ENGINEERING THE FUTURE

Training a new generation of Native and American Indian engineers through the National Science Foundation's Pre-Engineering Education Collaborative

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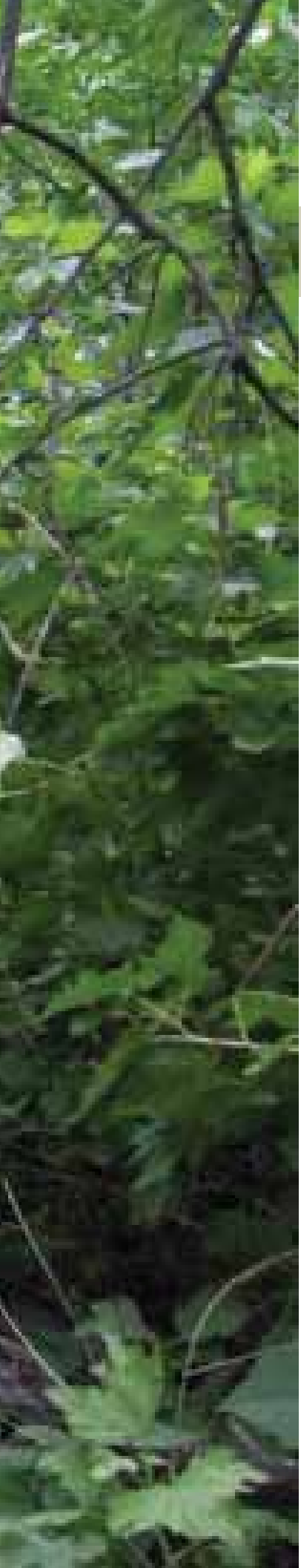

Engineering is the application of

The Menominee Indian Tribe of eastern Wisconsin *occupies a land rich with large stands of mature trees. Visitors often remark on its untouched beauty and some assume the tribe is protecting the forest from development.*

The real story is even more remarkable.

The Menominee reservation is actually one of the most consistently and intensively logged regions of the country. Since the late nineteenth century, the tribe has removed more than two billion board feet of lumber. Yet far from being a desolate and scarred landscape, the tribal nation has learned how to manage and sustain the forest, both in its ecological diversity and its economic potential. Despite a century of extraction, logging remains a major source of income and employment for the tribe and an integral part of its long term economic development plans.

But the tribe hopes to accomplish even more in the twenty-first century. Looking to the future, the Menominee people want to move beyond extraction and engage in both policy and research. They envision a day in the near future when scientists will study forest management practices and develop new forest-based products. In this new vision, sustainability requires both loggers and engineers committed to the future of the Menominee people.

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A few hundred miles to the west, *another story of natural wealth is unfolding in the Plains of North Dakota where oil drilling is turning small and isolated communities into modern day boomtowns.*

In this historically poor and isolated region, the discovery of large oil reserves has brought new residents, new development, and new environmental concerns to the state and many of its five Indian reservations. Housing is in short supply and rural roads are crumbling under the weight of drilling and construction equipment. Engineering expertise is needed to deal with these new pressures.

More worrisome are growing environmental concerns. Just as booms and busts in centuries past left scars on the western landscape, some worry that today's oil rush will affect the quality of life for today's residents. Environmental impacts must be monitored and some tribal leaders believe Indian nations must take the lead in developing alternative energy

SCIENCE TO THE NEEDS OF HUMANITY.

~ Theodore von Karman ~

sources by tapping into the region's solar, wind, and geothermal reserves. They look to a future where tribal lands are energy self-sufficient and models of environmental sustainability for the nation as a whole.

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SEVERAL THOUSAND MILES FARTHER WEST, *Native Hawaiians are facing another set of challenges on their island home.*

While the state of Hawaii supports a world class higher education system, many of the state's original residents lag behind in academic achievement. Like Native American counterparts on the mainland, Native Hawaiians are underrepresented in science and math. Lack of academic preparation, a traditional disinterest in these "Western" disciplines, and a geographically fragmented education system conspire to limit enrollment in science, technology, engineering and mathematics among desendents of the Island chain's first settlers. State education leaders are looking for ways to engage all residents in these critical areas of study.

