

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

The LSAMP Alaska Alliance is the BS STEM undergraduate portion of a comprehensive longitudinal model that starts with middle school students, extends through high school, into the undergraduate years, on to graduate school and into the professions. LSAMP funding supports only the summer bridge and undergraduate BS degree portion of our work. We started 17 years ago. We have graduated 431 minority STEM students since 2002 and increased the average annual underrepresented STEM BS graduate number from a pre LSAMP number of 16.67 to 43.10 since our first award in 2001. Of these graduates, 248 have been during this award period.

The focus of our longitudinal effort is to effect systemic change by:

- inspiring students to complete advanced science and math coursework in middle and high school,
- bringing students who are academically prepared for BS STEM degrees into a welcoming environment on our Alliance campuses and supporting them through degree completion
- inspiring undergraduate STEM students to enroll in graduate school
- providing opportunities and guidance for all students
- creating empowerment and excitement around engineering and science
- providing career visioning opportunities through experiential activities led by practicing STEM professionals
- focusing on the academic, personal, and professional development of every student
- infusing values of family and community in all we do

Our students are among the poorest people in the nation. The parents and grandparents of some of our Alaska Native students were raised on the tundra as nomads and are the first generation of people in their families to ever use money. Some Alaska Native LSAMP students are the first in their family to ever graduate from high school. Native students have historically come to our Universities under-prepared in math and science. We would do years of remedial work at the University before these students were able to successfully complete a University level course. In many of the schools with high populations of Native students, coursework was not available that would foster success in STEM degree programs. LSAMP has catalyzed a change in this paradigm and spawned affiliated components that extend from sixth grade to graduate school. We are now bringing native students who are prepared in math and science to our Universities in numbers that are unprecedented. Some students arrive ready for calculus 3 during their first semester freshman year. Students are graduating and moving on to the professions and graduate schools. We are replicating our model at 12 higher education institutions in nine states and have developed partnerships with 130 industrial firms, philanthropic organizations, federal agencies, state agencies, K-12 schools, colleges, and universities who provide cash, advocacy, research opportunities, and internships for our students at every level. We have successfully institutionalized with State of Alaska General Fund money all faculty and staff positions as well as programmatic components initially funded through LSAMP. We have a new 13,000 square foot building to house our programs on the campus at UAA and a dedicated endowed chair so that minority students will forever have a STEM faculty advocate.

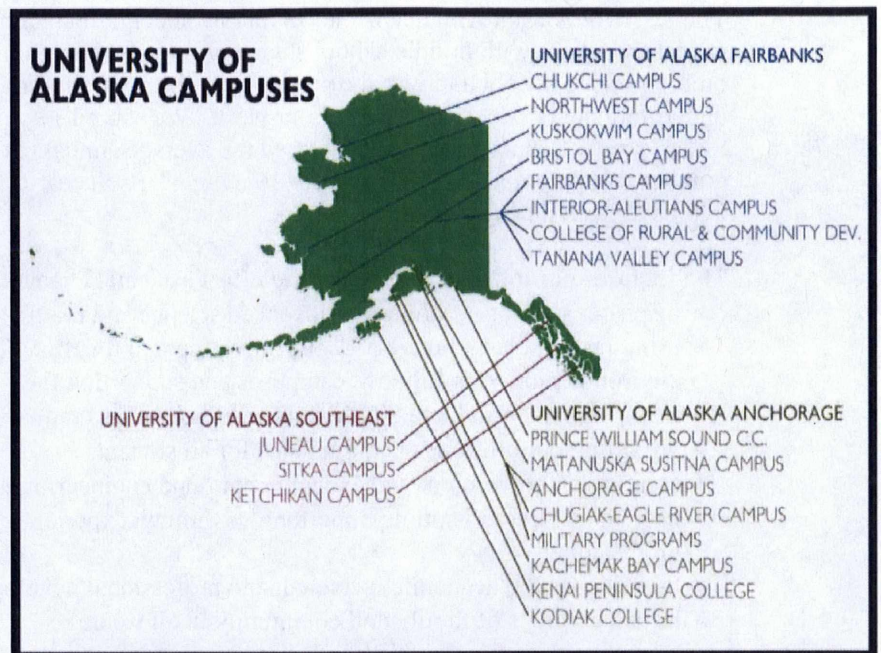
Pacific Alliance

The Pacific Alliance (2001) originally consisted of the University of Alaska Anchorage as the lead institution, the University of Alaska Fairbanks, the University of Hawaii Manoa, and the University of Washington. The current award did not include the University of Hawaii. In 2009 the University of Washington was awarded a separate LSAMP and left the Pacific Alliance. Today we refer to our Alliance as the Alaska Alliance.

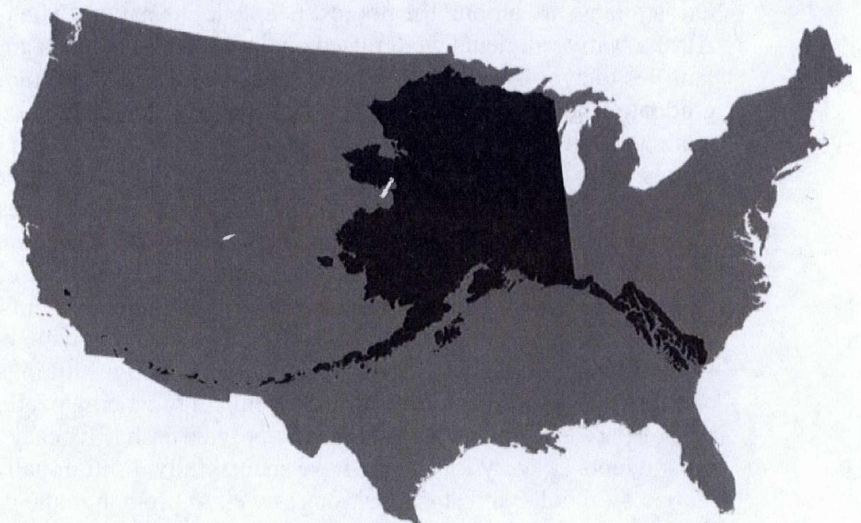
**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

The Alaska Alliance setting

The University of Alaska Statewide System consists of 3 separately accredited institutions. These are the University of Alaska Anchorage, University of Alaska Fairbanks, and University of Alaska Southeast (Juneau). Each institution includes separate community campuses. There are 19 campuses total. Each community campus serves the function of a community college, as they provide two-year degree programs, general continuing education, and adult basic education. Our students do not have problems with matriculation across campuses because they are in the same University system. Some of the community campuses have fewer than 100 students. System-wide there are 33,000 full- and part-time students enrolled, studying among 500 unique degree, certificate or endorsement programs.



Alaska is a huge place. We have a very limited road infrastructure and rely upon air travel to get to the bulk of the communities in the state. The people living outside of the metropolitan hubs of Anchorage, Fairbanks, and Juneau rely heavily upon fish and game to subsist. These communities are not connected to the power grid. We fly or take the ferry to our capital city of Juneau. Alaska Native people have lived here for 10,000 years. They are underrepresented in the science and engineering professions.



Alaska rural communities face many unique challenges, including challenges to development and economic self-sufficiency; geography and climate; isolation; unemployment; high cost and low standards of living; and infrastructure issues. There are 710,000 people in Alaska and 105,000 Alaska Native people. 22% of the K-12 students in the state are Alaska Native. Most rural Alaska schools have fewer than 100 K-12 students. Many students never receive preschool education. Since the schools are geographically isolated, teachers are difficult to find and retain. This is particularly so for math and science teachers. As a result, the coursework required to be prepared for STEM BS degrees is often not available in the schools. This is exacerbated by the fact that many of the teachers and administrators in the schools do not believe the students are capable of science and math coursework. Rural Alaskan villages have some of the worst literacy rates in the nation. Alaska Native students are less likely to pass standard tests than any other demographic, and Alaska Native students are more likely to drop out of school than any other demographic.

This presents a formidable challenge when moving students through the university and into graduate school and the professions. Yet, because of LSAMP we are being successful and are transforming our State.

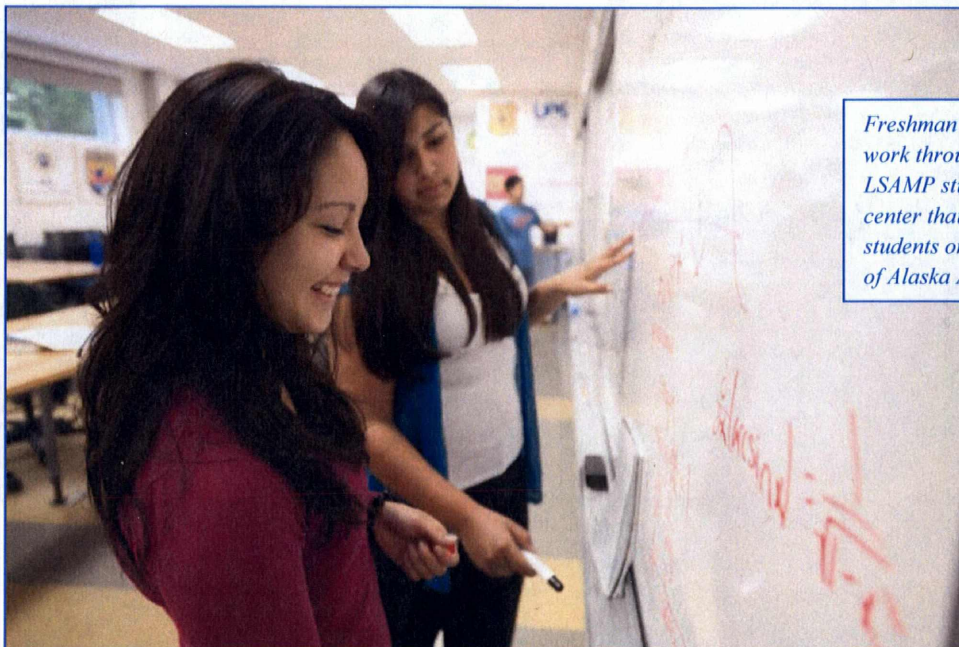
**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

Alliance Design

The design of the Alaska Alliance is based on evidence of sound programmatic approaches.

The Alaska Alliance university recruitment and retention strategies for targeted STEM undergraduates has been developed using theories and best practices related to student involvement (Astin, 1982, 1984, 1985, 1993), student retention (Tinto 1993, 200; Bean & Eaton, 2000; Bean & Noel, 1980), a local model of student expertise (Padilla et al., 2007), the power of self-efficacy beliefs (Bandura, 1997; Bean & Eaton, 2001-2002; Usher & Pajares, 2009), diverse university learner groups (Antonio, 2003; Bean & Eaton, 2001-2002; Belgarde & LoRE', 2003-2004; Braxton, et al., 2004; Demmert, Jr., 1998; Jackson, Smith, & Hill, 2003; Kuh & Love, 2000; Landis, 2005; Larimore & McClellan, 2005; Mayo, Murguia, & Padilla, 1995; Pavel et al., 1998; Tinto, 1993; Zhao & Kuh, 2004), and the LSAMP model for STEM undergraduate success (Clewell, et al., 2006). Research on STEM enrollment (Freeman & Fox, 2005; NSB, 2010; NSF, 2011) and guidance on diversifying the STEM workforce and pathways to the professorate found in the literature (BEST 2004; CEOSE, 2004; COSEPUP, 2007; Chubin, May, & Balco, 2005) have also informed the Alliance team in its approach to providing an effective undergraduate STEM retention program, real world internship experiences, undergraduate research opportunities, pathways to STEM graduate studies, career mentoring and networking, and on-site job interviews for seniors with employers in STEM fields.

The Alaska Alliance's model for the recruitment, retention, and graduation of minority STEM undergraduates has been influenced by the successful strategies employed by other university retention programs for underrepresented ethnic and racial minority STEM undergraduates presented in the literature, during the LSAMP grantee annual conferences, and in Alaska Alliance dissemination conferences and meetings with other universities and community colleges. The positive impact of the existing practices of the Alliance's recruitment and retention strategies for targeted STEM undergraduates has been supported in independent studies (Behrens, 2010; Lazzell, 2007). A twenty-year longitudinal study of the impact of (LSAMP university) retention strategies on graduation rates of Alaska Native engineering undergraduates enrolled at the University of Alaska Anchorage found a statistically significant increase ($p < .05$) in their graduation rates in the ten years after the strategies were adopted compared to the ten years prior to adoption (Lazzell, 2007).



Freshman LSAMP engineering students work through a math problem during a LSAMP study group in the learning center that was built to support LSAMP students on the campus at the University of Alaska Anchorage.





**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

The Alaska Alliance is Comprehensive and Longitudinal

Our model has been continuously evolving for the past 17 years. In 2001 we were awarded our first LSAMP grant. LSAMP became the catalyst that sparked a programmatic evolution that continues today and reaches from sixth grade to the PhD. We focus on the academic, personal, and professional development of each student.

LSAMP funds provide support for baccalaureate STEM degree seeking students only. Our other partners provide the financial support for the pre-college and graduate school components. In Alaska, our sixth grade to PhD comprehensive longitudinal model is known as ANSEP, the Alaska Native Science & Engineering Program.

Alaska Alliance LSAMP Model*

PRE-BACCALAUREATE	BACCALAUREATE (LSAMP)				POST BACCALAUREATE
  <p style="font-size: small; margin: 0;">Middle & High School Activities</p> <ul style="list-style-type: none"> • Middle School Academy 83% of these students graduate from middle school with algebra 1 successfully completed. 54 students annually. • High School Computer Assembly More than 50% of these students successfully complete chemistry, physics, and trigonometry prior to high school graduation. 100+ students annually. • High School Acceleration Academy More than 70% of these students graduate from high school with chemistry, physics, and trigonometry successfully completed. 50 students annually. <p style="font-size: x-small; margin: 0;">Pre-Baccalaureate activities are supported by others. No LSAMP funds are used.</p>	Focus/Activity	STEM Academic Integration	STEM Social Integration	STEM Professional Development	  <p style="font-size: small; margin: 0;">Graduate Success</p> <ul style="list-style-type: none"> • Fellowships • Graduate Coursework • Skill Building • Research Planning/Initiation • Membership • Community • Conferences: Scientific & Professional • Career Awareness & Professional Development • Ethics: Scientific and Professional <p style="font-size: x-small; margin: 0;">Graduate success activities are supported by others. No LSAMP funds are used.</p>
	FACULTY	INSTITUTIONAL/DEPARTMENTAL			
	Summer Bridge	✓	✓		
	Scholarship/Stipend	✓			
	Peer Study Groups	✓	✓		
	Skills-Building Seminars	✓	✓		
	Learning Center	✓	✓		
	Academic Advising	✓			
	Summer Academic Enrichment	✓			
	Tutoring	✓			
	Research Experience (local/international)	✓	✓	✓	
	Peer and professional mentoring	✓	✓	✓	
	Conferences	✓		✓	
	Internships: Domestic		✓	✓	
	Career Awareness	✓		✓	
	GRE Test Preparation	✓		✓	
	Graduate School Admissions Support	✓	✓	✓	
	FACULTY				
	Workshop on Teaching	✓			
	Diversity Sensitivity Training	✓	✓		
	Faculty Research Program	✓			
	INSTITUTIONAL/DEPARTMENTAL				
	New Course Development	✓			
	Curriculum Material Sharing	✓			
	Distance Learning Courses	✓			
	Changes in Institution Endowed Chair	✓	✓	✓	

* Modified to show Alaska Alliance components from Clewell, B.C., Clemencia Cosentino de Cohen, Lisa Tsui and Nicole Deterding. 2006. Revitalizing the Nation's Talent Pool in STEM. Urban Institute. Washington, DC. 25 pp. Dissemination Report. <http://www.urban.org/url.cfm?ID=311299>

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

STEM Pipeline

The table below shows where each of our minority students are in the Alaska Alliance pipeline. It has taken us a great deal of effort to progress to this point. We are filling the pipeline. Our Alliance is poised to see a dramatic increase in the number of BS STEM minority graduates in the next five years. Two former LSAMP undergraduates have graduated with PhDs from our University. An additional student is earning a PhD in Chemistry at the University of Washington and one at the University of Colorado in Boulder. One former LSAMP undergrad has graduated from the University of Washington Medical School and now practices family medicine at the Alaska Native Medical Center.



Athabascan Indian and 2002 LSAMP civil engineering Alum Matt Calhoun leads a study group. As an undergraduate Matt was inspired by LSAMP and is now completing his PhD at the University of Colorado Boulder. We are paving the way so that he can join the faculty in fall 2012. Matt will be the only underrepresented minority person on the School of Engineering Faculty.

