources to develop their technology.

Look to the Mountain: An Ecology of Indigenous Education by Greg Cajete is a book about Indigenous perspectives in education. In the chapter "Indigenous Science: Seven Orientations of Environmental Knowledge," Cajete explains that ethnoscience is a Western terminology useful for describing some of the key elements of Indigenous science. The separation between science and ethnoscience represents a dilemma that has been associated with the orienting, teaching, and learning of science by primarily non-Western learners. In most Western cultures, ethnoscience is seen as cultural while science is seen as acultural, an idea which has alienated many Indigenous learners from science. Because many Indigenous students have been alienated from learning Western science and because Indigenous

science is neither acknowledged or validated, students have been excluded from science type professions. Cajete presents a remarkable model for curriculum development which is reflective of Aboriginal philosophy and which is based on seven orientations (organized around: a Center, the four directions, Below and Above. Students begin with the Center place of creation and learning through self. Students learn the nature of creativity by learning to be creative through journal writing, making art, creative encounters with Nature and researching creative expression in Indigenous cultures. Through this process students find their own Center and form the foundation for the process of learning and creation. The four directions provide a framework for researching other forms of knowledge. The East orients the student to the natural philosophy which guides them to Indigenous knowledge. The East is where students prepare for their personal journey of learning. The West represents sustenance, social well-being, and community. Through the West students understand the human community and its reflection in themselves. The South is the world of plants, fertility, healing, and wholeness. Here students understand their relationship and dependence on the plants and the natural world. The North is associated with animals and human relationships. Here students are introduced to concepts from wildlife biology, ecology, mythology, and theology. Students establish a direct personal relationship with the animal world through the form of making animal masks, drawing animals, and working with animals. Myth and art bring to life the relationship between people and animals. The Below is the domain of the Earth Mother and the elements of earth, wind, fire, water, and air. Students are introduced to natural phenomena such as the winds, mountains, seas, forests, lakes, rivers, plains, and deserts. The seventh orientation is the Above and the domain of

the Celestial Father, the Great Mystery, the Sun, Moon, and Stars. The Cosmos is the grand expression of the creative centre that is within each of us. Students see themselves as part of a greater story of creation.

"The Foundational Values of Cultural Learning" by Kallen M. Martin describes the Ahkwesahsne Science and Math Pilot Project which is under the auspices of the Mohawk Board of Education. The reserve of Ahkwesahsne is split among the provinces of Ontario and Quebec and the state of New York. Ahkwesahsne has developed a curriculum which relies on the principles of three foundational aspects of Iroquoian culture, the Great Law of Peace, the Iroquoian Creation Story, and the Thanksgiving Address. The curriculum was created as a response to the high failure rate of Iroquoian students and is based on values which honour Mohawk culture and science. It teaches students who they are as a people. The co-ordinator of the project, Brenda LaFrance defines science as a way of coming to knowing. LaFrance says that it was important to look at dreams, visions, and the prophecies and information that they have come to know as being Mohawk. The information is then compared to Western science. Creation stories were incorporated into the math, science, and language arts components of the curriculum. The curriculum begins at the ground level and then goes up to the sky world. Circles and lines, earth, water, trees, animals and birds, agriculture and food, medicine, the cosmos, and energy, constitute the unit theme.

The Tree of Peace is discussed in the unit on trees. The symbolism of the great white pine in Iroquoian stories is discussed. Principles of peace, honor, and a good mind, are instilled in students. The project ensures use of Elders and spiritual leaders in the classroom. Camping trips enable students to track animals and to identify them by their droppings. Students also find

out about Indian medicines, herbs, and edible plants. The water unit enables students to look at history, geography, and language arts, as well as the impact of industrial pollutions and its impact on the seventh generation. Bird studies include local birds habitat, coloring, breeding, wingspan, and plumage. No other textbook provides the information on the alteration of the environment along the St. Lawrence River.

