

RESEARCH REPORT

# Evaluation of the Alaska Native Science & Engineering Program (ANSEP)

*Hamutal Bernstein  
Theresa Anderson  
January 2015*

*Carlos Martín  
Stephanie Owen*

*Lauren Eyster  
Ananda Martin-Caughey*



## ABOUT THE URBAN INSTITUTE

The nonprofit Urban Institute is dedicated to elevating the debate on social and economic policy. For nearly five decades, Urban scholars have conducted research and offered evidence-based solutions that improve lives and strengthen communities across a rapidly urbanizing world. Their objective research helps expand opportunities for all, reduce hardship among the most vulnerable, and strengthen the effectiveness of the public sector.

The Urban Institute is a nonprofit policy research organization. It has been incorporated and is operated as a public charity. It has received official IRS recognition of its tax-exempt status under section 501(c)(3) of the Internal Revenue Code. The Institute's federal ID number is 52-0880375. Donations will be tax deductible and may be disclosed to the IRS and the public, unless given anonymously. We are committed to transparent accounting of the resources we receive. In addition to required tax filings, a copy of the Urban Institute's audited financial statement is available to anyone who requests it.



## ABOUT THE ALASKA NATIVE SCIENCE & ENGINEERING PROGRAM

Based at the University of Alaska, the Alaska Native Science & Engineering Program (ANSEP) is designed to prepare and support Alaska Native students from middle school through graduate school to succeed in engineering and science careers. ANSEP offers intensive academic support, exposure to industry, and the opportunity to participate in a learning community incorporating Alaska Native cultural identity. ANSEP provides comprehensive programming for its precollege, undergraduate, and graduate components aimed at empowering and exciting youth around engineering and science, promoting success in educational and career paths, and connecting local communities to science, technology, engineering, and math (STEM) resources. In addition to supporting individual students, the ANSEP model is also designed to effect systemic change to improve the climate for Alaska Natives in the Alaska kindergarten through 12th grade (K-12) educational system, the University of Alaska, and Alaska's STEM industries.

# Contents

<b>Acknowledgments</b>	<b>VIII</b>
<b>Abbreviations</b>	<b>IX</b>
<b>Key Findings</b>	<b>X</b>
<b>Part I. Background</b>	<b>1</b>
<b>Chapter 1. Introduction</b>	<b>2</b>
Background: The Achievement Gap for Alaska Natives and the Need for Homegrown Scientists and Engineers	2
The ANSEP Model	3
Underrepresentation of Minorities in STEM Education	4
ANSEP Logic Model	13
The ANSEP Evaluation	18
Implementation Study	19
Participant Outcomes Study	20
Limitations of the Evaluation	20
The Remainder of the Evaluation Report	20
<b>Chapter 2. ANSEP’s Development: The Historical and Current Context</b>	<b>22</b>
Introduction	22
Alaska’s Economy and STEM Industries	22
Alaska Native Economic and Social Conditions	26
Alaska Native Educational Access and Attainment	29
Alaska Native STEM Postsecondary Education and Employment	33
Alaska Natives at the University of Alaska	39
ANSEP and Changing the Context at the University of Alaska for Alaska Natives	42
Summary	42
<b>Part II. Implementation Study</b>	<b>43</b>
<b>Chapter 3. Input: Staffing and Leadership</b>	<b>44</b>
Overall ANSEP Staffing	44
Staffing Levels	44
Executive Director	45
Other Permanent Staff	46
Temporary Staff	47
Faculty and Instructors	48
Adequacy of Staffing and Plans for New Hiring	49

Perspectives on ANSEP Staffing	50
<b>Chapter 4. Input: Facilities</b>	<b>53</b>
University of Alaska Anchorage Campus	53
The ANSEP Building	53
Other Anchorage Facilities	56
Other Campuses	56
Plans for Future Facilities	57
<b>Chapter 5. Input: Funding</b>	<b>58</b>
Budget Planning, Spending, and Revenues	58
Revenues	59
Expenditures	60
Spending by Component	62
Oversight of ANSEP Finances	64
UAA and UAF spending	65
Funding Successes	65
Funding Challenges	66
<b>Chapter 6. Activity: Recruitment and Selection</b>	<b>67</b>
Recruitment Goals	67
Alaska Native Youth	68
Female Youth	68
Rural Youth	68
Previous ANSEP Participants	69
Outreach and Recruitment Activities	69
Formal Recruitment Strategies	70
Informal Recruitment Strategies	70
Motivations for Application	72
Selection Process and Applicant Characteristics	72
Evolution	74
<b>Chapter 7. Activity: Partnership and Relationship Management</b>	<b>75</b>
STEM Industries	75
Industry Contributions to ANSEP	75
Benefits of Partnership to STEM Industries	76
University of Alaska	78
Referrals and Recruitment	78
Instruction and Research	79
Student Supports	79
Administration and Funding	80
K-12 School System	80

Outreach and Referrals	81
School District Programs	81
Other Partnerships	82
<b>Chapter 8. Activity: Marketing and Communications</b>	<b>84</b>
Marketing and Communications Activities	84
ANSEP's Audiences	86
Students and Parents	86
Funders and Other Stakeholders	87
Brand Recognition	87
<b>Chapter 9. Activity: Alumni Outreach and Activities</b>	<b>88</b>
Alumni Tracking	88
Alumni Contributions	88
<b>Chapter 10. Activity: Policy Work and Advocacy</b>	<b>91</b>
Goals	91
Activities	91
Results	92
<b>Chapter 11. Component: Middle School Academy</b>	<b>94</b>
Recruitment and Selection	94
Participant Characteristics	96
Component Activities	98
Academic Training	98
Experiential Training	99
Supports	102
Evolution	104
<b>Chapter 12. Component: STEM Career Explorations</b>	<b>106</b>
Recruitment and Selection	106
Component Activities	107
Experiential Training	107
Supports	109
Evolution	110
<b>Chapter 13. Component: Acceleration Academy</b>	<b>111</b>
Recruitment and Selection	111
Outreach and Recruitment	112
Participant Characteristics	113
Component Activities	114
Academic Training	115
Experiential Training	117

Supports	119
Evolution	120
<b>Chapter 14. Component: Summer Bridge</b>	<b>122</b>
Recruitment and Selection	122
Participant Characteristics	124
Component Activities	125
Academic Training	125
Experiential Training	126
Supports	130
Mentoring and Advising	131
Peer Supports	131
Financial Supports and Scholarships	132
Evolution	132
<b>Chapter 15. Component: University Success</b>	<b>134</b>
Recruitment and Requirements	134
Participant Characteristics	138
Component Activities	140
Academic Training	140
Experiential Training	142
Supports	143
Evolution	148
<b>Chapter 16. Component: Graduate Success</b>	<b>150</b>
Recruitment, Application, and Requirements	150
Supports	151
Evolution	152
<b>Part III. Outputs and Outcomes</b>	<b>153</b>
<b>Chapter 17. Program Outputs and Participant Outcomes</b>	<b>154</b>
Introduction	154
Component Outputs	156
Middle School Academy	156
Acceleration Academy	159
University Success	170
Graduate Success	187
Multiple Components	188
Participant Outcomes	191
Graduate Study	192
Overall Employment and STEM Employment	194
Income	199

Institutional Outcomes	202
Climate for Alaska Natives at the University of Alaska	202
Climate for Alaska Native STEM Professionals	203
ANSEP Alumni Activity Participation	205
Summary	206
<b>Chapter 18. Conclusions</b>	<b>208</b>
Operational Implications	208
Organization of the ANSEP Model	208
Organization of Components	209
Target setting and Participant Definitions	209
Operations across Locations	210
Staffing	210
Institutional Context	210
Management Systems	211
Pipeline Evaluation	211
Mission Implications	212
STEM	212
Alaska Natives	212
Achievement Eligibility	213
Educational Level	213
Pedagogy	214
<b>Appendix A. Data and Methods</b>	<b>215</b>
Program Data	215
Secondary Data	215
Interviews and Focus Groups	216
Observations	217
Alumni Survey	218
Analytical Variables	219
Documents and Materials	221
<b>Appendix B. Detailed Context Tables and Figures</b>	<b>222</b>
<b>Appendix C. Definition of STEM Majors Used in Outcomes Chapter</b>	<b>229</b>
<b>Appendix D. Definition of Graduate Degree and Employment Categories Used in Outcomes Chapter</b>	<b>231</b>
<b>Notes</b>	<b>235</b>
<b>References</b>	<b>237</b>
<b>About the Authors</b>	<b>242</b>

# Acknowledgments

The authors express their gratitude to the ANSEP participants who took part in focus groups and the alumni who pre-tested and completed an in-depth survey, as well as the ANSEP staff at the University of Alaska Anchorage and Fairbanks campuses. We also thank the stakeholders whom we interviewed at the University of Alaska, STEM industry organizations, and the Matanuska-Susitna Borough and Lower Kuskokwim school districts, as well as the community stakeholders and parents whom we interviewed in Bethel, Oscarville, and Napaskiak. We thank Tad Lindley for his assistance on our visit to the Bethel region. The authors thank Herb Schroeder, Michael Bourdukofsky, Jared Brandner, Shirlee Willis-Haslip, and Josephine Mattison for their insights as we conducted this research and their assistance in providing the administrative records for our analysis. Hal Salzman and David Hersh provided valuable expertise and data analysis. We also thank Eleanor Pratt, Tim Triplett, and Nancy Pindus at the Urban Institute for their contributions.

Urban strives for the highest standards of integrity and quality in its research, analyses, and policy recommendations. Urban scholars believe that independence, rigor, and transparency are essential to upholding those values. Funders do not determine research findings or influence scholars' conclusions. As an organization, the Urban Institute does not take positions on issues. Urban scholars and experts are independent and empowered to share their evidence-based views and recommendations shaped by research.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders.

# Abbreviations

AISES	American Indian Science and Engineering Society
AcA	Acceleration Academy
ACS	American Community Survey
AI	American Indian
AISES	American Indian Science and Engineering Society
AN	Alaska Native
ANSEP	Alaska Native Science & Engineering Program
ANSME	Alaska Native Science/Math Education
AP	Advanced Placement
ASME	American Society of Mechanical Engineers
BA	Bachelor of Arts
BLS	Bureau of Labor Statistics
BS	Bachelor of Science
CS	Computer science
DEED	Department of Education and Early Development
FY	Fiscal year
GDP	Gross domestic product
GPA	Grade point average
GRE	Graduate Record Examinations
IT	Information Technology
K-12	Kindergarten through 12th grade
LKSD	Lower Kuskokwim School District
Mat-Su	Matanuska-Susitna
MS	Master of science
MSA 1	Traditional summer Middle School Academy
MSA 2	School district-based Middle School Academy
NH	Native Hawaiian
NILF	Not in labor force
PI	Pacific Islander
RA	Resident adviser
RANSEP	Rasmuson ANSEP College Readiness Program
SNAP	Supplemental Nutrition Assistance Program
STEM	Science, technology, engineering, and math
UA	University of Alaska
UAA	University of Alaska Anchorage
UAF	University of Alaska Fairbanks
UAS	University of Alaska Southeast
YPM	Youth peer mentor

# Key Findings

Based at the University of Alaska, the Alaska Native Science & Engineering Program (ANSEP) is designed to prepare and support Alaska Native students from middle school through graduate school to succeed in engineering and science careers. ANSEP offers intensive academic support, exposure to industry, and the opportunity to participate in a learning community incorporating Alaska Native cultural identity. ANSEP provides comprehensive programming for its precollege, undergraduate, and graduate components aimed at empowering and exciting youth around engineering and science, promoting success in educational and career paths, and connecting local communities to science, technology, engineering, and math (STEM) resources. In addition to supporting individual students, the ANSEP model is also designed to effect systemic change to improve the climate for Alaska Natives in the Alaska kindergarten through 12th grade (K-12) educational system, the University of Alaska, and Alaska's STEM industries.

The Urban Institute conducted an implementation and participant-outcomes evaluation of ANSEP between September 2013 and December 2014. The research team collected and analyzed data from interviews and focus groups conducted with participants, staff, partners, and stakeholders in the University of Alaska, the K-12 educational system, and organizations in the STEM industry. The team also fielded a survey to alumni and analyzed student records. The evaluation assesses the ANSEP model to inform its programming and planning as well as provide lessons for other STEM education programs that serve underrepresented minorities nationwide.

The research conducted found the following key findings:

- ANSEP combines academic and experiential learning with a wide range of supports, including all the elements that have been identified in previous literature as valuable components of successful STEM enrichment programs.
- Though ANSEP is organized as a multi-stage educational model—from middle school to post-secondary education and into the workforce—the various components are generally discrete and autonomous with regard to a comprehensive curriculum. Though some of the components are relatively new, many participants are enrolling in multiple components as encouraged by ANSEP staff and aligned with the model.
- ANSEP is not a static, easily replicable program, although individual components may potentially be replicated. It is a dynamic and evolving model that continues to adapt as the program expands to a wider range of STEM fields, to additional University of Alaska campuses, and earlier into kindergarten through 12<sup>th</sup> grade (K-12) education. However, with leadership's

efforts to continuously improve the program, better data systems and more rigorous evaluation of the model may be challenging to develop.

- ANSEP rewards students who are high-achieving relative to their geographic and racial group cohorts, particularly in the precollege components. Rigorous academic requirements drive eligibility standards and ongoing participation. However, many participants, in particular those who have not taken part in ANSEP precollege components, may still suffer from academic and personal barriers in pursuing their degrees.
- In its recruitment, ANSEP targets groups that are underrepresented in Alaska's STEM workforce, specifically Alaska Native and nonurban students. Its programming is open to all students, however, and many beyond the target groups benefit from ANSEP's activities and resources.
- To date, 164 ANSEP scholarship recipients have graduated from the University of Alaska with bachelor's degrees in STEM fields. These STEM and STEM-related professions are in demand in Alaska's industries. Eighty-seven percent of a nonrandom sample of graduates report being employed in STEM occupations in the first year after graduation.
- ANSEP has an employer-centered model, built on a wide range of partnerships with STEM organizations in the private and public sector that are important funders and also provide internships and other career exposure to link participants to STEM employment. These relationships make the program highly dependent on the strength of the industries that hire scientists and engineers.
- Stakeholders credit ANSEP for contributing to an improved climate for Alaska Natives at the University of Alaska and in the state's STEM industries. One strategy shaping these perceptions has been ANSEP's use of marketing, branding, and advocacy efforts as well as promotion of Alaska Native cultural identity.
- The climate for the program at the University of Alaska has and generally continues to be tense because of the program's significant resources and unique status, but has improved as ANSEP has won support from key university leaders. Many university stakeholders and programs express admiration for ANSEP's visibility and success and note benefiting from it.
- ANSEP has benefited from a charismatic leader whose personality is central to the program, and who has developed the program's visibility and connections to significant funding resources. Careful sustainability planning, which is currently under development, will be crucial to ANSEP's long-term success.

- Program expansion to additional university campuses and to additional participants has faced and will continue to confront operational challenges in terms of providing sufficient staffing and facilities to maintain consistent supports to all participants and ensuring fidelity to the model.
- ANSEP's approach offers important lessons for other STEM education programs for underrepresented minorities, especially in its engagement of students from middle school to graduate school. However, Alaska's unique social and economic conditions and the unusual institutional placement of ANSEP at the University of Alaska may pose a challenge to replication in other contexts outside of Alaska.

# Part I. Background

# Chapter 1

## Introduction

Since 1995, the Alaska Native Science & Engineering Program (ANSEP) has prepared and trained Alaska Natives in science and engineering. The program provides a multistage educational model—from middle school to graduate school and into the workforce—intended to build a strong science, technology, engineering, and math (STEM) pipeline for Alaska’s industries. The Urban Institute conducted an evaluation that assesses the ANSEP model to inform its programming and planning as well as provide lessons for other STEM education programs that serve underrepresented minorities nationwide. The Urban Institute’s evaluation approach includes an implementation study and a participant outcomes study.

This chapter provides a brief background of the problem ANSEP is addressing. It then summarizes the program model and provides a description of the evaluation.

### Background: The Achievement Gap for Alaska Natives and the Need for Homegrown Scientists and Engineers

As Alaska’s economy and its industries that hire scientists and engineers have expanded, most Alaska Natives have not benefited from the economic prosperity. A 2002 report by the US Commission on Civil Rights highlights many of the reasons Alaska Natives may fail to succeed in today’s workforce (US Commission on Civil Rights 2002). The disparities in educational achievement of Alaska Native and non-Native students are long-standing, with continuing inequities in the education systems, the urban-rural divide, and misperceptions of their ability. The educational challenges of Alaska Natives carry over into the workforce, with the underrepresentation of Alaska Natives in all industries, but especially in the largest Alaskan industry—oil and gas.

At the same time, Alaska’s industries, require a stable source of productive workers. Alaska’s STEM industries have a strong need for engineers and scientists with university degrees. STEM occupational demand over the next decade will include growing openings for STEM postsecondary teachers and a range of occupations in the life and physical sciences, architecture and engineering, and computer and mathematical occupations (Stimpfle and Mosher 2011).

It may be particularly difficult for Alaska’s employers to fill these jobs because many of Alaska’s residents, especially young people, are leaving the state. In one study, 38 percent of young people who were

Alaska residents in 1994 were no longer residents by 2002. However, 84 percent of the young Alaska residents in the study who pursued their postsecondary education in Alaska remained in the state (Hadland 2004). This finding means that Alaska can stem outmigration of its residents by encouraging residents to stay in Alaska to go to college.

ANSEP's goals are to encourage and support Alaska Natives in the fields of science and engineering, both to bring economic success to Alaska Natives and to fill labor needs in Alaska's economy. As the demand for trained workers in STEM occupations has expanded, the need for a homegrown STEM workforce has become increasingly essential to ensuring Alaska's future, in a state where the natural resources and environmental issues make the contribution of Alaska Natives' perspectives even more crucial. ANSEP is addressing these issues through its multistage educational model, discussed next.

## The ANSEP Model

ANSEP began in 1995 by initially focusing on engineering undergraduate students at the University of Alaska Anchorage. Since then, the program has expanded to include additional University of Alaska campuses; to incorporate programming for middle school, high school, and postgraduate students; and to add natural and life sciences as a key component of its programming. Since its initial focus on college-level students, ANSEP has transformed into a multistage model because many Alaska Native students arrived at college unprepared and were unaware of STEM programs and careers. With University Success as its anchor component, ANSEP developed its first precollege component, Summer Bridge, for students coming into the university. As the need to help prepare students before they reached college became more apparent, the program then reached further back to high school students through Acceleration Academy, and subsequently to middle school students through Middle School Academy and STEM Career Explorations. ANSEP also provides the Graduate Success component, supporting participants who continue on to graduate-level studies. Thus, the ANSEP model provides a pipeline of potential STEM workers for Alaska starting in middle school and continuing through graduate school.

ANSEP provides comprehensive programming for its precollege, undergraduate, and graduate components that are aimed at creating empowerment and excitement around engineering and science; success in educational and career paths; and connection of local communities to STEM resources. In addition to supporting individual students, the ANSEP model also is designed to effect systemic change to improve the climate for Alaska Natives in the Alaska kindergarten through 12th grade (K-12) educational system, the University of Alaska, and Alaska's STEM industries. It offers a promising model for bringing underrepresented minorities into STEM fields by motivating students during their formative years and preparing them for college-level coursework. ANSEP's model prioritizes academic preparation and

effectively engages STEM industry partnerships, while building a learning community that incorporates Alaska Native cultural identity. ANSEP aspires to produce a cadre of Alaska Native leaders to inhabit leadership positions in STEM industry and educational spheres and change Alaska's STEM culture, where Alaska Natives have experienced persistent discrimination and bias.

## **Underrepresentation of Minorities in STEM Education**

One of the main goals of ANSEP is to address the underrepresentation of Alaska Natives in STEM education and the Alaska STEM workforce. The early development of ANSEP was funded, in part, by a National Science Foundation grant that supported approaches to addressing underrepresentation and success of minorities in STEM fields of study in higher education. ANSEP expands on traditional approaches to addressing underrepresentation by addressing key challenges such as college readiness, academic preparation, and social support starting in middle school. Because the ANSEP model offers key lessons and ideas for replication, this chapter presents a review of the broader literature on underrepresentation of minorities in STEM fields to understand how the ANSEP model addresses this issue.

Underrepresentation of US racial and ethnic groups among STEM undergraduate and graduate students and STEM professionals is well documented. Although the numbers and proportions of minorities are higher than those just decades ago, the educational achievement rates still fall well below their proportions in the overall population in ways that cannot be explained solely by family income (Gerald and Haycock 2006). Despite the dozens of programs that have been created at universities since the 1970s to address these issues, evidence is still mixed regarding (1) the underlying factors for underrepresentation from a lack of precollege educational preparation, inadequate postsecondary curricula, and challenging higher education climate; and (2) the curricular, programmatic, behavioral, and financial interventions aimed at reversing underrepresentation, particularly those taking place at institutions of higher education (Collea 1990; Jackson 2003).

### **FACTORS ASSOCIATED WITH THE UNDERREPRESENTATION OF RACIAL AND ETHNIC MINORITIES IN STEM FIELDS**

Scholars point to the multiple challenges faced by minority STEM students as core determinants of underrepresentation (Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline 2011). At the precollege levels, these factors have included a variety of social, institutional, and structural factors that contribute to underpreparedness in general and to a lack of interest in science and math, as well as racial discrimination, among many other potential determinants of underpreparedness for STEM college education (Ginorio and Grignon 2000).

Structural and institutional challenges that have been associated with underrepresentation of minorities in STEM fields generally focus on disparities in school funding, teacher quality, and curricular supports, especially for K–12 schools that enroll higher proportions of minorities. The availability of appropriate science and math classes in primary and secondary schools, including advanced placement courses, may be less likely where these disparities exist (Oakes et al. 1990). And in schools where a range of math and science classes are available, many minority students have historically been “tracked” into remedial courses or received guidance diverting them from classes that would have helped them prepare for STEM majors in college. Social challenges also play an additional role in STEM college preparedness levels among minority students, such as differing social expectations and support levels in families and among peers (HeavyRunner and DeCelles 2002), psychosocial barriers such as low self-esteem, and the financial limitations of low-income households from which minority students disproportionately come.

Because of those factors, young minority students also are less likely to have been exposed to STEM fields and careers, and they may not express interest in or even familiarity with these fields as career options. While recent studies show that gaps in interest in STEM degrees between racial minorities and whites are shrinking (Elliott et al. 1996), the greater challenge, then, is the lack of K–12 educational supports and access to the coursework necessary to prepare for and succeed in STEM majors in college.

The young minority students who enroll in college and pursue STEM degrees often face challenges that may have existed in precollege years but persist and, in some cases, expand in postsecondary education (Hurtado et al. 2010; Jenkins 1999). Again, these challenges fall within social, structural, and institutional categories. The lack of appropriate role models in careers and among faculty has been noted as a common social factor in students’ ceasing their pursuit of STEM degrees (Hornett 1989; Museus et al. 2011), though this challenge is more prevalent at elite STEM universities and not present at minority-serving institutions (Hurtado et al. 2011). The lack of same-race peers who could provide social, cultural, and academic support in students’ fields of study (such as study groups or ethnic professional clubs) has also been suggested as a deterrent to students’ staying in and completing their STEM major, particularly for American Indian and Alaska Native students (Gloria and Robinson Kurpius 2001; Guillory and Wolverton 2008; Shotton, Oosahwe, and Cintron 2007). Psychological barriers from precollege experiences that may disproportionately affect minority students—including American Indian and Alaska Native students—persist and are often exacerbated in the more competitive and academically elite setting of college programs in which self-esteem issues are conflated with self-efficacy (Brown and Robinson Kurpius 1997; Davis 1992).

Having often arrived at college underprepared, minority college students in STEM programs may continue to suffer setbacks owing to structural issues—precollege academic gaps in coursework—that prevent them from keeping up with their peers. These gaps are notable not just in precollege academic

coursework but also in academic skills that are learned in higher preparatory levels in secondary education. The costs of STEM education, including access to financial aid and employment experiences, are also a key factor for continuation and completion among all middle- and lower-income college students (Almeida 1999). Many students also have family obligations, including child rearing, for which financial and supportive services may not be available. Similarly, a preexisting unfamiliarity with the academic and professional trajectories in STEM majors is common to many lower-income students or those whose parents have not completed postsecondary education. Finally, racism—including a campus climate in which racist speech and action are tolerated—persists in the teaching and professional careers in STEM fields (Graham et al. 2014; Grossman and Porche 2014). The cumulative result of these factors is that minority students who begin STEM majors in college are more likely than their white counterparts either to switch to non-STEM majors or to leave college altogether (Benjamin, Chambers, and Reiterman 1993; Jackson, Smith, and Hill 2003; Larimore and McClellan 2005; Pavel and Padilla 1993). Similar challenges for minority students persist in STEM educational institutions even beyond the undergraduate years (Fisher 2014; Garrod and Larimore 1997).

#### MINORITY STEM INTERVENTIONS

ANSEP is one of many programs that address underrepresentation of minorities in STEM education. To improve the educational outcomes of racial and ethnic minorities, historically black colleges and universities (HBCUs) and Tribal colleges have existed since the late 1800s and have STEM degree-granting departments (Palmer, Maramba, and Gasman 2013). However, in other traditional institutions of learning, programs aimed at serving the needs of African American, Latino, Native American and Alaska Native, Pacific Islander, and, though less common, Asian American students in STEM college programs are more recent. Though categorized by names other than “minority STEM” programs before 2001, these concerted efforts sprang up in the late 1960s from an acknowledgment by university administrators of both their programs’ diversity gaps (particularly with regard to student retention, achievement, and graduation rates) and the needs and challenges faced by the growing minority student population at their institutions (Matyas 1991).

Support programs and activities for minority undergraduates fall across a wide spectrum of programming and interventions. Several focus on student retention, whereas others concern themselves more with increased achievement beyond basic completion of coursework. The most common features of these programs fall into the following categories: financial support, academic supports, professionalization and career exploration, psychosocial supports, including mentoring and student groups, and institutional or curricular reforms. Activities within these categories are described below, together with references to supporting evidence of the activities’ overall effectiveness.

## **Financial Support**

Financial aid and support are a common facet of minority STEM college programs such as ANSEP, with the goal of increasing retention or academic achievement rates. The primary reasons for this type of student support are to motivate students to participate and continue in the program and to reduce the stress and distraction of financial concerns for students, including reducing student work hours outside of study.

Financial aid has been found to be a positive factor in student retention, particularly in STEM fields (Sharp, Kleiner, and Frechtling 2000).

Scholarships and grants, important parts of the ANSEP model, have shown to be the most beneficial and effective in ensuring minority students' degree completion, even more than student loans (Hauptman and Smith 1994; Pascarella and Terenzini 1991). In addition to formal financial aid for tuition and living expenses, many programs have experimented with support for minor expenses, such as the cost of field trips, attendance at professional conferences, needed technical equipment, computing or printing services, and even meals. For many programs, specific types of informal assistance are also associated with psychosocial supports, such as providing a sense of belonging or community. However, few cost-benefit analyses or other evaluations have examined the kinds of financial support services that are most effective (Gándara and Maxwell-Jolly 1999).

## **Academic Supports**

The most common support services offered by minority STEM programs involve assistance in academic preparation (particularly for gaps from secondary education) and continued achievement. The most prevalent support is tutoring, which ranges from coordinating peer or advanced peer tutoring programs (including graduate student or even staff tutors for undergraduates) to more intensive "learning centers." Tutoring has been shown to be a particularly effective academic approach for students in need of additional support in primary and secondary education settings. Although some evidence supports its effectiveness at the college level in general, little to nothing is known about how formal tutoring works for undergraduate minorities in college STEM programs (Benware and Deci 1984). Therefore, little information exists on whether peer versus staff tutoring is more effective for this group, though some research suggests that peer tutoring benefits both the tutors and the students (Good, Halpin, and Halpin 1998). Learning centers provide useful assistance to university students in general, though no known learning centers have been devoted solely to minority STEM students (Holton and Horton 1996).

Another common form of academic assistance is academic advising, including guidance on coursework selection, referrals to other academic supports (such as tutoring and learning centers), and help with the selection of academic majors. On the whole, minority students search for and use institutional and departmental academic advisers at a lower rate than other students, thereby increasing their likelihood of switching majors or leaving university altogether (Atkinson, Jennings, and Liongson 1990). When combined

with frequent monitoring of student progress and substantive knowledge of the coursework requirements in majors, academic advising has been shown to have positive effects on minority student retention and achievement (Lowe and Toney 2001; Trippi and Cheatham 1991).