The Alaska Alliance STEM pipeline starts with sixth graders and extends through high school, into LSAMP University Success, on to graduate school and the STEM professions. We focus on the personal and professional development of every student. LSAMP funds provide support for baccalaureate STEM degree seeking students only. Pre-College and graduate school support is provided by our other partners. In Alaska our sixth grade to PhD comprehensive longitudinal model is known as ANSEP, the Alaska Native Science & Engineering Program.

Alaska STEM Pipeline		
Number of Students		
	Fall 2010	Fall 2011
middle school*		
sixth graders	18	18
seventh graders	18	36
eighth graders	18	36
high school*		
freshmen	33	41
sophomore	40	70
junior	100	152
senior	150	160
baccalaureate	498	571
graduate school*		
Masters	15	18
PhD	5	3
*not supported by LSAMP		

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

High School to College Transition: LSAMP Summer Bridge

Summer Bridge sets students on a path to excel academically and professionally. During the *Summer Bridge* new high school graduates

- live on the University of Alaska Anchorage campus,
- work full time in paid professional internships doing real work in the oil industry, with state and federal agencies, or university and agency laboratories
- complete 160 hours of calculus instruction for credit.

Summer Bridge started with eight students in 1998 at BP. During summer 2011 there were 25 students at Alaska Department of Fish and Game, Arctic Slope Regional Corporation (ASRC) - Energy Services (AES), BP Exploration (Alaska), Inc., ConocoPhillips, NANA/Dowl HKM, NANA Worley Parsons, United States of Fish and Wildlife Service, NOAA, US Forest Service, US Bureau of Land Management (BLM), National Park Service, US Geological Survey (USGS), University of Alaska Anchorage Health Sciences, National Institute of Health- The Center for Addressing Health Disparities through Research and Education (CAHDRE), and Exxon Mobil.

Our goal is for each LSAMP *Summer Bridge* student to:

- Develop a peer group
- Earn the money they need for college
- Boost their math skills
- Meet mentors
- Solidify their vision of a career in the sciences or engineering
- Understand the importance of a supportive community/study group
- Learn to navigate at the University
- Link up with firms that will provide internships through graduation and beyond
- Learn what it is like to work in a corporate office or field research setting
- Transition to LSAMP *University Success*

How *Summer Bridge* works

Summer Bridge is for students who have just graduated from high school. Students who are calculus ready or higher and have completed chemistry and physics are eligible to apply. Some of the students work in Anchorage and others travel to field locations outside of town.

Anchorage *Summer Bridge* includes the following:

- After one week of orientation and team building, students begin the eight week internship phase of the *Bridge*. A typical weekday for students begins with an 8 a.m. calculus class. The class is taught for credit by a university professor. After the class, students then report to their intern jobs, where each student is paired with an engineer or scientist in their sponsor organization. Lunch is at noon and they are back to work at 1 p.m. At 5 p.m. the students return to the our building on campus where they eat and then work collaboratively on calculus with upper-class LSAMP peer mentors until bedtime. Friday lunches are reserved for “brown bag” sessions with practicing professionals from the community explaining their jobs. On Friday night and Saturday, there are required group activities. Sundays are free time and the students mostly sleep or do laundry.



Inupiaq Eskimo civil engineer and LSAMP alum Michael Johnson was a Summer Bridge student in 2003. Now he is out working and last summer he mentored Inupiaq Summer Bridge student Stephan Hansell.. Together they worked at the Northwest Arctic Native Association DOWL/HKM engineering group. There are now 431 LSAMP alumni working in STEM professions.

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

Field *Summer Bridge* includes the following:

- One week of orientation and team building in Anchorage followed by one week of safety training. Safety training is important for this group. They will be out in rural areas conducting research and need to know how to defend themselves in the presence of wildlife, be safe around small aircraft, helicopters, river boats, and ocean skiffs. Students then head out to the field to conduct research with scientists and engineers for four weeks. After four weeks they return to Anchorage and complete the calculus class in 5 weeks.

All *Summer Bridge* students make a presentation for the partners at the end of the summer. Students who successfully complete the program are awarded scholarship support.

LSAMP University Success

During the *University Success* component we work to foster an engaged learning community focused on academic success and professional development. Since 2002 we have graduated 431 LSAMP scientists and engineers and this fall there are 571 minority bachelor's degree-seeking students enrolled. Since 2006 we have graduated 248 LSAMP scientists and engineers.

How University Success works

Our undergraduate program life retention rates are high because we have designed an academic community that focuses on those areas where students have traditionally had difficulties. LSAMP students understand the importance of community and teamwork. We help them find ways to work together to be successful. Each student is required to complete a contract that lists the requirements of the program in order to be in good standing.

Our academic community for the *University Success* component is comprised of students, faculty, staff, and external partners who are focused on the academic success as well as the personal and professional development of each student. Students are teamed. They are co-enrolled in classes, participate in organized study groups, are provided with opportunities for peer and professional mentoring, do undergraduate research projects, work summer internships, and participate in planned group social and professional development activities.

Students are teamed in an academic community and supported by peers and professionals. The team works together for success. Many students live and study together on campus. Others come to organized study groups. Building a supportive peer group is a big part of why we are successful.

- **Scholarships.** Merit based scholarships are provided by many of our industrial partners. Scholarships play an important role in retention as many of our students would not be able to overcome the financial hurdle presented by educational costs without them.

We are working to build an endowment so that the scholarship component will live in perpetuity. LSAMP Alumni have an Alumni dinner each December where they raise scholarship funds for the undergraduates.

- **Peer Study Groups.** Recitation sessions are designed to strengthen skills in the gateway courses like calculus, chemistry, computer programming, and physics. Junior, senior, and graduate students who have previously completed the course with a grade of 'B' or better lead the sessions. Students meet weekly, and are required to get up and solve problems on the board and be able to explain what they are doing to the other students in the session. We have found this to be a very effective learning tool.

Our goal is for each LSAMP University Success student to:

- Be effective at working in teams and understand the importance of a supportive community/study group
- Earn money needed for college through internships
- Earn scholarship support
- Develop a network of peer mentors
- Develop a network of professional mentors
- Complete a research project as an undergraduate
- Develop leadership skills by making presentations to students and professionals describing summer internships and research projects
- Develop leadership skills by leading recitation sessions and mentoring other students
- Graduate with a B.S. in a STEM discipline
- Move on to graduate school or the STEM professions

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

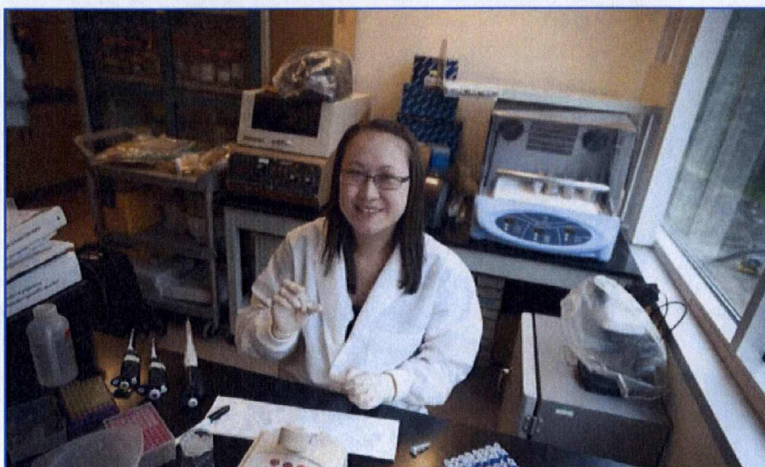
- **Skill Building Seminars.** Students are required to attend weekly team building meetings. These provide an opportunity for students to learn skills necessary for academic and professional success. LSAMP staff, other students, faculty, and professionals from our partner organizations come each week and we talk about success. Professionals from the community come to meet the students, make presentations, and explain jobs and opportunities available in engineering and science. LSAMP students make presentations on their research projects and internships so that others can see the array of career options. These meetings are an opportunity for us to see the students each week and to identify and mitigate problems before they jeopardize the student's academic success. We work to keep these sessions very informal and relaxed. We share pizza, bar-b-q, and native foods. The sessions are a powerful networking opportunity for the students with professionals, faculty, staff, and the other students. The food provided at these meetings is not paid through LSAMP.



LSAMP students celebrate in front of our Learning Center when it opened in October 2006.

- **Learning Center.** During October 2006 in the first year of the current award and 11 years after the program was founded, we moved into a new 13,000 square foot building on the campus at the University of Alaska Anchorage. The Tlingit dugout canoe design of the structure has become a landmark in our state. It is a home for all of the minority STEM students on campus.
- **Academic Advising.** Advising sessions with faculty advisers and LSAMP staff are required twice each semester for first and second year students. We also have peer advisors available in our building.
- **Summer Academic Enrichment.** All students are required to work in their field of study in paid summer internships or research projects. These applied learning opportunities provide for growth and professional development and provide the cash students need to attend the university.

- **Tutoring.** LSAMP peer tutors are available all day every day in our building.
- **Research Experiences.** Undergraduate research opportunities are provided for the students through our graduate schools, industrial partner organizations federal agencies, and state agencies. A partial listing of research projects our students have worked on since 2008 is included at the end of this report. We work to connect each of our students with undergraduate research opportunities, and foster mentoring relationships with current PhD



Unangan LSAMP student Tylyn Merculieff from St. Paul Island in the Bering Sea works on a research project in the genetics lab at the US Geological Survey.

candidates and research faculty. We encourage students to have one of their summer internships conducting research with research scientists. We work locally with University of Alaska National Science Foundation (NSF) and National Institute of Health (NIH) grantees to incorporate undergraduate research funding in their work. Nationally we encourage our students to consult the

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

directory of active REU Sites on the web at http://www.nsf.gov/crssprgm/reu/reu_search.cfm and apply directly to the REU sites. The LSAMP alumni graduate students working on the various research projects make presentations at the weekly undergraduate team building meetings.

- **Peer mentoring.** Peer mentoring is incorporated in every component of our model including peer study groups, co-enrollment in classes, skill building seminars at the weekly meetings, research experiences where students are teamed, tutoring, peer advising, internships where students are teamed, and others.
- **Professional Mentoring.** LSAMP students are mentored by professionals during their research experiences, summer internships, at the weekly meetings, and by our professional staff of LSAMP alumni.
- **Conferences.** Students travel with faculty to national and international conferences and sometimes present their research findings. We annually send a contingent of students to the American Indian Science & Engineering Society (AISES) national conference.
- **Internships.** Summer internships are required so students earn the money they need for school, clarify their vision of a career in science or engineering, expand their professional network, and provide additional mentoring opportunities. Internships are productive for the employer and educational for the student. Internship sites in town are structured with time each week for interns to make field trips to suppliers and attend 'brown bag' sessions where professionals explain important issues related to their profession.
- **Career Awareness.** Students are provided with opportunities to increase their career awareness through internships, research projects, weekly meetings, professional mentoring, peer mentoring, advising sessions, and conferences.
- **GRE Test Preparation.** We connect students and provide funding for private tutoring, small group instruction, local courses, and online courses.
- **Graduate School Admissions Support.** We provide financial, mentoring, and test preparation support for every LSAMP student who is interested in graduate school. Some students visit schools they are interested in attending.
- **Workshop on Teaching.** We have had Ray Landis and Vincent Tinto lead workshops on our campus. We have sent 10 faculty and staff to Landis' Chautauqua short course titled "Enhancing Student Success Through a Model Introduction to Engineering Course".
- **Diversity Sensitivity Training.** All faculty are provided with the opportunity to participate in cultural activities and awareness training in our building and on our partner campuses. There are now so many empowered minority STEM students co-enrolled in classes at UAA and UAF that large percentages of some classes are minority students. On many of the rural community campuses community colleges nearly all of the students are minority students. In the 17 years since we started, we have seen a dramatic shift in the attitudes and beliefs that faculty and staff express concerning the capabilities of our students. We have produced television commercials that are run for 4 months starting on Super Bowl Sunday each year. We do this to raise the awareness of the capabilities of our students among everyone in the state. You can view the commercials on the media gallery page at <http://ansep.net> UAA and UAF provide annual awards for the advancement of campus diversity initiatives. UAA participates in the National Coalition Building Institute (NCBI) and diversity training for new and continuing faculty is provided by the Center for Faculty Excellence (CAFE). For examples of other campus diversity resources see:
 - UAA NCBI at <http://www.uaa.alaska.edu/diversity/ncbi/index.cfm>
 - UAA Office of Diversity and Compliance at <http://www.uaa.alaska.edu/diversity/>
 - UAA Diversity Action Council at <http://www.uaa.alaska.edu/dac/index.cfm>
 - UAA Faculty Senate Diversity Committee at <http://hosting.uaa.alaska.edu/fsdc/diversity.html>
 - UAA Center for Faculty Excellence (CAFE) at <http://www.uaa.alaska.edu/cafe/>
 - UAF Office of MultiCultural Affairs & Diversity at <http://www.uaf.edu/omad/>
 - UAF Chancellor's Diversity Action Committee at <http://www.uaf.edu/cdac/>
- **Faculty Research Program.** The Alaska Alliance offers LSAMP students academic year and summer research opportunities that provide participants with the opportunity to work with research faculty. LSAMP students gain a deeper understanding of their field. Each student researcher makes a presentation of their work during the weekly meetings described above. We incorporate academic,

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

curricular, and co-curricular enrichment activities in order to improve instructional performance and increase the motivation, performance, and progression of talented students within STEM undergraduate degree programs in preparation for graduate degree programs.

- **New Course Development.** The Master Student Class follows the very successful curriculum developed by Dr. Ray Landis at California State University of Los Angeles. The class is based on the premise that students will do better in engineering and science if they understand how to go about becoming a successful student. All new students take the class.
- **Distance Learning Courses.** All students are provided with the opportunity to take courses offered on other Alaska Alliance campuses through distance learning. Many of our students on the rural campuses take classes this way. For more information about our distance delivered courses see <http://www.alaska.edu/distance/>
- **Curriculum Material Sharing.** We share curriculum materials among the Alaska Alliance campuses.
- **2-4 year College Transition Agreements.** In Alaska, our two-year colleges are part of the statewide University of Alaska system. We call the two-year colleges “community campuses”. There is no need for formal transition agreements because we are all a part of the same university.

Management:

- **Management and administrative collaboration among participating organizations to ensure long term continuation of LSAMP and associated activities beyond the term of NSF support**
The Alaska Alliance is managed by Dr. Herb Ilisaurri Schroeder, University of Alaska Anchorage (UAA) Vice Provost for the Alaska Native Science & Engineering Program and Professor of Civil Engineering. The programmatic effort is supported at UAA by an underrepresented minority staff comprised of five LSAMP science and engineering alumni, an Alaska Native fiscal director, and an Alaska Native fiscal technician. The staff also includes a professional biologist from the US Fish and Wildlife Service (USFWS) on permanent loan to support LSAMP program development in the sciences. LSAMP at UAF is led by Dr. Brian Rasley who is a Professor of Chemistry and lifelong Alaskan. He is supported by a full-time administrative assistant and a cadre of graduate students who are LSAMP alumni. The funding for all of these positions has been institutionalized and are no longer paid by LSAMP. This team is responsible for the statewide effort.

We have developed into a community that includes more than 70, industry partners, philanthropic organizations, federal and state agencies. When we include the schools and universities involved in our work the number of organizations is around 130. These organizations provide financial support, internships, research projects and advocacy with the Alaska State legislature, our Governor, the US Congress, and new partner organizations.

The chancellors of each of the three main University of Alaska campuses, the Alaska Commissioner of Education, the superintendents and principals of selected key high schools and middle schools, presidents of philanthropic organizations, leaders of industrial partner organizations, and the leaders of key state and federal agencies have worked with Dr. Schroeder for the past 17 years. The effectiveness of this arrangement is well demonstrated by the success of the programmatic effort, the development of such a comprehensive and longitudinal model, and institutionalization of the staff and programmatic components. In most cases we work with the top person in each organization because that president or top leader is the individual with the power to direct resources to support our work. They have provided funding and advocacy with the state legislature, multiple Alaska governors, the US congress, and other organizations who are interested in our work.

Transformation of academic and research environment

Prior to LSAMP few minorities graduated from our University with BS degrees in STEM. Also, there is very limited evidence of minority students working on research at our University prior to LSAMP. A partial listing of undergraduate science and engineering research and internships is included at the end of this report.