The mathematics curriculum includes Aboriginal number systems, origin of number words, limits of counting, mathematics thought of the Iroquoian agricultural and hunting society, Mesoamerican geometry, the Mayan concept of zero, Incan and Mayan calendrics, computational techniques, and notation devices. The use of Indigenous cultural values and concepts has shown an amazing increase in student self-esteem and it makes students better prepared for higher education.

In *Lighting the Seventh Fire* , F. David Peat (a brilliant physicist) writes about the spiritual ways, healing, and science of the Native American. Peat has written thirteen other books about science. This book was written after Peat's illustrious career in science, and after he had spent much time with Aboriginal philosophers, teachers, and elders. After many years as a scientist engaged in theoretical research, Peat began thinking about new ways and new ideas when he was struck by the way society had become separated from nature. Peat recalls looking at *Touch the Earth* by T.C. McLuhan and being struck by the images of Indigenous faces which spoke to him in a hauntingly beckoning manner. Shortly after, he was called by a man who was to become a lifelong friend and teacher, Leroy Littlebear, inviting him to an Aboriginal ceremony. That began Peat's journey to the richness, power, and subtlety of the Indigenous approach to knowing and being.

Lighting the Seventh Fire chronicles Peat's journey to the world of Indigenous science and knowledge. Peat claims that it is not so much an attempt to explain traditional knowledge in the light of Western science so much as it is an acknowledgment of another way of knowing and his attempt to dialogue with another world view. Peat relates his experience at a Sun Dance, acknowledging first and foremost the womens' important role in bringing together the conditions and energy for the Sun Dance to begin. For Peat, the Sundance experience is an example of two cultures clashing -- the Western and the Aboriginal. Western scientists do not accept Aboriginal science world views as authentic and valid, but measure them through a Western world view. Western paradigms, through their positions of power, deny any authenticity to Indigenous knowledge. Aboriginal knowledge becomes labelled as myths, legends, superstitions, and fairy stories. In Western science almost all knowledge is learned out of books however in the Indigenous coming to knowing, everything is learned thought listening and experiencing as well as relating and respecting other living entities, including natural resources such as rocks, water, trees, and the land. Peat talks about the quality of silence and role of Elders, dreams, visions, and clowns.

Stories of creation are central to all Indigenous peoples and are at the centre of their being. This fact presents a clash of values when compared to the stories of conquest, that Western falsification and projection history teaches. Peat finds error in many of the historical projections such as the Bering Strait theory, wherein Indigenous people supposedly crossed into the new world through the Bering Strait. Western science/history does not teach about the Indigenous holocaust wherein millions have died since contact with Europeans. Peat states that 90 to 95 percent of the people perished.

Nor does Western Science teach about Indigenous knowledge of plants and their contributions to Western medicines. Western knowledge fails to teach about the sacredness of all life forms. It fails to teach the facts that plants are important not only because of their medicinal qualities, but because of their important relationship to Indigenous peoples. Peat believes that much of Western illness is a product of the philosophy of disrespect for the natural world, something that Indigenous people neither experienced nor practised. Peat uses the metaphor of bacteria and viruses as not only causing sickness but also permeating ideas, values and ways of thinking.

Aboriginal knowledge in the sciences includes mathematics. Peat explains the importance of mathematics concepts, including geometry, surveying, computation and number representation. Early application of these principles by Indigenous people, helped them in the building of their early temples and earth works. As an example, Peat explains that the buildings of the Anasazi people of the Chaco Canyon were aligned astronomically. Balls of string kept by women of the northwest were knotted at periodic intervals. This method was used to keep accurate monthly times. To enter the world of numbers is a sacred act. For Indigenous people the number four represents the four directions, the four seasons, and the four cycles of human life (birth, childhood, adulthood, and old age). The number four also represents balance and harmony as seen in the Medicine Wheel.

