ANSEP
Alaska Native Science & Engineering Program
Institutionalization and Sustainability

What we do
Our objective is to effect systemic change in the hiring patterns of Alaska Natives in science and engineering by placing our students on a career path to leadership.

ANSEP has evolved into a longitudinal education model that provides a continuous string of components beginning with students in sixth grade and continuing on through high school, into science and engineering undergraduate degree programs and through graduate school to the PhD. By successfully completing the ANSEP components every student in Alaska can earn the Alaska Performance Scholarship regardless of where they live. We are providing inspiration, guidance, and opportunity for students from 95 communities. The focus at each level is to provide excitement and empowerment around these careers. We have arrived at this model after 18 years of effort and with the awareness that a fragmented approach that focuses on one academic level is not adequate to deal with the scope of the problem and ultimately falls short. Each component is based on the fundamental Native principle of working together in a community.

ANSEP:
- Builds a welcoming environment at the University;
- Infuses values of community, family, and collaboration in all elements of the program;
- Promotes readiness, including early identification of students, motivation, and preparation;
- Creates bridging programs as well as internship and research opportunities that provide intense preparation for university and industry involvement.

Who we are
- We are a group of more than 100 private corporations, philanthropic organizations, state and federal agencies, universities, high schools, and middle schools.
- We are more than 1,000 Alaska Native middle school students, high school students, university students and ANSEP alumni.

Outside of Alaska we are working with our partners in 11 states to influence national public policy around education. As noted by National Action Council for Minorities in Engineering (2008), the National Academies (2007, 2010) and others, we are confronted with a problem that may require a generation to fix. Yet, we must fix the problem if we are to remain a world leader in science and engineering.

An Education Crisis
We are in the midst of an education crisis. The system is failing. Nearly 40% of Native students do not finish high school on time. Only 4% of minority students nationwide come to college prepared for science and engineering. Organizations are concerned about finding the talent they need to stay competitive. Mothers and fathers are concerned for the future of their children. K-12 students are eager and bright but are often denied the inspiration, guidance, and opportunity that leads to success. College students are not graduating in the numbers necessary to meet the demand in science and engineering. Funders are concerned about the lack of progress despite huge investments spanning decades.

ANSEP reaches only 3% of our K12 Native students. 97% of our students are still unable to participate. We are convinced that there is enough money in the system to accomplish our goals for many many many more students. But the money in the system is not always spent in a manner that leads to success. We are paying for failure. This is denying students access to education and economic opportunities. People have been working hard to solve this problem for 40 years with little improvement.

ANSEP takes us back to the basics. We raise the bar and focus on preparing students academically and socially with the tools they need for success in college and beyond. We start in middle school and offer a string of linked components that continue through high school, into college, graduate school and the professions. In 1995 we started with one student. Today we are 1,000 middle school, high school, university students and alumni. And it's working.

ANSEP students at every level are successful at rates far exceeding national and state numbers.

- ANSEP Middle School students complete algebra 1 before graduating from eighth grade at a rate of 83%. The national average is 26%.
- More than half of ANSEP high school students graduate engineering ready. 4% of minority students nationwide do so.
- More than 70% of all ANSEP students who begin BS STEM degrees graduate.

Over the course of the next 5 years we intend to expand opportunities that foster success. First, by working with policy makers so that money flows only to science and engineering programs that demonstrate successful academic outcomes. Secondly, we will work with districts to weave ANSEP components into the fabric of the K12 system using existing K12 funding.

We need to be paying for success. Success means our students are socially and academically prepared for college and confident and ready to accept the challenge of building a better Alaska and a better nation.

The ANSEP Components

ANSEP Middle School Academy. Every summer, rising 6th, 7th, and 8th grade students attend this two-week, residential, science and engineering experience. So far we have had 224 students participate. We are planning for an additional 162 in summer 2013. Beginning in summer 2013 students who have successfully completed the two week Academy during a previous summer and are making good progress toward finishing Algebra 1 prior to eighth grade graduation will return to campus for an intense five day experiential career exploration exercise. Working with faculty from the School of Engineering students will be organized into teams of three and tasked with designing, building, and the wind tunnel testing of airplane wings. In summer 2014 we plan to have students do a different experiential career exercise in the biological sciences and the summer after that something else. We will keep these young students excited and engaged each summer they are in middle school with career exploration.

ANSEP Computer Assembly. We have assembled over 1,200 computers with ANSEP High School students so far and most have successfully completed chemistry, physics, and trigonometry prior to graduation. This compares to what the National Action Council for Minorities in Engineering (NACME), calls the "4 percent problem," which is that only 4 percent of underrepresented minorities nationwide who graduate high school are "engineering eligible". We are in the process of shifting our resources from building computers with high school students to the Middle School Academy activities described above. This is because the earlier we start with students the better the result and the more cost effective we become. We will continue to assemble approximately 100 computers annually with Bethel Regional High School and Mt. Edgecumbe High School.

ANSEP Acceleration Academy.
High school students participate in this five week, residential, summer academy at the University of Alaska Anchorage. All classes are taught by UAA math and science faculty. Students enroll in college level classes such as:

- Intro to Engineering
- Intro to Biology
- Intro to Geology
- Chemistry
- Physics
- College Algebra
- Trigonometry
- Calculus 1, 2, and 3
- Differential Equations

92% of all Acceleration Academy students advance at least one full level in math or science each summer. 75% complete six or more college credits. So far we have had 141 students participate. Students can begin immediately after graduation from eighth grade. We are planning on another 75 students during summer 2013.

Beginning summer 2013 students will be organized into teams of three and complete career exploration exercises. These will be similar to those we are planning for our middle school students but longer and more robust because the high school students are further along with their math and science. The five week duration of Acceleration Academy provides an opportunity for multiple career experiences. During summer 2013 students will design, build, and test airplane wings and complete an experiential environmental science data collection and analysis exercise.

ANSEP University Success.
ANSEP provides academic support, professional development, cultural enrichment and financial aid to students in pursuit of BS degrees in science or engineering. There currently are 425 Alaska Native students enrolled in science and engineering BS degree programs at University of Alaska campuses. 32 Alaska Natives earned BS degrees in science and engineering in May 2012. Our University has graduated 230 Indigenous engineers and scientists for the period from 2002 through 2012. Of these graduates 100% have transitioned into a professional position or graduate studies.

ANSEP Graduate Success. So far there have been five ANSEP students who have earned Masters degrees and two students who have earned PhDs in Alaska. Other students have earned their BS degree here and then went outside to earn PhDs. One student has earned an MD and another 2 headed to medical school next year. There are 16 Alaska Native students enrolled in MS and PhD programs in science and engineering at the University of Alaska. Four Alaska Natives graduated with advanced degrees last year.

Expanding Our Reach

Our six year objective is to build our Middle School Academy out to 12 districts according to the following schedule:

2013	3 academies
2014	4 academies
2015	6 academies
2016	8 academies
2017	10 academies
2018	12 academies

In 2020 the middle school component reaches a steady state where there will be in excess of 600 students graduating from eighth grade annually with a minimum of algebra 1 successfully completed. In that same year there will be more than 3,000 ANSEP students on track for science and engineering degrees. Two years later in 2022 there will be more than 4,000. This analysis is based upon 70% of middle school academy and computer assembly students remaining engaged in Acceleration Academy. University Success component program life retention rate used in this projection is 70%.

As we move forward and the districts and the University shift funds from activities that do not produce the desired academic results, we will be able to expand to additional districts around the state.

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