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

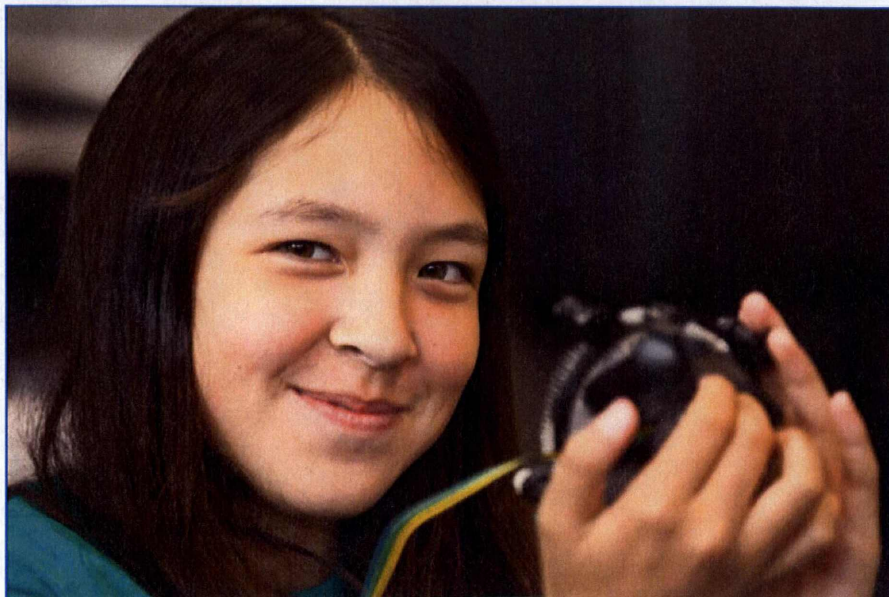
LSAMP Affiliated Pre-College and Graduate Programs (not supported by LSAMP)

Pre-College

Our Pre-College effort is focused on inspiring students to complete the coursework necessary for success in BS STEM degree programs. We are working with approximately 400 Pre-College students from 95 communities in Alaska.

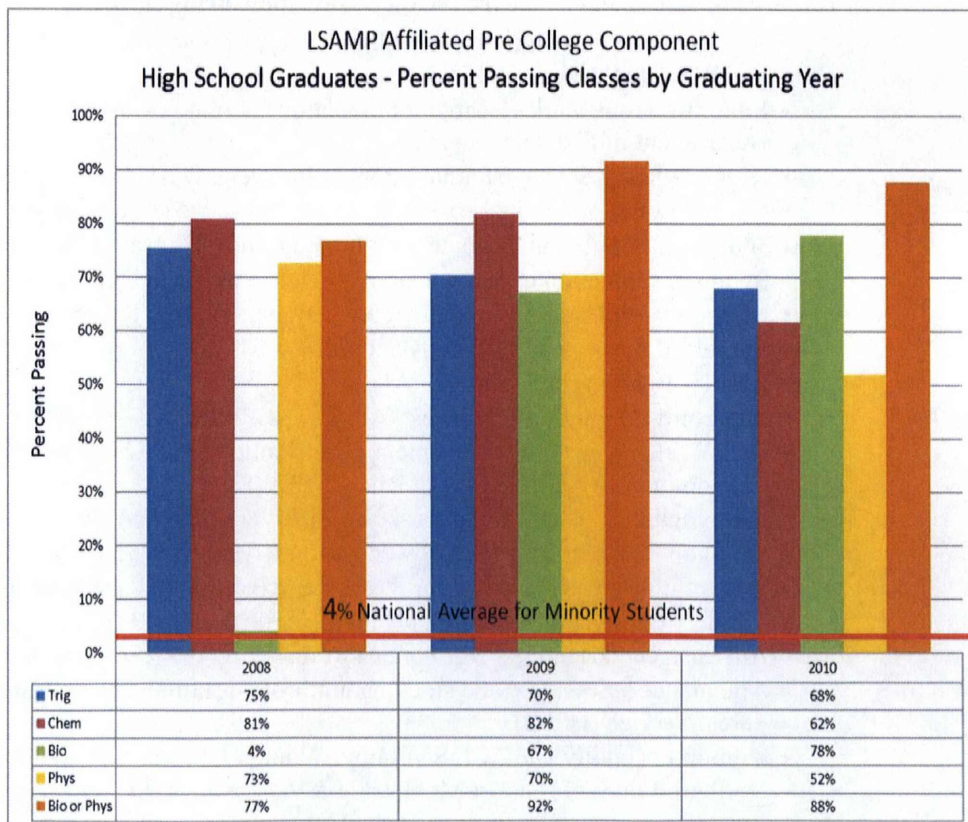
Pre-College components include:

- Middle School Academy
- High School Computer Assembly
- Acceleration Academy
- Tablet Tutoring
- Academies of Engineering
- Jump Start



LSAMP affiliated Pre-College students assemble computers and earn the right to keep them by completing advanced science and math classes in middle and high school.

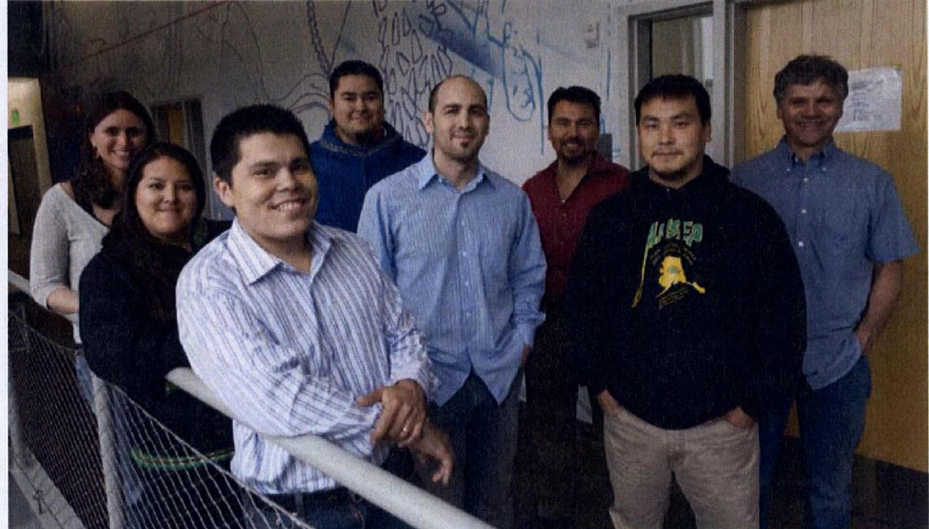
According to the National Action Council for Minorities in Engineering (NACME) in "Confronting the 'New' American Dilemma, Underrepresented Minorities in Engineering: A Data-Based Look at Diversity" only 4% of minority students in our country arrive at universities 'engineering ready'." Students engaged in our LSAMP affiliated pre-college components arrive with chemistry, physics, and trigonometry successfully completed at a rate of greater than 50%. Some arrive and take calculus 3 or differential equations first semester freshman year. 83% of our middle school students graduate from eighth grade with algebra 1 successfully completed.



**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

Graduate School

There are currently 21 students engaged in our Graduate Success component. Two of our Alaska Native students graduated with PhDs in August 2011. Other students travel outside of Alaska for graduate school. You can learn more about our comprehensive longitudinal model at <http://ansep.net>



A portion of the 21 Alaska Native Graduate students who have transitioned from LSAMP to graduate school. Electrical engineering professor and faculty mentor Jens Munk is at the far right. LSAMP funds are not used for graduate students.

Undergraduate science research project and sponsoring agencies

- ASL Juvenile Outmigration of Chinook and Coho Salmon on the Anchor River, Alaska. US Fish and Wildlife Service (USFWS))
- Rainbow Trout Mark-Recapture Population estimate on the Kisaralik River, Alaska. Alaska Department of Fish and Game (ADF&G)
- Kulukak River Sockeye Salmon Population Density Study (USFWS)
- Coastal Ponds and Lake Erosion Study in Western Alaska (USFWS)
- Whitefish Population estimate with Inland Ponds, Chevak (USFWS)
- Synoptic Collection of Marine Derived Nutrients for the Kwethluk and Kisaralik Rivers (USFWS)
- Migratory Bird Surveys in the Arctic National Wildlife Refuge (USFWS)
- Shorebird Surveys in St. Paul Island (USFWS)
- Cackler Banding in Southwest, Alaska (USFWS)
- Shorebird Banding in Southwest, Alaska (USFWS)
- Radio Telemetry on the Movement , Distribution, and Abundance for Chinook and Sockeye Salmon in the Mid-Kuskokwim River(USFWS)
- Ichthyophonous Study on the Kuskokwim River (USFWS)
- Ichthyophonous Study on the Lower Yukon River (USFWS)
- Anadromous Water Catalog for the Upper River of the Kuskokwim River (ADF&G)
- Minnow trapping of beaver ponds for Juvenile Salmonids (UM)
- Aufwuchs and Benthic Invertebrates Research on the Kwethluk, Kisaralik, Eek Rivers (USFWS)
- Abundance assessment and stocking cutthroat trout in lakes in Eastern Price William Sound US Forest Service (USFS)
- Salmon Fecundity and ASL Sampling, Wonder lakes in NW Alaska (ADF&G)
- Northern Fur Seal Harvest Monitoring & Assessment, St. Paul Island, Alaska National Oceanic and Atmospheric Administration (NOAA)
- Little Port Walter Ecosystem Assessment (NOAA)

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

- Humpback Whale Sighting Survey in Sitka Sound (NOAA)
- Transcription levels of Creatine Kinase in Antarctic fishes (ADF&G)
- Abundance, ASL and Installation of the Andrafsky River Weir (USFWS)
- Juvenile chum salmon and Krill Analysis, Auke Bay (NOAA)
- Sea bird productivity monitoring and Data Collection in Resurrection Bay, Homer, AK (USFWS)
- Enumeration of Gisasa River Chinook, Chum, Pink, and Sockeye Salmon (USFWS)
- Water Quality, Stream Surveys, and Fish Passage Assessment in Kake, Alaska (USFS)
- Diversity of Rhizospheric Fungi in Southeastern, AK Muskegs (USFWS)
- Abundance and population estimations on the Unalakleet River weir US Bureau of Land Management (BLM)
- Avian Influenza Genetic Sampling. US Geological Survey (USGS)
- Parasitic Behavior of Emperor Geese (USGS)
- Extraction of DNA from Avian Blood (USGS)
- Bioelectrical Impedance Analysis on Juvenile Salmon and Rainbow Trout (NOAA)
- Smolt Population Study on the Unalakleet River, AK Norton Sound Economic Development Association (NSEDC)
- Migratory Bird Surveys in Unalakleet and Eek, AK (BLM)
- Fish Passage Assessment in Western Prince William Sound, Alaska (USFS)
- Northern Fur Seal Pup Production Research on St. Paul and St. George Islands (NOAA)

Engineering Student Internships and sponsoring organization

- Extracting data from daily production reports and conducting trend analysis to identify problem areas in equipment on Prudhoe Bay's Edicott Island (ExxonMobil)
- Drilling and Wells research and data complication and analysis (ConocoPhillips)
- Completion of oil field processing and applied downtime, projected capacity, and temperature impact to improve field performance (ExxonMobil)
- Determining fluid contributions from different well pads and drill sites. (BP)
- Determining a road project road grading and street slopes, and pipe specifications for a water project and verifying plan sets were updated with edits to project (Dowl HKM)
- Designed/created a system to assist communications within the company. (ExxonMobil)
- Collection of true vertical depths, measured depths, and mud weights from drilling data for pore pressure and fractures gradient utilizing open wells, reviewing mud logs and drilling well files. Also converted the collected data into true vertical depths using digital well files. (BP)
- Finding trends within the change orders of the well tie-in project to make improvements. (BP)
- Created water wash programs for the gas injections at Prudhoe Bay and designed prosper models for various wells. (BP)
- Subsurface and surface drilling and operations research (BP)
- Researched the impact engineering has on North Slope. (BP)
- Design a chemical injection skid that would pump chemicals into a pipeline in order to maintain the condition of that pipeline, ensuring that the pipeline does not corrode and that it maintains optimum efficiency. (NANA Worley Parsons)
- Compiled information on the Greater Prudhoe Bay Area, its facilities and its resources for project planning. (BP)
- Determining how much trouble time and cost vendors gave the company, then entering them in to a system called WellView. (ConocoPhillips)
- Analyzing well log data for the petrophysicists. (BP)
- Inspected the Alyeska Pipeline under the 1RY Piggings Project and inspected the pipeline from drilling to processing. (ConocoPhillips)
- Adding perforations to drawings for the Put River. (BP)
- Created a Weibull Analysis Tool to predict failure probability for the equipment on the slope. (BP)

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

- Reviewing reports and performing cost analysis to create graphs. I also compiled a list of well work jobs and their results. (ExxonMobil)
- Spacing wells in the Greater Prudhoe Bay area for fits to the drilling rig Doyon-141 (BP)
- Reviewing AutoCAD drawings for heating and ventilation systems and doing an assessment of systems. (ASRC Energy Services)
- Generated an AutoCAD sketch of Tract 9 in Deadhorse to be used for active equipment and storage. (Peak Oilfield Service Company)
- Researched the effects of corrosion on many of BP's North Slope wells. (BP)
- Created core photo montages to condense the core photos and their information into an easy to read format. Also corrected perforation data on well sites and determined the source of L-202-produced water by comparing chemistries and water production rates. (BP)
- Optimized gas lift data to assist in the congruency of data. (BP)
- Appraising Low Flow Showerheads under in the Project Directorate-Appraisal Team. (BP)
- Organized data and created charts for the Drilling and Wells Department. (ConocoPhillips)
- Analyzed isometric drawings of pressure safety valves at the Alpine Central Facility in order to calculate head loss at various points in the lines. (ConocoPhillips)
- Patent digitizing and parcel level mapping and data entry of production logs and historic drill logs. (Calista)
- Research on developing paper based biofuel cell for low-power applications which included fabrication of a working prototype. (University of New Mexico)
- Purchasing, scheduling, and budgeting decision maker for Aircraft Survivability Product Improvement Program for the Apache Attack Helicopter in Huntington, Alabama. (Yulista)
- Completing the Selawik, Alaska house survey. (ANTHC)
- Complete design plans and grant applications for water and wastewater projects for rural Alaska communities. (ANTHC)
- Generated a plan for energy isolation for the Alyeska Pipeline shutdown and developed drawings for valve access. (Houston Construction)
- Drafting and design for the modification to the synchronizing circuits and the upgrade of the voltage regulators for 2 12MW stream turbine generators and implementation this design. (Alyeska Pipeline Service Company)
- Research of the Endicott Pipeline for low-temperature mitigation study and a pre-appraise study. (CH2M Hill)
- Completed a plan review and material take offs from detailed design drawings and also developed equipment list for construction projects and solicited material quotes from vendors. (NANA Construction)
- Evaluated and assessed the most optimum technologies for monitoring pipeline temperature to determine most efficient method of calculating lead detection temperature compensation. Also configure and test remote wireless gateway with temperature monitoring devices. (BP)
- Performing energy audit for Russian Mission and Goodnews Bay, Alaska and installing an energy recovery system. (ANTHC)
- Assess inventory for water and wastewater system and create process manuals for utility operations. (ANTHC)
- Fire hydrant inspections, preconstruction walk thru, post construction inspections redlines and project research. (AWWU)

A partial listing of Professional Researchers who work with our undergraduates

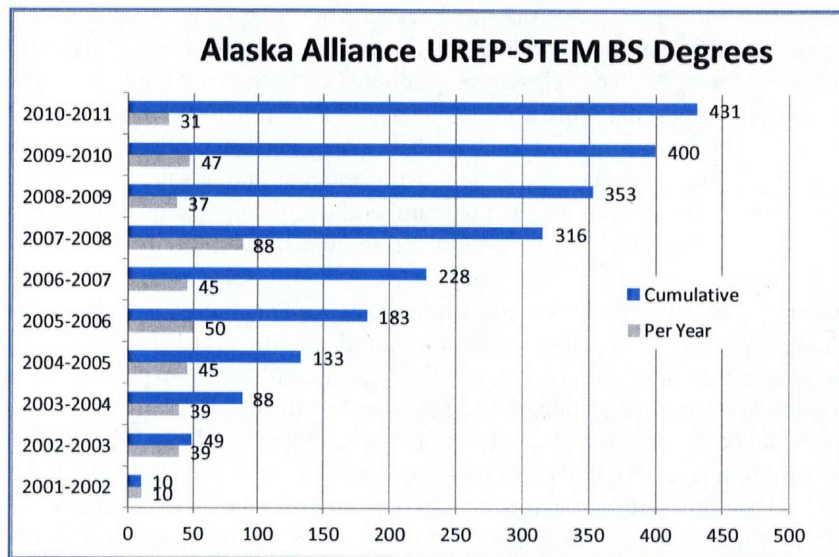
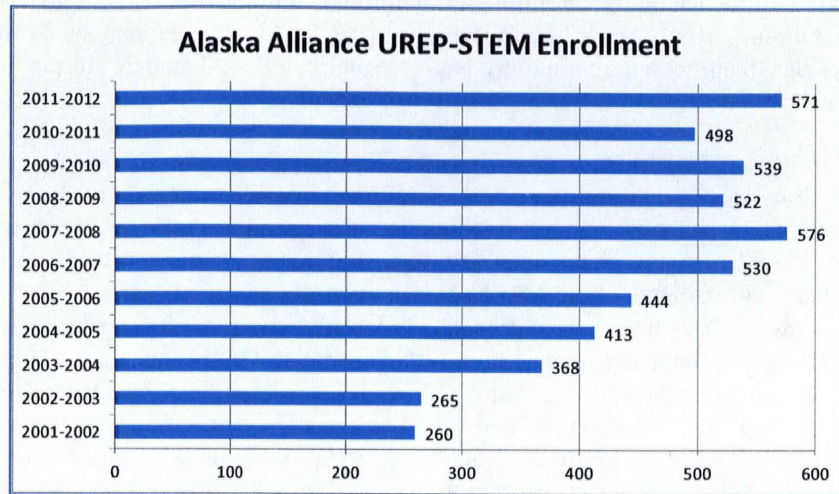
- Kevin Schaberg, Bethel Fisheries Manager (ADF&G)
- Mark Lisac, Refuge Biologist (USFWS)
- Dan Gillikin, Refuge Biologist (USFWS)
- Geoff Beyersdorf, Subsistence Biologist (BLM)
- Steve Kendall, Migratory Bird Biologist (USFWS)
- Courtenay Carty Gomez (BBNA)