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THESE DIVERSE NATIVE COMMUNITIES *have their own languages and cultural traditions. The Menominee are part of the eastern Woodlands Indian culture; the North Dakota tribes are part of the Plains Indian tradition. Native Hawaiians, meanwhile, sustain their Polynesian heritage. Yet despite this geographic and cultural diversity, common themes emerge. Within each community there is a strong desire to promote economic development while also assuring the health and vitality of tribal homelands. All this is part of what some call the renaissance of indigenous societies in the twenty-first century.*

Looking more closely, however, it is clear that these communities share something else in common: a growing recognition that engineering is necessary for their growth and empowerment. Like all nations, Native communities need people who can design structures and manage systems. No longer willing to cede control to federal agencies or miss out on opportunities for employment, Native communities see the value of training engineers who can strengthen their own communities.

Native Peoples and the Engineering Gap

This awareness is part of a larger trend. Over the past century, engineering has emerged as one of the most important agents of economic growth in the nation as a whole. By designing and maintaining the machinery of modern life—from dams and bridges to computers and satellites—engineering exists, as MIT professor Gordon Brown once famously observed, at the dynamic boundary "between science and society."

The need for engineers is also felt in tribal and Native communities. American Indian reservations cover great stretches of the continental United States and are home to more than 500 federally recognized tribes. Some of the largest reservations—the Navajo Nation of the southwest and the Pine Ridge of South Dakota, among others—are larger than several eastern states. Within these tribes, Indian leaders manage government bureaucracies, build roads, fix dams, and manage mineral, oil, gas and timber reserves. They are responsible for promoting public heath and, like all nations, they are working to find their place in a globalized and technology-based economy.

Despite this real and growing need, however, there are relatively few Indians trained in the engineering professions and few chose engineering majors. Recent research conducted by the National Science Foundation found that Native American students are dramatically under-represented in engineering programs, even at universities with a relatively large number of Indian students. In 2006, only 353 American Indians graduated with a four-year degree in engineering, out of more than 68,000 engineering degrees awarded that year. While this represents a modest growth in enrollment over previous years, the growth is lower than all other groups tracked by the NSF.*

Meanwhile, the number of American Indians graduating with degrees in civil engineering and other disciplines vital to the growth and development of tribal communities hovers in the lower double digits. Representation in other fast-growing fields that lead to employment off the reservation, such as aerospace engineering, is equally scant.

The barriers facing Indians interested in engineering are well documented. More than a simple lack of interest, many Native Americans must overcome poor academic preparation in math and science, a lack of role models, as well as a pervasive attitude that Indians "can't do" math and science. In addition, adult students, who comprise a large percentage of American Indians in college, often struggle to balance rigorous academic programs with work and family obligations. These and other forces help explain why so few Indians pursue engineering degrees and why many of those who start degree programs drop out or change majors.

This limited participation is more than a missed opportunity for Indian and Native students. It represents a missed opportunity for the engineering field, which has long sought to attract more women and minorities into the profession. It is also a missed opportunity for Native communities, which urgently need people who can develop tribal lands and promote economic development.

Introducing the Pre-Engineering Education Collaborative

In this environment, the National Science Foundation is supporting a major new initiative intended to dramatically increase the number of American Indian and Native students pursuing engineering degrees. Led by the nation's network of tribally controlled colleges in partnership with several state university systems, the Pre-Engineering Education Collaborative (PEEC) supports the growth and development of two-year pre-engineering degree programs within tribal colleges and universities. The initiative also includes mainstream community colleges that have a mandate to serve Native students. The goal of the initiative is to identity strategies that encourage Native student enrollment in engineering programs and the successful transfer of these students to four-year institutions.