Mayan people wrote vast numbers of books about religion, mathematics, and daily life. These books were destroyed by the early Spaniards on the grounds that the writings were pagan. Mayan astronomy, science, history, literature, ceremonies, cosmology and philosophy will never be known except for that knowledge which has been passed down

orally from generation to generation. Peat feels that the highest mathematics is identical for Europeans, Mayans, Arabs, Chinese and Indians. Therefore mathematics should translate across cultures, as it is the study of basic logical relationships of the world. For Peat, mathematics begins with the structure of the cosmos and of sacred sites. Peat states that the Mayan number system is superior to all others because the Mayans invented the number zero. The concept of zero made it possible to represent astronomically large numbers which was necessary when the Mayans figured out the great cycles of the solar system and the universe.

Within Indigenous science, language has a power all its own, it is not simply a matter of translating Western concepts into Indigenous languages. Speaking can evoke powers and energies. Thus people must be careful when choosing their words.

Peat states that Indigenous science conforms to the definition of Western science. But it is not possible to separate Indigenous science from ethics, spirituality, metaphysics, ceremony, and social order.

> On the other hand, it is not possible to separate Indigenous science from other areas of life such as ethics, spirituality, metaphysics, social order, ceremony, and a variety of other aspects of daily existence. (p. 242)

Indigenous science is a way of being. In comparing Western and Aboriginal science, Peat examines how true Western science is to its principles and what makes Aboriginal science sound. He feels that Westerners need to drop their obsession with ideals and accept Indigenous science as a valid understanding of nature. Both Western and Indigenous cultures have much to gain by listening and dialoguing. They need to envision new and harmonious relationships for all of life. Particularly because physics has had

a profound effect upon the world population, it is important that a bridge be established between Western physics and Indigenous science and metaphysics.

Red Earth White Lies, Native Americans and the Myth of Scientific Fact by Vine Deloria, Jr., is another critical look at the field of Western science. Deloria begins by giving some history to the American Indian situation and how this history sets the stage for the public to view Indians as child-like with no history and no sense of nationhood. Deloria goes on to say how this frame of mind sets the stage to acknowledge only one form of scientific knowledge, the Western form. Deloria (1995) presents his information in such a way as to belittle Western knowledge and by stating that science is fueled by racism which acknowledges only its own knowledge.

> Unfortunately, the discussion of the age of the Earth and the nature of past events was conducted wholly within the confines of Western civilization. Consequently, the traditions of all other peoples were shunted aside. (p. 38)

Deloria states that scientists spend time proving they are right, rather than bothering to consider any other world views.

Deloria criticizes the Bering Strait theory as a way of denying Indigenous peoples' claim to the Americas. He also calls into question Western scientists information on human origins and states that many inconsistencies and inaccuracies exist in contemporary interpretations.

> Like any other group of priests and politicians, however, scientists lie and fudge their conclusions as much as the most distrusted professions in our

> society-lawyers and car dealers (p. 41).

Deloria refers to science as a very powerful religion. Deloria states that many of Western scientists' theories and postulations go unchallenged because it is an old boys network of gentlemanly agreements.

> Scientists and scholars are notoriously obedient to the consensus opinions of their profession, which usually means they pay homage to the opinions of scholars and scientists who occupy the prestige chairs on Ivy League and large research universities or even dead personalities of the past (p. 43).

Scholars who question commonly held beliefs are often pay personally. If they question issues such as the often touted overkill of the mammoth, mastodon, and other prehistoric animals by Paleo-Indians, scholars are squeezed out of the scholarly world.

Racism plays a large part in Western science thereby disregarding any non-Western contributions.

> In methodological terms there is a major problem in bringing non-Western traditions within the scope of serious scientific perspective, and that is the inherent racism in academia and in scientific circles. Some of the racism is doctrinaire and unforgiving-for instance, the belief that, for a person or community possessing any knowledge that is not white/Western in original, verification and articulation are unreliable (p. 49).