A related third form of academic support, which ANSEP includes as a central feature of its model, involves more fundamental assistance for students, that is, the building of learning skills through review and recitation of coursework material. Seminars and workshops whose subjects range from study habits, time management, test taking, organizational strategies, and other life skills that can assist in academic performance are common parts of many minority STEM undergraduate programs. Little is known about the effects of these activities, and possible evaluations are complicated by the fact that these activities are often performed in conjunction with other activities, such as social supports, peer study groups, and professional workshops (Gándara and Maxwell-Jolly 1999).

### **Professionalization and Career Exploration**

Because of the unique culture of STEM professions and the intensive requirements for entry, minority STEM programs have directed a significant set of activities toward the professionalization of students and exposure to professional work environments. The primary activities in this area of support, many of which ANSEP provides, include the following:

- Mentoring
- Student research and publication opportunities
- Professional internships
- Sponsorship of professional association chapters and payment of students' memberships and conferences, both ethnic professional associations like the American Indian Science and Engineering Society (AISES) and disciplinary professional associations
- Career counseling and awareness programs
- Graduate school counseling and preparation programs, including graduate bridge programs

Typically, all of these activities are designed to maintain students' interest in their chosen STEM fields, socialize them to the culture and demands of their selected professions, and increase the likelihood of higher achievement during their undergraduate work as well as into their eventual careers. Ultimately, the activities seek to provide the "cultural capital" and systems knowledge that minority students often lack.

Mentoring is one of the more prevalent offerings. Mentors can be administrative staff members who advise on personal decisionmaking, faculty members who guide students' educational paths (particularly for

students interested in graduate study), or industry mentors who provide career guidance. The benefits and effectiveness of mentoring have been documented largely through qualitative evidence, much of which suggests positive outcomes in terms of students' retention, goal setting and efficacy, and academic success (Redmond 1990; Santos and Reigadas 2002). Much of the research has been complicated by the fact that mentoring takes many forms (e.g., occasional meetings with mentors), each of which can be implemented at different levels of intensity or frequency (i.e., once a semester or weekly). Recent scholarship suggests that mentorship effects may not be as strong as those of other professionalization services, such as research experience, because of variations in mentorship quality (Estrada, Hernandez, and Schultz 2008). A challenge for implementing mentorships has been in identifying individuals who are appropriate and available, particularly for faculty mentors at institutions with climates that have been less open to minority student programming.

The outcomes from another professional strategy, direct research opportunities with faculty and internships, have been documented with a stronger evidence base (Chemers et al. 2011; Laursen et al. 2010). These outcomes are particularly strong with regard to retention in STEM undergraduate majors, persistence in interest in pursuit of STEM degrees and careers, professionalization in STEM occupations, and pursuit of graduate study and research (Hackett, Croissant, and Schneider 1992; Nagda et al. 1998). These experiences have additional benefits in other categories of support. For example, they may result in informal mentorships with faculty members and industry leaders, as well as provide salaries that can assist in financing students' undergraduate education (Alfred et al. 2005). Ultimately, however, employment in STEM-related activities early in the students' careers appears to provide the most educational and professional benefit.

A related professional support includes career counseling or career exposure activities, which ANSEP provides throughout its components. Within minority STEM interventions, these generally include presentations or workshops with industry professionals, because career counseling services tend to exist as a separate administrative unit in most universities. The effect of these activities on postgraduation employment is unclear. Similarly, the quality of graduate school preparation supports such as GRE (Graduate Record Examinations) test preparations or graduate school "summer bridge" activities is unknown, largely because so few minority STEM graduate preparation programs exist.

### **Psychosocial Supports**

In contrast with the other activities that are more common to university programming, such as financial aid and academic achievement supports, many minority STEM programs, including ANSEP, also include activities focused on students' well-being and stability. These include providing personal counseling beyond typical advising or even mentoring; institutionalizing peer support groups, through either formal study groups or informal communications in student lounges or similar meeting facilities; sponsoring cultural

events relevant to specific ethnic groups; and even encouraging the families of students to become part of broader support networks (such as parent groups and newsletters). These activities collectively are designed to acculturate minority students to campus through social integration as well as serve as long-term social supports—strategies that have both been critical to student outcomes (Hurtado 1990; Tinto 1993).

For minority STEM students, the development of peer groups is a particularly critical psychosocial need. One version of these is the peer study group, which has the added benefit of providing academic support. There is increasing evidence of the benefits of peer learning environments for minority STEM student outcomes (Alexander, Burda, and Millar 1997; Moreno and Muller 1999; Springer, Stanne, and Donovan 1999). In all cases, researchers find strong evidence that minority students' sense of belonging (also referred to as social cohesion) at university is complex and often hindered (Hurtado and Carter 1997). Social supports like group events and social gatherings of any type—including academic and ethnocultural ones— increase a sense of belonging among STEM undergraduates and motivate them to persevere (Estrada-Hollenbeck, Woodcock, and Schultz 2008).

### **Institutional or Curricular Reforms**

Most minority STEM programs have looked at interventions at the student level to address retention and achievement challenges. However, a number of them have also included changes to the curricula, particularly for first-year math and science courses that are often milestones for high attrition (Gainen 1995). Various approaches to alternative teaching and pedagogical techniques have been employed to address these concerns, though most exist in parallel with the offerings of traditional academic departments (Landis 1985, 1991). For example, active-learning models have been shown to yield greater engagement among STEM undergraduates (Gasiewski et al. 2012). Especially when offered early in students' academic careers, these courses socialize students in noncompetitive learning environments while achieving the same instructional objectives. Research has demonstrated positive effects of these revised pedagogies on student persistence and later achievement (Ackermann 1991; Gold, Deming, and Stone 1992). Aside from its development of curricula in individual precollege components, ANSEP has not attempted any curricular reform, either comprehensively across components or within the University Success component, whose participants attend traditional college classes.

Another strategy for integration of minority STEM students has focused on the ethnic composition of the faculty and administration rather than the students. Though rare, these programs include workshops on cultural diversity and sensitivity as well as alternative pedagogical tools for dealing with a diverse student population. Many of these strategies have been employed beyond minority-specific programs to deal with the generally high attrition rates in STEM majors in particular.

A final institutional factor associated with minority STEM program outcomes has been the basic commitment of resources to these programs, which ANSEP has accomplished through its successful and abundant fundraising and University of Alaska support. In instances where minority STEM students are particularly vulnerable to attrition or low achievement, the cause may be a lack of commitment to sponsoring targeted programs with sufficient resources and programming. This kind of supportive institutional environment, with senior administrative support, is necessary to facilitate program goals and, in turn, student achievement objectives (Urban Institute 2005). Providing appropriate information and outreach during recruitment may also increase enrollment of both minority and low-income students (Hoxby and Turner 2013). Though not well documented in research, industry support of minority STEM programs has been critical, not only for providing resources but also for assisting in career awareness and internship development.

#### MINORITY STEM INTERVENTION MODELS

Many STEM programs use a combination of the above services and supports. Among the most common combinations are those that combine academic preparation and early peer supports in summer bridge programs. Though common for a variety of university academic programs, bridge programs that introduce college freshmen to campus for early orientation and early coursework have been especially prevalent in STEM programs (Gándara and Maxwell-Jolly 1999).

However, many minority STEM programs, such as ANSEP, extend well beyond the pre-freshman summer and provide several activities throughout the students' undergraduate experience. Two commonly cited examples of these comprehensive programs are the Meyerhoff Scholars Program at the University of Maryland, Baltimore County, and the Minority Engineering Program, which originated in the California State University system in the 1970s and is now common throughout California's university system.

In the Meyerhoff Scholars Program, selected top-performing African American students first participate in a summer bridge program and then proceed to receive academic advising, personal counseling, tutoring, peer study groups, internships, professional mentors, and comprehensive financial aid. These services are provided only if the students maintain at least a B average. Preliminary evidence suggests that recipients of the services had both higher grade point averages (GPAs) than comparable African American peers during their academic tenure, as well as higher graduation and graduate school attendance rates (Hrabowski and Maton 1995; Maton, Hrabowski, and Schmitt 2000; Summers and Hrabowski 2006). Benefits accrued to the institution as well, including faculty members' positive perceptions of their African American students.

The Minority Engineering Program has many of the same program services as Meyerhoff, along with the addition of strong links to the hosting institution's engineering academic unit and curricular changes in the

form of cooperative learning and community building, particularly in the first-year courses. Study centers and similar facilities are also common. Students are closely monitored for progress and counseling (Collea 1990; Landis 1988). This intervention has resulted in dramatically increased retention rates across many of the program's campus sites, and it has been used as a model for similar interventions elsewhere (Merisotis and Kee 2006; Schroeder and Lazzell 2013).

A core concern with minority STEM programs lies in their operational approaches beyond the specific services and supports they provide students. In particular, there is increasing attention to how these programs define eligibility and participation. Most programs are generally vague about selection and continuity criteria or have fairly low eligibility levels (Gándara and Maxwell-Jolly 1999). This ambiguity is often purposeful, because college enrollment is viewed as an already selective filter or because the mission of the programs is to retain students' enrollment in STEM programs in the long term—that is, not penalizing the students they assist.

Another related concern has been the lack of targets for achieving goals, whether numeric or qualitative, beyond minority STEM students' continued enrollment and eventual degree completion. The desire to increase minority STEM graduates has led many programs to open recruitment and participation beyond narrow merit bands. Ultimately, minority STEM programs often waver between being honors programs that motivate and reward high-performing minority undergraduates and programs that serve the lower-achieving minority students or those who are struggling to remain in their STEM programs. The latter philosophical mission is often supported by the belief that high-performing students are likely to perform well without additional assistance, but as Gándara and Maxwell-Jolly (1999) note, the case can be made “quite compellingly that some resources need to be dedicated to this specific purpose, and that by doing so the interests of minority communities, as well as those of the university and society as a whole, are best served” (29).

In all cases, many programs contain both target groups and follow the respective strategies required for each—that is, both rewarding high achievers and nurturing low achievers. However, the ambiguity in programs' targets for eligible participants, in turn, shapes the quality and combination of services that the programs provide and the financial and staffing resources required to provide them.

## SUMMARY

Few studies use experimental or quasi-experimental methods to produce rigorous evidence of minority STEM interventions, particularly in college education. Most studies rely on implementation evaluation designs and, where possible, outcome reporting and analysis to provide preliminary evidence of activities that are only suggestive of impacts.<sup>1</sup> ANSEP is building on this early knowledge, and although this evaluation

still does not provide the most rigorous evidence, it will contribute to the literature on minority STEM programs.

ANSEP aims to address the social, structural, and institutional barriers to racial and ethnic minorities' equal participation and success in STEM education and careers. Those barriers include underpreparedness for STEM postsecondary programs, financial hardship, and discrimination. ANSEP provides many of the services and activities that have shown promise in previous interventions, such as financial, social, and academic supports. However, ANSEP has a unique and more holistic approach by creating a model that reaches back to the middle school grades to address the issues faced by Alaska Natives early in students' academic trajectories. This evaluation will provide new evidence in STEM education for underrepresented minorities, which can help others who are looking for ways to more effectively address this issue.

## ANSEP Logic Model

ANSEP has constructed a multistage model that trains high-skilled STEM professionals (figure 1.1). The model encourages repeated participant exposure, from middle school, through high school, into college, and on to graduate school. This structure aims to affect participant outcomes and institutional outcomes, including for the Alaska K–12 system, the University of Alaska system, and Alaska's STEM industries. The logic model, presented below, is a graphic representation of ANSEP's theory of change—that is, the assumptions around the program's operational plan, activities, and expected outcomes or effects.

The ANSEP logic model is a product of the early exploratory research for this evaluation, and the evaluation team developed it in consultation with ANSEP leadership. The model has served as the framework for data collection in this evaluation, and it is the basis for the organization of this report.

The logic model includes the following:

- **Context:** the structure in which the program operates
- **Assessing the Need:** the areas that are the targeted domains or spaces for intervention
- **Inputs:** the basic resources that support the programmatic and functional activities
- **Functional Activities:** the activities that facilitate ANSEP programming
- **Programmatic Activities (Components):** the programming activities that serve participants
- **Outputs/Short-Term Outcomes:** the short-term results of program activities
- **Long-Term Outcomes:** the long-term results of program activities, aligning with the areas targeted in the needs assessment

FIGURE 1.1

# Alaska Native Science & Engineering Program (ANSEP) Logic Model

## ASSESSING THE NEED

### INSTITUTIONAL

<b>ALASKA K-12 SYSTEM</b> Teachers • Curriculum • Other resources	<b>UNIVERSITY OF ALASKA</b> Faculty and staff • Student social and academic supports • Research resources • State STEM career preparation • Student diversity and climate for Alaska Natives	<b>STEM INDUSTRY</b> STEM workforce • Interaction with Alaska Native communities • Staff diversity and climate for Alaska Natives
--	---	--

### STUDENTS

Preparation for and awareness of STEM educational and career pathways
Motivation and commitment to STEM
Family and community resources

### CONTEXT

Economic conditions and labor market • Policy and budget climate (K-12 system, University system, and federal, state, and local/village) • Historical and social conditions for Alaska Natives
--

## INPUTS

### FUNCTIONAL ACTIVITIES

### RECRUITMENT AND SELECTION

### PARTNERSHIP AND RELATIONSHIP MANAGEMENT

### FINANCIAL MANAGEMENT

### FUNDRAISING

### MARKETING AND COMMUNICATIONS

### ALUMNI OUTREACH AND ACTIVITIES

### POLICY WORK AND ADVOCACY

## PROGRAMMATIC ACTIVITIES (COMPONENTS)

MIDDLE SCHOOL ACADEMY	CAREER EXPLORATIONS	ACCELERATION ACADEMY	SUMMER BRIDGE	UNIVERSITY SUCCESS	GRADUATE SUCCESS
Computer assembly Residential experience on campus Hands-on STEM modules Team-building work Social activities Field trips Exposure to Alaska Native and other mentors	<b>Recurrent program</b> Residential experience on campus Hands-on STEM modules Team-building work Social activities Field trips Exposure to Alaska Native and other mentors	<b>Recurrent program</b> Computer assembly Residential experience on campus Hands-on STEM modules Team-building work Academic preparation Supports and advising Social activities Exposure to Alaska Native and other mentors Scholarships for college <i>Jump Start for former participants</i>	Freshman-year academic preparation Residential experience on campus Team-building work Paid internship Supports and advising Social activities Professionalization and skill-building Exposure to Alaska Native and other mentors Scholarships for college	Performance requirements Merit-based scholarships Residential experience on campus Team-building work Paid internship Peer study groups Weekly meetings and employer networking Study/social space and resources Supports and advising Job-placement assistance Informal mentoring/networking Teaching and research opportunities Research exposure Exposure to Alaska Native and other mentors	Scholarships and financial support Supports and advising Academic research skill-building Career awareness and exposure to other universities Team-building work Exposure to Alaska Native and other mentors

## OUTPUTS / SHORT-TERM OUTCOMES

<b>ALASKA K-12 SYSTEM</b> Higher performing students returning to classroom • College application rates • Contact with university	<b>UNIVERSITY OF ALASKA</b> Diversity rates • Retention rates • Resources	<b>STEM INDUSTRY</b> Diverse workforce • Interns' work product • Alaska Native community relations
--	--	---

Knowledge of college life • Soft skills • Leadership development • Application to further ANSEP activities • Social integration • STEM professional identity and socialization					
Commitment to complete algebra by the end of 8th grade		Commitment to complete trigonometry, chemistry, and physics by end of high school		Retention at university • Entry-level STEM employment	
Completion of Academy	Completion of Career Explorations • Reinforcement of Middle School Academy experience	Completion of Academy, with credits • Application to university	Completion of Summer Bridge, with college credits	Completion of STEM major coursework	Retention in advanced degree

## LONG-TERM OUTCOMES

<b>ALASKA K-12 SYSTEM</b> Pool of qualified Alaska Native and non-Alaska Native STEM teachers • STEM education practices that emphasize hands-on learning and career-focused curriculum • Resources committed to STEM	<b>UNIVERSITY OF ALASKA</b> Recruitment and retention of Alaska Native students and other minorities • Use of existing university resources, visibility and attraction of STEM funding to campus • Filling Alaska's STEM occupational needs	<b>STEM INDUSTRY</b> Access to skilled, stable workforce of scientists and engineers • Access to Alaska Native perspective and leadership on STEM and natural resource issues
--	--	--

Excitement about STEM • Connection to academically focused peer group • Reinforcement of Alaska Native identity					
Knowledge about STEM education and occupations for parents, social networks, and sending communities					
Personal computer		Personal computer			
College-readiness for STEM field • College enrollment • College degree attainment • Advanced degree attainment • Career advancement and wages • Commitment to STEM field					
Empowerment and leadership • Commitment to Alaska Native community and Alaska					
Social and professional network of colleagues and employers					

Alaska Natives in leadership roles • Changing attitudes toward Alaska Natives and minorities • Greater sensitivity to diversity

## CONTEXT

The context in which ANSEP operates includes the economic and labor market conditions and the policy and budget climate in several institutions: the K–12 educational system, the University of Alaska system, the federal government, the state of Alaska, and the local or village-level context. In addition, the historical and social conditions of Alaska Natives in the state provide an important backdrop for ANSEP’s activities. These broad conditions affected how and why ANSEP came to be and will facilitate or hinder its ongoing functioning and success.

## ASSESSING THE NEED

The needs for students include three key areas of knowledge or capacity that were deficient when ANSEP started and that the program model aims to address: (1) individual preparation for and awareness of the STEM educational and career pathway, (2) motivation and commitment to STEM, and (3) family and community resources. ANSEP was also created to address deficiencies within the Alaska K–12 system, including the capacity of teachers, the quality and pace of the curriculum, and the availability of other resources. In the University of Alaska system, ANSEP leadership saw unmet needs related to faculty and staff, student social and academic supports, research resources, state STEM career preparation, and student diversity and climate for Alaska Natives. In STEM industries, unmet needs related to the STEM workforce, the interaction with Alaska Native communities, and staff diversity and the climate for Alaska Natives within STEM organizations. A desire to address those needs motivates almost all ANSEP activities, and most of the outputs and outcomes of the program relate directly to meeting the needs.

## INPUTS

The logic model depicts four key inputs:

- **Staffing and leadership** relates to the personnel who make up the ANSEP workforce. The majority of staff members and the overall management team are headquartered at the University of Alaska Anchorage (UAA).
- **ANSEP facilities** relate to the ANSEP building on the UAA campus and other physical spaces that ANSEP uses to conduct its programming.
- **Funding** is the monetary resources that support ANSEP activities and come from a variety of partners.
- **Partnerships** are the relationships and interactions with internal and external entities such as the University of Alaska system and employers that support the ANSEP model.

The inputs are described in chapters 3 through 5 of part II of this report, which contains findings from the implementation study of ANSEP. The exception is that the role of partnerships as inputs is described with the functional activity portion of part II (chapter 7) because it is closely related to the activities of building and maintaining partnerships.

## FUNCTIONAL ACTIVITIES

ANSEP programming consists of the following seven key functional activities:

- **Recruitment and selection** describes the processes by which ANSEP encourages students across the state to apply to ANSEP and by which ANSEP chooses whom to admit to components.
- **Partnership and relationship management** is the activity through which ANSEP builds its partnerships and relationships with external organizations, such as STEM employers or the K-12 educational system, or within the University of Alaska system.
- **Financial management** is the activity conducted by ANSEP staff to manage revenues and costs and coordinate with funding sources and administration.
- **Fundraising** describes the activities related to raising funds to support ANSEP programming.
- **Marketing and communications** include advertising and communications through media outlets and other brand development across the state.
- **Alumni outreach and activities** describes how ANSEP seeks to keep alumni engaged.
- **Policy work and advocacy** describes ANSEP's efforts to reform the K-12 educational system, STEM industries, and the University of Alaska to improve conditions for Alaska Natives.

These functional activities are necessary because they encourage more inputs (e.g., funding) and set the stage for ANSEP programming. A chapter of this report is dedicated to each functional activity, except for financial management and fundraising activities, which are both described in the funding input chapter (chapter 5).

## PROGRAMMATIC ACTIVITIES (COMPONENTS)

The inputs and activities support the delivery of ANSEP's six components—Middle School Academy, STEM Career Explorations, Acceleration Academy, Summer Bridge, University Success, and Graduate Success—as follows:

- **Middle School Academy** is the first possible entry point to the ANSEP multi-stage model. It provides youth who are middle school age with an 11-day residential experience at the University of Alaska

Anchorage. The experience provides active learning opportunities designed to foster enthusiasm for pursuing STEM education and careers and a commitment to completing Algebra 1 by the end of eighth grade. The program has grown since its creation in 2009, evolving from a centralized program run entirely by ANSEP staff to a hybrid model that relies on collaboration with specific school districts around the state of Alaska.

- **STEM Career Explorations** provides an opportunity for participants who previously attended a Middle School Academy to return to the University of Alaska Anchorage for a five-day residential experience in which they focus on a particular STEM field. This allows participants to renew their dedication and enthusiasm to the ANSEP community and to STEM study.
- **Acceleration Academy** gives high school-age participants college preparatory coursework and supports to ensure they continue on the STEM education path. Acceleration Academy is a five-week summer session at the University of Alaska Anchorage, whereby participants can earn college credit through intensive summer college courses and gain hands-on STEM experiences. Participants benefit from a college residential experience, peer socialization, and college scholarships to reward completion.
- **Summer Bridge** provides a transition summer for participants who are beginning a STEM undergraduate degree at the University of Alaska in the fall. The eight-week program combines academic coursework with a paid internship in a STEM workplace, either in Anchorage or in the field elsewhere in the state. This prepares participants to successfully transition both academically and socially into the university, and it provides them work experience and exposure to STEM career fields.
- **University Success** provides a comprehensive set of supports to undergraduate students enrolled in science and engineering majors at UAA, University of Alaska Fairbanks (UAF), and University of Alaska Southeast. University Success supports the academic, professional, and social success of participants by providing a range of supports and requirements. The program requires participants to meet high academic standards, complete summer STEM internships, and actively participate in the learning community.
- **Graduate Success** supports participants who choose to continue their post-secondary education by pursuing a master's, doctoral, or other professional degree in STEM fields at the University of Alaska or partner institutions elsewhere in the United States. The program provides financial and other supports to develop leaders for STEM industry organizations and the faculty of the University of Alaska.

The logic model lists the key aspects of each component, and these activities are highlighted in the component chapters in this report. ANSEP intends for these activities to encourage students to progress to the next stage of the model and anticipates that this participation will result in the outputs and outcomes described below each component.

### OUTPUTS AND SHORT-TERM OUTCOMES

Highlighted in three categories, the outputs and short-term outcomes for students are the immediate results of participation in each component. In light yellow are those outputs and short-term outcomes that respond to the first need listed under “Assessing the Need” for students: “preparation for and awareness of STEM educational and career pathway.” Outputs and short-term outcomes, in yellow, address the need “motivation and commitment to STEM.” Finally, those in orange respond to the need for “family and community resources.” In addition, the logic model lists institutional outputs and short-term outcomes, which are not color-coded but are responsive to the needs of each institutional realm identified earlier in the model.

### LONG-TERM OUTCOMES

Finally, the logic model lists long-term outcomes. These outcomes may occur years after component participation. Similar to the outputs and short-term outcomes, the student long-term outcomes are color coded to correspond to needs that ANSEP seeks to address. A list of long-term institutional outcomes highlights ANSEP’s ambitious goals, including changing the statewide climate for Alaska Natives in all three institutional realms and promoting the health of the STEM industries for years in the future.

## The ANSEP Evaluation

The Urban Institute conducted an implementation and participant outcomes study of ANSEP between September 2013 and December 2014. The Urban team collected data from a number of sources, further detailed in appendix A. Researchers collected data during site visits, holding interviews and focus groups with a wide range of participants, staff, partners, and stakeholders in the University of Alaska, the K-12 educational system, and organizations in the STEM industries. The team also collected ANSEP’s participant records at UAA and UAF and had staff collect and share participant records from the university’s Banner software system. Researchers also fielded an online survey to all 216 University Success alumni in the summer of 2014. ANSEP staff provided additional program documentation, such as financial records and marketing materials. The following provides a short description of the evaluation approach.

## Implementation Study

The implementation study is designed to address three key topics: (1) program composition and theory of change, (2) program evolution, and (3) program performance. From these topics, the team detailed important research questions (see table 1.1).

TABLE 1.1

### Implementation Topics

Program Composition and Theory of Change	Program Evolution	Program Performance
<ul style="list-style-type: none"> <li>■ What are the various components of ANSEP?</li> <li>■ How do they support the overall program goals and objectives?</li> <li>■ Do certain components or activities appear to play more significant roles in shaping outputs and outcomes?</li> </ul>	<ul style="list-style-type: none"> <li>■ How were these components originally designed?</li> <li>■ How have they evolved over time from the original design? What contextual factors have shaped that evolution?</li> <li>■ Who are the key individuals and organizations involved in the program’s context and activities?</li> <li>■ How have they changed over the course of ANSEP programming?</li> </ul>	<ul style="list-style-type: none"> <li>■ What have been the application, enrollment and participation, and output rates for each program component?</li> <li>■ Are the components serving the appropriate target populations?</li> <li>■ Which standards or target outputs have been consistent with the program’s goals?</li> <li>■ Which contextual factors and administrative practices shape these outputs?</li> </ul>

The implementation study was informed by qualitative data collection and analysis based on three site visits, which were timed to capture sessions of all the different ANSEP components from middle school through university. The Urban team conducted site visits to the campuses of UAA and UAF and to school districts in suburban Anchorage and the Bethel area, including two Alaska Native villages. The evaluation does not include the ANSEP site at the University of Alaska Southeast because of the newness and small size of that program. During the site visits and in phone interviews, the Urban team interviewed ANSEP staff at UAA and UAF; University of Alaska system leadership; administrators and faculty at UAA and UAF; employers, school districts, and other partners; and other community stakeholders. Interviewees also included ANSEP alumni and parents of ANSEP participants. Focus groups were conducted with ANSEP participants from every component, and research staff also observed activities taking place during the sessions of all components.

Data from participant records—both from ANSEP and University of Alaska records—provided descriptive information on each of the components and their performance. Data from the alumni survey provided rich information on the experiences of past participants in ANSEP. Research staff also accessed print materials, internal records, and financial records provided by ANSEP staff and partners.

## Participant Outcomes Study

An important component of our evaluation of ANSEP is understanding how well its participants are progressing toward eventually earning a college degree in a STEM field. To provide this understanding, evaluators often use a control or comparison group to statistically determine what would have happened to participants in the absence of the program. Because it is not feasible to randomly assign participants or identify a nonexperimental comparison group, benchmarks are used to measure how well ANSEP participants in the various components do compared with other relevant reference groups. A national sample of STEM college graduates surveyed by the US Department of Education National Center for Education Statistics provides context for the educational and employment outcomes of ANSEP participants (see further detail in appendix A). A survey of University Success alumni also documents the long-term outcomes of the program to inform the outcomes study.

The long-term outcomes are differentiated from the outputs and short-term outcomes that are examined in the implementation study to measure the performance of ANSEP by tracking participants' progress. The outcomes study, based on an alumni survey and available participant data, provides an understanding of how well ANSEP is achieving its educational, career, personal, and social goals for participants. The alumni survey also captures former participants' views of ANSEP.

## Limitations of the Evaluation

This evaluation does not propose to measure the impacts of ANSEP and its components, only the outputs of ANSEP components with regard to participants' achievements and the long-term outcomes with regard to STEM graduate study and employment for University Success participants. The implementation study's findings provide clarity regarding the limitations of the outcomes study by describing other possible explanations for the outcomes noted. Additional challenges arise across two primary data sources: ANSEP's administrative data, for which maintenance and informational categories evolved over time, and the responses from the alumni survey, for which sample size was limited by both the availability of accurate contact information and the low rate of consent to match to administrative and academic data. Regardless, the evaluation makes some descriptive inferences about participant outcomes.