Initiated in 2010, PEEC currently supports four collaborative grants involving sixteen tribal colleges, community colleges, and state universities in the Great Lakes, northern plains, and Hawaii:

North Dakota Pre-Engineering Collaborative

Cankdeska Cikana Community College
Fort Berthold Community College
Turtle Mountain Community College
Sitting Bull College

Mainstream University Partner:
North Dakota State University

Hawaii Pre-Engineering Education Collaborative

Kapiolani Community College
Leeward Community College
Maui Community College
Honolulu Community College
Windward Community College
University of Hawaii-Manoa, College of Engineering

South Dakota Pre-Engineering Education Collaborative

Oglala Lakota College

Mainstream University Partners:
South Dakota State University
South Dakota School of Mines and Technology

Wisconsin Pre-Engineering Collaborative

College of Menominee Nation

Mainstream University Partners
University of Wisconsin-Madison
University of Wisconsin-Platteville

While each pre-engineering program reflects the unique goals and needs of specific tribal communities, the threefold task of PEEC is to:

- Identify approaches to teaching and learning that increase retention and graduation rates of Native engineering students;
- Support development of new and expanded engineering programs within tribal colleges;
- Strengthen collaboration between tribal colleges and mainstream colleges and universities in engineering education. Without the ability to offer seamless movement into four year and graduate degree programs, tribal colleges and community colleges will struggle to attract and retain students in engineering fields.

The Unique Role of Tribal and Minority Serving Colleges

Leadership for the pre-engineering collaborative is provided by tribally controlled colleges and universities, as well as Hawaii's community college system. While most are small and relatively young institutions, they are an important point of entry for thousands of Indian and Native Hawaiian students who would not otherwise go to college. In addition, these institutions have a longstanding commitment to the development of Native societies and their leaders understand the needs of the communities they serve.

This mandate is clearly seen within tribally controlled colleges and universities, which are institutions of higher learning chartered by tribes and, in most cases, located on reservations. While they are fully accredited and operate much like mainstream institutions, they also sustain tribal cultural traditions and provide training relevant to the needs of their tribal nations. Most students enrolled in tribally controlled colleges hope to earn degrees that lead to local employment.

Increasingly, this means that tribal colleges are making STEM education a top priority. Recognizing that tribal development requires strong math and science skills, many tribal colleges now offer four year and even graduate degrees in nursing, business, and education, among other professional fields. Several tribal colleges offer degrees in STEM-related fields of forestry, environmental science, and natural resource management. Graduates find employment as biologists, forestry technicians, and extension agents within tribal, state and federal agencies.

A similar commitment to STEM education is found in Hawaii's community college system, which provides a vital entry point Native Hawaiian students pursuing careers related to math and science. As an integral part of the state's higher education system, Hawaii's community colleges are committed to the academic success of Native Hawaiians.

Although these tribal colleges and community colleges are different in several important ways, all serve Native peoples and all agree that engineering represents a logical next step in their development, especially

South Dakota Collaborative

Oglala Lakota College's Pre-Engineering Education Collaborative builds on a long-standing commitment to community development. Located in the Pine Ridge Reservation of South Dakota—one of the poorest rural communities in the nation—the college believes engineering is another way to empower the tribe and strengthen the quality of life for all tribal members.

Reflecting this philosophy of social engagement, Oglala Lakota College emphasizes a practical and hands-on approach to STEM education. At all levels of instruction, faculty members want to show that math and science is connected to real world problems. Introductory math classes might focus on skills needed to complete a concrete slump test, for example, while basic engineering principles might be taught by designing and drilling a well. In this approach, students encounter and solve dozens of complex "real world" design problems. "There's a lot of science behind all this," according to Charles Tinant, co-chair of the college's math and science department.

He views this as a "back door" approach to STEM education. Core concepts are taught, but in ways that engage students.