This attribute of Western science is echoed by Gill and Levidow (1987) and by Harding (1993).

In "Redefining science Education for Aboriginal students" Madeleine MacIvor (1995) gives statistics to show that much needs to be accomplished

in the teaching and learning of science by Aboriginals. It is essential that Indigenous people take their place in the development of their own community, and science is an important component of that development. But Western science needs to be reconstructed to meet the needs of the Aboriginal community. MacIvor uses Eber Hampton's twelve standards of education as a framework for science curriculum development for Aboriginal people. Those twelve standards are: spirituality, service, diversity, culture, tradition, respect, history, relentlessness, vitality, conflict, place, and transformation. MacIvor makes a case for the inclusion of Aboriginal knowledge, culture, ways of knowing and material and social reality when developing science curriculum. She states that Indigenous people must be fully engaged when learning science. An example would be the involvement of Aboriginal students in mapping out traditional territories in documenting resource use and traditional sustainable methods. MacIvor cites several examples of environmental disasters on Indigenous lands. They illustrate science gone bad and they give one more reason for the redrafting of a new scientific paradigm. According to MacIvor, the use of the twelve standards will ensure that science curriculum requires Indigenous peoples not to assimilate but will instead honour and respect them.

In "Bridging Native and Western Science", Pam Colorado describes Native science through the metaphor of a tree. The tree is the precursor to human existence and is likened to a respected elder. According to Colorado, Native science has a sacred basis, its teachings are grounded in the natural world. All of life can be understood from the tree. A law of Native science requires that we look ahead seven generations when we make decisions. Laws and standards govern Native science. The goal of Native science is the search for balance, harmony, and peace with all living relations.

Colorado writes about four dynamics that drive Native science: feelings, the historical now, a quiet still place, and relations. Because elders are the purveyors of Native science, a potential barrier exists: today many youths do not know how to ask for knowledge. Qualities which allow a person to become a Native scientist include self-discipline, patience, sharing, faith experience, information, and prayer. Native language is the key to all.

Colorado states that it is necessary to strengthen Native science to block penetration by Western science. The annihilation of 25 million Indigenous peoples was a direct result of the birth and evolution of Western science. We Indigenous people have become dependent on a foreign system of knowledge to understand our own destruction. We try to find solutions through someone else's eyes rather than through our own means, our own knowledge. How we came to that destructive point has historical roots. Events such as the burning of the Mayan libraries and the murder of elders were two ways that the destruction of the Indigenous knowledge base came about. More recently Colorado states that Indigenous Elders, Shamans, and ceremonial events are trivialized and undermined by outsiders. All of these symptoms Colorado claims reflect a European colonial structure or intellectual imperialism. Our survival relies on the ability of our youth to develop a critical consciousness about their world and an understanding of Indigenous science. Native science will protect and nurture the natural environment which is in dire need of protection .

Colorado states that the survival of the planet is dependent on Western science's ability to acknowledge and utilize the principles of Indigenous science. One way to ensure this bridging is to take advantage of cross-cultural scientific exchange and collaboration. Participatory research can serve as a tool towards change. In order to avoid pitfalls in the relationship,

Indigenous science must be recognized as standing on its own right as a knowledge base.

Indigenous people acquire much knowledge through listening. I recall a story told by Danny Musqua, Saulteaux elder at the University of Saskatchewan, in which he relayed an incident with his 86 year old grandmother. One day Danny greeted her only to be told to be quiet. Every time he would try to greet her she would tell him to be quiet. Finally she said, "I'm listening for the sounds that these tiny bugs make and if you talk I will not be able to hear their voices." It was after they both heard the sharp highpitched tiny screech, did the old woman tell Danny the significance of the bug's voice. Her knowledge goes something like this: In the spring the tiny insects lay their eggs on the shaft of a special plant which at this time of the year is underground. If we hear the bugs before they actually lay their eggs we will be able to identify the spot where the plant will grow. I gathered from this that the plant may be dug up accidently or damaged if we don't walk carefully-- hence the bug listening ritual. The plant leaves will be used as a medicine, and later in the season the flowers and the roots will all be used for medicinal purposes. All because of the sound of a bug.