## The Remainder of the Evaluation Report

This report next reviews the economic and social context in which ANSEP operates in the state of Alaska and within the University of Alaska setting. Chapters 3 through 10 in part II describe the implementation of

each aspect of the logic model, beginning with the inputs of staffing and leadership, facilities, and funding and move on to the functional activities of recruitment and selection, partnership and relationship management, marketing and communications, alumni outreach and activities, and policy work and advocacy. The report goes on to describe implementation findings for each component (chapters 11 through 16), moving through the ANSEP model, from Middle School Academy to STEM Career Explorations to the high school-level Acceleration Academy and Summer Bridge and then to University Success and ending with Graduate Success. Each implementation study chapter describes the operations and evolution of each element of ANSEP operations and programming. In part III, the study results of participant outputs and outcomes are described in chapter 17. The final chapter discusses implications for future programming and policy.

# Chapter 2

## ANSEP's Development: The Historical and Current Context

This chapter reviews the historical and contemporary context in which the Alaska Native Science & Engineering Program (ANSEP) developed. It describes the overall economic and social conditions in the state of Alaska and in the University of Alaska (UA) system, where ANSEP is situated. The review reflects on how this context influences ANSEP's goals and program design. It also provides a background for understanding ANSEP's operations and components.

### Introduction

In 1995, Herb Schroeder, ANSEP's founder and engineer, began ANSEP with the University Success component at the University of Alaska Anchorage (UAA). University Success provided academic, financial, and social supports to assist Alaska Native undergraduate engineering students. Over time, ANSEP has expanded to prepare students for careers in science and technology earlier in their academic careers. ANSEP's focus on engineering and science responds to the needs of Alaska's industries, many of which primarily hire workers with science, technology, engineering, and math (STEM) education and experience. These industries include land and wildlife management, oil extraction and other resource mining, and construction. In addition, ANSEP focuses on addressing the social context for Alaska Natives, affecting their representation in education and the workforce, as well as the institutional context in which the program operates, namely the UA system.

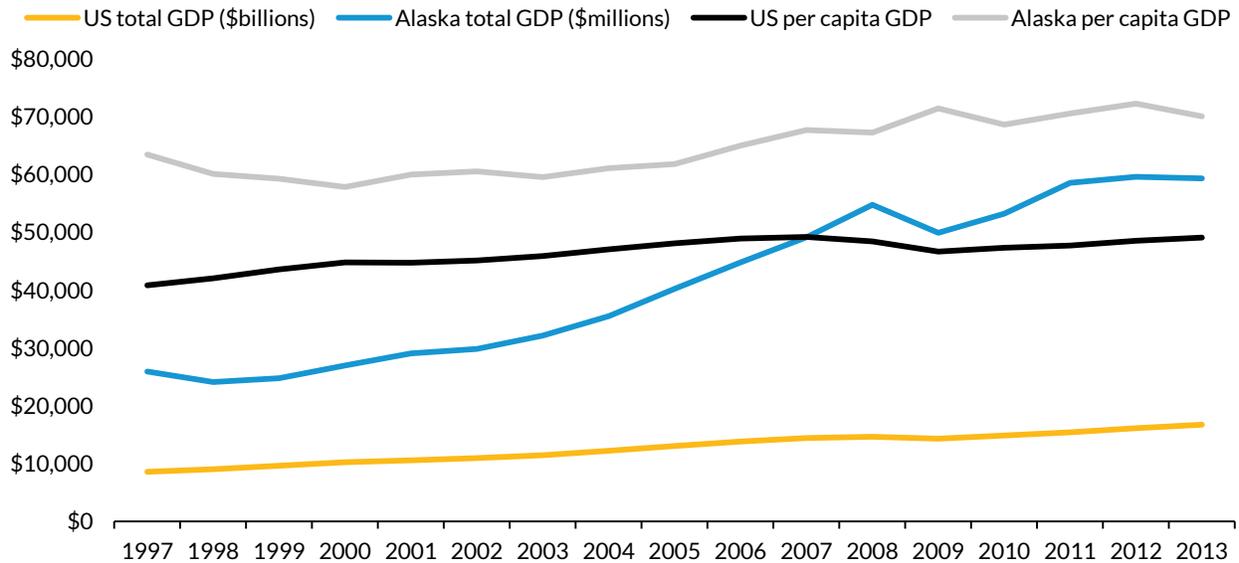
This chapter explores ANSEP's context in three realms: Alaska's economy and industries, conditions for Alaska Natives within the state (including the primary and secondary education system), and the UA system. It concludes with a brief discussion of how ANSEP has specifically tailored its programmatic offerings and other activities to overcome challenges for Alaska Natives and promote participants' success in STEM.

### Alaska's Economy and STEM Industries

Compared with other states and the nation as a whole, Alaska has a relatively small economy. As shown in figure 2.1, Alaska's average annual gross domestic product (GDP) over the past decade is only 0.3 percent of

US average annual GDP. Nonetheless, the per capita GDP in Alaska is substantially higher than the US average. Alaska’s total GDP more than doubled over the decade prior to the 2008 recession.

**FIGURE 2.1**  
**Alaska and US per Capita GDP, 1997–2013**



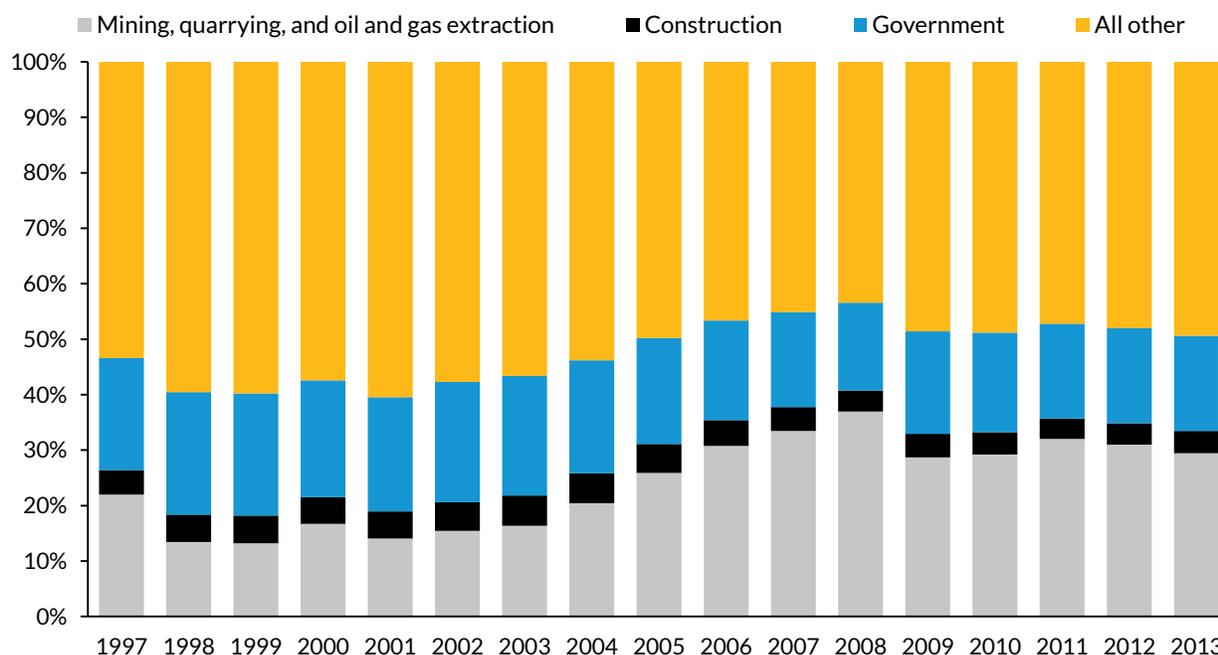
**Source:** US Department of Commerce Bureau of Economic Analysis, regional data.  
**Note:** GDP = gross domestic product (in chained 2009 dollars).

The primary source for this growth came from a single sector: mining, quarrying, and oil and gas extraction, as shown in figure 2.2. In the five-year time frame from 2003 to 2008, the oil and gas extraction subindustry grew almost fourfold in economic value and doubled its contribution to the overall state GDP, adding over \$17 billion dollars to Alaska’s economy by the time of the recession. Table B.1 in appendix B contains detailed information about other industries in Alaska.

FIGURE 2.2

## Industrial Composition of Alaska's GDP, 1997–2013

Percentage contribution of total GDP



Source: US Department of Commerce Bureau of Economic Analysis, regional data.

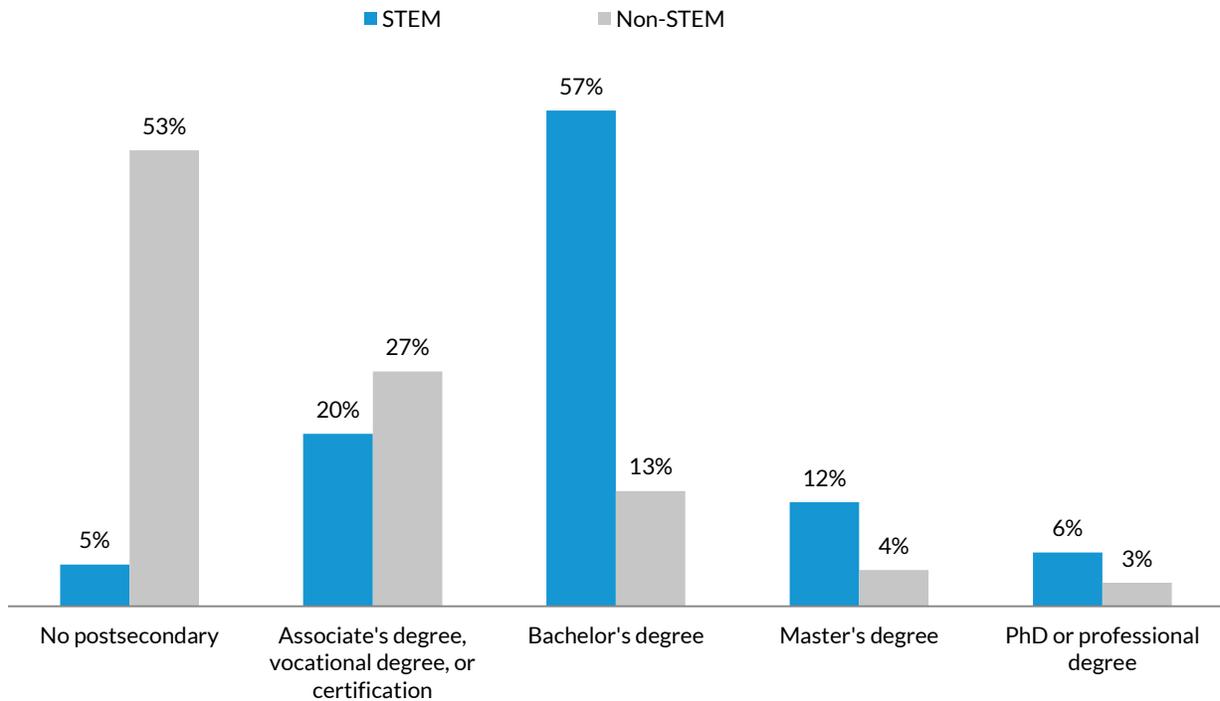
Note: GDP = gross domestic product.

The oil and mining industries have also played a major role as an employer for occupations at all levels of educational attainment and professional experience—that is, from construction and mining laborers to civil and petroleum engineers. Over 5 percent of all working Alaskans work in the mining and oil extraction sectors alone, with additional related employment in energy production, transportation, and construction (US Department of Labor 2014). Between 2012 and 2022, employment in the mining sector is projected to grow by 19.8 percent, a rate surpassed only by the health care sector (25.0 percent) (Alaska Department of Labor 2012).

Specific STEM occupations both inside and outside specific STEM industries are especially poised to grow. As in national patterns, Alaska's STEM occupations pay higher compensation than most others. In the case of petroleum engineers, the average salary is almost three times the average across all occupations.<sup>2</sup> STEM occupations in Alaska tend to require higher educational achievement than non-STEM occupations (figure 2.3); an estimated 75 percent of STEM workers in Alaska need a bachelor's or graduate degree, compared with 20 percent of non-STEM workers (Stimpfle and Mosher 2011).

FIGURE 2.3

**STEM and Non-STEM Educational Levels and Average Earnings in Alaska, 2008**



**Source:** Alaska Department of Labor and Workforce, tabulations of DOL/O\*NET data.

**Note:** STEM = science, technology, engineering, and math.

Jobs in STEM occupations are expected to grow over the next decade, according to the US Department of Labor Bureau of Labor Statistics. Two long-term trends characterize Alaska’s STEM fields in the midst of this apparent growth. In the first trend, Alaska’s STEM employers work primarily in oil and gas extraction, in which growth has slowed in recent years. Recent changes in oil and gas prices and investments in new production are likely to affect the economic growth of these industries and demand for STEM occupations within them, but the long-term picture for this industry is unclear (Martz 2014). Science occupations are also in demand by Alaska’s industries and government, but that demand is not as great as for engineers. STEM-related occupations that have not traditionally been considered STEM jobs, such as jobs in health care and medical fields or in postsecondary education for STEM fields, are also growing at high rates in Alaska.

The second important trend relates to who fills STEM occupations in Alaska. The age, gender, and racial distributions of STEM workers in Alaska differ remarkably from the state’s non-STEM workforce. Age differences are especially notable. According to researchers in Alaska’s Department of Labor and Workforce Development, in 2008 only about 9 percent of STEM workers were under the age of 25,

compared with 20 percent of non-STEM workers. Although educational requirements for STEM careers likely account for much of this difference, this characteristic suggests that STEM employers may experience challenges in recruiting and retaining workers to replace current workers as they retire or as new openings emerge in these professions.

As in the national STEM workforce, the population of STEM workers in Alaska is largely male. According to current population estimates, women make up approximately one-fourth of the STEM workforce in the state, compared with higher rates in occupational groupings like health care, where women make up three-fourths of the workforce. Table B.3 in appendix B shows the detailed gender and ethnic demographics of Alaska's workforce by occupation. Among STEM fields, women tend to be more represented in mathematics and the physical sciences than in engineering; women make up almost one-third of Alaska's scientists and almost one-half of mathematicians, but only one-fifth of engineers.

When considered by racial groups, the proportions of Alaska Natives employed in STEM professions diverge strongly from their shares in the general and employed populations. According to the most recent US Census data, American Indians/Alaska Natives<sup>3</sup> make up an estimated 5.6 percent of the STEM workforce in Alaska, though they make up almost 10.0 percent of those employed overall in Alaska. The proportion is smallest for scientists; only 3 percent of scientists are identified as Alaska Native.

The interaction between ethnicity and gender within STEM professions is also notable. The gender distribution for the few Alaska Native scientists in Alaska is similar to the distribution in the overall population of scientists in Alaska. However, the gender distribution for Alaska Native employees in other STEM professions is more unequal than the overall STEM gender distribution in Alaska: women make up only 20.2 percent of Alaska Native computer and math occupation employees and only 4.2 percent of the Alaska Native architectural and engineering employees. However, the estimated number of Alaska Native STEM employees in Alaska (1,109) is too small to make statistically valid conclusions.

Not everyone in Alaska has benefited from the growth and expansion of Alaska's STEM economy. The following section discusses the economic and social challenges faced by Alaska Natives, the population that ANSEP targets.

## Alaska Native Economic and Social Conditions

As of 2014, Alaska has a population of around 735,000 people, of whom 14.7 percent are Alaska Native and 7.1 percent are multiracial. Despite a generally stable or positive economic outlook in the state and a median household income that is almost one-third higher than that in the mainland United States, Alaska Native groups have experienced less-promising social and economic trajectories.

Alaska Natives, the second-largest racial group in the state by overall population and working-age population (that is, over 16 years of age), participate in the labor force at significantly lower rates and have the highest unemployment rate among all groups in Alaska. As table 2.1 shows, only 59 percent of the work-eligible Alaska Native population participates in the formal labor force, and the current unemployment rate among these individuals is about 22 percent, almost two and a half times the unemployment rate of the overall population. Alaska Natives also have the lowest median income among all racial groups in Alaska (\$40,705) and the highest poverty rate (25.0 percent compared with the overall 9.3 percent).

TABLE 2.1

**Total Labor Force, Employment, and Unemployment Rates in Alaska by Race, 2013**

	Population	Labor Force Participation (%)	Employment Rate (%)	Unemployment Rate (%)	Median Annual Income (\$)	Poverty Rate (%)
White	393,303	72.8	65.3	6.3	79,102	6.1
Black or African American	18,483	72.8	51.5	18.1	51,780	6.4
American Indian/ Alaska Native	75,070	59.0	46.0	21.6	40,705	25.0
Asian	32,497	74.8	71.7	2.7	76,126	7.0
Two or more races	33,766	73.3	62.5	12.2	58,086	9.4
<b>Total population over 16</b>	<b>565,724</b>	<b>71.2</b>	<b>62.4</b>	<b>8.7</b>	<b>72,237</b>	<b>9.3</b>

**Source:** US Census Bureau, ACS 2013 American Community Survey 1-Year Estimates.

**Note:** Inflation-adjusted dollars.

Since the end of the 2007–10 recession, overall unemployment rates have slowly declined throughout the United States, but Alaska’s most recent unemployment rate (at a seasonally adjusted 6.8 percent in September 2014) still ranks among the highest. Persistent unemployment exists among Alaska Natives, particularly in rural areas.

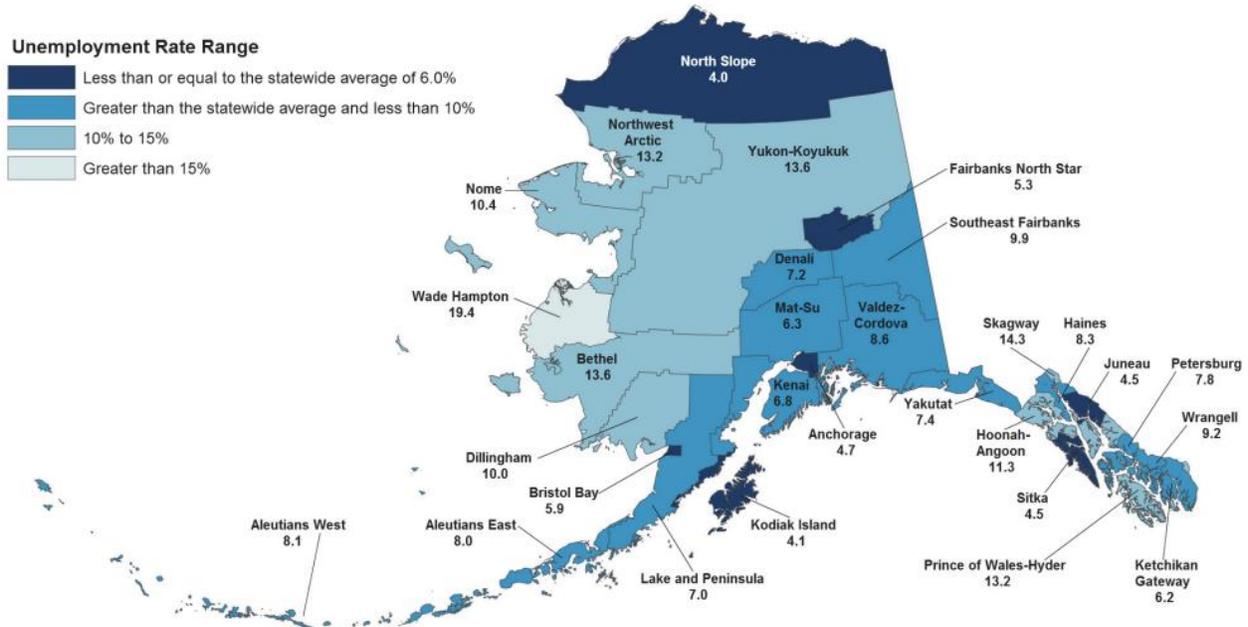
Some of the trends in employment may relate to the large areas of rural terrain in Alaska, which may have few attributes of a formal economy. For example, in many rural Alaskan communities, subsistence hunting and fishing are common. The government does not classify people who engage in these activities for a living as participating in the labor force or earning an income. In Alaska overall, differences in rural and urban work contribute to wide disparities in recorded income. As the map in figure 2.4 shows, these differences can be stark. Most rural areas have high unemployment, a lack of job opportunities, larger households, and younger overall populations—all of which depress income (Fried 2012). With the exception of places like Bristol Bay (which has some of the largest commercial fisheries in the world) and the North Slope (with the Prudhoe Bay and Kuparuk River oil fields), rural communities tend to be poorer and have higher Alaska Native populations. Table B.4 in appendix B contains further detail about the demographics of

geographic regions of Alaska. In all communities in Alaska, including in wealthier communities, the Alaska Native median household income is lower than that for all racial groups.

FIGURE 2.4

### Map of Alaska Census Regions by Unemployment Rate

October 2014



The statewide unemployment rate for October 2014 is 6.0 percent.

Source: Alaska State Department of Labor, <http://labor.alaska.gov/research/uimap/map.pdf> (accessed November 24, 2014).

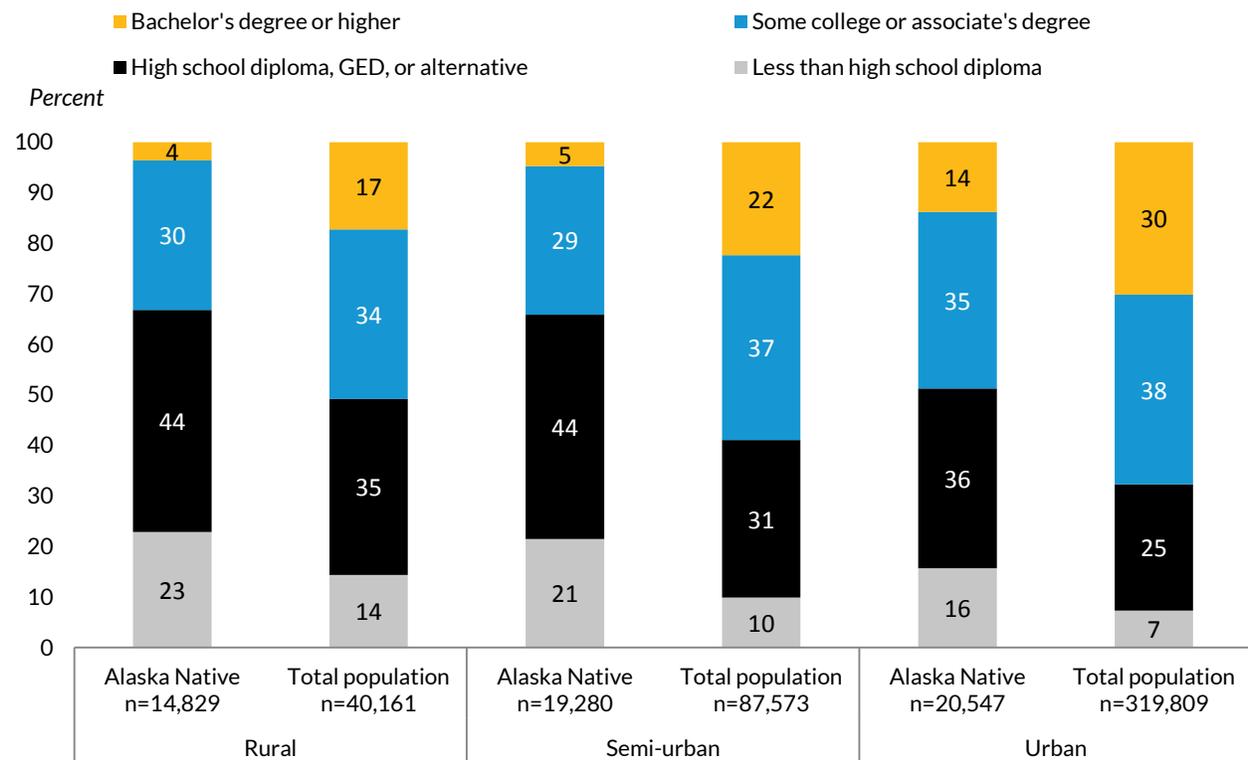
In addition, the rate of receipt of any kind of public assistance is higher in rural communities, as summarized in table B.4 in appendix B. In 2013, according to the American Community Survey, 9.8 percent of Alaska’s households received the Supplemental Nutrition Assistance Program (SNAP, formerly Food Stamps) in the past 12 months, whereas the rate for Alaska Native households was higher, at 31.6 percent. In addition, in almost all communities, in 2013 Alaska Natives made up a disproportionate share of households living below the poverty level compared with their share of the overall population.

## Alaska Native Educational Access and Attainment

Just as overall economic conditions vary, educational access and attainment vary in Alaska by geography and race. As shown in figure 2.5, urban, semi-urban, and rural regions have a higher proportion of adult Alaska Natives with less than a high school degree and a lower proportion of adult Alaska Natives with a bachelor's degree or higher compared with the overall population in the region. Rural regions have lower educational attainment rates overall than urban regions.

FIGURE 2.5

### Education Attainment for Alaska Natives and the Total Population by Urbanity



Source: American Community Survey, 2008–2012.

Note: GED = General Equivalency Diploma.

Several factors contribute to Alaska Native educational attainment, including the nature of their educational needs and the offerings and quality of precollege education to fill those needs. Recent data on Alaska Native students in Alaskan primary and secondary schools—in which Alaska Native students make up nearly a quarter of the student population—shed some light on both categories of factors. For example, Alaska Native students in grades 7 through 12 dropped out at a higher rate than all other groups in the 2012–13 school year: 6.2 percent of all Alaska Native students dropped out compared with 4.0 percent of

all students (Alaska Department of Labor 2014). This dropout rate had decreased by 8.6 percent from 2000 to 2010; therefore, retention is particularly challenging with regard to this population.

In addition, Alaska Native students more commonly have language barriers; have physical trouble getting to school as a result of geographic barriers; and are less likely to enroll in advanced math courses, either because their schools do not offer these courses or because Alaska Native students choose not to take them. In 2010, the US Department of Education documented that a much higher proportion of Alaska Native students have limited English proficiency and are enrolled in proficiency courses (25 percent in each category) compared with the overall Alaskan student population (11 percent in each category) (US Department of Education 2010). Furthermore, a higher proportion of Alaska Native students (17 percent) were enrolled in long-distance homeschooling than white students (12 percent) in 2010. This last metric relates to the high number of Alaska Native students who live in rural areas. Aside from those who are homeschooled, many Alaska Native students attend small schools that are less likely to have the financial and curricular capacity to offer the math and science courses that are needed for STEM college preparation. Of the schools across the state that serve fewer than 50 students, 64 percent are majority Alaska Native, as shown in table 2.2.

TABLE 2.2

### Share of American Indian and Alaska Native in Alaska Secondary Schools

2011 estimate

	N of schools by size	Schools with majority AIs/ANs (%)	Schools with AI/AN minority but higher than state average (%)	Schools with less than state average (%) <sup>a</sup>
<b>School size</b>				
Schools with < 50 students	118	63.6	16.1	20.3
Schools with 50–100 students	58	55.2	22.4	22.4
Schools with 100–200 students	89	47.2	29.2	23.6
Schools with 200–350 students	76	30.3	26.3	43.4
Schools with 350–500 students	91	5.5	33.0	61.5
Schools with > 500 students	61	1.6	23.0	75.4
<b>Total number</b>	<b>493</b>	<b>178</b>	<b>121</b>	<b>194</b>

**Source:** 2011 Civil Rights Survey, US Department of Education, <http://ocrdata.ed.gov/> (accessed November 24, 2014).

**Note:** Secondary schools include middle and high school. AI/AN = American Indian and Alaska Native.

<sup>a</sup> The state average is 14.7 percent.

The rural dimension of Alaska’s educational system has other indirect effects on student performance. Teacher turnover in rural Alaskan schools is high, at one point averaging 20 percent at the school district level over the 1999–2012 period and up to 30 percent at the school level, a rate higher than the national

average of 12 percent for districts and 16 percent for schools (Hill and Hirshberg 2006, 2013; Keigher and Cross 2010). Teacher turnover is a significant negative factor for high school math proficiency in Alaska, providing instability for students and increasing burdens on school administrators (Roehl 2010). As shown in table 2.3, the proportion of students in seventh and eighth grades enrolled in Algebra 1 in the 2009–10 school year who were Alaska Native was well below their proportions of the overall student population (though not necessarily of their representative population in those grades). This suggests that Alaska Native students were less likely to be in advanced math courses in middle school than were their white counterparts.