The collaborative is funded to support ten students who will, it is hoped, continue their students at South Dakota State University or the School of Mines. But the benefits of this approach reach beyond students who begin and complete their engineering degrees. Even students who plan to find work after two years of study will benefit from an approach to instruction that emphasizes practical skills and overcomes the many barriers Native learners face.

as leaders look for new ways to build their communities and create a stronger, more diverse economic base.

"Engineers provide powerful tools in Native America's quest for self determination and self-sufficiency," explained Dr. David Gipp, president of United Tribes Technical College in testimony to the Congressional Diversity and Innovation Caucus in September 2009. "If the tribes are to maintain their sovereignty into the future, economic development of the reservations is an imperative."

Unique Barriers

However, it is also true that tribal and minority-serving community colleges face unique challenges as they work to develop STEM programs in general and pre-engineering degrees in particular. Education leaders confirm that relatively few Native and American Indian students pursue STEM degrees and that many students interested in math, science and engineering struggle with the academic requirements.

This problem reflects, in part, the uneven quality of math and science education at the k–12 level. Lacking encouragement and support in elementary and secondary school, the majority of students who enroll in tribal colleges require a semester or more or remediation before they are prepared for even introductory-level math and science classes. In many cases, students spend a year or more completing remedial coursework before they are ready to earn college-level credit. For academically underprepared students, the path from remediation to an engineering career can appear long and arduous.

It is also slowed by a lack of role models. Native and American Indian students, like all students, pursue what they know; they find work as foresters, carpenters, casino workers, teachers and nurses among other careers that are known and understood within their communities. In contrast, many educators say their students do not know any Native engineers and many do not know what engineers do.

Finally, the growth of engineering programs has been hampered by a lack of instructors and facitilies within minority-serving colleges—especially the tribal colleges. Most Indian controlled colleges and universities are located in rural regions, serve very poor communities, and enroll between 300 and 1,000 students. The smallest tribal colleges do not have the resources needed to offer advanced math and science courses, which are the foundation of any pre-engineering program. "I'm a faculty of one," observed a science instructor at a North Dakota tribal college, noting that his college can offer only what he and a few adjuncts have time to teach. Some tribal colleges—especially those serving larger reservations or located in more populated regions--are now offering four year and even graduate degrees in a wide range of STEM fields, but most colleges understabably focus on introductory courses.

Building Effective Pre-Engineering Programs

The National Science Foundation's Pre-Engineering Education Collaborative provides resources needed to overcome these barriers. The common goal of all PEEC programs is to engage student interest in engineering, provide necessary remediation, offer higher level math and science classes, and strengthen connections to four-year and graduate level engineer degree programs at mainstream colleges. Ultimately, the goal is to attract more Native students into pre-engineering degree programs, provide a strong academic experience, and promote the successful transfer of students into four-year engineering degree programs at partnering state universities.

Each NSF-funded pre-engineering collaborative is unique; there is no one-size-fits-all approach to engineering education in this initiative. However, among the four grants awarded, some common approaches to student recruitment and retention are seen, representing both established practices and emerging examples of best practice in math, science and engineering education. They include:

SUPPORTING K–12 SCHOOLS: Successful development of pre-engineering degree programs depends on strong academic preparation at the K–12 level. Students who lack skills and confidence in math and science are, as a group, less interested in STEM careers and less likely to pursue a rigorous pre-engineering degree program when they enter college.

Building on longstanding partnerships, several tribal colleges are reaching out to schools serving tribal members, offering academic enrichment programs that engage student interest in engineering. By making presentations to science classes and sponsoring summer science camps, the colleges are introducing middle school and high school students to the engineering profession and showing its relevance to their lives. For example, Ft. Berthold Communty College Vice President Clarice Baker-Big Back said her college's outreach effort is aided by an existing dual credit program with the local high school and activity-oriented "Sunday science academies" offered by faculty to school-age children and their parents.