**Louis Stokes Alliances for Minority Participation (LSAMP)
Alaska Alliance 2010-2011 Annual Report**

- Steve Klein, Sport & Wildlife Biologist (USFWS)
- Mike Thalhauser, Biologist (KNA)
- Doug Molyneaux, Biologist(Retired ADF&G)
- Tracey Fischbach, Engineer (USFWS)
- Dayna Kunch, Forest Fish Biologist (USFS)
- Jim Menard, Nome Biologist (ADF&G)
- Mike Boylan, Refuge Supervisor (USFWS)
- Mike Williams, Research Biologist (NOAA)
- Juan Leon Guerrero, Research Biologist (NOAA)
- Keith Cox, Research Biologist (NOAA)
- Frank Von Hippel, Biology Professor and Researcher (UAF)
- Carrie Hackett, Educator (KNA)
- Blair Flannery, Geneticist (USFWS)
- Adam Cross, Forest Fish Biologist (USFS)
- Sean Stash, Forest Biologist (USFS)
- Kent Kohlhasse, Forest Engineer (USFS)
- Durelle Smith, Scientist (USGS)
- Michael Rearden, refuge Manager (USFWS, Retired)
- Kenton Moos, Refuge Manager (USFWS)
- Sean Sanchez, Refuge Manager (USFWS)
- Charlie Lean, Biologist (NSEDG)
- Wes Jones, Biologist (NSEDG)
- James Whitlock, Biologist (BLM)
- Bruce Seppi, Biologist (BLM)
- Tom Kron, Biologist (USFWS)
- Michael Milholin, Engineer (USFWS)
- Jim Finn, Safety Specialist (USGS)
- Rod Murray, Safety Specialist (USGS)
- Vanessa Williams, Geneticist (USGS)
- Zack Liller, Biologist (KNA)
- John Linderman, Area Manager (ADFG)
- John Gerkin, Biologist (USFWS)
- Jake Schlapfer, Training Specialist (BLM)
- Patrick Snow, Biologist (USFWS)
- Rob Spangler, Biologist (USFWS)
- Carol Ann Woody, Researcher (Fisheries Research and Consulting)
- Kris Savage, Refuge Manager (USFS)
- Joel Schmuts, Researcher (USGS)

Alaska Alliance Findings 2010-2011

Underrepresented Minority STEM BS degree enrollment and graduation data



Project Evaluation

Two external evaluations for our LSAMP Alliance have been conducted during the grant term. A university retention program assessment survey was designed for the 2007 evaluation to collect and analyze data on the perceptions of the Alaska Native engineering undergraduates who participated in LSAMP at UAA (Lazzell, 2007). The 2010 evaluation was a validation study of the 2007 evaluation results that included LSAMP science, technology, engineering and math undergraduates (Behrens, 2010). According to Lazzell, the 2007 survey results suggested that LSAMP students perceived LSAMP-related experiences as “having important and positive impacts on their success as students” (2007, p. iv). Lazzell stated, “The study findings suggest that [LSAMP] retention strategies positively influence the academic and social engagement of [LSAMP] students. The survey results further suggest that [LSAMP] students experience high levels of peer support, congruence with the university through [LSAMP], and commitment to complete their degrees. The success of Alaska Native engineering students might be enhanced at other universities by their active participation in a university retention program with a supportive and safe learning community that provides purposeful academic, social, and financial support in a manner that incorporates and affirms Native values and cultures” (p. iv-v).

Alaska Alliance Findings 2010-2011

The 2010 evaluation results validated the 2007 findings that the Alliance's university retention practices had a positive influence on the recruitment, retention, and graduation of LSAMP Alaska Native STEM students (Behrens, 2010). According to Behrens, "The LSAMP model may be a contemporary benchmark for universities to attract and retain more Native American STEM students through postsecondary degree completion" (2010, p. 86).

SWOT Analysis of STEM Recruitment and Retention Strategies

The LSAMP Alliance programmatic components have been continuously analyzed internally using data and feedback (student/faculty/industry) to ensure we are producing the results we want in a cost effective manner. Approaches that work we keep and those that do not are discarded. External evaluators conduct comprehensive assessments of our LSAMP components every three years.

- *Weaknesses* – Native high school graduates interested in STEM degrees often came to our university underprepared in math and science with little coordinated support at the university. This often led to change of degrees to non-STEM majors, slow progress towards degree completion or student attrition.
Interventions – The Alliance provided weekly homework help sessions, applied learning summer internships, scholarships for meeting academic and programmatic requirements, professional industry mentors to provide a career vision, and a supportive environment of peers, faculty, and staff. As the student success increased, UAA obtained grants from other funding sources to tackle the gaps in pre-college academic preparation and to incent Native undergraduates to pursue STEM graduate degrees. The result was more Native high school graduates coming to the university academically prepared to pursue STEM degrees and more Native undergraduates pursuing STEM graduate degrees.
- *Threats* – The threats for this program were a lack of permanent funding and insufficient space
Interventions – Over time there has been institutionalization of salary and benefits for key staff positions, a permanent home for the program, and a dedicated faculty member (described below). More private scholarships have been obtained to help support the increase in our Native STEM majors.
- *Strengths and Opportunities* – The positive impacts of the Alaska Alliance's recruitment and retention practices for targeted STEM undergraduates have been supported in independent studies (Behrens, 2010; Lazzell, 2007). The 2007 evaluation included a longitudinal review of Native engineering undergraduate enrollment at UAA that found significantly more of this cohort group enrolled in introduction to engineering courses and graduated with BS degrees in engineering in the ten years after the recruitment and retention strategies were adopted by the Alaska Alliance compared to the ten years prior to adoption (Lazzell, 2007). Early successes of UAA Native engineering undergraduates led to providing similar recruitment and retention opportunities for UAF Native engineering students. These Alliance recruitment and retention opportunities were then provided to Native undergraduates pursuing other STEM degrees at UAA and UAF, with similar positive impacts reported (Behrens, 2010).

Impact and Institutionalization

We were awarded our first LSAMP grant in 2001. We had 22 undergraduate students. We increased our baccalaureate STEM enrollment from 183 in 2006 to 571. We work with in excess of 400 K-12 students who are engaged in LSAMP affiliated pre-college programs, and 21 LSAMP alumni attending Alaska Alliance graduate schools. We have had 431 LSAMP STEM BS graduates in Alaska since 2002 with 248 since 2006. With support from the NSF Partnerships for Innovation (PFI), we organized the Indigenous Alliance for Engineering & Science Education, which includes 12 higher education institutions in 9 states, to disseminate our longitudinal model across the nation. We have developed partnerships with 130 industrial firms, philanthropic organizations, federal agencies, state agencies, schools, colleges and universities who provide cash, advocacy, and internships for our students at every level. We have successfully institutionalized with State of Alaska General Fund money all faculty and staff positions as well as programmatic components initially funded through LSAMP. We have a new 13,000 square foot building to house our programs on the campus at UAA and a dedicated endowed chair so that minority students will have a STEM faculty advocate in perpetuity.

Alaska Alliance Findings 2010-2011

Innovative and Transformative Practices in STEM Retention Strategies

There has been national and state recognition for the accomplishments achieved by this LSAMP Alaska Alliance. Dr. Schroeder, LSAMP P.I., received the *Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring* (PAESMEM) in 2005, the National Action Council for Minorities in Engineering (NACME) *Reginald Jones Founders Award* in 2009, and the Alaska Federation of Natives *Denali Award* in 2005, the top award bestowed upon a non-Native by the Federation.

2010 Management Summary for the UAA ANSEP Alaska Native Undergraduates

The merit of the Alaska Native Science & Engineering Program student success components to the UAA Alaska Native undergraduate participants

External review conducted by Dr. T. Tylor Behrens from February - June 2010

Introduction

In 2001, Dr. Herbert P. Schroeder applied for and was awarded a National Science Foundation Louis Stokes Alliances for Minority Participation (LSAMP): LSAMP Pacific Alliance grant that included support for the university retention component of the Alaska Native Science & Engineering Program (ANSEP) originating from the University of Alaska Anchorage (UAA). The NSF LSAMP Pacific Alliance Phase II grant was awarded in 2006 and remains active through October 31, 2011 (Schroeder, 2006).

Purpose of Evaluation

The purpose of this 2010 external evaluation was to describe and evaluate the impact of the Alaska Native Science & Engineering Program (ANSEP) university retention strategies on the persistence and academic success of Alaska Native science, technology, engineering, and mathematics undergraduates who participated in ANSEP at University of Alaska Anchorage (UAA), a Master's I public university in Anchorage, Alaska.

This external evaluation reviewed the effectiveness and consistency over time of the existing ANSEP evaluation measures and metrics—the ANSEP survey and ex post facto reviews of enrollment and graduation data—and presented recommendations for any additional or more relevant measures and metrics for future consideration.

External Evaluator

Dr. T. Tylor Behrens served as the external evaluator. He has 20 years of higher education at private and public institutions and private industry experience, with a Doctorate in Higher Education Management from UCLA and a Master's Degree in Counseling Psychology from the University of Arizona.

After serving as a career counselor with the University of Arizona's Career Center, Dr. Behrens became the Director of Career Services for Roosevelt University in Chicago and was appointed Executive Director of Career Services at Southern Methodist University (SMU) in Dallas. Dr. Behrens also served 9 years as Business Development Manager and Director of College Relations for Siemens where he earned The Siemens TOP+ Award for Innovative Engineering Business Solutions as well as a Global Recruiting Best Practices Award for preparing engineering majors for the workforce.

He is currently Assistant Vice President of Student Affairs at SMU and current responsibilities include assessment. Dr. Behrens is also Vice President of Workforce Curriculum Development for ASCL, Inc. He has authored 65 career management articles and five books.

Background

In 2007, the executive director for ANSEP collaborated with a doctoral student on study of the impact of the ANSEP university retention program on the retention and graduation rates of Alaska Native undergraduate engineering students enrolled at the University of Alaska Anchorage. The 2007 research was a single-institution mixed-method study.

Twenty years of quantitative data were collected and analyzed through an ex post facto study of archival enrollment and graduation data. One of the findings of the study was that significantly more, ($p < .05$), Alaska Native students were awarded bachelor of science degrees in civil engineering during the ten-year period after ANSEP began compared to the prior ten-year period (Lazzell, 2007).

A university retention program assessment survey was designed for the 2007 study to collect and analyze quantitative and qualitative data on the perceptions of the Alaska Native engineering undergraduates who participated in ANSEP at UAA. Specifically, the survey was designed to study currently enrolled ANSEP engineering undergraduate perceptions of the value and importance of the components of the ANSEP university retention program; their perceptions of the quantity and quality of their interactions with ANSEP peers, faculty, university staff, and the university system; and who they deem most important in helping them persist and be academically successful in college. The data collected from the survey were also analyzed for evidence of social and academic integration, educational goal commitment, institutional commitment, congruence with the university, and a local model of student expertise peer support (Lazzell, 2007).

The 2007 ANSEP Survey results suggested that ANSEP students perceived ANSEP-related experiences as having important and positive impacts on their success as students. The top eight ANSEP-related experiences that were most frequently ranked as having the *most* positive impact on their success as a student by the 2007 survey respondents were:

- (1) Attending ANSEP tutoring/recitation sessions together
- (2) Studying with other ANSEP students outside of classes
- (3) Taking classes with other ANSEP students
- (4) Receiving ANSEP scholarship funding
- (5) Experiencing ANSEP summer internships
- (6) Attending weekly ANSEP meetings
- (7) Developing friendships with other ANSEP students
- (8) Socializing with other ANSEP students outside of class (Lazzell, 2007)

Additional 2007 ANSEP Survey results suggested that ANSEP university retention strategies positively influenced the academic and social integration of the ANSEP students. The 2007 survey results further suggested that ANSEP students experienced high levels of peer support from other ANSEP students and high levels of help from ANSEP faculty and staff. The 2007 respondents reported that they experienced a high level of institutional commitment and congruence, or student-institution fit, within the UAA environment. The 2007 respondents reported a high level of educational goal commitment to completing bachelor's degrees in engineering. The 2007 survey respondents indicated in their responses to open-ended sentence completion questions that ANSEP created a supportive and safe learning community that was respectful of Alaska Native students and their cultures (Lazzell 2007).

2010 Methodology

This 2010 evaluation of the ANSEP metrics was designed as a single-institution mixed model validation study of the 2007 ANSEP university retention component assessment survey. This 2010 study replicated the 2007 ANSEP Survey instrument that included quantitative closed-ended questions and qualitative open-ended questions. The 2010 study used the basic design of the 2007 ANSEP survey instrument that was updated to reflect any programmatic and participant changes related to ANSEP at UAA since 2007. The 2010 ANSEP survey was delivered in a web-based format using the *SurveyMonkey* web-based survey tool during February 2010.

The current study expanded the 2010 survey participant pool beyond Alaska Native engineering ANSEP participants. All ANSEP participants currently enrolled at UAA during the 2010 spring semester were invited to complete the 2010 ANSEP survey. This included ANSEP participants of all ethnicities and races and undergraduate science, technology, engineering, and mathematics (STEM) degree programs. For the purposes of this evaluation, only the survey results for the Alaska Native STEM undergraduates who participated in ANSEP at UAA during the 2010 spring semester and completed the survey are presented in this management summary. The survey data for all survey respondents are included in the full report appendices.

In Part I, the 2010 item choice survey results are summarized and presented in tables using percentages and frequency statistics. Responses to the open-ended sentence completion items were analyzed for common themes regarding educational and personal experiences and opinions related to ANSEP and are presented in a narrative format and in tables. In Part II, 2010 and 2007 comparisons of results for Alaska Native ANSEP engineering undergraduates who responded to the survey are presented in similar formats. All tables are presented in the full report.

As a validation study of the 2007 ANSEP Survey, this survey set a 60 percent or higher benchmark for survey responses to be considered an important finding, consistent with the benchmark set in the 2007 survey. A 60 percent or higher response rate benchmark for important concepts addressed in the 2007 ANSEP survey was set after consultation with an expert in the field of survey design. Lazzell (2007) stated

According to Dr. Rice, a 60 percent response on a survey item choice, such as “strongly agree”, or on an aggregate of like survey items choices, such as joining “agree” and “strongly agree”, is considered an important finding. Dr. Rice stated that a 60 percent response rate is considered important because it represents a preponderance of those responding to the survey item. (p. 127-128)

Part I – 2010 ANSEP Survey Results for UAA Alaska Native ANSEP STEM Respondents

Introduction

On February 19, 2010, the 2010 ANSEP Survey was first administered using an online *SurveyMonkey* application in the UAA ANSEP Building's Collaborative Learning Lab. An outside reviewer was enlisted as the external reviewer's proxy to oversee the survey process. The proxy asked all potential participants if they were willing to listen to the informed consent information and consider taking survey. All students agreed to participate in the informed consent presentation. One hundred and two ANSEP students completed the online survey over the course of a one-week period from February 19 to 26, 2010.

Demographics of Alaska Native STEM Respondents

The 2010 target population for this evaluation was 56 ANSEP participants who were Alaska Native undergraduates pursuing bachelor of science degrees in STEM fields and enrolled at UAA during the 2010 spring semester. There were 52 Alaska Native participants who met all the inclusion criteria and completed the 2010 ANSEP survey. This represents a 93% response rate for the 2010 target population. There were 36 Alaska Native engineering respondents, 10 Alaska Native science and math respondents, and 6 Alaska Native technology respondents.