This disparity shifts slightly in 9th and 10th grades, where Alaska Native students are enrolled in Algebra 1 at a slightly higher rate than whites compared with their overall student share. Although, again, this rate could be explained by a larger share of all Alaska Native students being in grades 9 and 10 than whites, it does suggest also that some parity is occurring. Nevertheless, more students enrolled in Algebra 1 in 11th and 12th grades were Alaska Native than white, suggesting that more Alaska Native students deferred taking Algebra 1 until later in their high school years than did white students. However, the passing rates for Alaska Native students in Algebra 1 are below those of their white counterparts at all grade levels.

The disparities are even more prevalent in advanced courses that are often prerequisites for entry into STEM college degree programs. As table 2.4 demonstrates, the proportion of Alaska Native students enrolled in higher math and science courses is well below their proportion in the overall student population.

All of these educational access factors ultimately contribute to a history of lower performance of Alaska Native students in Alaska's schools compared with other groups, particularly in STEM-related coursework. Alaska Native students in Alaska test at significantly lower levels on the National Assessment of Educational Progress examinations, with a majority of Alaska Native students in grades 4 and 8 performing at below basic levels in reading or math (Alaska Department of Education 2013).

TABLE 2.3

### Estimated Total Enrollment and Algebra 1 Enrollment and Passing Rates by Grade Group in Alaska's Schools, 2009–10

	Total students	AI/AN students	AI/AN proportion (%)	White students	White proportion (%)
<b>Algebra 1 enrollment in 2009–10</b>					
Enrolled in grades 7 and 8	3,837	449	11.7	2,420	63.1
Passed in grades 7 and 8	2,467	219	8.9	1,659	67.2
Passing rate (%)	64.3	48.8	NA	68.6	NA
Enrolled in grades 9 and 10	6,062	1,602	26.4	3,615	59.6
Passed in grades 9 and 10	4,472	1,021	22.8	2,607	58.3
Passing rate (%)	73.8	63.7	NA	72.1	NA
Enrolled in grades 11 and 12	1,296	643	49.6%	561	43.3
Passed in grades 11 and 12	908	393	43.3%	482	53.1
Passing rate (%)	70.1	61.1	NA	85.9	NA
<b>Total student population</b>	<b>68,051</b>	<b>16,437</b>	<b>24.2</b>	<b>39,597</b>	<b>58.2</b>

**Source:** US Department of Education, Civil Rights Data Collection, 2009–10 National and State Estimations.

**Note:** Information on grade-level population is not available. AI/AN = American Indian and Alaska Native; Alg. = Algebra, NA = not applicable.

TABLE 2.4

### Estimated Advanced Math and Science Course Enrollment and College Preparatory Exams Participation in Alaska's Schools, 2010

	Total	AI/AN	Share of course total (%)	White	Share of course total (%)
<b>Enrolled in</b>					
Geometry	8,774	1,932	22.0	4,817	54.9
Algebra 2	5,093	796	15.6	3,291	64.6
Advanced math	3,219	331	10.3	2,292	71.2
Calculus	2,183	115	5.3	1,554	71.2
Biology	10,271	2,065	20.1	5,880	57.2
Chemistry	4,988	505	10.1	3,193	64.0
Physics	1,741	285	16.4	1,383	79.4
Took some AP exams	447	48	10.7	128	28.6
Passed all AP exams	1,068	38	3.6	866	81.1
Taking ACT or SAT	4,199	709	16.9	2,794	66.5
<b>Total population</b>	<b>68,051</b>	<b>16,437</b>	<b>24.2</b>	<b>39,597</b>	<b>58.2</b>

**Source:** US Department of Education, Civil Rights Data Collection, 2009–10 National and State Estimations.

**Note:** Information on grade-level population is not available. AI/AN = American Indian and Alaska Native; AP = Advanced Placement.

## Alaska Native STEM Postsecondary Education and Employment

As previously demonstrated, the disparities in educational and employment opportunities that lead to STEM careers begin early in many Alaska Natives' educations. For the students who are able to overcome these early disadvantages and enroll in STEM university programs, disparities still persist in college attrition, degree completion, and eventual STEM employment or continued graduate study.

Unfortunately, little is known about the college enrollment and completion of Alaska Native students in STEM majors because of the small numbers in this population and the consequent difficulty of making statistical inferences. In national reporting, information regarding Alaska Native STEM graduates is combined with both American Indians and Native Hawaiian/Pacific Islanders, though sample sizes continue to be very small. According to the most recent national census in 2010, this collective group made up 0.9 percent of the US population. With cautious interpretation, however, some suggestive patterns emerge. To simplify, this section refers to that group as Native students, and the tables include Alaska Natives, American Indians, and Native Hawaiian/Pacific Islanders.

In 2003–04, for example, tabulations from the National Center for Educational Statistic's Beginning Postsecondary Students Longitudinal Study data reveal that about 58 percent of Native students nationally graduated in the same STEM field as they started, as shown in table 2.5. This rate of continuation and completion is lower than for most other racial groups, except blacks and Hispanics in certain STEM fields, but it is higher than rates in some other fields, such as health care.

TABLE 2.5

### Percentage of STEM Graduates Who Graduate in the Same Starting Major

By select characteristics, 2003–04

	STEM <sup>a</sup>	Engineering	Science, technology, and math	Health care	All majors
Men	60	66	54	15	55
Women	56	61	55	49	56
White (non-Hispanic)	57	65	52	43	55
Black	42	43	42	42	53
Hispanic	58	69	43	45	58
Asian	76	74	77	31	56
AI/AN and NH/PI	58	<sup>b</sup>	58	31	64

**Source:** Tabulations are by Hal Salzman and David Hersh, Rutgers University, of Beginning Postsecondary Students Longitudinal Study data from 2003–04, National Center for Education Statistics. <http://nces.ed.gov/surveys/bps/about.asp>.

**Note:** Includes only those who graduate with bachelor of arts or bachelor of science within six years from start. AI/AN = American Indian/Alaska Native; NH/PI = Native Hawaiian/Pacific Islander; STEM = science, technology, engineering, and math.

<sup>a</sup> These data exclude health care.

<sup>b</sup> Sample size too small to report weighted estimates per NCES requirement. These data exclude health care.

In 2003–04, the mean cumulative grade point average (GPA) of Native graduates was 2.91 (2.89 in engineering and 2.92 for science, technology, and math). This mean GPA was lower than that of students in the same racial groups in other majors (in health care, Natives' mean GPA was 3.28), though graduates in STEM majors of all races tended to have lower GPAs than other majors, as summarized in table 2.6). Additionally, though, Natives' GPAs were lower than other racial groups on the whole. Native graduates also took more time to complete their STEM degrees than other racial groups in almost every major (except Hispanics in Engineering), as shown in table 2.7. Across all STEM fields, Natives took an average of 59.8 months to complete a degree, a rate slightly less than Native health care majors (62.7 months).

TABLE 2.6

## Mean GPA for STEM Graduates of Four-Year Colleges

By characteristics

	STEM <sup>a</sup>	Engineering	Science, technology, and math	Health care	All majors
Men	3.14	3.09	3.18	3.00	3.10
Women	3.29	3.34	3.28	3.34	3.27
White (non-Hispanic)	3.25	3.14	3.29	3.34	3.25
Black	2.87	2.93	2.86	3.06	2.89
Hispanic	3.13	3.15	3.11	3.31	3.09
Asian	3.26	3.27	3.25	3.10	3.23
AI/AN and NH/PI	2.91	2.89	2.92	3.28	3.31
<b>Overall</b>	<b>3.20</b>	<b>3.14</b>	<b>3.23</b>	<b>3.30</b>	<b>3.20</b>

**Source:** Tabulations are by Hal Salzman and David Hersh, Rutgers University, of Beginning Postsecondary Students Longitudinal Study data from 2003–04, National Center for Educational Statistics. <http://nces.ed.gov/surveys/bps/about.asp>.

**Note:** Includes only those who graduate with bachelor of arts or bachelor of science within six years from start. AI/AN = American Indian and Alaska Native; GPA = grade point average; NH/PI = Native Hawaiian and Pacific Islander; STEM = science, technology, engineering, and math.

<sup>a</sup> These data exclude health care.

TABLE 2.7

## Mean Time to Graduate from Four-Year College among Graduates in STEM Major

By characteristics

	STEM <sup>a</sup>	Engineering	Science, technology, and math	Health care	All majors
Men	54.12	55.40	53.30	57.90	53.70
Women	51.22	52.10	51.10	54.10	51.79
White (non-Hispanic)	52.41	54.50	51.60	53.90	52.06
Black	56.35	54.90	56.60	54.40	55.13
Hispanic	55.98	57.80	54.20	60.60	55.76
Asian	52.18	52.70	52.00	57.40	51.40
AI/AN and NH/PI	59.83	56.30	61.40	62.70	56.26
<b>Overall</b>	<b>52.93</b>	<b>54.80</b>	<b>52.20</b>	<b>54.60</b>	<b>52.58</b>

**Source:** Tabulations by Hal Salzman and David Hersh, Rutgers University, of Beginning Postsecondary Students Longitudinal Study data from 2003–04, National Center for Educational Statistics. <http://nces.ed.gov/surveys/bps/about.asp>.

**Note:** Includes only those who graduate with bachelor of arts or bachelor of science within six years from start. AI/AN = American Indian and Alaska Native; NH/PI = Native Hawaiian and Pacific Islander; STEM = science, technology, engineering, and math.

<sup>a</sup> These data exclude health care.

These tabulations are also corroborated by recent National Science Foundation statistics on STEM education rates (figure B.1), which shows a paucity in the percentage of bachelor's, master's, and doctoral degree completions held by Alaska Natives in the science and engineering fields. Although the percentage of Native students enrolled in undergraduate education in any field generally is in line with the group's share of

the overall population nationally (approximately 0.74 percent according to the 2010 US Census), their share of four-year institutional degree completion at all levels are lower, particularly in engineering.

When one looks beyond educational achievement to consider STEM careers, the numbers for Alaska Natives are also too low for statistical accuracy, yet some patterns emerge regarding college graduates with STEM degrees within the Native population. As estimated, only 8.8 percent of Native college graduates are employed in STEM professions, as shown in table 2.8. Natives make up only 0.7 percent of employed STEM professionals, shown in table 2.9. The mean income for this group after one year of employed AI/AN–NH/PI college STEM graduates (excluding health care) in 2008 was \$43,257, summarized in table 2.10.

Exploration of the rates of employment of Native college graduates in particular fields provides more nuance to these numbers. These workers were distributed among fields including Computer Science and Information Technology, which employed 6.3 percent of the Native graduate population (table 2.8). Native graduates made up 1.3 percent of the employed graduates in the field (table 2.9).

In engineering, only 0.5 percent of Native graduates were working in the various fields (table 2.8). Collectively, Native graduates made up 0.1 percent of the employed engineering graduate population (table 2.9). However, employed Native college graduates had a mean income of \$57,455 (though, again, the sample size is statistically very small) (table 2.10).

In science, math, and technology fields, including agricultural research, the proportions of Native employed graduates is relatively as low as other STEM fields: 2.1 percent of Native graduates are scientists and other professionals in this group (table 2.8). Of the employed graduates in these professions, only 0.8 percent is Native—a rate lower than that of Natives' share of the unemployed graduates (table 2.9). In contrast to their engineer counterparts, employed Native science, math, and technology graduates earned an average \$40,524 one year after graduation (table 2.10).

Additional insights from these tabulations include those related to the health care professions, a set of college disciplines and subsequent occupations with significant overlap in subject matter to STEM. A notable share of Native college graduates were educated and employed in health care: 11.2 percent of the group, the highest proportion of any racial group (table 2.8). However, Natives still make up only 1.1 percent of employed health care graduates altogether (table 2.9). The mean income after the first year from graduation for Natives in health care was \$47,573, lower than the mean for the racial group in engineering but higher than that of Native scientists, mathematicians, and technicians (table 2.10).

TABLE 2.8

## Status after Degree Attainment for Certain Gender and Race/Ethnicity Groups, 2008–09 (%)

Group	CS/IT	Engineering	Math/science /ag	Health care	Other	Unemployed	Not in labor force	Total	All STEM	Graduate school
All population of graduates	3.6	3.8	1.9	67.3	9.3	16.5	9.2	100.0	7.2	7.0
Male	6.5	7.6	2.6	2.4	64.5	10.0	6.4	100.0	16.7	26.2
Female	1.5	1.0	1.4	10.8	69.4	8.5	7.4	100.0	3.9	28.5
White (non-Hispanic)	3.6	4.0	2.0	7.1	68.5	7.8	7.0	100.0	9.6	26.5
Black	2.8	2.2	1.2	9.3	66.7	12.8	5.0	100.0	6.2	31.6
Hispanic	2.3	2.5	0.9	6.5	70.1	12.4	5.4	100.0	5.7	28.0
Asian	6.9	5.8	4.4	7.6	46.2	15.6	13.5	100.0	17.2	32.2
AI/AN and NH/PI	6.3	0.5	2.1	11.2	64.7	13.4	1.8	100.0	8.8	17.4
Two or more other	1.8	3.6	0.8	6.1	75.2	7.7	4.8	100.0	6.2	32.9

**Source:** Tabulations by Hal Salzman and David Hersh, US Department of Education, National Center for Education Statistics, 2008–09 Baccalaureate and Beyond Longitudinal Studies (B&B:08/09): <http://nces.ed.gov/surveys/b&b>.

**Note:** Graduate school, not in labor force, and unemployed are not mutually exclusive. Ag=Agricultural Science; AI/AN = American Indian and Alaska Native; CS/IT = computer sciences, information technology; NH/PI = Native Hawaiian and Pacific Islander; STEM = science, technology, engineering, and math.

TABLE 2.9

## Status One Year after Graduation for Certain Sex and Race/Ethnicity Groups, 2008–2009 (%)

Group	CS/IT employed graduates	Engineering employed graduates	Math/science/ ag employed graduates	Health care employed graduates	Other	Unemployed	NILF	Employed STEM graduates	Graduate school
Men	76.5	84.7	57.4	14.0	40.6	46.3	39.0	75.9	40.4
Women	23.5	15.3	42.6	86.0	59.4	53.7	61.0	24.1	59.6
White (non-Hispanic)	73.5	77.2	74.7	70.9	74.0	61.9	73.2	75.3	70.0
Black	6.7	5.1	5.6	11.2	8.7	12.2	6.3	5.8	10.1
Hispanic	5.9	6.2	4.4	8.4	9.8	12.7	7.3	5.7	9.6
Asian	11.3	9.0	13.5	6.2	4.0	10.0	11.3	10.8	6.9
AI/AN and NH/PI	1.3	0.1	0.8	1.1	0.7	1.1	0.2	0.7	0.5
Two or more other	1.2	2.4	1.0	2.1	2.8	2.1	1.7	1.7	3.0
<b>Overall</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Source:** Tabulations by Hal Salzman and David Hersh, Rutgers University of US Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B:08/09); <http://nces.ed.gov/surveys/b&b/>.

**Note:** Ag = Agricultural Science AI/AN = American Indian and Alaska Native; CS/IT = computer science and information technology; NH/PI = Native Hawaiian and Pacific Islander; NILF = not in labor force; STEM = science, technology, engineering, and math.

TABLE 2.10

### Mean Income in Job One Year after Graduation for Selected Bachelor's Degree Groups (\$)

Full-time employees only	STEM <sup>a</sup>	Engineering	Science, technology, and math	Health care	All majors
Men	50,940	55,549	45,790	45,717	45,516
Women	40,208	50,644	36,630	47,807	37,802
White (non-Hispanic)	47,976	54,932	41,898	47,044	41,405
Black	50,823	56,097	46,992	51,394	40,877
Hispanic	46,053	50,885	42,693	44,713	39,261
Asian	48,273	54,540	53,750	50,229	44,178
AI/AN and NH/PI	43,257	57,455	40,524	60,863	37,107
<b>[Overall] Total</b>	<b>48,055</b>	<b>54,808</b>	<b>42,429</b>	<b>47,573</b>	<b>41,300</b>

**Source:** Tabulations by Hal Salzman and David Hersh, Rutgers University of US Department of Education, National Center for Education Statistics, 2008/09 Baccalaureate and Beyond Longitudinal Studies (B&B:08/09): <http://nces.ed.gov/surveys/b&b/>.

**Note:** AI/AN = American Indian and Alaska Native; NH/PI = Native Hawaiian and Pacific Islander; STEM = science, technology, engineering, and math.

<sup>a</sup> These data exclude health care.

## Alaska Natives at the University of Alaska

As the institution that is best prepared geographically to serve the educational needs of Alaska Natives, the University of Alaska has made progress toward documenting the enrollment, attrition, and degree completion rates of this population, as well as providing educational and student services. In 2013, Alaska Natives accounted for a notable share of degree completions: 12.6 percent of all endorsements, certificates, and degrees conferred by the entire UA system, as summarized in table 2.11. Rates for Alaska Native conferrals at the associate's degree level and lower are similar to the group's share of the total population in the state, but the share begins to drop off dramatically at higher levels, beginning with the bachelor's degree. With the exception of the few Alaska Native-held doctorate degrees (most of which are given at University of Alaska Fairbanks (UAF), the University of Alaska Anchorage (UAA) confers the bulk of bachelor's degrees and higher.

TABLE 2.11

**Degree, Certificate, and Endorsement Conferral at UA***Fiscal Year 2013*

<b>Degree</b>	<b>Number of total conferrals</b>	<b>Proportion conferred to Alaska Natives (%)</b>	<b>UAA share of Alaska Native completions (%)</b>	<b>UAF share of Alaska Native completions (%)</b>	<b>UAS share of Alaska Native completions (%)</b>
Occupational endorsement	279	17.6	31	33	37
Certificate (1 year)	27	11.1	67	NA	33
Certificate (2 year)	249	26.1	2	85	14
Associate's (AAS)	834	14.7	56	33	11
Associate's (AA)	407	21.4	54	37	9
Licensure	205	6.3	31	23	46
Bachelor's	1,757	10.0	55	35	10
Master's	679	6.8	35	13	30
Doctorate	54	5.6	33	67	NA
<b>Total</b>	<b>4,491</b>	<b>12.6</b>	<b>45</b>	<b>2</b>	<b>15</b>

**Source:** Urban Institute tabulations from the University of Alaska (UA), "UA in Review 2014: Academic Profile," using data supplied by the UA Information Systems: UA Decision Support Database.

**Note:** UA = University of Alaska; UAA = University of Alaska Anchorage; UAF = University of Alaska Fairbanks; UAS = University of Alaska Southeast.

Although completion rates remain below the shares of Alaska Natives in the overall Alaskan population, enrollment rates in different disciplines at different degree levels are changing. For example, the number of Alaska Native students enrolled at the UAA campus at all levels increased by 10.1 percent from 2009 to 2013. Therefore, specific administrative units, such as the College of Engineering at the UAA's Anchorage campus, are reporting higher rates of enrollment than previous years, particularly at the graduate level. The 2013 rates are shown in table 2.12.

TABLE 2.12

**Alaska Native Shares of Total, Undergraduate, and Graduate Enrolled Students at UAA***Fall 2013, percent*

	<b>Total share</b>	<b>Undergraduate share</b>	<b>Graduate share</b>
UAA	9.4	9.5	6.9
UAA Anchorage campus	9.7	6.8	10.0
UAA Anchorage campus—College of Arts and Sciences	10.7	5.7	10.9
UAA Anchorage campus—College of Engineering	11.8	9.0	12.2

**Source:** University of Alaska Anchorage 2014, using UA Statewide IR DSD data system at semester closing.

**Note:** UAA = University of Alaska Anchorage.

At the undergraduate level, an additional concern beyond recruitment and enrollment, however, involves retention of Alaska Native students. Table 2.13 shows that, as reported by UAA, Alaska Native

retention rates are persistently lower by yearly cohort than the rates for the overall student population. These rates also appear to be declining further, with a drop from a 2005 peak of about 61 percent to 49 percent in 2010.

TABLE 2.13

**Retention Rates of AN Students and Total Student Populations at UAA**

*By cohort, 1999–2010, percent*

Year cohorts entering	FY01 Fall 1999	FY02 Fall 2000	FY03 Fall 2001	FY04 Fall 2002	FY05 Fall 2003	FY06 Fall 2004	FY07 Fall 2005	FY08 Fall 2006	FY09 Fall 2007	FY10 Fall 2008	FY11 Fall 2009	FY12 Fall 2010
Total FTFT Cohort	57.7	61.9	61.4	65.0	65.9	64.6	67.6	66.7	68.7	70.2	67.8	68.0
Alaska Native	39.8	46.6	48.9	55.8	49.7	43.1	60.8	58.7	55.4	52.2	52.0	49.0

**Source:** Urban Institute compilation of data presented in University of Alaska Anchorage (UAA), Office of Institutional Effectiveness, Engagement, and Academic Support, “Performance ‘09” (September 2009), “Performance ‘10” (September 2010), “Performance ‘11” (October 2011), and “Performance ‘12” (October 2012) using data compiled by UAA Institutional Research from UA statewide corresponding fall semester freezes from the prior year.

**Note:** AN = Alaska Native; FTFT = first-time full-time degree seeking freshman ; FY = fiscal year ; UAA = University of Alaska Anchorage.

The introduction (chapter 1) summarized the various factors that affect retention rates for many underrepresented racial groups in degree-granting programs and especially in STEM programs. The factors include early differences in educational preparation between those groups and other students, students’ adjustment to the cultural settings within universities and STEM programs, and hostile environments within those settings. Student groups such as the American Indian Science and Engineering Society at the Anchorage and Fairbanks campuses have created support services that address some of those challenges. In addition, the various campuses in the UA system have supported additional student services and interventions to bridge the transitions and increased Alaska Native student enrollment, retention, and degree completion. These support services are offered in addition to the educational and other student services available to all students on campus. Among the services are the UAF’s Rural Student Services, the University of Alaska Southeast’s Native & Rural Student Center, the UAA’s Native Student Services, the Alaska Native & Rural Outreach Program, and ANSEP.

# ANSEP and Changing the Context at the University of Alaska for Alaska Natives

The UA system has dual obligations to educate the diverse population in the state and to produce the workforce for Alaska’s changing industrial and economic sectors. STEM fields in particular are a focus for the UA and its partners in state government (Alaska State Committee for Research 2014). ANSEP serves as one link in UA’s commitment to professional career pathways. ANSEP affects conditions at three levels at UA: (1) the climate for the Alaska Native students on UA campuses that the program serves; (2) the institutional setting, resources, and commitments to the Alaska Native students for which ANSEP advocates; and (3) the administrative units and relationships in which ANSEP itself is situated.

## Summary

There is an ongoing need to serve the educational needs of Alaska Native students in a systemic fashion and to serve the workforce needs of Alaska’s evolving industry base. As presented in this review, the disparities in education are apparent as early as in primary education. The differences in the rates of achievement and advancement for Alaska Native students compared with almost all other racial groups persist through secondary, postsecondary, and graduate levels of study. In turn, these disparities shape the nature of employment and economic capacity throughout Alaska—especially in sectors and industries viewed as critical to the state’s growth, such as the STEM fields.

ANSEP is working to make progress in meeting the state’s economic needs, address a history of systematic discrimination against Alaska Natives, and change the climate for Alaska Natives within the university context. As one key connector between the educational attainment of Alaska’s diverse citizenry and the state economy’s productivity, UA is an appropriate starting point for ANSEP to address some of these contextual problems. ANSEP began by addressing disparities in undergraduate- and graduate-level education. It has since expanded to address broader issues that affect Alaska Natives in the statewide primary and secondary education systems and in the workforce. The remainder of this report explores how ANSEP has undertaken this charge, describing the complex state and university context in which it operates and how its participants have progressed in their STEM educational and professional careers.

## Part II. Implementation Study

# Chapter 3

## Input: Staffing and Leadership

Staffing and leadership of ANSEP have grown as ANSEP has built new components and required more complex management structures. ANSEP employs staff at three campuses: eight full-time professional program staff members at UAA and many temporary and seasonal staff; three part-time staff members at UAF; and one part-time coordinator at the UAS. These staff members are the engine of ANSEP programming, and participants and stakeholders praise them for their high capacity and dedication to ANSEP. ANSEP also relies on students and volunteers from STEM industries to staff programming for participants.

### Overall ANSEP Staffing

Figures 3.1 through 3.3 present schematics of the ANSEP staffing structure at each campus, with the major responsibilities of each position. The executive director oversees all staff and operations at all three campuses. The following provides descriptions of the staffing levels at each campus, followed by general descriptions of staff roles and hiring and training procedures.

#### Staffing Levels

##### UAA CAMPUS

ANSEP headquarters is located on the UAA campus. The eight permanent, full-time, ANSEP-funded staff members on this campus are employees of UAA, and they receive UAA personnel benefits. In addition, the US Geological Survey funds ANSEP's national partnership director position through an Interagency Personnel Agreement, discussed below.

ANSEP hires temporary staff to support ANSEP activities at UAA, including 35 to 40 youth peer mentors (YPMs) who are brought on each summer to staff the precollege component, and two to three summer directors who supervise the YPMs. ANSEP also relies on instructors for precollege components, on both a volunteer and a paid basis. During the school year, University Success participants may serve as part-time recitation leaders or lab assistants, managed by the University Success manager.

## OTHER CAMPUSES

The three individuals who run the UAF ANSEP are only part-time. They are all employees of the College of Natural Science and Mathematics, supported through a combination of ANSEP funds, grant money, and funds from UAF. ANSEP at UAA supports 94 percent of UAF's ANSEP operations costs outside of scholarships, primarily for staffing. The UAF ANSEP coordinator, who manages the UAF program, is a faculty member with a one-course buy-out to dedicate 20 to 25 percent of his time to ANSEP. The coordinator is supported by an administrative assistant, who dedicates all of her effort to ANSEP but is employed at only 75 percent, and an academic adviser, who splits her time between ANSEP and Rural Student Services. In addition, ANSEP hires some participants as recitation leaders; the UAF ANSEP administrative assistant oversees these student employees. One faculty member dedicates 30 percent of his time to ANSEP to manage the newly created UAS program in Juneau.

## Executive Director

As with many successful programs for youth, ANSEP benefits from a charismatic and dynamic leader who founded and has been developing the model for 20 years. When Executive Director Herb Schroeder was a faculty member and administrator in the School of Engineering, the school's advising and support staff assisted with ANSEP, which at the time consisted only of the University Success component. When ANSEP separated from the School of Engineering and created the precollege components, starting with Summer Bridge, the program began to bring on its own personnel. Initially, the executive director developed and directly oversaw the components, fiscal and operational management, partnerships, marketing, and fundraising. As ANSEP grew and hired dedicated staff, many of the day-to-day tasks were distributed to others. This approach has freed the executive director to focus on expanding ANSEP through partnerships and fundraising.

The role of the ANSEP executive director cannot be underestimated. One community stakeholder described the executive director as a "pastor" to his staff and as a person with passion and vision. An industry partner referred to him as a "personal hero." The engaged leadership of ANSEP's executive director has allowed ANSEP to establish itself in the university, but with some challenges, because it is a unique program that does not always fit within the university structure. Stakeholders inside and outside the university generally agree that the executive director has been successful, but some noted personal conflicts that have been a challenge for certain partnerships.

Because of the importance of the executive director's leadership to the ANSEP model, many stakeholders are concerned about long-term sustainability after he retires. However, ANSEP leadership have developed a succession plan. This plan includes (1) establishing a board of advocates in the community

to ensure that ANSEP has ongoing political support, (2) negotiating an endowed chair position to guarantee that UAA will hire somebody to fill the executive director role in the future, (3) sending staff to train at the Harvard Professional Leadership Development program (discussed below), and (4) working with UAA to hire ANSEP alumni as permanent UAA faculty.

---

*“He knows he’s not going to be around forever and he wants to make sure that there is always somebody that is going to be a good advocate for the program and is going to be out there in the trenches battling, fighting the good fight for ANSEP students... Having that endowed chair set up to support somebody in his position forever, that’s a big part of that.” -ANSEP staff member*

---

## **Other Permanent Staff**

The ANSEP management team is located at UAA and is led by the executive director. As depicted in the organizational chart (figure 3.1), there are two officer positions—chief administrative officer and chief operations officer. These staff members are responsible for high-level operations and financial management. The chief administrative officer manages all budgetary and fiscal responsibilities, and the chief operations officer oversees high school programs and helps the executive director with fundraising and program development. The chief administrative officer manages a full-time accountant and fiscal technician.