This work represents a philosophy within many tribal and Native-serving colleges that engineering education requires what Charles Jason Tinant, co-chair of the math and science department at Oglala Lakota College, calls "a longer runway." The K–12 student population is poorly prepared in math and students cannot be expected build necessary skills within a few years. "It's not a five year program," he said. "It's more like a 20 year program to raise student preparation in pre-engineering."

As institutions of higher learning, tribal and community colleges are relegated to a supporting role in K–12 education reform. But the programs and services they offer can help raise expectations and, of special importance, help Native students gain familiarity with engineering and the work of engineers.

COHORTS AND ACADEMIC ENRICHMENT: An especially important innovation in several collaboratives is the creative use of student centered learning communities, or cohorts, which are known to promote both academic success and higher retention rates for Native students in STEM degree programs. Cohorts allow students to move through their academic

Hawaii Collaborative

Although Hawaii's community colleges are not tribally controlled, they do enroll a significant number of Native Hawaiians. The university Pre-Engineering Education Collaborative focuses on the specific needs of this community.

Like their tribal college counterparts, the colleges serve students who lack confidence in math and science and have few role models to follow. They face the added challenge of serving students who are scattered across a chain of islands. This has resulted in a unique programs that combines on-line learning with on-campus summer research opportunities and a strong commitment to both academic and social support.

According John Rand, who is on the faculty at the University of Hawaii-Kapiolani Community College and co-principal investigator of the Hawaii PEEC, most core courses, ranging from physics to basic circuit analysis, can be completed online. The list of available courses will grow until nearly all credits can be earned through distance education.

A widely acknowledged limitation of distance education is a lack of academic support and social interaction, which are both important for the success of Native students pursing engineering degrees. In response, the university is also developing student cohorts that meet as a group that will meet each summer, beginning with the summer between high school and college. These programs allow students to also complete hands-on environmental research, engage in robotics competitions, develop papers for presentation, and earn credit for lab classes that cannot be taught through distance education.

Innovation is also built into the planned modular instruction of Calculus I, which will allow students to move through this notoriously difficult core course one unit at a time and with strong academic support.

program as a group and encourage members to look to each other for both academic and emotional support. Typically, faculty and college staff also provide a range of enrichment and support programs for cohort members.

Cohorts are especially important in The University of Hawaii's Pre-Engineering Education Collaborative, which serves students from multiple community college campuses scattered across several islands. In this initiative, students complete coursework at their home campus and online, but are brought together for a series of summer enrichment programs, according to Co-Principal Director John Rand.

The cohort begins the summer before college when entering students are provided a variety of introductory engineering experiences at the University of Hawaii's Maui campus, where the focus is on environmental research. In subsequent summers, cohort members gather at the university's Manoa campus for an intensive lab experience, which is important for students who are completing a large percentage of courses through online study. Between summer gatherings, students stay connected through social networking.

Another model of cohort-based learning is practiced at the College of Menominee Nation, where students are offered an unprecedented level of support from both peers and faculty. Admission is selective and requires students to commit to full time study. In exchange, the college provides students, most of whom are adult learners with responsibilities to their families, with a stipend to help offset the loss of income. Within this selective group of learners, students forge close and supportive friendships that encourage mutual support. In addition, the college offers programs and presentations on topics ranging from faculty research to college success strategies.

These and similar programs at mainstream institutions across the nation have demonstrated their ability to strengthen student retention and completion rates. A cohort-based engineering program developed by Arizona State University led to an impressive 86 percent retention rate for students. Similarly, development of a "community living/community learning" program at Montana State University increased retention rates from 55-60 percent to approximately 70 percent and improved grade point averages.

Flexible learning strategies: Tribal college are attracting a growing number of recent high school graduates. However, most students are older and the majority are parents. In fact, the "typical" tribal college student is often said to be a single mother in her 30's. Most, too, have limited financial resources and are the first in their families to purse a college degree.

It is not surprising, therefore that many students face multiple barriers as they work to complete a degree. Many drop out or "stop out" when a car breaks down, a family member dies, or they feel that they can't keep up with the pace of academic life.