Gender

All 52 Alaska Native ANSEP respondents provided their gender information on the survey. Of these 52 respondents, 58% were males and 42% were females. The 36 Alaska Native ANSEP engineering respondents consisted of 23 males (63.9%) and 13 females (23.1%). The 10 Alaska Native ANSEP science and math respondents yielded 2 males (20%) and 8 females (80%). Finally, the 6 Alaska Native ANSEP technology respondents consisted of 5 males (83.3%) and 1 female (16.7%).

Parental collegiate experiences

Of the 52 Alaska Native STEM respondents to the question on parental college attendance, 21.2%, or 11, indicated that neither parent had attended college. Of the 51 Alaska Native STEM respondents (one skipped the question) to the question on parental bachelor's degree or higher attainment, 54.7%, or 29, indicated that neither parent had earned a bachelor's degree or higher.

ANSEP funding status

Of the 52 Alaska Native STEM respondents to the question on ANSEP scholarship funding, 86.6%, or 44, reported that they had received scholarship funding from ANSEP.

There were 52 responses to the question, "*I have received other sources of financial support from ANSEP (stipends for leading study group/recitation sessions, awards for GPA or student achievement, student wages, etc.)*." Thirty-two of the fifty-two Alaska Native STEM respondents, or 61.5%, reported that they had received other sources of financial support from ANSEP while attending UAA.

Length of ANSEP involvement

There were 52 Alaska Native STEM respondents to the question about the length of ANSEP involvement. Nineteen of the 52 STEM respondents, or 36.5%, indicated that this was their first year being involved with the UAA ANSEP university retention component. Twenty-four of the 52 Alaska Native STEM respondents, or 46.2%, indicated that they had been involved with the UAA ANSEP university retention component for two to three years. Nine of the 52 STEM respondents, or 17.3%, indicated that they had been involved with the UAA ANSEP university retention component for four or more years.

Participation in ANSEP pre-college or summer bridge programs

There were 52 responses to the question on involvement in the ANSEP pre-college program as well as on the question pertaining to involvement in the ANSEP summer bridge program. Nine of the 36 Alaska Native engineering respondents, or 25%, participated in the ANSEP pre-college program while in high school, compared to three of the ten (30%) Alaska Native science and math respondents and one of the six (16.7%) Alaska Native technology respondents.

Thirteen of the thirty-six Alaska Native engineering respondents, or 37.1%, participated in the ANSEP summer bridge program prior to attending UAA, compared to six of the ten (60%) Alaska Native science and math respondents and three of the six (50%) Alaska Native technology respondents.

Plans after graduation

There were 52 responses to the question “*After graduation I plan on... (Check Only One).*” Only 5.8% of the 52 respondents indicated that they did not know what they were going to do after graduation. Nearly 53% of Alaska Native engineering respondents, 50% of Alaska Native technology respondents, and 20% of the science and math respondents stated they planned on working in a field related to their degrees. Additionally, under the “*Doing something else*” more respondent plans to work in fields related to their degrees were revealed. One technology respondent reported planning on “*Working in the field then going back to school as an engineering student*” and one engineering respondent stated plans to “*Go crab fishing first, then work in a field related to my degree.*”

Forty-two percent of the fifty-two Alaska Native STEM respondents indicated they planned on attending graduate school. Twelve respondents chose “*After graduation I plan on attending graduate school.*” Seven respondents chose “*After graduation I plan on attending graduate school after working in a field.*” Three respondents indicated they planned on attending graduate school in their responses to “*Doing something else*”, where two Alaska Native science and math respondents stated that they plan to 1) “*Attend chiropractic school*”; and 2) “*Attend medical school.*” One Alaska Native technology respondent stated that he/she plans on “*Working in the field then going back to school as an engineering student.*”

Finally, across the three STEM groups, 44 of 52 Alaska Native survey respondents, or 85%, reported that they “quite often” or “almost always” felt confident that what they were studying would lead to the job or career they wanted (70% of the Science & Math, 83% of the Technology and 89% of the Engineering).

Survey Results for UAA Alaska Native ANSEP STEM Respondents

The 2010 research project was a validation study of 2007 ANSEP research that studied university retention strategies for Alaska Native STEM students participating in ANSEP at UAA. Part I reports the results for all 2010 Alaska Native STEM survey respondents and Part II reports the results for 2010 Alaska Native engineering respondents compared to the results of the 2007 Alaska Native engineering respondents.

What factors relating to the ANSEP university retention program did Alaska Native STEM ANSEP participants perceive as important positive contributors to their success in college?

There were 15 ANSEP-related item choices and 5 item choices not related to ANSEP listed on the 2010 survey for this question. The 15 ANSEP-related item choices were:

- Developing friendships with ANSEP students
- Attending ANSEP weekly meetings
- Socializing with ANSEP students outside of class
- Studying with ANSEP students outside of class
- Taking classes with other ANSEP students
- Participating in an ANSEP summer internship
- Receiving funding from ANSEP
- Participating in ANSEP social/recreational activities
- Participating in ANSEP Summer Bridge
- Attending ANSEP tutoring/ recitation sessions
- Having contact with ANSEP faculty/staff
- Working with ANSEP students in the summer
- Participating in ANSEP pre-college program
- Living in ANSEP Engineering/Alyeska Wing
- Leading ANSEP tutoring/recitation sessions

Ten of fifteen ANSEP-related experiences listed on the 2010 survey were chosen by 60% or more of the 52 Alaska Native STEM survey respondents as important contributors to their success in college. Consistent with the 2007 study, a response rate of 60% or more for an item was a benchmark set for an important finding in this evaluation.

These results indicate that 10 items received response rates above 60% from the 2010 Alaska Native STEM survey respondents as a whole, which was consistent with the results for the 2007 Alaska Native engineering survey respondents for this question. Refer to the entire report for the three individual group response rates (technology, science and math, and engineering). See Table 1.1 for results.

Table 1.1: Factors relating to the ANSEP university retention program that UAA Alaska Native ANSEP STEM students reported as important positive contributors to their success in college, Spring 2010 Semester.

(Only Answer Options with 60% or more responses are listed.)

ANSEP-Related Item Response Choices	Frequency	% of Total Respondents
Attending ANSEP weekly meetings	50/52	96.2%
Developing friendships with ANSEP students	49/52	94.2%
Socializing with ANSEP students outside of class	48/52	92.3%
Attending ANSEP tutoring/ recitation sessions	44/52	84.6%
Receiving funding from ANSEP	43/52	82.7%
Taking classes with other ANSEP students	42/52	80.8%
Studying with ANSEP students outside of class	41/52	78.8%
Participating in ANSEP social/recreational activities	39/52	75.0%
Having contact with ANSEP faculty/staff	38/52	73.1%
Participating in an ANSEP summer internship	36/52	69.2%

*n = 52 respondents . **An item response choice selected by 60% or more of the survey respondents is considered an important finding in this study. ***20 item choices in survey questions in Part II of the survey.

What factors relating to the ANSEP university retention program did Alaska Native STEM ANSEP participants perceive as having the most significant positive impact on their success in college?

The survey participants were then directed to *rank* the top seven responses of items listed in the previous question that they perceived as having the *most* significant positive impact on their success in college in the 2010 survey. A review of the responses revealed that 39 of the 52 Alaska Native STEM ANSEP survey respondents correctly followed the instructions for ranking items for this question. See Table 1.2 for ranking results for those 39 respondents.

Table 1.2: Experiences that UAA Alaska Native ANSEP STEM students most frequently ranked as one of the “Top 7” university experiences that had the most positive impact on their success as a student, Spring 2010 Semester.

Most Frequently Chosen “Top 7” Ranked Item Choices	Number of “Top 7” Ranks	Percentage of Total Respondents
ANSEP tutoring/recitation sessions	(1 st) 32	**82.0%
ANSEP Friday/pizza meetings	(2 nd) 31	**79.4%
Funding from ANSEP	(3 rd) 29	**74.3%
Studying together outside of class	(4 th) 23	58.9%
Socializing together outside of class	(5 th) 22	56.4%
Participating in ANSEP summer internship	(6 th) 20	51.2%
Taking classes together	(7 th) 19	48.7%

*n = 39 respondents to survey question 2 in Part II. **An item response choice selected by 60% or more of the survey respondents that appears above the dotted line is considered an important finding in this study. ***There were 20 response choices in Part II of the survey.

Consistent with the 2007 ANSEP Survey, two survey questions were asked about the perceptions of the Alaska Native ANSEP participants on who helped them the most to be academically successful and to stay in college. According to Lazzell (2007)

ANSEP faculty or staff were most often identified by survey respondents as the individuals who helped them the most to stay in college. Faculty and staff have been found to be important facilitators of the academic and social integration of Native American college students (Cibik & Chambers, 1991; Hornett, 1989). Family members not in ANSEP were the second most identified individuals helping survey respondents stay in college. Encouragement and support from family was found to positively impact Native American college student persistence (Jackson et al., 2003; Rindone, 1988). (p. 183)

Which individuals did Alaska Native STEM ANSEP participants perceive as having the most significant positive impact on their persistence in college?

Consistent with the 2007 ANSEP Survey, the concept of persistence in college was presented on the survey as “staying in college”.

The Technology survey respondents identified the ANSEP faculty and staff as the individuals who helped them the most to stay in college (83%). Family members not in ANSEP were the second most frequently selected individuals perceived as helping survey respondents the most to stay in college (80% of science and math respondents). This was also the only response option that all three STEM groups identified at least once. No additional individuals met the 60%+ benchmark needed to be considered an important finding related to helping the survey respondents the most to stay in college. See Table 1.3 for results.

Table 1.3. Individuals helping UAA Alaska Native ANSEP STEM students the most to stay in college, Spring 2010 Semester.

Response Option	Science & Math (N=10)	Technology (N=6)	Engineering (N=36)
ANSEP faculty/staff member	40% (4)	66% (4)*	36% (13)
Another ANSEP student	30% (3)	16% (1)	22% (8)
UAA student not in ANSEP			
Family member not in ANSEP	20% (2)		33% (12)
Significant other not in ANSEP		16% (1)	3% (1)
Friend I knew before coming to UAA			3% (1)
Another UAA faculty/staff member	10% (1)		3% (1)

*An individual item response choice selected by 60% or more of the survey respondents is considered an important finding in this study.

Which individuals did Alaska Native STEM ANSEP participants perceive as having the most significant positive impact on their academic success in college?

Technology survey respondents identified ANSEP faculty or the ANSEP staff as the individuals who had the most significant impact on their academic success in college, with 66% of the respondents selecting the response choice. Another ANSEP student was the only identified group of individuals that was selected across all three STEM groups at least once. Family members not in ANSEP were the third most frequently identified group, although the numbers were not enough to meet the 60%+ benchmark for an important finding in this study. See Table 1.4 for results.

Table 1.4. Individuals having the most significant positive influence on the UAA Alaska Native ANSEP STEM students' academic success in college, Spring 2010 Semester.

Response Option	Science & Math (N=10)	Technology (N=6)	Engineering (N=36)
ANSEP faculty/staff member		83% (5)*	31% (11)
Another ANSEP student	20% (2)		16% (6)
UAA student not in ANSEP			
Family member not in ANSEP	80% (8)*	16% (1)	33% (12)
Significant other not in ANSEP			16% (6)
Friend I knew before coming to UAA			3% (1)
Another UAA faculty/staff member			

*An individual item response choice selected by 60% or more of the survey respondents is considered an important finding in this study.

What evidence existed, if any, that the ANSEP student participants transferred campus-specific knowledge to other ANSEP student participants to help their peers overcome barriers to academic and personal success?

The questions in this section were originally designed for the 2007 ANSEP Survey to determine if there was any evidence of the Padilla et al. (1997) local model of student expertise among Alaska Native ANSEP survey respondents. According to Lazzell (2007)

A local model of student expertise proposed by Padilla et al. (1997) focused on the transfer of campus-specific knowledge that successful students of color had acquired and the actions they took to solve problems and overcome difficulties they experienced while in college. Padilla et al. found that this practical knowledge was passed along from the more experienced students of color to the new students of color through individual contacts or through ethnic/race-based student organizations. The survey respondents in this study reported high levels of student support and transfer of campus-specific knowledge within the ANSEP culture that were much like the local model of student expertise. (p. 186)

The results suggest that a local model of expertise exists among the 2010 Alaska Native STEM students who participate in ANSEP university success components. These results are consistent with the 2007 survey responses for Alaska Native engineering survey participants. See Table 1.5 for results.

Table 1.5. A local model of student expertise: UAA Alaska Native ANSEP STEM students, Spring 2010 Semester.

STEM	Have you provided enough information that helped an ANSEP student become more successful in his/her UAA classes?	Have you provided enough encouragement that helped an ANSEP student become more effective in navigating the administrative system at UAA?	Have you provided enough encouragement to an ANSEP student so he/she felt more at ease (comfortable) while attending UAA?	Has an ANSEP student provided you with enough information that helped you become more effective in navigating the administrative system at UAA?	Has an ANSEP student provided you with enough information that helped you become more successful in your UAA classes?
	<i>YES response</i>	<i>YES response</i>	<i>YES response</i>	<i>YES response</i>	<i>YES response</i>
Science & Math N=(10)	60%* (6)	50% (5)	88%* (8/9)	40% (4)	70%* (7)
Technology N=(6)	100%* (6)	67%* (4)	100%* (6)	83%* (5)	100%* (6)
Engineering N=(36)	86%* (31)	63%* (22/35)	89%* (32)	75%* (27)	100%* (36)

*An individual item response choice or a combined choice selected by 60% or more of the survey respondents is considered an important finding in this study.

What were the types and levels of academic and social engagement of the Alaska Native STEM ANSEP participants at the university?

Consistent with the 2007 ANSEP Survey, indicators of student involvement, a sense of belonging, self-efficacy, social integration, academic integration, commitment to educational goals and institution were used to measure academic and social engagement. Positive responses, “quite a bit” and “a lot”, on survey responses were also joined together for this analysis. Results suggest that there were high levels of academic and social engagement among the Alaska Native STEM survey respondents who participated in ANSEP university success components. See results in Table 1.6 and Table 1.7.

Table 1.6. Levels of student involvement of the UAA Alaska Native ANSEP STEM students, Spring 2010 Semester.

Response Option	Science & Math (N= 10)			Technology (N=6)			Engineering (N=36)		
	A Bit	A Lot	Combined	A Bit	A Lot	Combined	A Bit	A Lot	Combined
I have learned how to manage my time better.	40% (4)	40% (4)	80%	0.0% (0)	83% (5)	83%	39% (14)	39% (14)	78%
I have learned how to be more successful in my classes.	50% (5)	30% (3)	80%	0.0% (0)	83% (5)	83%	28% (10)	61% (22)	89%
I have learned how to successfully navigate the UAA system.	40% (4)	40% (4)	80%	0.0% (0)	83% (5)	83%	19% (7)	58% (21)	77%
I have learned ways to find funding for my education.	20% (2)	50% (5)	70%	0.0% (0)	67% (4)	67%	22% (8)	58% (21)	80%
I have had help figuring out which type of career I want.	30% (3)	40% (4)	70%	17% (1)	50% (3)	67%	28% (10)	44% (16)	72%
I've had opportunities to work in engineering- or science-related jobs.	20% (2)	60% (6)	80%	17% (1)	50% (3)	67%	22% (8)	61% (22)	83%
I've participated in ANSEP social/recreational activities.	20% (2)	50% (5)	70%	17% (1)	0.0% (0)	17%	47% (17)	25% (9)	72%
I have made friends with other ANSEP students.	40% (4)	50% (5)	90%	0.0% (0)	50% (3)	50%	22% (8)	64% (23)	86%
I have lived with other ANSEP students on campus.	10% (1)	30% (3)	40%	0.0% (0)	0.0% (0)	0%	8% (3)	11% (4)	19%
I have lived with other ANSEP students off campus.	0.0% (0)	10% (1)	10%	0.0% (0)	0.0% (0)	0%	3% (1)	6% (2)	9%
I have gotten to know ANSEP faculty/staff.	20% (2)	50% (5)	70%	17% (1)	67% (4)	84%	22% (8)	64% (23)	86%

*An individual item response choice or a combined choice selected by 60% or more of the survey respondents considered an important finding in this study.

A basic element of a student's successful social and academic engagement is feeling comfortable within the university setting (Tinto, 1993). Consistent with the 2007 ANSEP Survey, items were included in the 2010 ANSEP Survey to measure components of academic and social integration. Previous sections of this report contain valuable social and academic engagement data. Questions in Table 1.7 were designed to assess additional measures of academic and social engagement of the survey respondents.

Table 1.7. Levels of academic and social engagement, as measured by UAA Alaska Native ANSEP STEM students' perceptions of sense of belonging and self-efficacy, Spring 2010 Semester.