The middle school director, national partnership director, high school regional director, and University Success manager at UAA report to the chief operations officer, as their roles are less oriented toward high-level programmatic operations than the chief administrative officer and the chief operations officer. Instead, they focus on the functioning of the precollege and University Success components, respectively. The staff chart describes their responsibilities (see figure 3.1). The University Success manager oversees all college temporary staff who are employed during the school year, such as recitation leaders and lab assistants. The middle school director collaborates with the high school regional director to oversee temporary summer staff for the precollege components, which take place on the UAA campus. The national partnership director supports science training for ANSEP. This position is an “in-kind” contribution by the federal government to support ANSEP. Box 3.1 discusses the evolution of this position, and chapter 7 explains the arrangement with the US Geological Survey.

At UAF, the ANSEP coordinator liaises between the executive director and the local staff and oversees local operations. The administrative assistant and academic adviser run daily operations and oversee recitation leaders, as described in the staff chart (figure 3.2).

---

### BOX 3.1

## The Origin of the National Partnership Director Role

The national partnership director—formerly called the science director—has a unique role within ANSEP. This position has been financially supported through an interagency personnel agreement with initially, the US Fish and Wildlife Service, and later US Geological Survey. ANSEP created the science director role in 2008 when the father of a University Success participant contacted the executive director to ask why the Alaska Native *Science & Engineering Program* did not have a stronger science focus. This father was a wildlife biologist with the US Fish and Wildlife Service who was impressed by his son’s progress with ANSEP in engineering. He expressed interest in helping ANSEP build its capacity to support participants interested in science, and ANSEP was able to arrange the interagency personnel agreement. When the original science director retired, a new director expanded the role to include supporting federal partnerships as well as coordination with other Native-targeted enrichment programs across the country through the Indigenous Alliance. In recognition of these additional responsibilities, ANSEP retitled the role national partnership director, though the primary focus of supporting ANSEP science programming remains.

---

## Temporary Staff

A variety of temporary staff support permanent staff in the daily operations of the ANSEP components. During the school year, ANSEP hires student assistants to support University Success, as recitation leaders and lab technicians. These student workers lead recitation groups and oversee common lab areas. Temporary University Success employees are hired through a less formal process in which no interviews occur. Instead, the University Success manager at UAA or the UAF ANSEP administrative assistant identifies promising University Success participants, or they may volunteer. Those who do well in the position are usually invited back in subsequent semesters. At the beginning of each semester at UAA, student workers meet with the University Success manager to review the schedule and expectations. In the future, the program may have a more formal “new hire” orientation at the beginning of each semester to explain taxes and human resource concepts, because student workers do not attend the regular UAA new staff orientation.

In the summer, youth peer mentors (YPMs) play a critical role in ANSEP middle and high school programming. Many YPMs are University Success participants, and working as a YPM with ANSEP counts as a summer internship for the University Success requirements. Other YPMs come from other majors within the University of Alaska system, from graduate programs, or from other colleges and universities around the country. Temporary summer directors—more experienced temporary staff who handle much of the summer logistics—supervise the YPMs and assign them to work with different precollege groups. The YPMs chaperone precollege participants throughout the summer sessions, working most intensively with the middle school participants. Each YPM is assigned to a group of eight middle school participants with whom he or she works throughout a seven- to eight-hour shift, walking them among buildings, aiding with activities, and providing mentorship. YPMs who work the evening shift are resident advisers, who help participants with homesickness and ensure their safety at night. For high school precollege participants, YPMs monitor and assist with activities and lead recitation sessions. The ANSEP permanent staff call the YPMs a “dynamic body of workers” and believe that they both enhance participants’ experiences and provide a range of skills—such as technological proficiency, experience working with kids, and in-depth knowledge of mathematics—that benefit the summer programming. The most important qualification, according to ANSEP staff, is that the YPMs are able to engage with the age group. Though there are no requirements that YPMs be Alaska Native, the staff emphasize that it is important that YPMs understand issues faced by Natives.

Those interested in the YPM position apply through UA’s office of human resources, and ANSEP summer directors interview those who have not worked with ANSEP before. Before the summer session, the summer directors design and facilitate an off-site group training for YPMs. This training focuses on team building, leadership skills, and familiarization of the YPMs with the activities that participants will experience; during the training, the YPMs experience all the learning activities that the participants will complete as part of the precollege programming. In addition, summer directors and other ANSEP permanent staff members teach YPMs first aid, rapid response strategies, and the code of conduct.

## **Faculty and Instructors**

ANSEP leadership solicit faculty and other instructors for the precollege components, sometimes based on recommendations by staff members or current instructors. Some instructors are adjunct members of the university. ANSEP pays University of Alaska faculty for teaching summer sessions, and they accept volunteer instructors from partner organizations. The faculty and instructors do not receive any particular training, and they may have limited experience working with a precollege age group. Instructors for middle school programs report that they do not routinely meet with each other or communicate, and they are often not informed about the other lessons being taught to the participants.

## Adequacy of Staffing and Plans for New Hiring

Many stakeholders agree that ANSEP needs more staff to serve various functions in order to alleviate some of the workload borne by the existing staff. Current staff, alumni of the precollege programs, participants in University Success, community stakeholders, industry partners, and university partners expressed these views. Some of the more commonly discussed needs for additional staff include conducting recruitment in the villages; acting as student advisers at the high school and college levels; building out the UAF ANSEP program and making it more robust; maintaining more regular contact between UAA and UAF; finding internship and job opportunities for students outside of Anchorage and in science fields; and assisting with fiscal operations at UAA, particularly for the precollege components.

ANSEP is planning to increase staffing levels by 70 to 75 percent during the 2014–15 school year to support the precollege components and overall ANSEP operations. Plans call for all of the new staff to be based at UAA.

Shortly before summer 2014, ANSEP hired a new regional director for high school programs. As of June 2014, ANSEP had posted three other positions and had planned for three or four more. These new positions include a regional director to focus on middle school components, a fiscal technician, a program assistant, and a program coordinator. Funding provided by foundations and the state of Alaska will support the new positions. (Chapter 5 discusses the state funding in more detail.) ANSEP may add several part-time or short-term positions in the near term, including a computer programmer to develop a data system for tracking participants. Staff indicate that they will likely assign social media duties to a YPM and are considering hiring an individual to manage ANSEP's online presence and to film activities for training.

ANSEP is further considering hiring ANSEP-affiliated faculty to help keep up with demand for summer courses. ANSEP leadership have been in negotiations with the UAA Office of Campus Diversity and the human resources department to be granted direct appointments of their alumni who are Alaska Native because it would help the university meet diversity goals. ANSEP already has plans for three ANSEP Graduate Success alumni to join the UAA faculty in the near future.

Several stakeholders made suggestions that ANSEP could consider when planning for future personnel needs. A stakeholder from the K-12 grade system suggested that ANSEP consider bringing on permanent staff with experience teaching in that system, because they would have advanced classroom management skills. Current staff expressed that they have learned useful management techniques from working with middle school teachers as part of the new Middle School Academy model, described later in this report. In addition, an industry partner suggested that ANSEP bring in industry professionals as temporary help,

either doing programmatic support and outreach or working with currently enrolled participants. These in-house partners could act as adjunct teachers, advisers, or mentors.

## Perspectives on ANSEP Staffing

A variety of stakeholders expressed in interviews that the quality of ANSEP staff overall is very high and they are hardworking. ANSEP leadership emphasized that ANSEP “hire[s] people who can grow into those jobs ahead of them.” Current staff described how passion is a key quality for success in working at ANSEP, as well as drive, enthusiasm, and organizational skills. Three of the eight full-time UAA ANSEP staff members are alumni of the University Success component. In addition, five of the eight full-time UAA ANSEP staff members are Alaska Native. Participants in focus groups articulated the value of having Alaska Native role models in these leadership positions, because they would be familiar with the social and cultural context of rural and Native communities.

---

*“In addition to understanding where these kids are coming from ... as teachers and as people who are here to help them succeed, you have to realize that we have to put more time into these kids. Just because they are high school kids, they are not quite there yet. They are precollege kids. So you have to be willing to provide that additional support on many levels—academic, emotional, [and] behavioral as well.” -ANSEP staff member*

---

A common theme among staff members is that communication is an area for improvement. Conveying expectations, describing curriculum, and giving feedback are perennial challenges, particularly for temporary summer hires. This is particularly important because participants across all precollege components report that the YPMs vary widely in quality and helpfulness. Permanent staff have difficulty finding time to meet at both UAA and UAF, though staff at both campuses expressed a desire to meet more regularly and routinely share new developments.

FIGURE 3.1

UAA ANSEP Staff Chart, Mid-2014

**Dark blue** – Current permanent staff as of mid-2014  
**Medium blue** – Future permanent staff  
**Light blue** – Seasonal or temporary staff  
**White** – Staff loaned through federal government inter-agency personnel agreement  
**Dashed lines**—Supervision but not authority

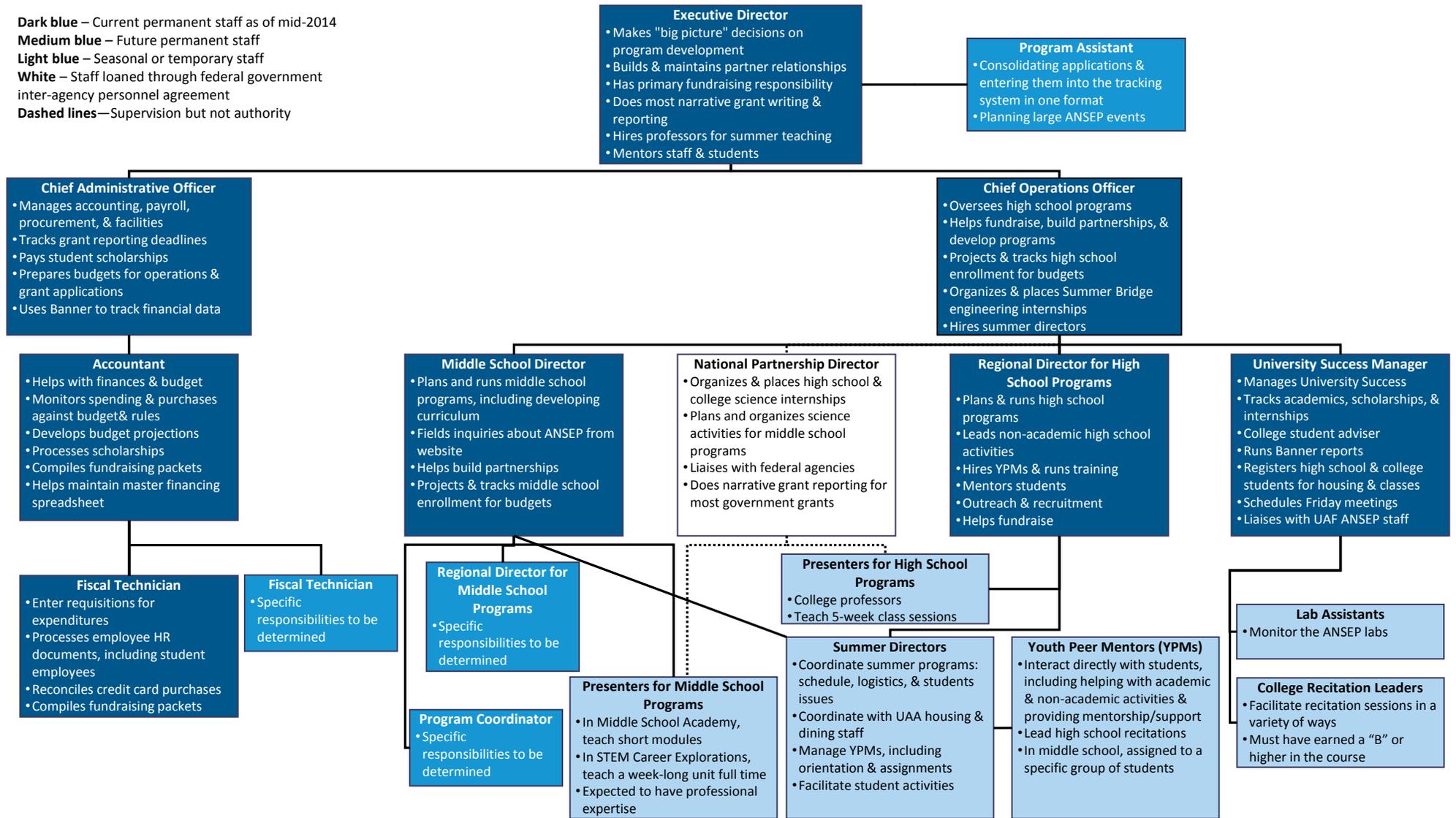


FIGURE 3.2

**UAF ANSEP Staff Chart, Mid-2014**

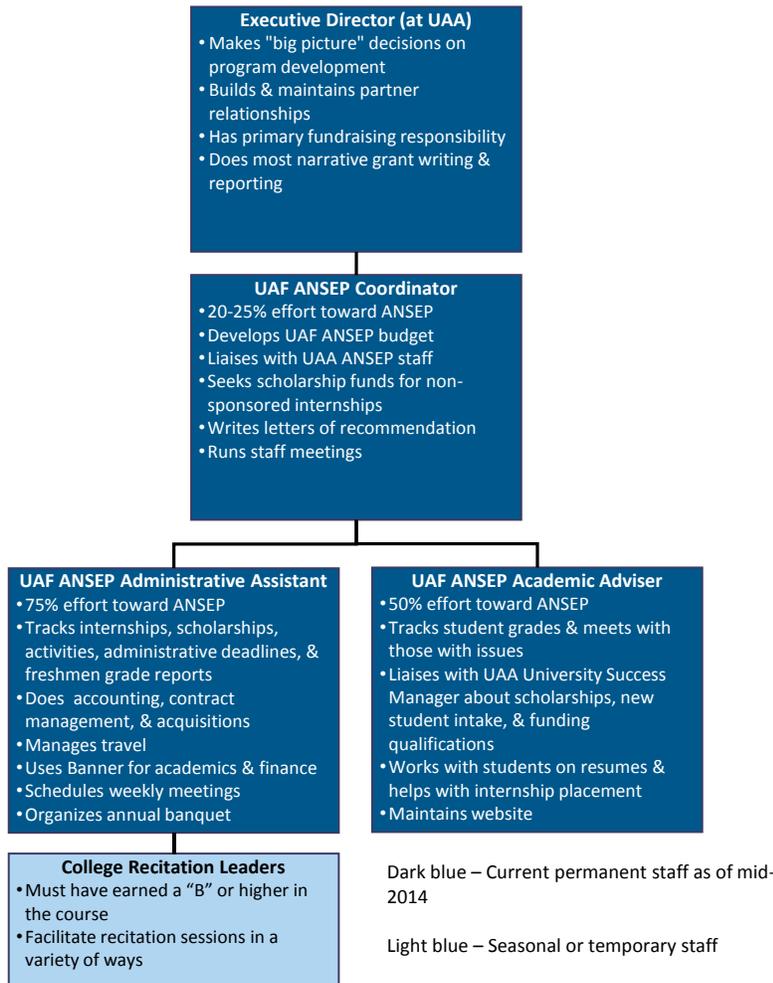


FIGURE 3.3

**UAS ANSEP Staff Chart, Mid-2014**



# Chapter 4

## Input: Facilities

The facilities of ANSEP do more than provide space for community building and learning; they also are an important aspect of programmatic identity. Although ANSEP’s physical presence at the UAA is well established and growing, inequities in the quality and availability of space can be seen across ANSEP programs.

### University of Alaska Anchorage Campus

#### The ANSEP Building

A key feature of ANSEP is that it has its own building on the UAA campus, serving as headquarters and providing space for component activities. The ANSEP website describes the ANSEP Building on the UAA campus as “forever reserved for the participants as a hub for learning, safety, and a community of belonging.” Almost all participants and stakeholders mentioned the building as being important to the ANSEP presence on campus and to participants’ experience in different components. Figure 4.1 shows a photo of the building, constructed in 2006. The 14,000 square foot ANSEP structure, designed by an Alaska Native architect with participant and community input, is shaped like a traditional dugout canoe and decorated with Alaska Native art pieces. It includes classrooms where participants can study, a large computer lab for participant use, and a full kitchen that is kept stocked with food. State-of-the-art furniture, appliances, and Alaska Native imagery and artwork reinforce the message that ANSEP has invested in the space and is committed to promoting Alaska Native heritage. ANSEP staff offices are located in this building, and the University Success manager is available to participants during business hours.

FIGURE 4.1

## ANSEP Building



Source: RIM First People, [http://www.rimfirstpeople.com/portfolio/portfolio\\_project.asp?ProjectID=59](http://www.rimfirstpeople.com/portfolio/portfolio_project.asp?ProjectID=59).

The creation of the ANSEP Building was important to establish a strong symbol and presence for ANSEP on the UAA campus. ANSEP features the building in promotional materials, and it is recognizable to stakeholders around Alaska. One middle school teacher reported first hearing about ANSEP from a news article about the construction of the building. Besides serving as a strong symbol to stakeholders outside the university, the building also firmly establishes ANSEP's permanent presence on the UAA campus.

According to staff members, participants, and partners, the building represents a place for the learning community to develop, and the space explicitly reinforces the Native identity in the design of the exterior and the decoration of the interior. In the past, the executive director cooked dinner in the kitchen once a week for ANSEP participants to build a sense of community, until the program size and logistics made that less feasible. Almost all of the participants in focus groups at all levels commented on the space, and others have taken notice of its importance as well. A university stakeholder indicated that the building is "like a big clubhouse," in that it provides a place for participants to gather. An industry stakeholder thought that having a physical place for participants to go promotes success in the program.

---

*"They have something that's really cool ... an iconic building at the University of Alaska Anchorage that symbolizes the intent of ANSEP ... I think that's a really important message."  
-UAF stakeholder*

---

Participants emphasized the functional uses of the building. Especially popular is the kitchen, stocked with food, coffee, and snacks. Each week, ANSEP staff provide funds for participants to buy food at Costco for communal use. ANSEP staff indicate that providing food at the building supports participants so they are not distracted by hunger while studying. In addition, participants use the computers, printers, and copy machine; they can check out textbooks and laptops for a semester at a time; and they have a welcoming space where they can seek out help from the staff and from peers. Having a shared space provides many opportunities for participants to reach out to classmates and more experienced participants, and participants in focus groups described helpful interactions in the shared study space.

---

*“[When they got the building] it really transformed [the program]... [Y]ou got free printing, you got all the computer pieces you need, you have all the kids who are studying in the same classes so you see all the kids that are in your class and it’s just that workflow becomes far easier. You have pretty much all the answers at your fingertips if you need them.” -University Success alumnus*

---

To promote security and minimize abuse of resources by those who are not affiliated with ANSEP, the staff implemented a formal building access policy for University Success participants. Participants who would like to use the building after business hours must sign a building access agreement annually. Before permitting after-hours access, ANSEP staff check criminal histories and require five recommendations from current ANSEP participants who are in good standing to vouch for the character of new participants. Those who have completed a precollege component are not required to gather recommendations. Participants who have after-hours access can enter the building using their key cards and stay until 11 p.m.

The process of negotiating the construction of the ANSEP Building in the university context was contentious, but ANSEP leadership was able to move forward with the support of industry and foundation partners. Unlike the upkeep of other buildings on campus, ANSEP pays for the building’s maintenance rather than using university services.

## Other Anchorage Facilities

ANSEP also recently acquired the use of a small space on campus called Fireside Café, which was formerly a student eatery. In 2014, ANSEP held the middle school summer components in that space to allow room for the high school programs in the ANSEP Building.

ANSEP also manages a wing of the student dormitories, called the Alyeska Wing. ANSEP staff help participants who wish to reside on campus apply to live in this area, where they can study together and interact socially in the common lounge. ANSEP supports living expenses for participants who live in this wing, including a stipend for food. The wing is made up of four- to eight-person suites, and University Success participants describe it as a quiet space that is like an “ANSEP home.” In the summer, precollege participants reside in the Alyeska Wing.

## Other Campuses

The University of Alaska Fairbanks (UAF) and University of Alaska Southeast (UAS) campuses have no ANSEP-specific facilities. At UAF, where University Success enrollment is similar to that at UAA, participants and staff members conduct their weekly University Success meeting in a room in the College of Rural and Community Development, where Rural Student Services is located. With the growing number of participants at UAF, capacity is an important challenge. UAF has no physical facility with computers or other resources for University Success participants. There are also no dedicated spaces for participant recitation sessions. Two part-time staff members share one office space, and the third adviser is located in Rural Student Services.

Participants and staff members at UAF frequently mention the disparity in physical resources compared with those at UAA. They have expressed concern that a lack of dedicated space makes the program less attractive to UAF students, holds the UAF program back from being able to progress at the same pace as the UAA program, and symbolizes the secondary role that the UAF program plays to the UAA program. Other UAF stakeholders are also well aware of the facilities disparity, as are industry stakeholders, some of whom commented on the inequity between the UAA and UAF campuses.

ANSEP staff expressed that the challenge at UAF is the university administration’s lack of cooperation about guaranteeing ANSEP’s exclusive use of any building that might be constructed. Instead, staff are concerned that the administration at UAF would take over any new building for another use, which would undermine the purpose of the space. Similarly, ANSEP staff are skeptical about the feasibility of dedicating dorm space for ANSEP use because of resistance from the UAF administration.

## Plans for Future Facilities

UAA ANSEP will soon undertake renovations to the Fireside Café space to make it better suited to hosting the middle school component activities. The middle school director and her staff's offices will be located in the new space as well. To support its hosting of middle school participants on campus during the school year, ANSEP is also taking over an entire floor of the dorms and renovating the space to enhance security and to make it appropriate for middle school participants' use. A \$500,000 capital improvement grant from the state legislature is supporting these new construction projects.

Further, ANSEP is planning construction of a new, 40,000 square foot building on the UAA campus that would be a hybrid academic and residential space to support the year-round precollege components. Funders are collaborating with ANSEP on the plans.

ANSEP has no current plans to construct new facilities on non-UAA campuses, though ANSEP leadership have budgeted for a few "small space improvements" at UAF. ANSEP staff hope for the eventual feasibility of constructing a building at UAF that can house the program and serve as a productive space for participants to build the ANSEP community.

# Chapter 5

## Input: Funding

The successful fundraising by ANSEP has been a major factor in the program's success and ability to expand throughout its existence. ANSEP receives funding from the University of Alaska (UA) system, state and federal government, corporate sponsors, and foundations. With continued increases in revenue and a call for greater transparency, ANSEP has recently instituted more advanced financial structures to track spending and report to funders.

### Budget Planning, Spending, and Revenues

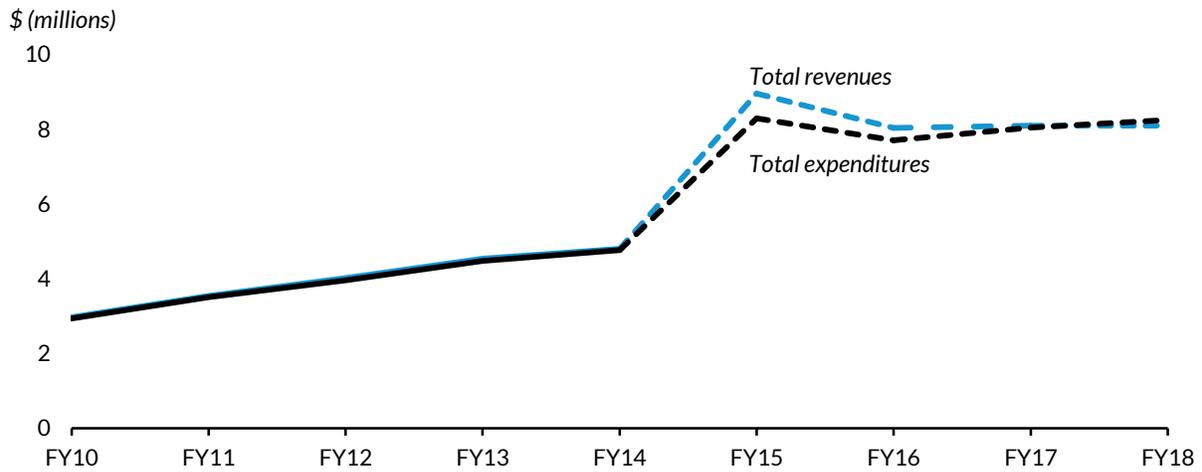
In recent years, ANSEP's tracking of budgets has become more detailed, as shown in the documentation provided to the evaluation team. In 2012, ANSEP hired a chief financial officer to develop sound financial structures and processes for the program to ensure that ANSEP tracked spending and met grant requirements. Given the limited documentation of revenues and sources prior to the creation of that position, this section focuses on data from fiscal year (FY) 2010 to FY 2014 and future projections through FY 2018, which were last revised in May 2014.<sup>4</sup>

From FY 2010 to FY 2014, ANSEP's total budget grew from just under \$3.0 million to \$4.8 million, with a small surplus in each year. As shown in figure 5.1, ANSEP projects that expenditures will grow to slightly over \$8 million in FY 2015 and remain around that level through FY 2018. The reason for this growth, as discussed later, is the major expansion of the Middle School Academy component. ANSEP projects that revenues will keep up with spending through FY 2017; past that point, ANSEP will need to secure additional funding sources to meet expected expenditures. The large increase from FY 2014 to FY 2015 is due to a \$6 million appropriation from the Alaska legislature. The legislature authorized the award through the Department of Education and Early Development (DEED), and DEED will award the amount to ANSEP across three years. However, at the time ANSEP compiled the budget projections used in this report, the staff anticipated \$3 million per year from FY 2015 to FY 2017, rather than the \$2 million per year that DEED awarded; therefore actual revenues may be somewhat lower than predicted in figure 5.1. Most of these dollars will go toward expanding Middle School Academy. In addition, DEED provided \$1 million to ANSEP for FY 2015, as a capital grant that ANSEP will share evenly with the Matanuska-Susitna Borough (Mat-Su) School District to help the district improve its data tracking capacity of students. ANSEP will use its portion of this award to improve the facilities for participants, as discussed in chapter 4.

FIGURE 5.1

## ANSEP Annual Revenues and Expenditures

Fiscal Year 2010-18



**Source:** ANSEP budgetary documents.

**Notes:** Dashed lines indicate projected data.

## Revenues

ANSEP categorizes its revenue sources into six key groups:

- **Federal grants:** This funding source includes money from science-focused agencies that sponsor ANSEP interns, such as the National Oceanic and Atmospheric Administration and the US Geological Survey, as well as sources such as the National Science Foundation.
- **State grants:** This source includes awards from the Alaska Department of Education and Early Development as well as state agencies that sponsor ANSEP interns, such as the Alaska Department of Fish and Game.
- **Philanthropic and nonprofit awards:** These revenues come from foundations such as Rasmuson Foundation, Alfred P. Sloan Foundation, Oak Foundation, and Bernard Harris Foundation. The ANSEP Alumni Fund is also included in this category.
- **UA general funds:** The state appropriates this money to the UA system; UA, in turn, appropriates it to ANSEP.
- **UA Foundation revenues:** This category includes all corporate and industry donations from companies such as Alyeska Pipeline, BP, and ExxonMobil. Many provide ANSEP internships.

- **Indirect recovery:** These funds are costs remitted to ANSEP by the university for the university services not used by ANSEP.

Figure 5.2 shows the distribution of revenue over the FY 2010–18 period. Revenues for FY 2015–18 are projected. Between FY 2010 and FY 2014, federal grants as a proportion of total ANSEP revenues shrank significantly (from 44 percent to 4 percent), and they are projected to remain small over time. State grants show a general increase over time, with large jumps in FY 2015 through FY 2017, when they account for roughly half of revenues; the vast majority of that is the DEED funding mentioned earlier. The share of philanthropic and nonprofit revenues increased from FY 2010 to FY 2014 (from 5 percent to 32 percent) and is expected to account for 15 to 25 percent of funding through FY 2018. The growing importance of philanthropic revenue is primarily due to a recent five-year, \$5 million award by the Rasmuson Foundation that went into effect in FY 2014. The Rasmuson grant came with an expectation that each year UA will increase its contribution by \$200,000 until, by the end of the fifth year, the permanent funding base for ANSEP from UA will have increased to \$1 million annually. UA general funds are expected to provide 36 percent of revenues in FY 2018, though this amount could change if ANSEP procures other funding sources. Finally, UA Foundation revenues—the category that includes corporate donations—accounted for between one-fourth and one-third of revenues between FY 2010 and FY 2014, and ANSEP expects that these will remain nominally constant but decrease in importance over time.