Recognizing that success in a rigorous pre-engineering program requires flexibility, some colleges are allowing self-paced instruction that divides core math courses into smaller, more manageable learning "modules." Students quickly complete familiar material, while moving more slowly through concepts that are unfamiliar and more challenging. It is also possible to repeat modules without having to repeat entire courses. In this approach, a temporary personal setback need not derail pursuit of a promising career.

This is the approach taken by Hawaii's pre-engineering collaborative which recognizes that the required Calculus I course is a stumbling block for many students. Now under development, the college hopes to create an approach to instruction that combines self paced learning with strong academic support. "It's a way for students who don't do well on one component to still finish the course," said John Rand.

Relevant Learning Experiences: All collaboratives believe it is important to engage student interest in engineering by offering relevant and real-world engineering experiences, even during the first year of study. While core math and science classes are important, college leaders also believe Native students need to learn engineering by doing engineering. This hands-on approach reinforces theory, engages student interest, and shows how engineering can strengthen tribal communities.

This hands-on approach is the foundation of Oglala Lakota College's pre-engineering collaborative. Community engagement is not only valued,

according to Charles Tinant, it is the heart of the entire pre-engineering program. Even during the development of the degree program, tribal agencies were consulted and asked to identify community needs. "We worked with tribal agencies and leaders to develop a list of engineering priorities," he said. From this list, the college creates research projects that engage students even during the first year of study.

Many of the needs identified by these leaders are closely related to the work of engineers. "Water is a big concern," Tinant said. High levels of uranium and arsenic in reservation groundwater, along with high cancer rates, indicate the need for water source protection. Community leaders also want to develop alternative energy sources and better maintain tribal roads that quickly crumble in the harsh climate. Students, who are deeply committed to serving their tribal nation, can research these issues even during the first year of study and know they are helping to building stronger communities.

MAKING THE TRANSITION: Ultimately, the goal of each collaborative is to support the smooth transition of Native students to four-year engineering degree programs at mainstream institutions. Research shows that tribal college students, in general, are more likely to complete a four-year degree, but pre-engineering students still face many hurdles when they find themselves in large institutions.

The first priority, say tribal college leaders, is to reassure students that the credits earned in the pre-engineering program will be accepted by mainstream institutions. "Articulation is a key part of the collaboration," according to Robert Pieri, a professor of Mechanical Engineering at North Dakota State University who works closely with the tribal colleges. "You can offer courses in math and science but if there is not an articulation agreement in place, the students might have to repeat the course." Close collaboration among two-year and four-year programs in the NSF-funded collaboratives assures as seamless transfer of credits for students.

In addition, the pre-engineering collaboratives allow unprecedented level of interaction between two-year and four-year institutions. In some cases, mainstream faculty are engaged to teach courses and make presentations,

North Dakota Collaborative

North Dakota is home to numerous tribes, including the Assiniboine, Ojibwe, Lakota, Hidatsa, Mandan, and Arikara. Each has its own language, culture and ancestral land base. But leaders within the state's five tribally controlled colleges share a common interest in strengthening math and science instruction and preparing students for STEM-related careers.

The challenges are enormous. Small, poor and geographically isolated, these colleges struggle to meet all of the pressing needs faced by their communities. Most colleges serve a few hundred students and support a limited range of STEM courses taught by a dedicated but overextended faculty. For example, the "number one" barrier faced by Ft. Berthold Community College in New Town, North Dakota "is finding engineers to be on the faculty," said Dr. Clarice Baker-Big Back, vice president of academics. Low salaries, lack of tenure, and isolation from urban areas limits the pool of available applicants.

In this setting, the pre-engineering collaborative is an opportunity to combine resources and build stronger relationships with mainstream universities in the state. Courses taught by faculty at one tribal college can be offered via distance learning technology to students at all other tribal colleges, effectively multiplying the size of the faculty and range of courses. And because of strong articulation agreements, students know that credits earned through the tribal colleges will be accepted by the mainstream universities. All this, combined with a strong cohort program and summer research opportunities, provide both the academic support and enrichment opportunities that are typically found at much larger institutions.