Response Option	Science & Math (N= 10)			Technology (N=6)			Engineering (N=36)		
	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined
I feel comfortable being a student at UAA.	40% (4)	50% (5)	90%	33% (2)	50% (3)	83%	19% (7)	72% (26)	91%
I feel like the ANSEP faculty/staff care about my success as a student.	10% (1)	70% (7)	80%	17% (1)	83% (5)	100%	14% (5)	86% (31)	100%
I enjoy what I am studying.	40% (4)	30% (3)	70%	17% (1)	67% (4)	84%	14% (5)	60% (21)	74%* (26/35)
I feel confident that I will earn a bachelor's degree.	20% (2)	60% (6)	80%	33% (2)	67% (4)	100%	17% (6)	75% (27)	92%
I feel confident that I will earn a bachelor's degree in engineering, science (including mathematics) or technology (including construction management).	30% (3)	50% (5)	80%	33% (2)	67% (4)	100%	25% (9)	69% (25)	94%
I feel confident that what I am studying will lead to the job/career I want.	20% (2)	50% (5)	70%	17% (1)	67% (4)	84%	25% (9)	64% (23)	89%
I feel like other ANSEP students care about my success as a student.	30% (3)	30% (3)	60%	33% (2)	67% (4)	100%	36% (13)	39% (14)	75%
ANSEP helps motivate me to continue studying engineering, science (including mathematics) or technology (including construction management).	10% (1)	50% (5)	60%	17% (1)	83% (5)	100%	25% (9)	72% (26)	97%
ANSEP provides resources to help me be more academically successful.	30% (3)	50% (5)	80%	17% (1)	83% (5)	100%	17% (6)	81% (29)	98%

*On this item choice there were 35 engineering respondents. **An individual item response choice or a combined choice selected by 60% or more of the survey respondents is considered an important finding in this study.

What was the level of congruence between the Alaska Native STEM ANSEP participants and the public university that they attended?

One survey item was included on the 2010 ANSEP Survey to assess the level of congruence, or student-institution fit, between the Alaska Native ANSEP participants and UAA. This question was replicated on the 2010 survey.

These results suggest that Alaska Native ANSEP STEM respondents experienced very high levels of feeling comfortable being students at UAA, a measure of congruence with UAA. This is consistent with the 2007 ANSEP Survey results for Alaska Native ANSEP engineering survey respondents. See results in Table 1.8.

Table 1.8. Level of congruence with UAA, as measured by UAA Alaska Native ANSEP STEM students' perceptions of a sense of belonging at UAA, Spring 2010 Semester.

Response Option	Science & Math (N= 10)			Technology (N=6)			Engineering (N=36)		
	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined
I feel comfortable being a student at UAA.	40% (4)	50% (5)	90%	33% (2)	50% (3)	83%	19% (7)	72% (26)	91%

*An individual item response choice or a combined choice selected by 60% or more of the survey respondents is considered an important finding in this study.

What was the level of commitment of the Alaska Native STEM ANSEP participants to obtaining their education goals?

Consistent with the 2007 ANSEP Survey, four questions were included in the 2010 ANSEP Survey to assess the Alaska Native ANSEP participants' levels of commitment to obtaining their educational goals. Those questions were:

- "I enjoy what I am studying."
- "I feel confident that I will earn a bachelor's degree."
- "I feel confident that I will earn a bachelor's degree in engineering, science (including mathematics) or technology (including construction management)"
- "I feel confident that what I am studying will lead to the job/career I want."

The response choices "quite often" or "almost always" were considered positive responses and joined for the analysis of the data from this part of the survey. Below are the findings when the three STEM group responses were analyzed as one whole STEM group.

- 73% reported that they quite often or almost always enjoyed what they were studying.
- 93% reported that they quite often or almost always felt confident that they would earn a bachelor's degree (80% of the Science & Math, 100% of the Technology and 92% of the Engineering).
- 92% reported that they quite often or almost always felt confident that they would earn a bachelor's degree in engineering, science (including mathematics) or technology (including construction management (80% of the Science & Math, 100% of the Technology and 94% of the Engineering).
- 85% reported that they quite often or almost always felt confident feel confident that what they were studying would lead to the job or career they wanted (70% of the Science & Math, 84% of the Technology and 89% of the Engineering).

These results suggest that Alaska Native STEM survey respondents experienced high levels of self-efficacy and commitment to obtaining their educational goals. See Table 1.9 for results.

Table 1.9: Level of commitment of the UAA Alaska Native ANSEP STEM students to obtaining their education goals, Spring 2010 Semester.

Response Option	Science & Math (N= 10)			Technology (N=6)			Engineering (N=36)		
	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined
I enjoy what I am studying.	40% (4)	30% (3)	70%	17% (1)	67% (4)	84%	14% (5)	60% (21)	74%* (26/35)
I feel confident that I will earn a bachelor's degree.	20% (2)	60% (6)	80%	33% (2)	67% (4)	100%	17% (6)	75% (27)	92%
I feel confident that I will earn a bachelor's degree in engineering, science (including mathematics) or technology (including construction management).	30% (3)	50% (5)	80%	33% (2)	67% (4)	100%	25% (9)	69% (25)	94%
I feel confident that what I am studying will lead to the job/career I want.	20% (2)	50% (5)	70%	17% (1)	67% (4)	84%	25% (9)	64% (23)	89%

*35 engineering respondents responded to this item choice. **An individual item response choice or a combined choice selected by 60% or more of the survey respondents is considered an important finding in this study.

What was the level of commitment of the Alaska Native STEM ANSEP participants to continued attendance at the public university that they currently attended?

Consistent with the 2007 ANSEP Survey, five questions were included in the 2010 ANSEP Survey to assess the Alaska Native ANSEP STEM respondents' levels of commitment to continued attendance at UAA by measuring their levels of academic and social engagement. Those questions were:

- "I feel comfortable being a student at UAA."
- "I feel like the ANSEP faculty/staff care about my success as a student."
- "I feel like other ANSEP students care about my success as a student."
- "ANSEP helps motivate me to continue studying engineering, science (including mathematics) or technology (including construction management)."
- "ANSEP provides resources to help me be more academically successful".

These results suggest that the Alaska Native STEM respondents experienced high levels of commitment to continued attendance at UAA. See results in Table 1.10.

Table 1.10. Levels of commitment to continued attendance at UAA of the UAA Alaska Native ANSEP STEM students, Spring 2010 Semester.

Response Option	Science & Math (N= 10)			Technology (N=6)			Engineering (N=36)		
	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined	Quite Often	Almost Always	Combined
I feel comfortable being a student at UAA.	40% (4)	50% (5)	90%	33% (2)	50% (3)	83%	19% (7)	72% (26)	91%
I feel like the ANSEP faculty/staff care about my success as a student.	10% (1)	70% (7)	80%	17% (1)	83% (5)	100%	14% (5)	86% (31)	100%
I feel like other ANSEP students care about my success as a student.	30% (3)	30% (3)	60%	33% (2)	67% (4)	100%	36% (13)	39% (14)	75%
ANSEP helps motivate me to continue studying engineering, science (including mathematics) or technology (including construction management).	10% (1)	50% (5)	60%	17% (1)	83% (5)	100%	25% (9)	72% (26)	97%
ANSEP provides resources to help me be more academically successful.	30% (3)	50% (5)	80%	17% (1)	83% (5)	100%	17% (6)	81% (29)	98%

* An individual item response choice or a combined choice selected by 60% or more of the survey respondents is considered an important finding in this study.

2010 Open-Ended Question Results for UAA Alaska Native ANSEP STEM Respondents

Consistent with the 2007 ANSEP Survey, four open-ended sentence completion survey items were included in Part VI of the 2010 ANSEP Survey to further explore the Alaska Native STEM respondent's opinions of their experiences as university students and ANSEP participants. Their responses were analyzed for common themes. Summaries and tables of the common themes can be found in this section. Complete responses by Alaska Native STEM respondents to open-ended questions in Part IV can be found in the full report appendices.

Question One: Advice to High School Students

"One thing I recommend that high school students from my community do to prepare for studying engineering and/or science in college is (and state why)" (50 of 52 Alaska Native respondents):

"Make sure to develop GREAT study habits. Do the homework, make and go to study groups, get help from the teacher. TAKE MATH ALL FOUR YEARS OF HIGH SCHOOL! If you don't, math will seem more difficult as a freshman, in any college."

---Science Student

"Research all the resources available at school (such as computer labs, free printing services with hours of operation, where you can get free coffee, clubs you might like, extracurricular activities on and off campus like working out at school, or attending music events as some examples) and outside (such as non- UAA scholarships)."

---Engineering Student

"Public speaking. Because public speaking increases confidence significantly (if one learns to talk in front of a crowd and learn there are no negative sides to it, one learns that talking with groups and other people is easy too), and so students would be more outgoing to seek out help, friends, and speak with their voice."

---Technology Student

Summary of Themes

Field	Number of Mentions*
Take more math & science classes	15
Study hard, get into study groups	6
Think/plan ahead (classes & career)	5
Get a strong understanding of math principles	5
Take AP level math & science classes	5
College will be tough, but stick with it	4

*For tabulation purposes, a "mention" of a particular topic/theme means that it is the main item of discussion in the student narratives. Some open-ended responses made multiple "mentions" of many helpful services/programs/people. Those statements that had one or two clear themes were tabulated and given a specific category in the table above.

Question Two: Academic Advising

“When I seek academic advising, I typically go to (an ANSEP advisor, faculty, another student, family member, etc) and please state why” (50 of 52 Alaska Native respondents):

“When I seek academic advising I only go to an ANSEP Advisor or faculty member, because I know that their doors are always open to me, and they sincerely care about me, my academic success, and my future. I get the most support from people who have been in this degree program and come from a similar back ground.”

--- Engineering Student

“I typically go to an ANSEP advisor because I know that anyone who works with ANSEP is always willing and they help me out a lot. If they do not have the resources to immediately assist me, they direct me in to someone who does.”

---Technology Student

“Another student because I'd rather talk to someone from my class that is working on the same material.”

---Science Student

Summary of Themes

Field	Number of Mentions*
ANSEP Advisor/Staff (Caring, Open Door, Trust Them)	20
Another ANSEP Student (Tells which classes are best)	8
Faculty (ANSEP faculty provide more encouragement)	5

*For tabulation purposes, a “mention” of a particular topic/theme means that it is the main item of discussion in the student narratives. Some open-ended responses made multiple “mentions” of many helpful services/programs/people. Those statements that had one or two clear themes were tabulated and given a specific category in the table above.

Question Three: Most Memorable ANSEP Experiences

“What I think I will remember the most about ANSEP years from now is (and state why)” (51 of 52 Alaska Native respondents):

“I will remember most) the friendships I've made. I had a hard time making friends my own age in school before I came to ANSEP. Now I have more friends at UAA than I have ever had in elementary, middle or high school. ANSEP helped me overcome my personal social barriers and make new friends my own age.”

--- Engineering Student

“I will remember what kind of confidence and attitude ANSEP has given me. I will remember how ANSEP has given me a community of students and staff with similar interests, facing similar challenges, whom I could call upon for help.”

---Science Student

"I will remember that ANSEP provided the opportunity to succeed, and the resources to make a dream a reality. I wouldn't be this close to graduating without ANSEP's support."

---Technology Student

Summary of Themes

Field	Number of Mentions*
Making Friends	9
Encouragement & Support	8
Sense of Community & Belonging	7
Feeling Welcome	6

*For tabulation purposes, a "mention" of a particular topic/theme means that it is the main item of discussion in the student narratives. Some open-ended responses made multiple "mentions" of many helpful services/programs/people. Those statements that had one or two clear themes were tabulated and given a specific category in the table above.

Question Four: Important Experiences Not Addressed in Survey

"Something about my ANSEP experience that has not been covered in this survey and that is important to me is (and state why)" (44 of 52 Alaska Native respondents):

"If it had not been for the ANSEP summer bridging program I would have gone to school out of state, be in debt for \$1,000s, and possibly have struggled to earn a degree. Thanks to ANSEP, I am debt free and doing well in school has almost always been easy."

--Engineering Student

"The many internship opportunities with companies that keep in contact with ANSEP, I'm sure, help keep students to be motivated in successfully finishing school."

---Math Student

"The summer bridge and precollege components are amazing opportunities that you should jump at if given the chance."

---Science Student

"Getting in contact with my culture and the cultures of other Alaska Natives."

---Technology Student

Summary of Themes

Field	Number of Mentions*
Gaining Advice About Studying	8
Feeling Welcome	5
Support with Personal Life	4
Financial Assistance	4
Cultural Learning/Connections	4
Programs: Summer Bridge, Internships, etc.	4
Making Friends	3
Great Faculty and Staff	3
ANSEP Building	2

*For tabulation purposes, a "mention" of a particular topic/theme means that it is the main item of discussion in the student narratives. Some open-ended responses made multiple "mentions" of many helpful services/programs/people. Those statements that had one or two clear themes were tabulated and given a specific category in the table above.

Summary of Open-Ended Questions

The 52 Alaska Native STEM participants in this study responded to these open-ended survey questions, and for the most part, friendships and community were frequently mentioned as important in response to this item.

“The sense of community (is important to me). It is not just one person that makes ANSEP memorable (although the ANSEP executive director does a good job towards that). ANSEP is a community of people, like a neighborhood where everyone knows each other and everyone helps each other when something needs to get done. That sense of community gives you a feeling of security, safety and acceptance that I have rarely felt outside of my home and my religion.”

--- Engineering Student

“The whole ANSEP situation is admirable. It forms a community of individuals with all different backgrounds, all aiming for a similar goal. But it's not a competition, we're all in this together and we'll all be successful, because ANSEP teaches the idea that anyone can be successful as long as they put the right effort and approach into their education.”

---Science Student

“When I felt like giving up due to a class that I failed, and was unsuccessful in, I spoke with an ANSEP faculty member, and told them all my problems and how stressed I was, and didn't think I could handle it, I was encouraged to stick with it. They told me thier story of how they failed a class, and that i wasn't the end of the world. "It's a hard degree, and it's not a race". It made me feel better to know that it's not only difficult for me but for them as well, and they did it, and that so can I. I am grateful for all the encouragement and help that I have recived as an AMSEP member.”

---Technology Student

Summary of Themes

Field	Number of Mentions*
Helped students overcome personal & academic problems.	4
Benefiting from Summer Bridge	3
Grateful to the ANSEP Staff	3
Connecting with Various Native Cultures	2
Helped students make friends.	2
Offering Wonderful Internships	2

*For tabulation purposes, a “mention” of a particular topic/theme means that it is the main item of discussion in the student narratives. Some open-ended responses made multiple “mentions” of many helpful services/programs/people. Those statements that had one or two clear themes were tabulated and given a specific category in the table above.

Summary of 2010 ANSEP Survey Findings and Conclusions for UAA Alaska Native ANSEP STEM Respondents

This study focused on analyzing what factors contributed to the success of Alaska Native ANSEP undergraduate participants pursuing STEM degrees.

The 2010 Alaska Native STEM survey respondents, taken as a whole, and the 2007 Alaska Native engineering respondents chose the same ten ANSEP-related items as important contributors to their success as students frequently enough that those experiences met or exceeded the 60% benchmark response rate needed for an important finding in this study and the 2007 study. These are noted earlier in this report (See Table 1.1).

Each of the three Alaska Native 2010 survey groups (engineering, science and math, and technology) chose eight ANSEP-related experiences as important contributors to their success as students frequently enough that those experiences met or exceeded the 60% benchmark response rate needed for an important finding in this study. They were (unranked):

- Attending ANSEP tutoring/recitation sessions together
- Receiving ANSEP scholarship funding
- Participating in ANSEP summer internships
- Attending ANSEP weekly meetings
- Developing friendships with other ANSEP students
- Having contact with ANSEP faculty and staff
- Participating in ANSEP social/recreational activities
- Socializing with ANSEP students outside of class

Additionally, two ANSEP-related experiences met or exceed the 60% benchmark with the science and math group and the engineering group. Those experiences were studying with other ANSEP students outside of class and taking classes with other ANSEP students. Nearly 67% of science and math group chose ANSEP Summer Bridge as an important contributor to their success as a student, exceeding the 60% benchmark.

The top three ANSEP-related experiences that 60% or more of the ANSEP STEM respondents ranked as having the most positive impact on their success as a student by the 2010 survey respondents were, in order of ranking (See Table 1.2):

- (1) Attending ANSEP tutoring/recitation sessions together
- (2) Attending weekly ANSEP meetings
- (3) Receiving ANSEP scholarship funding

ANSEP faculty and staff were the most frequently chosen individuals who ANSEP STEM respondent groups identified as most helpful to their academic success. ANSEP faculty and staff, family members not in ANSEP, and other ANSEP students were the most frequently chosen individuals who ANSEP STEM respondent groups perceived as most helpful in motivating them to stay in college (See Tables 1.3 and 1.4).