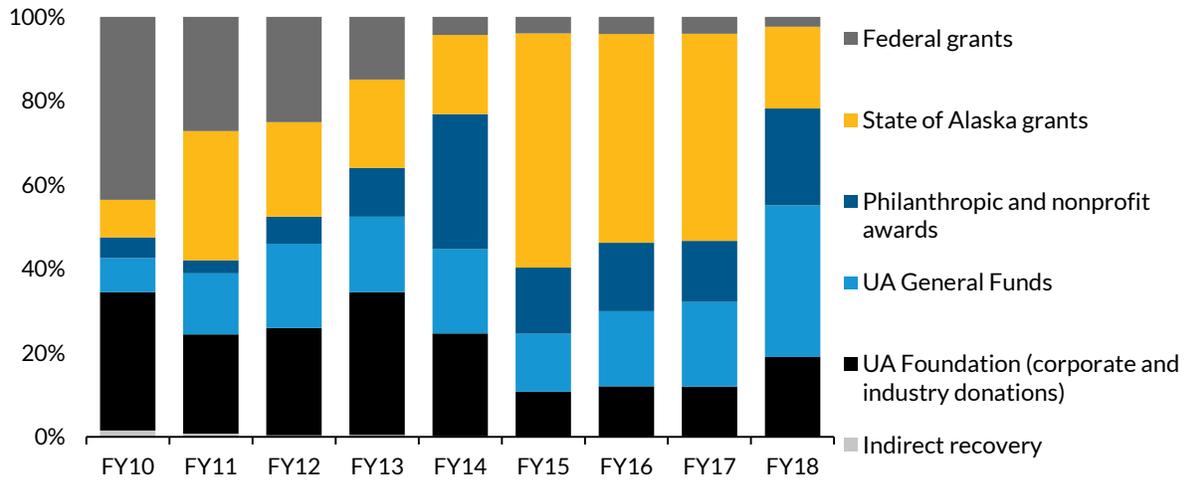
## Expenditures

In its expenditure tracking for FY 2010 to FY 2014, ANSEP categorizes its expenditures by labor and benefits, travel (staff members and participants), services (consultant/contractual services, office expenses, and advertising/publicity), commodities (program costs such as computers and uniforms), equipment (includes capital expenses), scholarships, cost recovery (indirect costs), and miscellaneous items (entertainment, prizes/awards, cost overruns, and disallowed costs). Of these categories, only projections past FY 2014 for labor were available. As shown in figure 5.3, the highest proportion of spending was on labor and benefits, which accounted for roughly one-third of spending in every year through FY 2014. Nominal spending on labor will increase in future years by over 50 percent, according to budget projections, with component expansion and growing administrative needs. Labor as a proportion of total expenditures will decrease slightly. Spending as a proportion of expenditures grew the most for services, from 20 percent in FY 2010 to 34 percent in FY 2014. Spending on scholarships grew slightly as a proportion of overall spending, while relative spending on travel, commodities, equipment, cost recovery, and miscellaneous items decreased.

FIGURE 5.2

### Percentage of Revenues for Fiscal Years 2010–18

By budget category

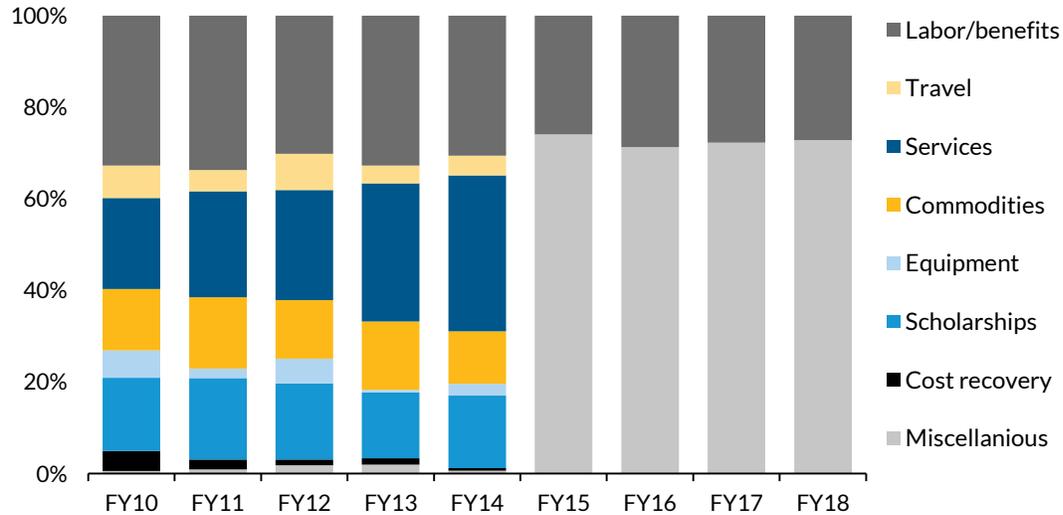


Source: ANSEP budgetary documents.

FIGURE 5.3

### Percentage of Expenditures for Fiscal Years 2010–18

By budget category



Source: ANSEP budgetary documents.

## Spending by Component

ANSEP also estimates spending by component and per participant in its current budget projections for FY 2015 to FY 2018. The following provides a short summary of estimated spending by component for those years:

- **Middle School Academy:** ANSEP staff estimate the cost per participant for the two-week Middle School Academy at \$2,593. Each Middle School Academy serves 54 participants. This cost includes all the instruction and the room and board for the participants. Travel costs are covered by participants, their school districts, or ANSEP, depending on the specific program. In the school district-run model, districts provide chaperones, whereas in the traditional Middle School Academy model (see details in chapter 11), ANSEP hires youth peer mentors at a cost of \$14,000 per academy, according to ANSEP staff. This component is expanding more than any other component, and it is projected to serve an estimated 648 participants per year by FY 2016.
- **STEM Career Explorations:** The cost per participant for the one-week STEM Career Explorations, a follow-on component to Middle School Academy, is \$1,000. STEM Career Explorations serves 54 participants per session. Participants' families are responsible for the cost of transportation to and from Anchorage.
- **Acceleration Academy:** ANSEP staff estimate the cost per participant for Acceleration Academy at \$6,157. Costs include travel, room and board, activities, and tuition for classes over a five-week period. (Stand-alone Computer Assembly activities, separate from any precollege component activities, have an average cost per student of \$1,383 in FY 2015 through FY 2018. ANSEP plans to conduct Computer Assembly with 114 students annually.)
- **Summer Bridge:** The cost per participant for this 10-week component is \$7,784, which is slightly more than Acceleration Academy. It has the same instruction costs for the academic component, but Summer Bridge participants require additional weeks of room and board, and they also incur costs for internships and field skills training.
- **Scholarships:** The average scholarship received by University Success and Graduate Success participants is estimated at \$2,910 per semester in FY 2015 through FY 2018. For UA students in University Success and Graduate Success, the program provides a minimum scholarship of \$2,500 per semester for tuition, fees, and other college costs if they meet component requirements for two consecutive semesters. According to ANSEP leadership, this minimum scholarship has changed slightly over the years but will remain at \$2,500 in the near term.

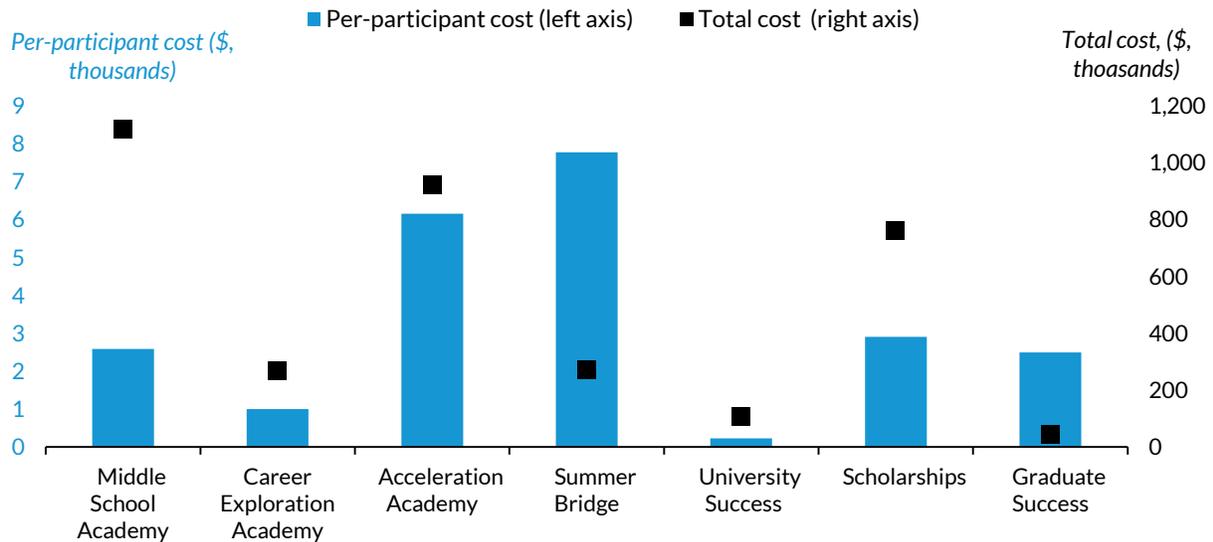
Former participants in Acceleration Academy and Summer Bridge do not have to complete two semesters of requirements before being eligible for the University Success support. They receive scholarships in the first semester of their freshman year: \$1,000 each semester for Acceleration Academy and \$2,500 each semester for Summer Bridge.

- **University Success:** Other spending for University Success—such as recitations, activities, and weekly meetings—is estimated at \$225 per participant per year.
- **Graduate Success:** Graduate Success costs are about \$2,500 per participant per year, in addition to scholarship costs. These costs include travel, research support, supplies, and conference attendance for participants. Graduate Success participants at UA also incur activity costs similar to those of University Success.

Figure 5.4 shows the per unit and total costs for each component. The Middle School Academy costs are for the school district model and do not include the costs of the youth peer mentors. Although Summer Bridge is the most costly per participant, ANSEP expends the most overall on Middle School Academy because of the larger number of students served.

FIGURE 5.4

### ANSEP Per-Participant and Total Costs per Component, FY 2015



Source: ANSEP budgetary documents.

## Oversight of ANSEP Finances

According to both staff and university stakeholders, ANSEP is unique among UA programs in the way it solicits contributions and in the high level of outside funding the program receives. ANSEP often courts funders without the assistance of the advancement or development offices of UAA, which is a departure from standard university protocols. For example, DEED conferred the recent \$6 million award directly to ANSEP rather than to UA, which several members of university leadership said is unusual. Although ANSEP leadership conducts most of their own fundraising, the revenues received through grants and donations must be processed through the UA system. Grants must be processed through UA’s grants and contracts office, and donations are processed through the UA Foundation. However, according to ANSEP leadership and university stakeholders, ANSEP retains all control over the management of those dollars, while following UA rules. The high degree of control over finances is unique across the UA system, and ANSEP has faced criticism for lacking transparency and for going around “normal” UA processes for fundraising and fiscal oversight.

ANSEP recently created new fiscal systems to help track and oversee its revenues and expenditures. It made this change for several reasons. First, ANSEP leadership indicated that ANSEP was growing, especially in scaling up its precollege components, and it lacked enough internal structure to ensure that all expenditures were properly tracked and allowable and that accurate financial reports were provided to

fundes. In addition, ANSEP staff found the Banner software system difficult to use to track spending. The new systems were a direct response to satisfy the recommendations of an audit conducted by UA in 2010-11 to ensure that ANSEP was adhering to funding requirements and following university rules. ANSEP staff believe that the new fiscal systems have been successful in achieving better efficiency and transparency of ANSEP finances.

## UAA and UAF spending

ANSEP has a major presence at the University of Alaska Fairbanks (UAF), in addition to its headquarters at UAA. Analysis of student records shows that in 2013, 50 University Success participants were receiving scholarships at UAF, and 76 at UAA. UAF ANSEP staff run their own college components—University Success and Graduate Success—but no precollege components take place at UAF. No separate facilities exist for UAF participants, resulting in fewer capital expenditures. Most of the \$350,000 (in FY 2015) that ANSEP provides to the UAF program goes toward scholarships, activities such as recitations and weekly meetings, and staff. The UAF administration contributes a small amount toward part-time staff.

Stakeholders and ANSEP participants at UAF have been critical of what they perceive as a lack of investment in UAF ANSEP. Several UAF participants and industry stakeholders expressed that ANSEP leadership did not give the same level of attention to the UAF program as to the UAA program and that the leadership view it as peripheral to the Anchorage program, even though UAF as an institution has stronger research and academic programs. Stakeholders and participants had other concerns that the scholarship payments are often late because the payments come from UAA and that they do not have their own building or dedicated space, unlike the UAA participants. In addition, UAF ANSEP staff do not have much autonomy in developing relationships with funders, particularly in the Fairbanks area, where UAF University Success participants may prefer to intern.

## Funding Successes

The executive director oversees all fundraising activities, with the assistance of key staff members. Numerous stakeholders within UA, STEM (science, technology, engineering, and math) industries, the Native community, and the K-12 grade system highlight his skill at attracting financial support for the program.

---

*“I think [the executive director] is probably one of the most articulate and persuasive advocates for Natives in this state. As a result, he is extremely good at getting funding.” -UAA stakeholder*

---

Overall, ANSEP has a reputation for its funding success. Stakeholders within and outside UAA noted that organizations and corporations want to be associated with ANSEP; one stakeholder said that many “are essentially tripping over themselves to help fund the program.”

## Funding Challenges

As with many programs that have experienced significant growth, ANSEP faces the challenge of maintaining funding levels into the future. To support its expanding program, ANSEP must sustain current funding sources and identify new sources equivalent to or greater than the awards from DEED and other organizations, which will end after four years. Falling oil prices may affect the revenues of the energy companies that donate to ANSEP, as well as the state budget. Leadership within UA pointed out that the university system has faced budget cuts over the past few years and anticipates further declining or stagnant revenues. As the program’s focus shifts increasingly to the precollege components—outside the scope of traditional university operations—some university stakeholders questioned whether UA can continue to support ANSEP’s activities. All of these factors will pose a challenge to ANSEP’s ability to attract more funds from within and outside of the UA system.

Numerous stakeholders discussed the money that ANSEP spends on its participants, events, and facilities and questioned whether there were ways to improve efficiency. Such an analysis is beyond the scope of this report, so the evaluation team is able to report only stakeholder impressions.

Several staff members and stakeholders noted the uncertainty of funding continuing at current levels when the executive director eventually retires. So far, funding has been heavily dependent on his efforts and relationships; stakeholders articulated the need for a sustainable model of fundraising that is not dependent on a single person.

# Chapter 6

## Activity: Recruitment and Selection

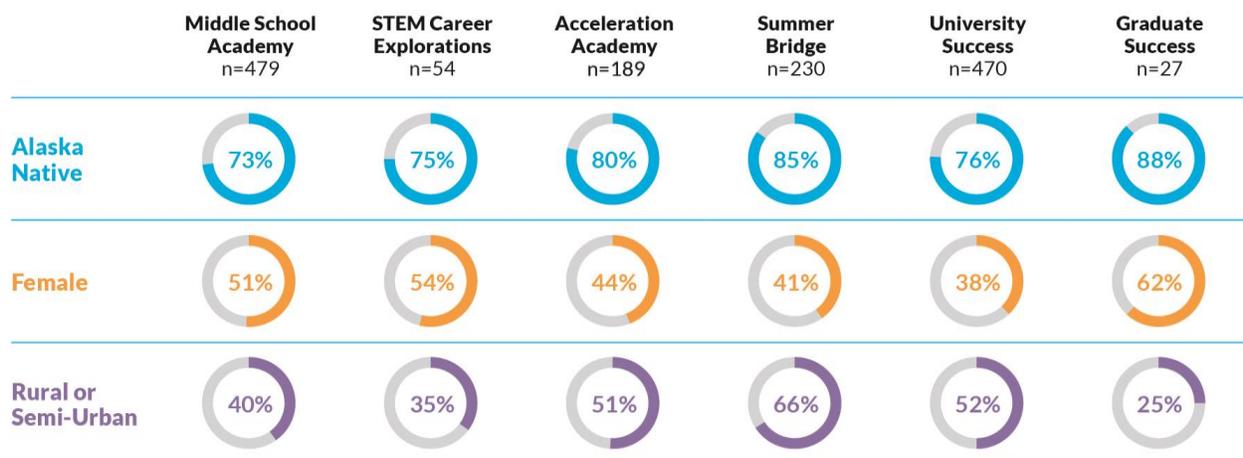
Recruitment is vital to ANSEP, especially for the precollege components, as it brings participants into the pipeline. Over time, ANSEP’s recruitment strategies have shifted to focus on previous participants and on younger students, as the precollege components were established. ANSEP has also increasingly relied on school district partnerships to bring in new students instead of sending staff to do direct recruitment in the field. Although ANSEP targets Alaska Native students, academic achievement and potential are also important selection criteria.

### Recruitment Goals

ANSEP seeks to reach a broad group of middle school to college-age youth from Alaska who are interested in and have demonstrated their ability to succeed in science, technology, engineering, and math (STEM) careers, with a focus on serving Alaska Native youth. However, the program recruits participants with an eye toward ensuring that Alaska Native, female, and rural youth are represented in the ANSEP components (see figure 6.1). ANSEP staff are also intent on ensuring that participants who enrolled in a previous component are recruited for the subsequent component.

FIGURE 6.1

### Target Group Demographics by ANSEP Component



**Notes:** Repeat participants are counted as single observations. Percentages exclude participants for whom demographic information is unknown. Participants whose hometowns are out of state or unknown are not included in the calculation of the proportion of rural and semi-urban participants.

## Alaska Native Youth

As its name implies, ANSEP targets Alaska Native students. Recruitment of Alaska Natives is central to its mission of elevating and supporting a group that has been underserved and underrepresented in STEM education and in the workforce. As described in chapter 2, Alaska Natives make up only 6 percent of Alaska's STEM workforce despite making up 14 percent of the state's population.

Alaska Natives make up the majority of participants in all the ANSEP components: 73 percent in Middle School Academy, 75 percent in STEM Career Explorations, 80 percent in Acceleration Academy, 85 percent in Summer Bridge, 76 percent in University Success, and 88 percent in Graduate Success. For a portion of the Middle School Academy sessions, Alaska Native or American Indian background is a prerequisite for participation, as it is a stipulation of the grant money that supports those sessions. For the other components, ANSEP actively recruits Native and rural students. Not all stakeholders realize that ANSEP is open to non-Native participants. Chapters 11 through 16 discuss these and other demographic details of the ANSEP components.

## Female Youth

ANSEP does not have an overall goal to recruit by gender, although staff do require that each Middle School Academy have equal numbers of male and female participants. There is approximately proportional representation of women in all components, except in Graduate Success which women are overrepresented. Girls and women account for 51 percent in Middle School Academy, 54 percent in STEM Career Explorations, 44 percent in Acceleration Academy, 41 percent in Summer Bridge, 38 percent in University Success, and 62 percent in Graduate Success.

## Rural Youth

ANSEP aims to recruit students from all over the state and emphasizes the particular need for the program in rural and semi-urban areas, where the K–12 educational system faces significant challenges in providing advanced math coursework and where students are less aware of STEM educational and career opportunities. Thirty-six percent of Alaska's population lives in rural or semi-urban ZIP Codes (see detail in table B.3). Participants from rural and semi-urban communities are thus overrepresented in all ANSEP components except Graduate Success and STEM Career Explorations: 40 percent in Middle School Academy, 35 percent in STEM Career Explorations, 51 percent in Acceleration Academy, 66 percent in Summer Bridge, 52 percent in University Success, and 25 percent in Graduate Success.

Although participants come from a wide range of towns and villages, in practice, most recruitment occurs in particular areas and schools that are more easily reachable and in which ANSEP staff have established relationships. ANSEP heavily targets the Matanuska-Susitna Borough (Mat-Su) School District outside Anchorage, the city of Bethel, and the Mt. Edgecumbe public boarding high school in Sitka for recruitment, and each area is well represented among participants. Many focus group participants and respondents to the alumni survey had the perception that ANSEP was not reaching rural areas as well as it could.

As noted by ANSEP staff, the geographic remoteness and low population density of rural Alaskan villages make reaching students in those areas difficult and costly. Students themselves have great difficulty traveling to Anchorage for the precollege components, partially because of the necessity to travel to Anchorage by air from most parts of Alaska, which can cost between \$700 and \$1,300 roundtrip and take 10 hours or more. In addition, the distance from home makes some rural students reluctant to participate. A further complication is that, according to ANSEP staff and stakeholders, students from rural schools are less likely to have received the math and science preparation that ANSEP expects from its applicants.

## **Previous ANSEP Participants**

As discussed in chapter 2, ANSEP has evolved into a multicomponent model, with the intention of retaining participants from first entry in middle school through college and graduate school. As such, ANSEP gives special attention to previous participants in its recruitment efforts. Previous participants receive customized invitations to continue to the next component, priority in the selection process for precollege components, and financial scholarships if they attend the University of Alaska and join University Success. ANSEP staff also embed participation in subsequent components as part of the component program. For example, in the final presentation for STEM Career Explorations, participants have to discuss how they will continue their ANSEP involvement.

## **Outreach and Recruitment Activities**

ANSEP relies on both formal and informal methods of recruitment for all of its components. With limited staff, ANSEP often depends on key partners within the university and the K-12 system to contribute to recruitment efforts. Word-of-mouth from ANSEP participants, parents, and teachers is also a key part of recruitment.

## Formal Recruitment Strategies

Formal strategies include advertising through television, print materials, and social media (see chapter 8). ANSEP also runs booths at events such as the statewide Alaska Federation of Natives convention and local college and career fairs. Some students learn about ANSEP during field trips or visits to UAA.

ANSEP staff regularly visit high schools across the state to make presentations about the ANSEP model and application process. The number of recruitment visits decreased in school year 2013–14 because of limitations in staff capacity. Two ANSEP staff members were previously responsible for recruitment, but this responsibility will be handled by one staff member in the future. These changes in strategy reflect the increasing number of participants coming in through early stages of the pipeline, particularly the Middle School Academy.

ANSEP has established relationships with several large high schools and school districts, such as Mt. Edgecumbe and Bethel Regional high schools and the Lower Kuskokwim (which includes Bethel Regional High School) and Mat-Su school districts. Within these schools and districts are staff members whose job descriptions include promoting ANSEP, though they are not employed by ANSEP. (Chapter 7 discusses this arrangement in more detail.) Other teachers and guidance counselors are also aware of ANSEP and encourage students to join. These school employees are familiar with the application process for the precollege components and are able to help students apply. Some staff members within these schools serve as advocates for their own students to ANSEP, and they are able to urge ANSEP to consider certain students who may fall short of the eligibility requirements. As a result, students at partner schools may have certain advantages in the intensive ANSEP application process because of better information and school support, whereas students at smaller schools may be at a disadvantage.

In addition, a growing source of recruitment is from school district–sponsored Middle School Academy sessions. School districts that sponsor Middle School Academies help promote ANSEP in the classroom and through other activities within students' schools, such as assemblies. Native students are invited to apply. School district recruitment will become an increasingly important aspect of ANSEP's pipeline as the number of Middle School Academies grows over the next couple of years.

## Informal Recruitment Strategies

Word-of-mouth is a powerful informal recruitment tool for ANSEP. It happens naturally when participants and their families talk about their experiences, and ANSEP encourages its current and former participants to recruit among their peers. One staff member described participants as “ambassadors for ANSEP” in their villages. Participants frequently have older siblings or cousins who have already gone through the program

and have recommended it, and current or prospective participants often encourage friends to join with them. Stakeholders reported a snowball effect in rural villages: once one child from a village has attended ANSEP, more and more students become interested. School district stakeholders and ANSEP staff described how encouragement from past participants to have their peers join ANSEP can also create an incentive for some students to work harder and enroll in certain classes to be eligible in the future.

On the UAA and UAF campuses, related academic departments and student support offices play a role in University Success recruitment through referrals. Native Student Services at UAA, Rural Student Services at UAF, and staff and faculty in academic departments are generally aware of ANSEP and encourage Alaska Native students studying STEM to consider joining.

---

#### BOX 6.1

### Computer Assembly

Computer Assembly (sometimes called Computer Build) was previously a standalone precollege component that has since been integrated into Middle School Academy and Acceleration Academy. ANSEP staff would frequently sponsor Computer Assembly sessions across the state, bringing together high school students from a region to build their own computers. According to ANSEP staff members, industry stakeholders, and participants, Computer Assembly was an important recruitment activity, effective in getting students excited about ANSEP and motivating them to stay on track academically. With the growth of the precollege components at the UAA campus, standalone Computer Assembly sessions around the state now take place only once or twice a year, and they have become less important for recruitment. All Middle School Academy participants build a computer as part of the component session; any Acceleration Academy participant who has not already done so has the opportunity to build a computer prior to, during, or immediately after the academy.

To keep the computer, participants must sign an agreement to complete physics, chemistry, and trigonometry before graduating from high school. Those who fail to do so must return their computers. Aside from providing an incentive to complete required courses, the Computer Assembly sessions give participants a hands-on learning experience with an emphasis on problem solving and teamwork.

---

## Motivations for Application

ANSEP participants generally cite similar reasons for applying to the program. First, almost all seem to understand that STEM education leads to good employment prospects and high income. Many understand the career payoff before ever hearing about ANSEP, and staff further emphasize the point during recruitment. Participants also noted that they value the opportunity to get real-world job experience and a foot in the door with employers. Participants said that the internships and overall participation are good for “building up that résumé” and connecting to potential employers. ANSEP is considered a selective and prestigious program, and students and their families are proud to be accepted. Multiple stakeholders reported that ANSEP is widely perceived as being successful at helping participants earn STEM degrees. Several University Success focus group participants stated that ANSEP’s reportedly high graduation rates were a primary attraction of the program. The chance to get a head start on earning college credits is another motivating factor for Acceleration Academy and Summer Bridge participants.

Participants in the University Success focus groups and respondents to the alumni survey reported that the financial support that ANSEP provides is a significant motivating factor. Participants also appreciate the peer supports and the community of learning created by ANSEP staff members and other participants. This support appeals to participants, most of who are high achievers and may not have had the experience of interacting with other academically oriented or STEM-focused peers in their home communities. Many participants in focus groups, especially those in the precollege components, joined ANSEP because they enjoy math and science. Finally, participants value the precollege academic preparation and the support ANSEP provides during Acceleration Academy, Summer Bridge, and university courses.

## Selection Process and Applicant Characteristics

For acceptance to and continued participation in all components, students are required to perform well academically and demonstrate an interest in math or science. Academic preparation and potential are ANSEP’s most important selection criteria, ahead of personal characteristics of applicants, such as Native heritage. Academic admission requirements are structured differently for the different components: precollege students must submit school transcripts and write personal essays that show their high performance and interest in STEM, and university participants must maintain a certain grade point average and pursue a STEM degree full-time. Consequently, most applicants and participants are above-average students and have an interest in math and science *before* participating in ANSEP. For example, many Summer Bridge participants reported—as of the summer preceding their freshman year—that they had already taken college-level courses outside of ANSEP. Within all precollege focus groups, a portion of

participants at every level described previous academically focused or STEM enrichment programs and summer camps that they had attended. Others, however, had spent their summers working, subsistence fishing, spending time with family, or attending nonacademic camps and training programs.

Many of the participants in focus groups had a connection to ANSEP through a family member, saying that they had a sibling or other family member who had participated in an ANSEP component. Many of the participants also indicated that they had parents or other family members who worked in STEM industries, such as aviation, construction, agriculture, engineering, or medicine, or who were primary or secondary school teachers. In addition, the level of parental involvement in children’s schooling in general and in ANSEP in particular varies across participants. In some cases, parents are heavily involved in and aware of their children’s education and ANSEP participation; in other cases, parents interviewed knew little about what their children were learning or doing.