In the end, students have the best both worlds. From the tribal college, students are given one-on-one support and a culturally-based curriculum. The collaborative, meanwhile, offers the full breadth and depth of a strong pre-engineering program. From both, the North Dakota tribal colleges hope to nurture a dedicated cadre of engineers ready to tackle the region's many pressing social and economic needs.

"PEEC is critical to addressing the need for engineering in regard to addressing civil and technological infrastructure for all of the reservations involved in this collaborative," explained Cankdeksa Cikana Academic Vice President Leander "Russ" McDonald, who also serves a principal investigator for the state's pre-engineering collaborative. "Cankdeska Cikana Community College continues to believe that investment in student success today will exponentially yield results for future generations."

both on-campus and through distance learning. Students also gain familiarity with mainstream institutions by taking courses and completing summer research opportunities at partnering universities. For example, summer research programs are offered by the University of Hawaii and other partnering universities, including the North Dakota collaborative, where students are able to take statics and during the summer months.

In these and other ways, pre-engineering students complete two year pre-engineering degrees are both academically and emotionally prepared for continued study. Mainstream institutions are no longer distant and mysterious institutions.

Outcomes and Next Steps

Funded in late 2010, the Pre-Engineering Education initiative is still taking shape. Some strategies, such as the use of student cohorts, build on well established models. Other educational innovations, such as modular learning, are promising, but still under development. Leaders within both the colleges and the National Science Foundation expect the projects to grow and evolve in the coming years. "This is an experiment," emphasized Michael Reischman, former Deputy Assistant Director for Engineering at the National Science Foundation, who was a guiding force behind PEEC. During the first year, especially, there will be "a lot of development," he said. Each college will refine its curriculum and get faculty in place. But within five years "we should have learned a lot about what worked and what didn't work."

However, all agree that the ultimate goal of the initiative, even during this learning process, is to increase the number of Native engineers. While the total number of graduates will, at first, not be large, their impact within Native communities will be significant, and possibly even transformative. In communities without any Native engineers, even two or three graduates will make a difference. "When you put an engineer in to a place that is needful," argued Reischman, "the quality of life changes."

Wisconsin Collaborative

At the College of Menominee Nation, engineering is a logical extension of an already strong STEM curriculum that fully rejects the argument that Indians "can't do" math and don't like science.

Like most tribal and community colleges, College of Menominee Nations enrolls students with limited math and science skills. According to Diana Morris, Dean of Letters and Science, 46 percent of entering students are severely under-prepared in math and also lack exposure to science. "Students will often come in never having had a chemistry class," she said.

Like all colleges, remediation is a priority, but the college recognizes that it is also stigmatizing. While remediation builds skills, it does not necessarily build confidence. Students who see themselves as remedial learners don't view themselves as high achieving scholars.

In response the college is working to not only provide missing skills but to also elevate expectations. Key to this mission is the development of a cohort-based programs that provide an unprecedented level of academic, social and even economic support to students pursing STEM-related degree programs.

For example, the STEM Scholars program, open to students who achieve mid to high level scores in remediation labs, offers team-taught courses, social support, and a monthly stipend. "We want to deal with students holistically," said Morris. Results are impressive: This well established program has a 97 percent completion rate--a remarkable achievement for any college or university.

The college sees these cohorts as a model for the development of its new pre-engineering initiative. Admission will be selective, limited to a small cohort, and strengthened by close collaboration with its partnership with the University of Wisconsin-Madison and the University of Wisconsin-Plattville. Students will interact with faculty from these institutions, who will teach some introductory courses at the tribal college.

And once students graduate with their engineering degrees, jobs will be ready for them on the reservation. A forest research station now under development will employ material scientists and other economic development projects supported by the college will only strengthen the tribe's well deserved reputation for entrepreneurship and its commitment to environmental sustainability.