Survey results suggested that local of local expertise and peer support was present among the ANSEP respondents where they transferred and received knowledge and support to be more

successful in classes, navigate UAA's administrative system, and feel more at ease at UAA (See Table 1.5)

There is additional evidence that academic and social engagement exists among the ANSEP students through high levels of involvement in ANSEP university retention strategies and support from ANSEP peers and ANSEP faculty and staff. ANSEP STEM survey respondents reported high levels of congruence with UAA by feeling comfortable as a student at UAA and commitment to continued attendance at UAA. They reported high levels of confidence and commitment to obtaining a bachelor's degree in their chosen fields and confidence that their chosen degrees will lead to a career they want. (See Tables 1.6, 1.7, 1.8, 1.9, 1.10).

A few common themes were discovered for the open-ended sentence completion questions (in order of the number of mentions): 1) helping students overcome personal and academic problems; 2) benefiting from Summer Bridge programs; 3) being grateful to the ANSEP staff; 4) connecting with various Native cultures; 5) helping students make friends; and 6) offering wonderful internships. These findings were consistent with previous research results for Alaska Native ANSEP participants attending UAA (Lazzell, 2007).

Part II - Comparisons of 2007 and 2010 ANSEP Survey Results for UAA Alaska Native ANSEP Engineering Respondents

The 2010 research project was a validation study of 2007 ANSEP research that studied university retention strategies for Alaska Native STEM students participating in ANSEP at UAA. Part I reports the results for all 2010 Alaska Native STEM survey respondents and Part II reports the results for 2010 Alaska Native engineering respondents compared to the results of the 2007 Alaska Native engineering respondents.

What factors relating to the ANSEP university retention program did Alaska Native engineering ANSEP participants perceive as important positive contributors to their success in college?

The same 10 ANSEP-related experiences were most often chosen by the 2007 and 2010 Alaska Native ANSEP engineering survey respondents as important contributors to their success in college. The 2010 Alaska Native engineering response rates for the 10 items also met the 60%+ benchmark set for an important finding in this study. They were (unranked):

- Attending weekly ANSEP meetings
- Attending ANSEP tutoring/recitation sessions together
- Taking classes with other ANSEP students
- Developing friendships with ANSEP students
- Socializing with ANSEP students outside of class
- Studying with ANSEP students outside of classes
- Receiving ANSEP funding
- Having contact with ANSEP faculty and staff
- Participating in ANSEP summer internships
- Participating in ANSEP social/recreational activities

These results indicate that the item response rates for the 2010 Alaska Native engineering survey respondents were consistent with those of the 2007 Alaska Native engineering respondents for this question. See Table 2.1 for results.

Table 2.1. ANSEP experiences perceived as important contributors to UAA Alaska Native ANSEP engineering student success, 2007 & 2010 comparison.

ANSEP-Related Item Response Choices	2007 % of Total Respondents	2010 % of Total Respondents
Attending ANSEP Friday pizza meetings	**95.3% (41/43)	**100.0% (36/36)
Attending ANSEP tutoring/ recitation sessions	**95.3% (41/43)	**91.7% (33/36)
Taking classes with other ANSEP students	**90.7% (39/43)	**91.7% (33/36)
Developing friendships with ANSEP students	**88.4% (38/43)	**91.7% (33/36)
Socializing with ANSEP students outside of class	**86.0% (37/43)	**94.4% (34/36)
Studying with ANSEP students outside of class	**83.7% (36/43)	**88.9% (32/36)
Receiving funding from ANSEP	**83.7% (36/43)	**86.1% (31/36)
Having contact with ANSEP faculty/staff	**74.4% (32/43)	**75.0% (27/36)
Participating in an ANSEP summer internship	**74.4% (32/43)	**66.7% (24/36)
Participating in ANSEP social/recreational activities	**65.1% (28/43)	**75.0% (27/36)

*n = 43 respondents in 2007; 36 respondents in 2010. **An item response choice selected by 60% or more of the survey respondents is considered an important finding in this study. ***22 response choices were in 2007 and 20 were in 2010. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher's exact test. No statistically significant differences exist, at the .05 level of significance.

What factors relating to the ANSEP university retention program did Alaska Native engineering ANSEP participants perceive as having the most significant positive impact on their success in college?

Respondents were then directed to *rank* the top seven responses of items listed in the previous question that they perceived as having the *most* significant positive impact on their success in college in the 2007 and 2010 surveys. A review of the 2010 responses revealed that 27 of the 36 Alaska Native engineering ANSEP survey respondents correctly followed the instructions for ranking items for this question. See Table 2.2 for the ranked results.

Table 2.2. Experiences UAA Alaska Native ANSEP engineering students most frequently ranked as one of the “Top 7” university experiences that had the most positive impact on their success as a student, 2007 & 2010 comparison.

Most Frequently Chosen “Top 7” Ranked Choices	2007	2010	
ANSEP tutoring/recitation sessions	**82.9% (1 st) (34/41)	**88.9% (1 st) (24/27)	
Studying together outside of class	**78.0% (2 nd) (32/41)	**63.0% (4 th) (17/27)	Tie
Taking classes together	**68.3% (3 rd) (28/41)	**63.0% (4 th) (17/27)	Tie
Funding from ANSEP	**63.4% (4 th) (26/41)	**74.0% (3 rd) (20/27)	
Participating in ANSEP summer internship	**61.0% (5 th) (25/41)	****	
ANSEP Friday/pizza meetings	58.5% (6 th) (24/41)	**81.5% (2 nd) (22/27)	
Contact with ANSEP faculty/staff	53.6% (7 th) (22/41)	51.8% (6 th) (14/27)	Tie
Socializing together outside of class	****	51.8% (6 th) (14/27)	Tie

*n = 41 respondents in 2007; 27 respondents in 2010 **An item response choice selected by 60% or more of the survey respondents is considered an important finding in this study. ***There were 22 response choices in 2007; 20 response choices in 2010. ****This item was not one of the most frequently ranked “Top 7” choices. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher’s exact test. No statistically significant differences exist, at the .05 level of significance.

Consistent with the 2007 ANSEP Survey, two survey questions were asked about the perceptions of the Alaska Native ANSEP participants on who helped them the most to be academically successful and to stay in college. According to Lazzell (2007)

ANSEP faculty or staff were most often identified by survey respondents as the individuals who helped them the most to stay in college. Faculty and staff have been found to be important facilitators of the academic and social integration of Native American college students (Cibik & Chambers, 1991; Hornett, 1989). Family members not in ANSEP were the second most identified individuals helping survey respondents stay in college. Encouragement and support from family was found to positively impact Native American college student persistence (Jackson et al., 2003; Rindone, 1988). (p. 183)

Which individuals did Alaska Native engineering ANSEP participants perceive as having the most significant positive impact on their persistence in college?

Consistent with the 2007 ANSEP Survey findings, 2010 Alaska Native ANSEP engineering survey respondents most frequently identified ANSEP faculty and staff members and family members not in ANSEP as individuals who have helped them the most to stay in college. See Table 2.3 for results.

Table 2.3. Individuals helping UAA Alaska Native ANSEP engineering students the most to stay in college, 2007 & 2010 comparison.

Item Response Choice	2007 % Total Responses	2010 % Total Responses
ANSEP faculty or staff	41.5%	30.5%
Family member not in ANSEP	34.1%	33.3%
Friend in ANSEP/Another ANSEP Student	17.1%	16.7%
ANSEP family member/significant other	2.4%	---
Significant other not in ANSEP	2.4%	16.7%
Another UAA faculty or staff	2.4%	0.0%
UAA student not in ANSEP	0.0%	0.0%
Friend I knew before coming to UAA	0.0%	2.8%
Total Responses	100.0%	100.0%

*n = 41 respondents in 2007; 36 respondents in 2010. **Item percentages are rounded. Totals may not add up to 100.0% due to rounding errors. ***Item choice deleted in 2010.

Which individuals did Alaska Native engineering ANSEP participants perceive as having the most significant positive impact on their academic success in college?

Consistent with the 2007 ANSEP Survey findings, 2010 Alaska Native ANSEP engineering survey respondents most frequently identified ANSEP faculty and staff members as the individuals who had the most significant positive influence on their academic success in college. See Table 2.4 for results.

Table 2.4. Individuals having the most significant positive influence on the UAA Alaska Native ANSEP engineering students' academic success in college, 2007 & 2010 comparison.

Item Response Choice	2007 % Total Respondents	2010 % Total Respondents
ANSEP faculty or staff	38.0%	36.1%
Friend in ANSEP/Another ANSEP Student	28.6%	22.2%
Family member not in ANSEP	23.8%	33.3%
Another UAA faculty or staff	4.8%	2.8%
Significant other not in ANSEP	2.4%	2.8%
Friend I knew before coming to UAA	2.4%	2.8%
ANSEP family member/significant other***	0.0%	---
UAA student not in ANSEP	0.0%	0.0%
Total Responses**	100.0%	100.0%

*n = 42 respondents in 2007; 36 respondents in 2010. **Item percentages are rounded. Totals may not add up to 100.0% due to rounding errors. ***Item choice delete in 2010.

What evidence existed, if any, that the ANSEP student participants transferred campus-specific knowledge to other ANSEP student participants to help their peers overcome barriers to academic and personal success?

The questions in this section were originally designed for the 2007 ANSEP Survey to determine if there was any evidence of the Padilla et al. (1997) local model of student expertise among Alaska Native ANSEP survey respondents. According to Lazzell (2007)

A local model of student expertise proposed by Padilla et al. (1997) focused on the transfer of campus-specific knowledge that successful students of color had acquired and the actions they took to solve problems and overcome difficulties they experienced while in college. Padilla et al. found that this practical knowledge was passed along from the more experienced students of color to the new students of color through individual contacts or through ethnic/race-based student organizations. The survey respondents in this study reported high levels of student support and transfer of campus-specific knowledge within the ANSEP culture that were much like the local model of student expertise. (p. 186)

The response rates for the 2010 Alaska Native ANSEP engineering survey participants were consistent with the response rates of the 2007 Alaska Native ANSEP engineering participants, suggesting that a local model of expertise exists among the 2010 and 2007 Alaska Native engineering students who participate in ANSEP university success components. See Table 2.5 for results.

Table 2.5. A local model of student expertise: UAA Alaska Native ANSEP engineering students, 2007 & 2010 comparison.

Item Response Choices	Percentage of "Yes" Responses	
	2007*	2010*
Has an ANSEP student provided you with enough information that helped you be more successful in your UAA classes?	**97.7% (42/43)	**100.0% (36/36)
Have you provided enough encouragement to an ANSEP student to help that student feel more at ease (comfortable) while attending UAA?	**97.7% (42/43)	**88.9% (32/36)
Has an ANSEP student provided you with enough encouragement that helped you feel more at ease (comfortable) while attending UAA?***	**95.3% (41/43)	---
Have you provided enough information to an ANSEP student on what to do to be more successful in his/her UAA classes?	**88.4% (38/43)	**86.1% (31/36)
Has an ANSEP student provided you with enough information that helped you be more effective navigating the administrative system at UAA?	**72.1% (31/43)	**75.0% (27/36)
Have you provided enough information to an ANSEP student on what to do to be more effective at navigating the administrative system at UAA?	**69.8% (30/43)	**62.9% (22/35)

*n = 43 respondents in 2007; 36 respondents in 2010 except respondents to, "Have you provided enough information to an ANSEP student on what to do to be more effective navigating the administrative system at UAA?" where n = 35. **An item response choice selected by 60% or more of the survey respondents is considered an important finding in this study. ***Item choice omitted in 2010. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher's exact test. No statistically significant differences exist, at the .05 level of significance.

What were the types and levels of academic and social engagement of the Alaska Native engineering ANSEP participants at the university?

The 2010 Alaska Native ANSEP engineering survey participant response rates were mostly consistent with the response rates of the 2007 Alaska Native ANSEP engineering participants for this research question. Results suggest there were high levels of academic and social engagement among the 2010 and 2007 Alaska Native engineering students who participated in ANSEP university success components. See results in Table 2.6 and Table 2.7.

Table 2.6. Levels of student involvement of the UAA Alaska Native ANSEP engineering students, 2007 & 2010 comparison.

Since I began participating in ANSEP at UAA I have:	Combined Responses “Quite a Bit” and “A Lot”	
	2007	2010
Made friends with other ANSEP students	97.7% (42/43)	86.1% (31/36)
Learned ways to find funding for educational expenses	90.7% (39/43)	80.5% (29/36)
Gotten to know ANSEP faculty/staff	86.0% (37/43)	86.1% (31/36)
Learned how to be more successful in my classes	81.4% (35/43)	88.9% (32/36)
Had opportunities to work in engineering-related jobs	81.4% (35/43)	83.3% (30/36)
Had help figuring out what type of job I want when I graduate	81.0% (34/42)	72.2% (26/36)
Learned how to manage my time better	76.7% (33/43)	77.8% (28/36)
Learned how to navigate the UAA system more successfully	72.1% (31/43)	77.8% (28/36)
Participated in ANSEP social and recreational activities	65.1% (28/43)	72.2% (26/36)

*n = 43 total respondents in 2007 except to “Had help figuring out what type of job I want when I graduate” where n = 42; 36 total respondents in 2010 **The combined item choices of “quite a bit” or “a lot” selected by 60% or more of the survey respondents are considered important findings in this study. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher’s exact test. No statistically significant differences exist, at the .05 level of significance.

Table 2.7. Levels of academic and social engagement, as measured by UAA Alaska Native ANSEP engineering students' perceptions of sense of belonging and self-efficacy, 2007 & 2010 comparison.

	“Quite Often” and “Almost Always” Combined Responses***	
	2007*	2010*
I feel like the ANSEP faculty/staff care about my success as a student	**97.7% (42/43)	**100.0% (36/36)
I feel confident that I will earn a bachelor's degree	**97.7% (42/43)	**91.7% (33/36)
I feel confident that I will earn a bachelor's degree in engineering/STEM	**97.7% (42/43)	**94.4% (34/36)
I feel comfortable being a student at UAA	**93.0% (40/43)	**91.7% (33/36)
ANSEP helps motivate me to continue studying engineering/STEM	**93.0% (40/43)	**97.2% (35/36)
I feel confident that what I am studying will lead to the job/career I want	**93.0% (40/43)	**88.9% (32/36)
ANSEP provides resources to help me be more academically successful	**93.0% (40/43)	**97.2% (35/36)
I enjoy what I am studying	**83.7% (36/43)	**74.3% (26/35)
I feel like other ANSEP students care about my success as a student	**81.4% (35/43)	**75.0% (27/36)

*n = 43 respondents in 2007; 36 respondents in 2010 except to “I enjoy what I am studying” where n = 35. **The combined item choices of “quite often” or “almost always” selected by 60% or more of the survey respondents are considered important findings in the study. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher's exact test. No statistically significant differences exist, at the .05 level of significance.

What was the level of congruence between the Alaska Native engineering ANSEP participants and the public university that they attended?

One survey item was included on the 2007 ANSEP Survey to assess the level of congruence, or student-institution fit, between the Alaska Native ANSEP participants and UAA. This question was replicated on the 2010 survey.

These results suggest that Alaska Native ANSEP engineering respondents experienced very high levels (93% in 2007; 91.7% in 2010) of feeling comfortable being students at UAA, a measure of congruence with UAA. See results in Table 2.8.

Table 2.8. Level of congruence with UAA, as measured by UAA Alaska Native ANSEP engineering students' perceptions of a sense of belonging at UAA, 2007 & 2010 comparison.

	“Quite Often” and “Almost Always” Combined Responses	
	2007	2010
I feel comfortable being a student at UAA	93.0% (40/43)	91.7% (33/36)

*n = 43 respondents in 2007; 36 respondents in 2010. **The combined item choices of “quite often” or “almost always” selected by 60% or more of the survey respondents are considered important findings in the study. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher’s exact test. No statistically significant differences exist, at the .05 level of significance.

What was the level of commitment of the Alaska Native engineering ANSEP participants to obtaining their education goals?

These results indicate that the 2010 Alaska Native ANSEP engineering survey participant responses were mostly consistent with the response rates of the 2007 Alaska Native ANSEP engineering participants. These results suggest that Alaska Native engineering survey respondents experience high levels of self-efficacy and commitment to obtaining their educational goals. See Table 2.9 for results.

Table 2.9. Level of commitment of UAA Alaska Native ANSEP engineering students to obtaining their educational goals, 2007 & 2010 comparison.