One of the most consistent themes that emerged during interviews and focus groups was the perception that because of its high standards and strict application requirements, ANSEP may be excluding more disadvantaged populations from accessing the precollege components, because many potential participants do not meet the math preparation requirements. Multiple stakeholders described ANSEP as “skimming the cream” of students, choosing only those who are already on track to be successful. Though they understand the need for requirements, several stakeholders in the K–12 system expressed concern that students from smaller, more rural schools cannot take the courses ANSEP requires because of small school size and limited resources rather than academic aptitude. These stakeholders also believed that some students have the potential to excel in ANSEP but their strengths are overlooked during the application process. One K–12 stakeholder also worried that ANSEP is pushing students into advanced math and science before they are ready, which may harm them in the long run and result in a superficial understanding of the concepts an engineer needs to master.

---

*“I think if they end up taking just the cream of the crop of every school, they will probably not do a whole lot to change the overall culture of the school or make college a more realistic possibility for communities in rural Alaska.” -K-12 stakeholder*

---

ANSEP leadership recognizes that this perception exists among some stakeholders. ANSEP staff have a different view about targeting lower-performing students. They emphasize that ANSEP is not a remedial program; rather, its goal is to “focus on students who are at least on track and keep them on track and keep

them excited” about STEM education. Staff believe that by lowering expectations, they would be setting students up to fail in demanding science and engineering degree programs. This, in turn, would “compromise [the] program’s integrity” and its ability to serve future students. That said, ANSEP staff are exploring the possibility of making academic content available online, especially Algebra 1, for students who are interested in taking supplemental math courses online. This approach may help students who want to attend ANSEP but have insufficient math preparation for entry into ANSEP.

## Evolution

As the program has grown in scope and size, ANSEP has formalized its application process and requirements. Each component now has a documented set of requirements and deadlines, which are more strictly adhered to now than in early years. Staff report that ANSEP’s applicant pool has become larger and more qualified, particularly in the precollege components. There is disagreement over the reasons for this. Some stakeholders say that because ANSEP is more popular and respected, it is naturally attracting more and higher-quality students who would not have previously considered participating. However, ANSEP staff and other stakeholders suggest that ANSEP itself is improving schools and students.

There are some concerns that urban, better prepared applicants have started to crowd out more disadvantaged students. As ANSEP has grown in size and reputation, non-Native interest and participation in the program have also increased. Analysis of ANSEP student records indicates that the percentage of white participants has increased over time in several of the components, though not Middle School Academy (see chapters 11–16 for changes in participant demographics of each component). Various ANSEP staff members, participants, and stakeholders have competing views about whether this trend is positive or negative and whether non-Native students should be encouraged or discouraged from joining. Some participants and staff members said that non-Native students are welcomed with open arms and are as much a part of the ANSEP community as their Native peers. Several non-Native participants who responded to the alumni survey described how much they learned about and came to appreciate Alaska Native culture through ANSEP and how they grew to view Natives in a more positive light. Other survey respondents and ANSEP staff members stated that serving non-Native students is a departure from the mission of ANSEP and that it negatively affects the community and cultural aspects of the program. Several staff members and stakeholders suggested that ANSEP has recently added certain application requirements and cultural activities in an effort to ensure that non-Native students who join University Success are invested in Alaska Native culture and will participate fully in the learning community, through mechanisms such as requiring that participants take a general education course on Alaska Native issues.

# Chapter 7

## Activity: Partnership and Relationship Management

ANSEP has successfully established many strategic partnerships that provide funding for the program, in particular through sponsorship of Summer Bridge and University Success internships. Partners are mainly in the STEM industries, the University of Alaska system, and the K-12 educational system. Beyond funding ANSEP activities, partners also refer and recruit students, design or implement academic and experiential training activities, hire graduates, and develop customized partnerships programs.

### STEM Industries

ANSEP has established many partnerships with organizations in (1) the private sector, in particular the oil industry; (2) the public sector, namely, federal and state government agencies that work in science and natural resource domains; and (3) the nonprofit sector, including a number of organizations focused on nature and preservation issues. These organizations support ANSEP components in various ways, such as offering employment opportunities for successful ANSEP participants who pursue STEM occupations and funding scholarships for participants. In some cases, ANSEP alumni are the key points of contact within partner organizations. They serve as advocates at their organizations for ANSEP and its mission of enhancing diversity in STEM career pipelines.

### Industry Contributions to ANSEP

One of the primary contributions by industry and government partners is to provide participants with STEM career experience by sponsoring interns as part of Summer Bridge and University Success. They pay for scholarships and other costs that interns incur while participating in the ANSEP component, such as room and board and academic and other activities. ANSEP contracts with some partners for internship spots, while other agreements are not formalized. The level of formality of communication between ANSEP and the partners also varies. ANSEP staff ask for basic feedback from all internship hosts on participants' performance, although some partners collect more detailed information on the internship experience internally or require ANSEP staff to provide additional information for more specific reporting purposes.

ANSEP takes a direct role in selecting applicants for Summer Bridge internships, whereas for University Success, employers make the selections when participants apply directly. ANSEP customizes its internship structure for different industry partners to fit their particular organizational needs. Some employers have worked with ANSEP University Success participants for many years and have developed specific models, such as BP's Summer Bridge 2, which brings successful Summer Bridge interns back to BP for a second and potentially third summer after their freshman and sophomore years at UA. This arrangement is described in more detail in chapter 15.

Partners reach out to University Success participants who may be interested in applying for internships or permanent positions. Employers come regularly to present at weekly meetings at both UAA and UAF, thus introducing University Success participants to a wide range of STEM career options. Some partners also offer extra supports for hiring, such as résumé writing workshops that they conduct on campus for ANSEP and non-ANSEP students.

Stakeholders and employers reported that ANSEP employer partners ultimately hire many ANSEP alumni in permanent positions. The alumni survey corroborates this: half of respondents listed an ANSEP internship partner as their first or most recent employer. Employers spoke positively about the high quality of ANSEP graduates.

An ongoing challenge for ANSEP is securing sponsored internships for participants studying science rather than engineering. Many science-focused Summer Bridge and University Success participants reported that they have fewer options and receive less attention than the engineering participants. Industry partners and ANSEP staff admitted that the financial commitment ANSEP requires is more burdensome for science-focused organizations, which tend to be in the public sector.

Many partners also provide instruction for ANSEP precollege components, providing practicing scientists and engineers who lead activities and lessons for participants. ANSEP staff ask for feedback from the instructors on their experience teaching. In some cases, the instructors are ANSEP alumni.

## **Benefits of Partnership to STEM Industries**

Industry partners benefit from being part of a pipeline of talented scientists and engineers who are invested in staying in Alaska. Stakeholders and ANSEP leadership note that a number of organizations, in particular the Alyeska Pipeline Service Company, are required to hire a certain proportion of Alaska Native employees or have strong internal diversity expectations. Many employers reported that they value recruiting and retaining Alaska Native residents. Working with ANSEP benefits them because, as one employer partner stated, "it is good business sense to hire local."

---

*“I think this is an incredibly inspiring program that really is transformational and has the ability to make such a difference to Alaska Natives and to us, as employers. I really think it is something that has the opportunity to change the soul of companies who hire STEM graduates.” -Employer partner*

---

ANSEP’s executive director initially fostered many of the relationships with partner organizations, and these connections have built up through years of interaction. However, ANSEP leadership noted that turnover at partner organizations can make maintaining relationships challenging. The national partnership director maintains relationships with the federal agencies, state agencies, and nonprofit organizations by working with them regularly and adapting the internship model to match specific organizations and their reporting needs. As mentioned in chapter 3, the national partnership director is employed by the US Geological Survey and works at ANSEP through an interagency personnel agreement, and so her position itself is the result of a key partnership.

To reach out to potential partners, ANSEP leadership call to gauge interest, and in some cases, organizations have approached ANSEP directly and requested to be involved. Staff indicated that establishing relationships with partners has become easier over time as a result of ANSEP’s recognition and success.

ANSEP spends time and money to keep partners involved in and aware of its success. ANSEP hosts an annual banquet in Anchorage every January, to which participants, alumni, partners, and donors are invited. This event highlights participant achievement, recognizes partner contributions, and is another opportunity for donors to contribute.

Several partners expressed that they would like to take more of an active role in shaping ANSEP activities and the academic training that participants receive at UA. Some described participating on advisory boards at UAA or UAF, and they expressed strong interest in promoting the specific types of academic training that will create graduates who meet their skill needs. One employer took a key role in supporting the establishment of a mechanical engineering department at UAA because the civil engineering graduates did not have the required skills. Many employer partners reported that they are willing to expand their relationship with ANSEP and take a more active role in strategy, design, and implementation, but they have not been approached by ANSEP to do so.

# University of Alaska

The ANSEP model centers on UA as the source of education and training for its participants. UA offers several programs to promote the recruitment, retention, and success of rural and Alaska Native students, including ANSEP. ANSEP offers a positive example of a Native-targeted program affiliated with the UA system that has a very strong public reputation and brand.

However, ANSEP faces challenges in its partnership with university administration and academic departments, as discussed in chapter 5. Criticism of ANSEP by stakeholders across the UA system generally involves the program's tendency to work outside university systems, especially in how it raises and manages revenue. Thus, relationships with UA stakeholders have not always been supportive. Over time, these relationships have improved as ANSEP has increasingly won support from key university leaders. Many UA stakeholders and programs outside of ANSEP expressed admiration for ANSEP's visibility and success and noted that they benefited from it, while also maintaining that ANSEP is not the only program worthy of attention.

Despite tensions resulting from ANSEP's unique position in the UA system, the ANSEP model depends on relationships with university faculty, student services, and administration to provide support for and implement all activities, from the Middle School Academy through the Graduate Success component. ANSEP works with a range of stakeholders on campus who train and support STEM students and support recruitment, retention, and success of Alaska Native and rural students.

## Referrals and Recruitment

Students and stakeholders are often aware of ANSEP because of its reputation and marketing, but ANSEP also receives new students for University Success based on referrals of STEM students from other entities on campus, such as academic departments and student services, in particular those targeted at rural and Alaska Native students. Among alumni survey respondents, more than two-thirds learned about ANSEP once they were already on campus, whether UAA or UAF. Of those who learned about ANSEP at UA, 31 percent were referred by Native Student Services (at UAA) or Rural Student Services (at UAF); 20 percent were referred by a faculty member or academic adviser in their academic department; and 10 percent heard about ANSEP from another university staff or faculty member (respondents could select more than one source). The Office of Enrollment Services at UAA, for example, encourages any Alaska Native students studying STEM to join University Success. University stakeholders indicated that ANSEP is well known among the faculty and administration and that STEM academic departments at both UAA and UAF generally

refer Alaska Native students to ANSEP as a good resource on campus. University stakeholders noted that relationships across different departments and campuses vary considerably.

## **Instruction and Research**

ANSEP invites university faculty members and graduate students to serve as instructors in the precollege components, and faculty members who teach STEM university coursework provide the academic foundation for University Success activities. Some University Success and Graduate Success participants also choose to work with individual faculty members on research projects, which can serve as sponsored internships for fulfilling University Success requirements.

Some faculty members described attending the weekly meetings as an opportunity to discuss their research and promote their work to interested University Success participants. Some approached ANSEP because they had learned about it through their departments or wanted to be involved with rural students, while others were approached by ANSEP leadership.

Some faculty members at UAA have played crucial roles not only in providing instruction but also in helping design precollege curricula. Faculty have developed and led a number of different projects in collaboration with ANSEP participants. For example, in 2008 a UAA engineering professor led a project on earthquake engineering in China, traveling with a group of ANSEP participants to Chengdu and Beijing after a major earthquake.

The relationships with faculty members can provide useful mentoring for participants, although this is done informally. For faculty, one benefit of working with ANSEP students is that they can apply for external funding focused on supporting underrepresented minority students in the sciences. ANSEP's record of accomplishment provides useful support for proposals to external funders, such as the National Science Foundation.

## **Student Supports**

University staff in student support positions view ANSEP as providing an additional support that can help the students they serve. Other university services that target rural and Alaska Native students sometimes coordinate with ANSEP, although some university stakeholders reported that they would like to see greater cooperation. At UAA, ANSEP staff attend monthly meetings of Alaska Native programs, including Native Student Services, Recruitment and Retention of Alaska Natives into Nursing (RRANN), the Alaska Native Studies department, the Native Student Council, and the rural student transition specialist from Enrollment

Services. This collaboration led to the creation of a web portal uniting resources for Alaska Native students at UAA. There has been pressure for ANSEP to partner more closely with other UA programs targeted at Alaska Native students. ANSEP leadership is reluctant to expand ANSEP to new fields, although they have considered extensions of the model to potentially include business, nursing, and education.

ANSEP leadership in Anchorage have been critical of the connection made by past UAF leadership between UAF ANSEP and the American Indian Science and Engineering Society (AISES), a student organization, although several UAF stakeholders felt that AISES could effectively complement ANSEP's mission. Like at UAA, some programs at UAF serve closely related populations, notably two precollege programs—the Alaska Summer Research Academy (ASRA) and the non-STEM-specific Rural Alaska Honors Institute (RAHI). These offer alternative precollege summer programming, with RAHI specifically targeting Alaska Native and rural populations entering UAF. Participants in focus groups reported that they had considered some of these programs along with ANSEP, and some had participated in both. UAF also has other smaller-scale STEM enrichment programs aimed at precollege students, such as GeoFORCE and Colors of Nature.

## **Administration and Funding**

As described in the logic model, ANSEP also aims to effect systemic change at UA to change the climate for Alaska Natives. To achieve this goal, ANSEP leadership have arranged for several Native ANSEP Graduate Success alumni to return to UA and take on permanent faculty positions.

ANSEP staff and leadership use a wide range of university facilities and administrative structures to run ANSEP components, relying on university administration to oversee all financial transactions, to provide facilities for activities, and to enroll ANSEP participants at the university. Stakeholders indicated that the positioning of ANSEP's administrative structure within each university has important consequences for the functioning of each program. At UAF, ANSEP lies within the purview of the College of Natural Science and Mathematics, whereas at UAA it is separate from any specific school and reports directly to the provost. ANSEP's unique position at UAA permits the UAA ANSEP program greater autonomy within the university structure.

## **K–12 School System**

Secondary schools have long been key sites for ANSEP recruitment and outreach, but the school districts have taken on even more crucial operational roles as the Middle School Academy component has evolved.

Through the new Middle School Academy model, specific school districts have embraced partnerships with ANSEP and developed customized programs.

## **Outreach and Referrals**

The essential function that primary and secondary schools play is to capture eligible students for ANSEP precollege components and inform students about ANSEP opportunities. Many participants in focus groups reported hearing about ANSEP at their home schools, from a STEM teacher or school counselor, or from ANSEP staff who came to their school on a recruitment visit. Among alumni survey respondents, 13 percent said that one of the ways they learned about ANSEP was from a teacher or staff member at their K-12 school. ANSEP has a formal partnership with Mt. Edgecumbe High School, where ANSEP provides a stipend to an individual to promote ANSEP. ANSEP staff also coordinate regularly with staff at Bethel Regional High School. In addition, the Lower Kuskokwim School District (LKSD) runs a customized program, coordinated with ANSEP, called STEM Ready (see box 7.1). The high school works closely with ANSEP staff to support recruitment for Acceleration Academy and Summer Bridge. The school college counselor provides a number of different supports to ANSEP applicants, including essay writing workshops and on-site college-level placement testing, specifically Accuplacer. The counselor works with ANSEP staff to organize an annual Computer Assembly.

## **School District Programs**

In addition to serving as recruitment and referral sites, school districts are increasing their operational roles, in particular for ANSEP's Middle School Academy component. As described in detail in chapter 11, ANSEP is beginning to implement a new model by which it decentralizes recruitment, staffing, and administration to school districts. ANSEP has engaged two districts to date, the Mat-Su School District in suburban Anchorage and LKSD, and has arranged to conduct individualized school district academies. Under these partnerships, the school districts run the recruitment and application process, provide teachers as chaperones for the actual academy, and also arrange and pay for the costs of participant travel. LKSD's STEM Ready (see box 7.1) coordinator took on the additional task of organizing the Middle School Academy that took place in spring 2014. In the Mat-Su School District, administrators and other personnel have taken on organizational and administrative roles. These programs require significant capacity on the part of the school districts and remove much of the administrative and capacity burden from ANSEP staff. The sponsoring district provides additional funding to cover costs in exchange for a customized ANSEP experience for their students.

---

## BOX 7.1

### STEM Ready

STEM Ready, formerly called the Rasmuson ANSEP College Readiness Program (RANSEP), is an example of a new formal partnership between ANSEP and a school district. The district includes schools in the city of Bethel as well as almost 30 rural villages, where providing high-quality science and math training to small, isolated village schools is challenging. In STEM Ready, high school juniors from surrounding villages attend Bethel Regional High School for one semester per school year, participate in an ANSEP Computer Assembly, and attend ANSEP Acceleration Academy between their junior and senior years. The program offers students an opportunity to access advanced math and science courses that are not available at their village schools and gives them a sense of life away from home, while allowing them to remain connected to their villages for most of the year. Participating in Acceleration Academy offers additional college preparation and introduces students to the ANSEP model and learning community, putting them on track to enroll at UA and pursue a STEM degree. Stakeholders noted that exposure to urban life in both Bethel and Anchorage expands participants' point of view and prepares them for future engagement outside of their villages.

Although the program initially had difficulty identifying eligible, academically prepared students and changes have been made to the design, stakeholders reported that the program has grown—in 2013, the program had about 40 applicants—and the students' level of academic preparation is improving. An LKSD stakeholder described how students who participate return to their home villages and serve as “real ambassadors for academic goals,” raising the expectations of “village kids” and promoting academic and career advancement. Other students at Bethel Regional High School benefit from the opportunity to interact with talented rural Alaska Native students, changing perceptions and prejudices about “village kids.” Stakeholders reported a rising self-image for Alaska Native youths and credit it to STEM Ready and ANSEP. LKSD considers STEM Ready to be so successful that it has developed another similar program called Aviation Ready. Aviation is a key occupation and sector in Bethel, so producing a pipeline of students prepared for the profession is important. This program has slightly lower eligibility requirements, serving students who may not be academically prepared for STEM Ready or who may have a particular interest in aviation.

---

## Other Partnerships

In addition to these three major groups of partners—STEM industries, UA, and the K–12 school system—ANSEP also has key partnerships with a range of other organizations, including foundations, organizations for the Alaska Native community, and universities outside of Alaska through the Indigenous Alliance.

ANSEP receives financial support from several key foundations and projects that 13 percent of total revenue in fiscal year 2015 will come from five philanthropic sources: National Action Council for Minorities in Engineering, Rasmuson Foundation, Alfred P. Sloan Foundation, Bernard Harris Foundation, and the ANSEP Alumni Fund. In addition to financial support, ANSEP leadership reports a strong influence and relationship with certain key foundation funders who are committed to the mission of supporting underrepresented students and investing in Alaska's future.

The Indigenous Alliance brings ANSEP together with other universities around the country that are seeking to foster the educational advancement of indigenous people. Representatives from these programs sometimes come to Anchorage to attend events such as ANSEP's annual banquet, where they learn more about the ANSEP model and observe activities. One stakeholder reported that programs attempting to replicate ANSEP Summer Bridge and University Success at the University of Hawaii Manoa and University of Washington are the most developed, although ANSEP's leadership indicate that they have not focused on these partnerships recently. Though they are not abandoning the idea of spreading the ANSEP model nationally, leadership say that improving Alaskan education at every level at the outset makes more sense strategically.

ANSEP has partnerships with several nonprofit and for-profit Alaska Native organizations, some on a formal basis, such as the Bristol Bay Native Association that sponsors a Summer Bridge intern, and others on an informal basis, such as the NANA Regional Corporation that has provided grant support. The Arctic Slope Regional Corporation has provided significant funding in support of the construction of the ANSEP Building and for the endowment. ANSEP has an agreement with the Chugach Alaska Corporation to recruit from the region to ensure the region is represented in ANSEP participation. ANSEP also has several "advocacy partners," influential organizations such as the First Alaskans Institute, the Alaska Federation of Natives, and Cook Inlet Tribal Council, who do not provide funding but advocate on behalf of ANSEP on policy and funding issues.

# Chapter 8

## Activity: Marketing and Communications

ANSEP devotes about 4 percent of its revenues to advertising, marketing, and public relations. To raise awareness about its mission and success and to reach potential participants and partners, ANSEP uses a variety of media, and their efforts have grown in scope and sophistication over the program's lifetime. In part because of these efforts, the program has developed a recognized brand throughout the state.

### Marketing and Communications Activities

ANSEP uses online media and television to market the program broadly. It hosts one key communication tool for both potential participants and partner organizations—a main program website that is not part of the main UAA website. ANSEP also has web pages within the UAA and UAF sites. The main website contains descriptions of all components, including application instructions, as well as a gallery of photos and videos, a list of partners, and a list of awards ANSEP has received. The website also has sections titled “Statistical Data,” which displays the educational outcomes of participants, and “Report to the Partners,” which describes ANSEP's model, mission, and recent successes.

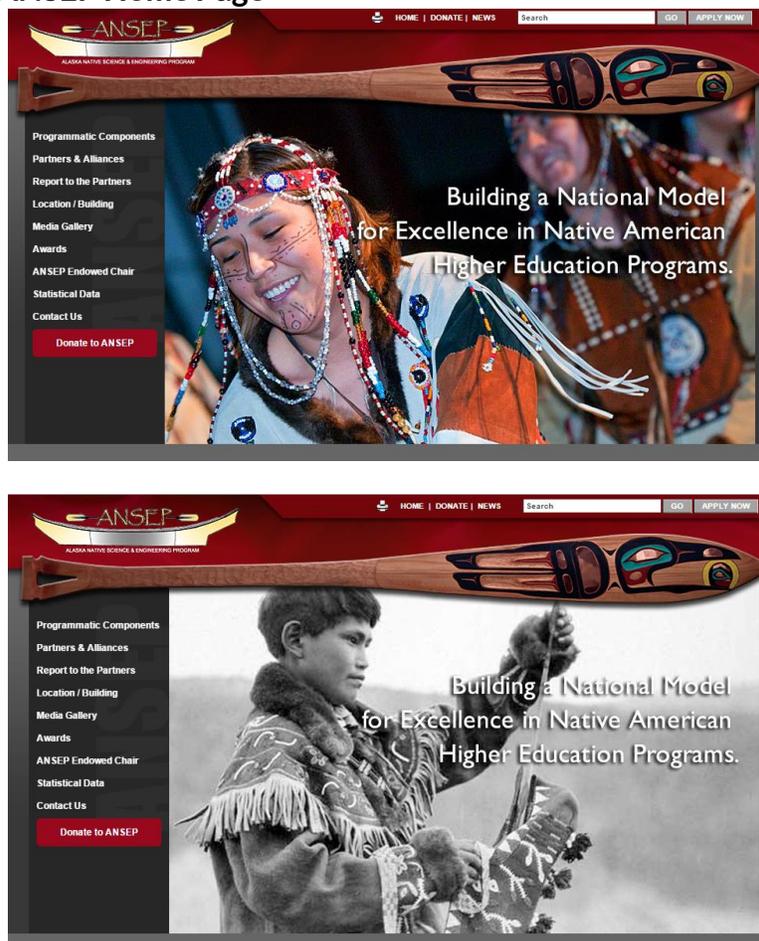
ANSEP has a social media presence, including a YouTube channel, multiple Facebook pages, and a blog. The YouTube channel includes all of the commercials and explanatory videos as well as videos of past events. Staff update the Facebook pages regularly with announcements, photos, and videos and use them to communicate with participants and parents. ANSEP staff use the blog to keep parents and other stakeholders updated on daily activities, particularly when the summer components are active. Recently, ANSEP began to run online ads, and it has produced a series of television ads that run statewide. Some highlight specific components; others describe ANSEP generally. All feature current and past participants and ANSEP staff and leadership. ANSEP also has a series of longer explanatory videos that give more detail about each component. Local and national news outlets have featured the program.

ANSEP also informs the public about its activities and successes through professionally designed brochures, reports, and other print materials that highlight component descriptions, application requirements, photos, and participation and performance data. ANSEP designers use unusual dimensions, bright colors, and multiple page textures to draw attention.

ANSEP has built its reputation as an organization that celebrates and values Alaska Native culture, and it has used visual displays to signify this. The ANSEP Building is an example of this effort, and the website indicates that the building “embodies the spirit of a people and is a landmark in our state.” Promotional materials all feature Native dress, activities, and art. For example, an image of a traditionally carved and painted canoe paddle runs across the top of the website, and below it is a slideshow of images that includes historical black-and-white photos of Native people; Native artwork; and participants dressed in traditional clothing, accessories, and face paint performing Native dances. Figure 8.1 displays a screen shot of the front page of the ANSEP website in late 2014. Similar images appear in the print materials, and the widely used ANSEP logo is the word “ANSEP” inside of a paddle over a canoe.

FIGURE 8.1

### Screenshots of ANSEP Home Page



Source: ANSEP, <http://www.ansep.net> (accessed November 6, 2014).

To produce and manage these promotional materials, ANSEP works with a team of outside specialists. This team includes professional designers and printers for brochures and reports, professional

photographers and videographers, and, recently, a public relations team to engage the media and other stakeholders. ANSEP plans to assign social media promotion duties to a youth peer mentor.

## ANSEP's Audiences

ANSEP's marketing activities serve related but distinct purposes for three key audiences: current and potential participants and their families; funders and employers; and other Alaska stakeholders, such as policymakers and potential partner organizations.

### Students and Parents

ANSEP's marketing efforts are designed to reach students and parents to inform them about ANSEP components and encourage students to apply. The television ads, in particular, seem to reach students; most participants in focus groups had seen them. The promotional materials highlight aspects of the program intended to appeal to students and their families; all feature photos and video footage of participants doing activities such as launching rockets, testing model buildings against simulated earthquakes, and riding in boats on open water.

ANSEP marketing materials convey to potential participants that the program and a STEM education are within their reach. One commercial tells viewers that ANSEP "instills the idea that if you work hard, there's nothing you can't achieve." Another lists hometowns of past participants. All the materials make clear that ANSEP promotes college readiness, degree attainment, and employment of participants. One commercial states, "Without question, these kids are going places." The materials also emphasize the supports ANSEP offers. The component brochures tell students that they will "earn scholarship money for the University of Alaska." One television ad points out that in addition to ANSEP scholarship money, "you've got a better chance at earning the [Alaska Performance] Scholarship by enrolling in ANSEP," referencing a common state scholarship. The community and peer supports are another prominent selling point. One young participant featured in a commercial says that ANSEP "is like a really big family." Several videos use the tagline, "Working together to accomplish what none of us can do alone."

Staff say that social media are an important tool for keeping parents informed, particularly for the middle school and high school components. The Facebook pages and the Middle School Academy blog give real-time updates of the activities participants are doing, which staff members report can help assuage the anxiety of parents whose children have never been away from home before.

## Funders and Other Stakeholders

ANSEP makes a point of recognizing key donors and partners in its print materials, on its website, and at its events, in particular, at an annual banquet that recognizes both partners and successful University Success participants. Several employer partners commented on the high quality of ANSEP's communications materials, especially the television commercials, and described the widespread recognition of the ANSEP brand.

The statistics in promotional materials convey that ANSEP participants achieve their goals in STEM education and college graduation. A wide variety of stakeholders discussed the program's success rates during interviews. Some university stakeholders, however, questioned the transparency of ANSEP measurement and reporting. Chapter 17, in part II, presents the evaluation team's analysis of data on ANSEP participant outcomes.

## Brand Recognition

ANSEP's promotional materials, particularly the television ads, are widely seen and contribute to a public awareness of ANSEP and its mission, as well as the impression that ANSEP is highly successful. Numerous stakeholders expressed that "ANSEP has built up a very strong brand in the state" and that the program is "really well-respected" throughout the entire state, even outside of the education and STEM industries.

# Chapter 9

## Activity: Alumni Outreach and Activities

ANSEP leadership and staff consider their graduates to be lifetime members of the ANSEP “family” and attempt to keep them engaged in a number of ways. Though program staff are not able to track and stay in touch with every graduate, a core constituency of alumni remains connected and plays important roles in the program’s continued growth. The engagement of alumni benefits both ANSEP and the alumni themselves.