Jack Weatherford is a non-Indigenous scholar who has spent a lot of time learning and writing about Indigenous contributions to science. Prior to writing his book Indian Givers, Weatherford spent considerable time in South America and other parts of the world learning about Indigenous knowledge, particularly in reference to food contributions. He claims that without the experimental and trial and error methods of early Indian farmer,

> modern science would have lacked the resources with which to start. The limited agricultural background of the Old World would have been far too meager and would have required

> centuries more of research before science reached its present level. (p. 82)

According to Weatherford, Indigenous peoples in South America were the first to develop the "planting" method (as opposed to the Old World "broadcasting" method) of planting seeds. Corn was adapted to grow with an protective husk which saved the corn seeds from both drought and insects. Prior to their adaptation away from wheat-based foods to potato diets, many Old World people died from famine when wheat was wiped out with more ease than underground potato crops. Weatherford states that without potato crops many populations (including the Irish and Russians) would not have survived. Indigenous peoples of South America were the first to freeze-dry potatoes for storage, and to use after the growing season had come and gone.

In the tiny jungle community of Genaro Herrera, the South American Indians are teaching scientists how to cultivate a wide variety of yams, potatoes, and tubers. These Western trained scientists have no understanding, knowledge, or language for many of these plants. Weatherford (1988) stated:

> The American crops required new ways of farming that appeared bizarre to Old World farmers and violated all past agricultural principles of good farming. The scientist working at Ganaro Herrera strive to unravel the complex technology of native agriculture and food processing as much as they strive to understand more about the biology of the plants themselves. (p. 82)

Weatherford talks about the general superiority of Indian medical knowledge and pharmacology. It is common knowledge that Indigenous peoples saved the live of many men who came with Jacques Cartier during the early voyages. Today the Incas still prevent goiter with seaweed (high iodine content) and kelp is harvested by large commercial ships from California to Peru for a variety of pharmaceuticals, foods, and toiletries (Weatherford, 1988). Other Indigenous medicines are petroleum jelly, oil of wintergreen, aspirin, quinine, and muscle relaxants from curare. Brain surgery was practised by Andean Indians to relieve concussions suffered from severe blows to the head during combat. The Aztec precision surgery surpassed the European centralization of medicine at that time.

> Even today no steel scalpel has ever been made that cuts sharper than the obsidian implements of the Aztec surgeons. Only the laser beam can cut a finer incision with less bleeding and less scarification than the Aztec surgeons. The fine Aztec scalpels allowed the doctors to cut with minimum blood loss, and the wound healed with fewer scars. (p. 188)

Similarly Sandra Harding in *Whose Science Whose Knowledge,* credits the knowledge of Indigenous African cultures. According to her sources, agricultural sciences developed in Africa at least seven millennia before appearing on any other continent.

> Barley and wheat were cultivated and harvested near the Nile and farther south in Nubia more that 10,000 years before the Egyptian dynasties. Cattle were domesticated in the Kenya highlands more than 15,999 years ago. It now appears that the Euphrates River Valley, familiar to North Atlantic schoolchildren as the cradle

> of civilization was developed through the diffusion from Africa of information, ideas, and technologies. (p. 225)

In the field of medicine, Africans used many of the components of some modern drugs, including, antibacterial agents, Kaopectate, aspirin, and reserpine. African societies had treatments for malaria fever, snakebite, neurotoxic venoms, intestinal parasites, catarrh, tumors, skin ulcers, venereal disease, conjunctivitis, bronchitis, urethral stricture, and others. Mathematics was highly developed in ancient Africa as evidenced by records of an 8,000 year old numerization system which was found in Zaire.