	“Quite Often” and “Almost Always” Combined Responses	
	2007	2010
I feel confident that I will earn a bachelor’s degree	97.7% (42/43)	91.7% (33/36)
I feel confident that I will earn a bachelor’s degree in engineering/STEM field	97.7% (42/43)	94.4% (34/36)
I feel confident that what I am studying will lead to the job/career I want	93.0% (40/43)	88.9% (32/36)
I enjoy what I am studying*	83.7% (36/43)	74.3% (26/35)

*n = 43 respondents in 2007; 36 respondents in 2010 except to “I enjoy what I am studying” where n = 35. **The combined item choices of “quite often” or “almost always” selected by 60% or more of the survey respondents are considered important findings in the study. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher’s exact test. No statistically significant differences exist, at the .05 level of significance.

What was the level of commitment of the Alaska Native engineering ANSEP participants to continued attendance at the public university that they currently attended?

Consistent with the 2007 ANSEP Survey, five questions were included in the 2010 ANSEP Survey to assess the Alaska Native ANSEP engineering respondents' levels of commitment to continued attendance at UAA by measuring their levels of academic and social engagement. Those questions were:

- “I feel comfortable being a student at UAA.”
- “I feel like the ANSEP faculty/staff care about my success as a student.”
- “I feel like other ANSEP students care about my success as a student.”
- “ANSEP helps motivate me to continue studying engineering, science (including mathematics) or technology (including construction management).”
- “ANSEP provides resources to help me be more academically successful”.

These results indicate that the 2010 Alaska Native ANSEP engineering survey participant responses were mostly consistent with the response rates of the 2007 Alaska Native ANSEP engineering participants for this research question. These results suggest that the Alaska Native engineering respondents experienced high levels of commitment to continued attendance at UAA. See results in Table 2.10.

Table 2.10. Levels of commitment to continued attendance at UAA of the UAA Alaska Native ANSEP engineering students, 2007 & 2010 comparison.

	“Quite Often” and “Almost Always” Combined Responses	
	2007	2010
I feel like the ANSEP faculty/staff care about my success as a student	97.7% (42/43)	100.0% (36/36)
I feel comfortable being a student at UAA	93.0% (40/43)	91.7% (33/36)
ANSEP helps motivate me to continue studying engineering/STEM	93.0% (40/43)	97.2% (35/36)
ANSEP provides resources to help me be more academically successful	93.0% (40/43)	97.2% (35/36)
I feel like other ANSEP students care about my success as a student*	81.4% (35/43)	75.0% (27/36)

*n = 43 respondents in 2007; 36 respondents in 2010 except to “I feel like other ANSEP students care about my success” where n = 35. **The combined item choices of “quite often” or “almost always” selected by 60% or more of the survey respondents are considered important findings in the study. Statistical significance of 2007 and 2010 differences were determined by the two-tailed Fisher’s exact test. No statistically significant differences exist, at the .05 level of significance.

2007 and 2010 Comparisons of Open-ended Question Results for UAA Alaska Native ANSEP Engineering Survey Respondents

Consistent with the 2007 ANSEP Survey, four open-ended sentence completion survey items were included in Part VI of the 2010 ANSEP Survey to further explore the Alaska Native engineering respondent's opinions of their experiences as university students and ANSEP participants. Their responses were analyzed for common themes. Summaries and tables of the common themes can be found in this section. Complete responses Alaska Native engineering respondents to open-ended questions in Part IV can be found in the full report appendices.

2007 ANSEP Survey Open-ended Question Common Themes

Question One: Advice to High School Students

Three common themes were: (a) take more mathematics and science courses in high school, (b) study hard and be serious about academic achievement in high school, and (c) gain knowledge and experiences related to engineering before going to college.

Question Two: Academic Advising

The individuals identified most often as academic advising resources, in order of frequency, were (a) ANSEP advisors and (b) other ANSEP students.

Question Three: Most Memorable ANSEP Experiences

Four common themes were: (a) supportive relationships (b) regular academic and social opportunities to interact, (c) help succeeding academically, and (d) valuing Native culture.

Question Four: Important Experiences Not Addressed in Survey

Three common themes in question four were a) friendships, b) community building and b) introduction to employers and summer internships during Friday meetings. The ANSEP building was mentioned as a good space to study, make friends, and build a safe, supportive community.

2010 ANSEP Survey Open-ended Question Common Themes

Question One: Advice to High School Students

"One thing I recommend that high school students from my community do to prepare for studying engineering and/or science in college is (and state why)" (34 of 36 Alaska Native engineering respondents):

"Research all the resources available at school (such as computer labs, free printing services with hours of operation, where you can get free coffee, clubs you might like, extracurricular activities on and off campus like working out at school, or attending music events as some examples) and outside (such as non- UAA scholarships)."

---Engineering Student

"Have patience. It doesn't matter if you don't do well in your classes; if you persevere and take those classes again, you will pass them. So work on your patience, and don't become discouraged if you don't do so well at first."

---Engineering Student

“Pay attention and apply yourself in your math and science courses as the more you learn in high school, the easier these subjects will come in college. Aside from making the transition easier, the further you take your studies in high school, possibly Advanced Placement courses counting for college credit, you'll be that much closer to obtaining your degree from the get go.”
---Engineering Student

“Take all four years of math, and double up on math on year (i.e. Geometry and Alg. II), take advantage of any AP Chemistry classes. Take University summer courses to get one up on other freshman entering college.”
---Engineering Student

“Stay in math and sciences even though they may not be required at the higher levels at your high school, even if you are not good at math or science it matters more that you keep trying and eventually you'll get it.”
---Engineering Student

THEMES
Take more math & science classes.
Study hard, get into study groups.
Think/plan ahead (classes & career).
Get a strong understanding of math principles.
Take AP level math & science classes.
College will be tough, but stick with it.

Question Two: Academic Advising

“When I seek academic advising, I typically go to (an ANSEP advisor, faculty, another student, family member, etc) and please state why” (34 of 36 Alaska Native engineering respondents):

“When I seek academic advising I only go to an ANSEP Advisor or faculty member, because I know that their doors are always open to me, and they sincerely care about me, my academic success, and my future. I get the most support from people who have been in this degree program and come from a similar back ground.”
--- Engineering Student

“I go straight to ANSEP faculty or the executive director at ANSEP for academic advice, because a.) they are knowledgeable, b.) they care about your success and will line up a smorgasbord of opportunities and resources if you ask them, and c.) they are great people to be around. I'm friends with each of them, and I stop by their offices every once in a while just to say "hi".”
--- Engineering Student

“When I seek academic advising I only go to an ANSEP Advisor or faculty member, because I know that their doors are always open to me, and they sincerely care about me, my academic success, and my future. I get the most support from people who have been in this degree program and come from a similar back ground.”
--- Engineering Student

"I usually go to my academic advisor when considering which classes to take the next semester. My flowchart also helps me a great deal."

--- Engineering Student

"I go to other ANSEP students because I know that they will offer their help to me when I need it and that they will always be happy to help a fellow student out with their problems in classes or just hard subject material."

--- Engineering Student

THEMES
ANSEP Advisor/Staff (Caring, Open Door, Students Trust Them).
Another ANSEP Student (Tells which classes are best).
Faculty (ANSEP faculty provide more encouragement).

Question Three: Most Memorable ANSEP Experiences

"What I think I will remember the most about ANSEP years from now is (and state why)" (35 of 36 Alaska Native engineering respondents):

"(I will remember most) the friendships I've made. I had a hard time making friends my own age in school before I came to ANSEP. Now I have more friends at UAA than I have ever had in elementary, middle or high school. ANSEP helped me overcome my personal social barriers and make new friends my own age."

--- Engineering Student

"Team building because it was always something kind of goofy, annual banquets because they are a lot of fun, and ANSEP recitations because they have helped me the most in my classes."

--- Engineering Student

"I will remember the people in my classes who studied with me because without them I would not be as successful as I am."

--- Engineering Student

"The support I have felt from this program will indefinitely stay with me throughout my career and my life. I have made some of my very best friends in this program."

--- Engineering Student

"The weekly meetings because it provides employers a chance to meet the students and vice-versa. It also provides the students a chance to present what they did for their summer internship program plus the pizza doesn't hurt either. I will also remember that they helped me financially in my college career."

--- Engineering Student

THEMES
Making Friends
Encouragement & Support
Sense of Community & Belonging
Feeling Welcome

Question Four: Important Experiences Not Addressed in Survey

"Something about my ANSEP experience that has not been covered in this survey and that is important to me is (and state why)" (31 of 36 Alaska Native engineering respondents):

"The sense of community (is important to me). It is not just one person that makes ANSEP memorable (although the ANSEP executive director does a good job towards that). ANSEP is a community of people, like a neighborhood where everyone knows each other and everyone helps each other when something needs to get done. That sense of community gives you a feeling of security, safety and acceptance that I have rarely felt outside of my home and my religion."

--- Engineering Student

"I really appreciate the food ANSEP provides its students with. I, being a college student, am inherently poor and make a solid effort to eat 1-2 meals a day, complements of ANSEP. I also make sure and dent the daily coffee supply provided. Thanks ANSEP."

--- Engineering Student

"I feel it is important for fellow ANSEP members to help other ANSEP members. This has been integral in my effort to stay in school while raising a family. Their encouragement gets me through!"

--- Engineering Student

"ANSEP gives a feeling of community. There is always someone available to listen to your problems whether it being school related or not."

--- Engineering Student

"How the ANSEP building has helped me with projects. It allowed me to have enough space to meet with my team and the computers allowed us to share documents easily. It also made it very easy to schedule meetings with my fellow students because there is always room for us to either study or work on homework together."

--- Engineering Student

THEMES
Helped students overcome personal problems.
Benefiting from Summer Bridge
Grateful to the ANSEP Staff
Connecting with Various Native Cultures
Helped students make friends.
Offering Wonderful Internships

Common Themes from 2007 and 2010

Question One: Advice to High School Students

The 2007 and 2010 common themes for question one on advice to high school students were: (a) take more mathematics and science courses in high school and (b) study hard. A review of the individual responses shows that planning ahead and encouragement to “stick with it” also emerged as common themes. A review of the individual 2007 and 2010 responses revealed that becoming proficient in advanced math courses while in high school was the most often mention advice to high school students.

Question Two: Academic Advising

The 2007 and 2010 common themes for question two on who ANSEP students sought out for academic advising resources were (a) ANSEP advisors and (b) other ANSEP students. A review of the individual 2007 and 2010 responses revealed that ANSEP advisors were seen as knowledgeable, caring and providing encouragement to the ANSEP students.

Question Three: Most Memorable ANSEP Experiences

The 2007 and 2010 common themes for question three on what ANSEP students would remember most about ANSEP years from now were: (a) supportive relationships such as making friends and b) receiving encouragement, help and support from ANSEP faculty and staff. A review of the individual 2007 and 2010 responses revealed that the concept of valuing and developing friendships with other ANSEP students was mentioned by a vast majority of the respondents. A sense of belonging, feeling comfortable and a caring community were concepts that were also mentioned by the 2007 and 2010 engineering respondents.

Question Four: Important Experiences Not Addressed in Survey

The 2007 and 2010 common themes for question four on important factors that were not addressed in the survey were a) friendships and help with problems and b) employment opportunities such as contact with employers, networking, ANSEP Summer Bridge and ANSEP summer internships. A review of the individual 2007 and 2010 responses revealed that there was a shared sense of community among the ANSEP students and the ANSEP faculty and staff and there was an appreciation for and valuing of Native cultures and values.

Conclusion of the 2007 and 2010 Survey Comparison for UAA Alaska Native ANSEP Engineering Students

Based on the evaluation of the 2010 survey results, and their comparison to the results of the 2007 survey results, the external evaluator has concluded that the results of the 2010 ANSEP survey validated the 2007 ANSEP survey. The results of the comparison of the 2007 and 2010 surveys also support the notion that the research findings “suggest that the ANSEP university retention approach has had a positive influence on the recruitment, retention and graduation of Alaska Native engineering students. ANSEP may be a new model for universities to attract and retain more Native American engineering students through postsecondary degree completion” (Lazzell, 2007, p. 196).

These findings are also consistent with research results found in the literature. Similar activities designed for underrepresented ethnic/racial minority undergraduates pursuing degrees in engineering and science were found to be important student retention strategies (Clewell, Cosentino de Cohen, Tsui, & Deterding, 2006). In addition, active participation in these types of activities with peer group members was found to positively influence student retention and academic success (Astin, 1984; Pascarella & Terenzini, 1991, 2005; Rendon, 1994; Tinto, 1993).

Final Remarks

The 2010 ANSEP Survey findings validated the 2007 ANSEP Survey findings. The high levels of academic and social integration, commitment to educational goals, congruence with UAA reported in the 2007 ANSEP Survey results were most often replicated in the results for the 2010 Alaska Native ANSEP STEM groups, particularly in the 2010 Alaska Native ANSEP engineering group. Common themes that emerged in the results for the open-ended questions in the 2007 ANSEP Survey were also found in the results for the open-ended questions in 2010 ANSEP Survey. The ANSEP Survey remains a relevant metric to measure the impact that Alaska Native ANSEP participants.

The research findings suggest that the ANSEP university retention approach has had a positive influence on the recruitment, retention and graduation of Alaska Native science, technology, engineering and math (STEM) students. The ANSEP model may be a contemporary benchmark for universities to attract and retain more Native American STEM students through postsecondary degree completion.

Bibliography

- Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 25(4), 297–308.
- Astin, A.W. (1993). *What matters in college: Four critical years revisited*. San Francisco: Jossey-Bass.
- Brown, L. L., & Robinson Kurpius, S. E. (1997). Psychosocial factors influencing academic persistence of American Indian college students. *Journal of College Student Development*, 38(1), 3-12.
- Chickering, A. W. (1969). *Education and identity*. San Francisco: Jossey-Bass.
- Cibik, M. A., & Chambers, S. L. (1991). Similarities and differences among Native Americans, Hispanics, Blacks, and Anglos. *NASPA Journal*, 28(2), 129-139.
- Clewell, B. C., Cosentino de Cohen, C., Tsui, L., & Deterding, N. (2006). *Revitalizing the nation's talent pool in STEM: Science, technology, engineering, and mathematics*. Washington DC: The Urban Institute.
- Clewell, B. C., & Ficklen, M. S. (1986). *Improving minority retention in higher education: A search for effective institutional practices*. Princeton, NJ: Educational Testing Service.
- Feldman, K. A., & Newcomb, T. M. (1969). *The impact of college on students*. San Francisco: Jossey-Bass.
- Haden, C. (2006). Retention of underrepresented students in engineering degree programs: An evaluation study. Ed.D. dissertation, Northern Arizona University, United States -- Arizona. Retrieved September 16, 2007, from *ProQuest Digital Dissertations* database. (Publication No. AAT 3213104).
- Hornett, D. (1989). The role of faculty in cultural awareness and retention of American Indian college students. *Journal of American Indian Education*, 29(1), 12-19.
- Jackson, A. P., Smith, S. A., & Hill, C. L. (2003). Academic persistence among Native American college students. *Journal of College Student Development*, 44(4), 548- 565.
- Landis, R. B. (2005). Retention by design: Achieving excellence in minority engineering education. *National Action Council for Minorities in Engineering (NACME) Monograph*. Retrieved September 8, 2007, from <http://www.nacme.org/>
- Lazzell, L. (2007). An assessment of the impact of university retention program strategies on the retention and academic success of Alaska Native undergraduate engineering students. Ed.D. dissertation, Argosy University/Sarasota, United States -- Florida. *Dissertations & Theses*. Publication No. AAT 3354477.
- Moller-Wong, C., & Eide, A. (1997). An engineering student retention study. *Journal of Engineering Education*, 86(1), 7-15.
- Munro, B. (1981). Dropouts from higher education: Path analysis of a national sample. *American Educational Research Journal*, 81, 133-41.
- Padilla, R., Trevino, J., Gonzalez, K., & Trevino, J. (1997). Developing local models of minority student success in college. *Journal of College Student Development*, 38(2), 125-135.
- Pascarella, E.T., & Chapman, D. W. (1983). A multi-institutional, path analytic validation of Tinto's model of college withdrawal. *American Educational Research Journal*, 20(1), 87-102.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research*. San Francisco: Jossey-Bass.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (2nd ed). San Francisco: Jossey-Bass.

- Rendon, L. I. (1994). Validating culturally diverse students: toward a new model of learning and student development. *Innovative Higher Education*, 19(1), 33-51.
- Rindone, P. (1988). Achievement motivation and academic achievement of Native American students. *Journal of American Indian Education*, 28(1), 1-8.
- Schroeder, H., & Maimon, E. (2006) LSAMP Pacific Alliance Phase II, Undergraduate Education, Alliances-Minority Participation, Division of Human Resource Development, *National Science Foundation Award No. 0602742*.
- Tan, D.L. (2003). Sputnik, STEM, and success? Paper presented at the *43rd Annual Association for Institutional Research (AIR) Forum* in Tampa, Florida, May 2003.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89-125.
- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: The University of Chicago Press.