While it is indisputable that Indigenous knowledge in the sciences predates much of Western science, and forms the basis for many contemporary scientific wonders, recognition for these contributions is not evident. Recently the Saskatoon Tribal Council and the University of Saskatchewan have embarked on a project which is addressing this problem, through the development of a project called Super Saturday. This program will incorporate Indigenous knowledge with Western science in the context of teaching children. The Project is based after a Hawaiian model from the Na Pua No'eau Center for Gifted and Talented Native Hawaiian Children in Hilo, Hawaii.

The Center for Gifted and Talented Native Hawaiian Children was established for the purpose of increasing educational enrichment opportunities for Native Hawaiian children from grades k to 12 at the University of Hawaii. There are four elements incorporated into the Na Pua No'eau program development. These elements are, talent enhancement, self-esteem development, integration of Hawaiian culture and values, and student and parent support services. The Na Pua No'eau centre serves as a resource

for educational institutions and teachers. It provides state of the art research, materials and knowledgeable personnel. Workshops are offered to classroom teachers to enable them to understand the needs of Native Hawaiian gifted and talented youth.

The Student and Parent Support Services is an integral part of the centre. The support services provide students and their families with information and activities that will help the students to succeed. Students and parents receive staff support, information, and enrichment activities to use at home. These activities permit parents to be positive advocates in the students success.

Within the Na Pua No'eau program, the Keala Lapa'au program develops an interest in medical careers. The program facilitates activities which enhance the number of students in medicine. It provides hands-on practice with day to day contact and other activities with medical doctors. It also includes career shadowing and internships, as well as an undergraduate pre-medicine program at the university.

An important part of the programming is the integration of Western knowledge with Native Hawaiian values and culture, as an effort to meet the needs of parents. Language, culture, handicrafts, and history is an integral part of the programming. The Hokule'a utilizes the outdoors and the wa'a kaulua (double hulled canoe) to gain knowledge in celestial navigation, astronomy, meteorology, and physics of wave action.

> Students use their creativity and thinking skills as they re-live the survival of their Kupuna(ancestors) who crossed the Pacific Ocean on the double-hulled canoe, Hokule'a. A thorough process of solving a series of everyday problems encountered while at sea is an every day challenge

> for student sailors. Psychomotor skills also come into play as students learn to construct tools for gathering food and water and learn to construct protective shelters while at sail. More psychomotor skills become important to master as students learn to paddle, navigate, sail, maintain and repair a Hawaiian sailing vessel (Na Pua No'eau Booklet)

Like the Hawaiian model, the Super Saturday program reflects Indigenous culture and incorporates Western science knowledge. The organizing team, which is made up of faculty members from the University of Saskatchewan, employees from the Saskatoon Tribal Council, and First Nations Elders and community people, met over the past year, identifying topics, resource people, curriculum ideas, and funding proposals. The pilot year, which began in July 1998, sponsored two groups of children in Grades 4-6 to study at the University of Saskatchewan campus, and to take part in some field work in their home communities during the months of July and August The second intake of 1998 took place in August.

> An essential component of the Super Saturday program includes themes that will incorporate cultural/traditional teachings. This particular aspect prevents the loss of knowledge of ancestral accomplishments. Therefore, serving as an anchor for students maintaining cultural identity in the mix of learning other world view perspectives. (SuperSaturday brochure)

In preparation for their studies, science faculty members (from engineering, mathematics, chemistry and biology) met with community people knowledgeable in their Aboriginal traditions. Together they

developed curriculum which appeal to young Aboriginal students and draw comparisons between Indigenous knowledge and Western science. The Engineering faculty along with teepee and sweatlodge builders, have incorporated the Aboriginal and Western design forms as examples of structurally sound building practices. The program expanded to include Grades 7-9 in the fall of 1998 and will expand to include grades 10 - 12 in the summer of 2000.

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