### Alumni Tracking

To stay connected to alumni, ANSEP maintains a list of all University Success graduates and their last known contact information, as well as available information about their current location and employment. As of fall 2014, the list included 235 individuals, with 19 of those missing any contact information. Though the alumni list is incomplete, ANSEP staff report that they use the list to invite alumni to events, send announcements, and alert them of relevant job openings. ANSEP staff members also report keeping in touch with several previous participants on a more informal basis.

An active and autonomous Alumni Committee holds meetings, hosts informal gatherings, and sponsors scholarships. Alumni are invited to annual events, including a summer fishing trip (for those who have donated money), the ANSEP banquet, and a smaller-scale ANSEP alumni dinner. Of alumni responding to the survey, 45 percent indicated they had attended one of these events, and more than half said they planned to participate in the next year. According to staff, these activities reward alumni for their involvement, keep them engaged with the program and its current participants, and extend the community and peer support the program offers to participants into their post-college lives.

### Alumni Contributions

Many alumni donate money and time toward current ANSEP activities. Overall, nearly 60 percent of the alumni survey respondents reported some participation in alumni activities, with 47 percent indicating that they have attended the annual banquet. Over 40 percent reported that they had made or planned to make a

financial contribution to ANSEP, and the ANSEP Alumni Fund contributes \$50,000 to participant scholarships every year, according to ANSEP's fiscal year 2015–2018 funding projections. Because many alumni hold jobs with companies that sponsor ANSEP, some continue to be involved by mentoring Summer Bridge and University Success summer interns, giving presentations on campus about job opportunities, and hiring ANSEP graduates. At BP, for example, several former ANSEP participants run the company's Summer Bridge internship program. More than one-fourth of respondents to the alumni survey have given time to ANSEP by volunteering as instructors and mentors, presenting at weekly meetings, or participating in other employment recruitment activities.

Several of the large employers have charitable donation programs that will match funds donated to ANSEP by employees or will contribute at an employee's suggestion. Having alumni working at and serving in leadership roles throughout Alaska's STEM industries is a key goal of ANSEP's long-term development strategy, according to ANSEP leadership. Alumni meet this goal through their representation in STEM organizations, and, as ANSEP leadership believe, their presence and contributions are leading to "systemic" change, making it possible for the next generation of participants to be successful. Of survey respondents, 47 percent said that their current employer conducts business with Alaska Native communities or organizations, and 27 percent said their employers engage in philanthropy or civic engagement work with Alaska Native communities or organizations.

Several University Success alumni have joined the program's full-time staff after graduating, filling roles that include recruitment, accounting, and administration. Another way alumni from all components contribute to the program is through informal recruitment, by encouraging younger friends, family, and peers to join the program and to pursue STEM graduate degrees.

---

*"ANSEP needs to recognize the potential that ANSEP alumni bring to the table when promoting ANSEP to future generations.... When ANSEP graduates leave the University setting ANSEP support doesn't need to end. ANSEP graduates can do more for ANSEP within their communities rather than alternatively sending ANSEP [financial] contributions." -University Success alumnus*

---

Many ANSEP alumni remain connected to each other after graduation. In the alumni survey, 91 percent of University Success alumni respondents reported being in contact with other ANSEP alumni, with 32 percent reporting that they are in contact more than once per month. Some alumni expressed that they would like even more opportunities to stay connected to each other and to the program, particularly from

their vantage point in rural communities. Alumni living outside of Anchorage indicated that they would value having activities take place in other parts of the state that would not require travel to Anchorage.

# Chapter 10

## Activity: Policy Work and Advocacy

ANSEP's mission extends beyond the individual participants it supports and into more systemic change. The program aims to affect the K-12 educational system, the STEM industries, and the University of Alaska (UA), while improving attitudes toward and the climate for Alaska Native students and workers.

### Goals

According to ANSEP leadership, part of ANSEP's mission is to prove that Native students, operating in a social context of historic discrimination and disadvantage, are capable of success in STEM degree programs.

One step toward this goal has involved trying to change the environment for Alaska Native students across the state's educational systems—both postsecondary and secondary—as discussed in earlier sections of this report. ANSEP leadership reported that discriminatory, sometimes hostile, attitudes toward Natives took place in the early years of the program. Although the negative perceptions faced by Alaska Natives have improved, ANSEP leadership report that issues of discrimination on campus remain. Beyond the UA system, ANSEP leadership plans to improve the quality of K-12 math and science education, raising standards so that students—rural students in particular—are prepared for college-level training. The leadership say that they “won't be satisfied ... until the opportunities we present for students are more broadly available” and that they “want to make it so glaringly obvious that this is the approach that we need to take with education that nobody can deny it.” These policy changes in turn contribute to the goal of affecting the STEM industries. ANSEP leadership say that they aim to “effect a systemic change in the hiring patterns” of STEM employers, which will happen only by increasing and improving the pipeline of Native scientists and engineers at every level.

### Activities

To meet its goals, ANSEP has worked to influence state policymakers in the executive and legislative branches. Several members of UA leadership stated that ANSEP is unique within the university system in that it interacts directly with state agencies rather than indirectly through UA administration, sometimes without the knowledge of the UA administration. ANSEP leadership meets with state officials, including the governor of Alaska and the state commissioner of education. In fall 2013, leadership gave a presentation to

the state legislature. In the past, ANSEP worked with federal legislators to influence education policy at the national level. These efforts were ultimately unsuccessful, and the result convinced ANSEP leadership of the importance of lobbying to build political influence. Therefore, ANSEP leadership has discussed plans to create another organizational entity that would be institutionally separate from the university and could hire a lobbyist based in Juneau to advocate for the program to state officials.

ANSEP's advocacy has translated into regular financial support from the state. Since 2011, the program has received a recurring annual grant of nearly \$1 million from the Alaska Department of Education and Early Development. In addition, in 2014 the Alaska State Legislature appropriated \$6 million to ANSEP, awarded by the Department of Education and Early Development and paid out over three years, to expand the number of Middle School Academies; an additional \$1 million was awarded as a capital grant (see chapter 5).

In 2014, ANSEP leadership worked with the governor and the state legislature to pass a bill that would give students high school credit for college courses taken. This law integrates coursework completed during ANSEP's precollege components with the state standards for high school graduation. As discussed in chapter 7, ANSEP has also worked increasingly with several school districts; and K-12 stakeholders reported that ANSEP has had some influence on policies and curricula within their school districts. For example, K-12 stakeholders reported efforts to offer certain courses, such as Algebra for middle school students, or to place students on certain tracks to meet ANSEP eligibility requirements. A portion of the capital grant ANSEP received from the Department of Education and Early Development will be shared with the Mat-Su School District and used to develop a student performance tracking system for the district. Although both of these changes benefit ANSEP, they have implications for school priorities and policies more broadly.

Finally, ANSEP leadership have discussed establishing an ANSEP Community Council made up of "powerful people within the community," such as representatives from foundations and industry, who would continue to advocate for ANSEP and its mission into the future.

## Results

Stakeholders indicated that ANSEP has contributed to a perception that Native students are succeeding in STEM degrees and careers and that the program has become a source of pride for Alaska Native communities. Even members of the Native community who do not themselves participate have a sense of pride regarding the participants and their accomplishments. Stakeholders and participants expressed that

ANSEP has been a positive force for all Alaska Natives, not only students who aspire to become scientists and engineers.

---

*“When I’m sitting there in the evening and I’m watching TV and the ANSEP commercial comes on, and I recognize some of those kids, and my boys and people in these towns and these villages are recognizing that those kids are from these villages, it’s hooked them. It’s relevant. What we have out here—and it’s been beaten down a lot—we have a sense of pride. What ANSEP does is gives us more sense of pride in who we are and what we’re trying to do. It’s relevant, especially to young kids. That’s what makes them so excited. It’s relevant to their lives. It’s not like talking about the moon and you’ve never been there.” -Community stakeholder*

---

Stakeholders and participants shared the perception that ANSEP has helped change the way that people in Alaska view and talk about Natives, steering conversations in a positive direction rather than focusing on disadvantages and shortcomings. ANSEP emphasizes the ability of participants to succeed, rather than focusing on the barriers they face and the “sad stories” (as described by one middle school participant) of those affected by problems such as poverty and substance abuse. A stakeholder involved with an influential Native organization claimed that ANSEP has independently done some of the work that the organization has been trying to accomplish on the messaging surrounding Alaska Native issues. One K-12 stakeholder argued that ANSEP has helped dispel the idea that for Native youth to be successful in “the Western world,” they must abandon their culture; instead, ANSEP participants can succeed as engineers while continuing to celebrate Native values.

---

*“What ... the program did for [UAA] is to give voice to the Alaska Native population. It didn’t have a voice on this campus in the same way or to the same degree.” -UAA stakeholder*

---

# Chapter 11

## Component: Middle School Academy

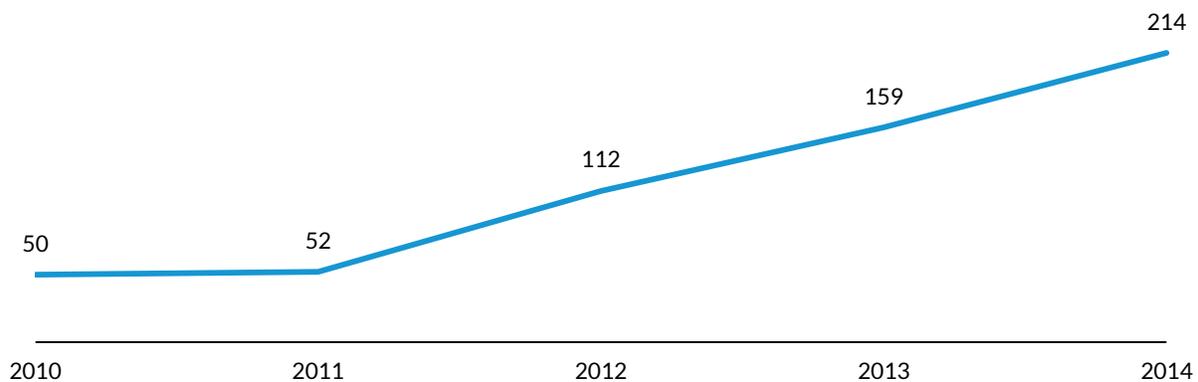
Middle School Academy is the first possible entry point to the ANSEP multistage model for participants. It provides middle school-age youth with an 11-day residential experience on the UAA campus with active learning opportunities designed to foster enthusiasm for pursuing STEM education and careers and a commitment to completing Algebra 1 by the end of eighth grade. The program has grown and evolved since its creation in 2010, and it is fundamental to ANSEP's expansion plans. Middle School Academy has evolved from a centralized program run entirely by ANSEP staff to a hybrid model that relies on collaboration with specific school districts around Alaska. ANSEP leadership initially created Middle School Academy to capture younger students early in their academic development and to help ensure that talented Alaska Native children would be prepared and eligible for the ANSEP high school and university components (see the Activities/Outputs/Outcomes part of figure 1.1).

### Recruitment and Selection

As described in chapter 6, ANSEP uses a variety of media tools and word-of-mouth to identify applicants around the state. ANSEP staff members, primarily the middle school director, also work directly with some school districts, which are increasingly crucial partners for the component as it expands. Middle School Academy has expanded precipitously since ANSEP established the component in 2010, serving about 214 students in 2014 (see figure 11.1). Over this time, 84 percent of participants came from the Anchorage, Matanuska-Susitna Borough (Mat-Su), Lower Kuskokwim (LKSD), Lower Yukon, and Fairbanks North Star Borough school districts.

FIGURE 11.1

### Growth in Middle School Academy Enrollment, 2010–14



**Source:** ANSEP administrative data.

**Note:** The 2014 enrollment number includes 108 participants from the two summer Middle School Academy 1 sessions, but detailed information on demographics or achievement is not available for these participants.

Applicants are required to submit an application packet that includes a written application, a 250-word essay, and two recommendations from current math and science teachers, as well as transcripts provided by the school district. In addition to the basic contact and demographic information, the application asks about students' current course enrollment, plans for future course enrollment, activities, and achievements (in both STEM-specific and other community activities), household composition, and income. The application packet includes form letters to the students' school registrars requesting transcripts and standardized test scores. In 2013, ANSEP received 332 applications for 108 spots in the traditional summer Middle School Academy (MSA 1). Sixty-three were incomplete, mostly missing test scores and transcripts. ANSEP staff reported that they follow up by e-mail on incomplete applications if applicants submit them before the deadline. Participants in focus groups reported that the application process was a significant amount of work, and some reported that they were intimidated by the requirements. Parents were excited about the opportunity for their children, and some were more engaged than others in assisting with the applications.

ANSEP staff have developed a sophisticated selection process under the middle school director's leadership in the past several years, in which they apply a standardized rubric that assigns points for different attributes of the applications. The rubric is heavily weighted to emphasize academic preparation, specifically students being on track to complete Algebra 1 by the end of eighth grade. Students are expected to have A and B grades in math and science classes and to have math and science test scores that indicate that they are proficient or above proficient. After the high academic requirement, the staff reported that the first priority is selecting rural Alaska Native students, followed by urban Alaska Natives, then rural, and finally other ethnic minorities. Different funding sources for different sessions of Middle School Academy

also impose specific requirements for participants, such as parity of males and females, or prioritization of low-income students.

For the school district–based Middle School Academy (MSA 2), applicants submit the same application materials to ANSEP staff, who review and make the selection decisions, but the recruitment is led by the school districts. The school districts explicitly target eligible Alaska Native students. In the Mat-Su School District, which participated in 2013 and again in 2014, district administrators promoted Middle School Academy by holding events for children and parents who were identified as Alaska Native and supported their applications. In LKSD, which first participated in spring 2014, administrators tasked a staff member to serve as the local recruitment specialist. The students identified by the districts are invited to apply for a specific MSA 2 session during the school year. These MSA 2 sessions include only students from that district, and teachers from the district accompany the students and act as chaperones during the session. These students undergo the same application process and selection criteria as described above, and the district and individual schools support applicants through what one partner described as the “marathon of paperwork” required for ANSEP. School district partners indicated that support on the application process provided in district-run events was helpful to the students and parents. They also observed that some students were initially uneasy about being targeted for recruitment based on their Alaska Native heritage, but these partners also noted that the students grew more comfortable with the idea once they understood the privileges of participation. School district staff members and teachers reported that, through the experience, students developed a common bond with other applicants from their districts. In one case, ANSEP also held a kickoff event with the astronaut Buzz Aldrin, providing an exciting opportunity for participants and their parents.

## Participant Characteristics

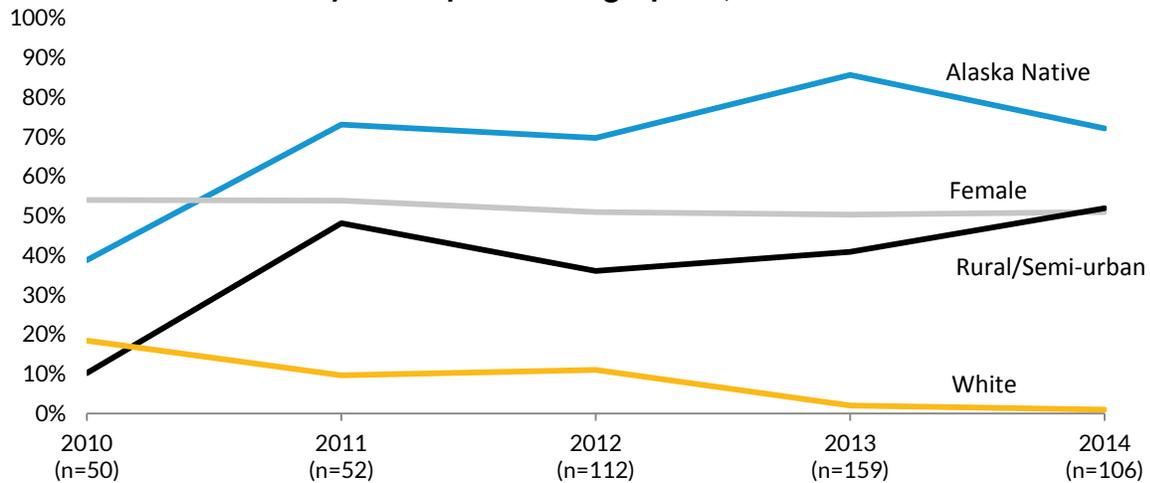
Administrative data on participants’ characteristics reveal that ANSEP does achieve gender parity for Middle School Academy (see figure 11.2). Over time, participants have become more likely to be Alaska Native, less likely to be white, and more likely to be from rural or semi-urban areas. The sessions of MSA 2 in 2013 and 2014, for which school districts recruited only Alaska Natives, may play a role in this trend. Alaska’s population in rural or semi-urban ZIP Codes is 36 percent, and by that measure, students from these areas are overrepresented (40 percent of the Middle School Academy participants), which suggests that ANSEP is reaching rural or semi-urban students.

ANSEP’s administrative records show that a very high proportion of Middle School Academy participants were at or above grade level in math and science at admission (see figure 11.3). Almost one-

third were above grade level in math before joining ANSEP, and this proportion increased from 16 percent in 2010 to about half of participants in 2014.

FIGURE 11.2

### Middle School Academy Participant Demographics, 2010–14

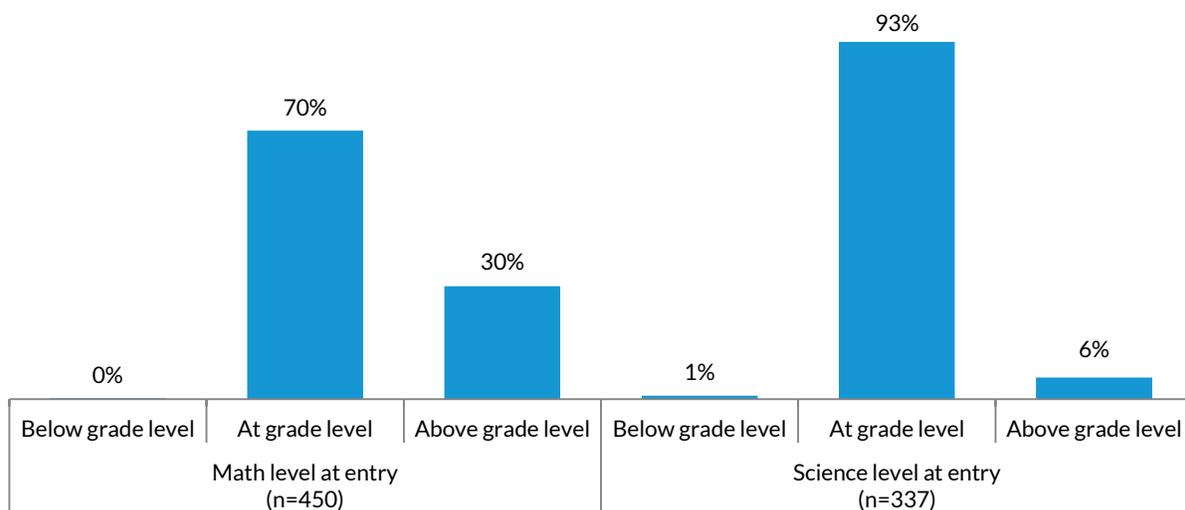


Source: ANSEP administrative data.

Note: 2014 percentages are out of 106 Middle School Academy 2 participants because demographic information was not available for the two summer 2014 Middle School Academy 1 sessions.

FIGURE 11.3

### Middle School Academy Participant Preparation at Enrollment



Source: ANSEP administrative data.

Note: Percentages exclude participants with missing school math and science level information. Grade level was interpreted qualitatively based on curricular interpretations and assumptions about grade-level standards.

# Component Activities

The Middle School Academy component draws on many of the activities that have been identified as important for STEM youth programs. It combines academic requirements for previous participants with a focus on experiential training during the session to stimulate interest and enthusiasm for STEM careers. Experiential training includes hands-on learning, career preparation, soft skills development, and college navigation activities. Supports include efforts to bridge participants into the multistage ANSEP model and learning community, peer supports, financial supports, mentoring, and recognition events, all within a setting that highlights Alaska Native cultural identity.

## Academic Training

Middle School Academy does not include specific academic training as part of component activities, but it is designed to motivate students to pursue academic advancement at their home middle schools. The key feature in this regard is the requirement that all participants complete Algebra 1 by the end of eighth grade. Stakeholders reported that students in home schools are working harder to advance through math coursework to meet the ANSEP requirements. This observation applies to both potential applicants who want to be eligible and past participants. Past participants are motivated by the expectation that they will complete Algebra 1 to keep the personal computer they built during Middle School Academy, as well as by the desire to be on track to join later ANSEP components. One K-12 education stakeholder reported that some students have pursued coursework during the summer months to be eligible for applying to Middle School Academy. ANSEP is developing new ways to support participants for remote learning to ensure that they complete Algebra 1.

Former participants who return to their home schools after their Middle School Academy experience can play an important role in spreading the word-of-mouth reputation and motivating other students to pursue STEM. ANSEP leadership said that participants are returning to their home school districts and pushing their schools to provide better math coursework. K-12 stakeholders agree that ANSEP's role in motivating students to excel in math has grown as more have participated.

Several stakeholders voiced concern about the high academic requirements for Middle School Academy, emphasizing that ANSEP is best serving students who were already achieving at high levels. They expressed concern that students in the middle tier of achievement are not eligible to apply—students they thought could also benefit from the ANSEP experience. One K-12 stakeholder thought that different students may progress at different rates and that required completion of Algebra 1 by the end of eighth grade is not an appropriate expectation for many students. Engaged parents also viewed the academic

requirement as a high bar for their children to reach but did not view it as unreasonable. ANSEP leadership and staff indicated that they do not want to lower their high academic standards because they do not want to “set up kids to fail.”

## Experiential Training

### HANDS-ON LEARNING

Middle School Academy focuses on exposing participants to STEM content and careers through active, hands-on activities and interaction with scientists and engineers. The 11-day experience comprises a number of activities, starting with the three-day Computer Assembly, in which staff members guide participants through the construction of their own personal computers. The remainder of the session includes active learning experiences, such as field trips and activities at Alaska SeaLife Center in Seward and Earthquake Park in Anchorage, and activities ranging from 45-minute interactive sessions to longer sessions where participants work in teams on complex problem solving. Participants build hands-on models for earthquake simulations, compete against each other in bridge construction contests, and develop an aerospace design. Through these sessions, participants learn about basic concepts of engineering and different scientific fields while actively applying their new knowledge. Fields include genetics, seismology, micro- and macrobiology, hydrology, geology, aerospace, and other STEM fields.

K–12 stakeholders spoke glowingly of the range of activities included in Middle School Academy, impressed by the exceptional opportunities for participants to learn STEM content outside the classroom. The combination of active hands-on learning in a different environment, with small groups and one-on-one attention, gives participants an experience that is very different from their STEM coursework at their middle schools.

Instructors include professors and graduate students from UAA as well as scientists and engineers from partner organizations. In one activity, instructors come to the ANSEP Building to teach short modules on specific topics related to their own career specialties. Observations of these modules revealed that the instructors generally framed their presentations in terms of real-world science careers while sharing academic or content knowledge. Most used hands-on activities that gave the participants an opportunity to interact with each other and with the instructor and to articulate the connections they saw between the content and the issues in the real world that mattered to them.

---

*“Maybe I’ll say something like, ‘If you ever go into civil engineering you’ll probably have to do a lot of this kind of planning. Drainage is one of the most important aspects of planning anything, so this is something that you’re going to need to know down the road,’ just to impress upon them that we’re working towards them finding a career in this field, even at such a young age.” -Middle School Academy instructor*

---

ANSEP staff provide minimal formal oversight or instruction to instructors, though they indicated that they may seek new instructors for the next session if they observe that the content knowledge of the instructor is not as robust as they expected. Observations showed that instructors seemed enthusiastic and well prepared and served as advocates for their own scientific specialties. Instructors expressed that they were pleased with the equipment and facilities available at the ANSEP Building and seemed to enjoy their teaching experiences, though they are not asked for formal feedback by ANSEP staff. ANSEP staff also do not routinely inform instructors about the details or background of the participants or the other activities in the component. The staff said that they are aware of the need to train and prepare instructors, but operational changes have focused more on improving the preparation of the chaperones and youth peer mentors (YPMs) rather than the invited presenters.

### **CAREER PREPARATION**

Exposure to activities gives participants an understanding of science and engineering careers and skills, and Middle School Academy is designed to help them envision themselves as future STEM professionals. The academy also includes a session in which staff share a web tool that allows participants to learn more about their skills, future plans and expectations, and the link between the cost and the financial payoff of STEM education and possible career paths. Participants’ written reflections reveal that the lesson impressed on them the importance of thinking about future financial stability and education plans that will lead to desirable careers.

### **SOFT SKILLS AND CONFIDENCE**

Experiential learning not only exposes participants to new perspectives and experiences but also intends to develop their soft skills in the areas of critical thinking, problem solving, communication, and teamwork, as well as promoting their self-confidence. Most of the Middle School Academy activities require participants to work in teams, learning skills of cooperation and communication. Staff members and instructors design activities to build team spirit and trust. Participants are split into six nine-member teams for the entire academy, and members of each team must work together to accomplish tasks.

Observations revealed that participants worked effectively with each other, both within and across their teams; for example, when participants finished individual tasks during Computer Assembly and were waiting for further instructions, many turned to help other participants complete their work, sharing their new knowledge. The instructor for Computer Assembly also encouraged problem solving and critical thinking by responding to participants' questions—not by giving them the answer, but by asking them probing questions so that they could figure it out on their own. K-12 stakeholders said that participants benefited from being mixed together with students from other schools because of the real-world experience of interacting with new people.

Academy activities are designed to foster oral and written communication by requiring daily written reflections, in which participants write what they learned that day, why it was important, and how ANSEP could improve the experience. ANSEP staff read all the reflections and coach the participants for clarity and completeness. The reflections also alert staff to issues that they should address.

Parents and K-12 stakeholders expressed that participants gain self-confidence by being selected for and participating in an exclusive program. Being chosen for a competitive program raises participants' expectations of themselves. Setting a high bar for participants also encourages them to think of themselves as high achievers.

## COLLEGE NAVIGATION

In addition to providing exposure to science and engineering careers and skills, Middle School Academy introduces participants to the university setting. The residential program gives participants an understanding of college life, as they experience living in the dorms, having roommates, and interacting not only with other participants but also with college students they meet in the cafeteria or elsewhere on campus. Activities such as a campus scavenger hunt give participants an opportunity to explore UAA. Participants in the focus groups described imagining themselves as future college students at UAA.

For most participants, it is their first experience of being away from home, and most reported being nervous but feeling welcomed by the other participants and ANSEP staff. ANSEP staff said that homesickness is one of the greatest challenges they have to manage for this age group, along with participants getting sick or posing disciplinary problems.

## Supports

### BRIDGE INTO THE ANSEP EXPERIENCE AND COMMUNITY

Middle School Academy is also an introduction to the ANSEP multistage model. Participants are encouraged to stay with ANSEP through high school and into university, and they gain direct exposure to college participants by attending the weekly University Success meeting (if they are enrolled during the school year) or by interacting with college-aged YPMs who are their counselors. ANSEP staff may also include middle school participants in other ANSEP activities during the year, such as the annual banquet. K–12 partners said that the recruitment sessions present the Middle School Academy experience as the first step in the ANSEP model, situating the program in the context of a longer-term program and commitment.

---

*“I thought the meetings were really good because the middle school kids got to see what the college students did. They got a peek into their lifestyle. They heard about classes they had to take, projects they had to work on, internships they were doing. They even had other professionals come in and talk ... to the students too, so that they could see the process of going from middle school to high school to college and what those expectations are.” -K–12 partner*

---

### PEER SUPPORTS

Another key feature of the Middle School Academy component is the social experience of being connected to other Alaska Natives and other students who are interested in math and science and on track for high academic achievement. Participants shared in focus groups that they are high achievers who may be teased in their home schools or feel different for being committed to academic or scientific pursuits. Some come from rural villages and schools where they have few STEM role models. Students expressed in focus groups that arriving at the academy helped them realize that there are many other kids like them, also passionate about math and science, and they experience a sense of belonging.

---

*“In my group of friends, I’m considered the smart one and ... it’s because I’m always doing math! And I come here and it’s a bunch of ‘smart ones.’” -Middle School Academy participant*

---

## FINANCIAL SUPPORTS

The Middle School Academy experience comes at minimal to no cost to participants or their families. However, travel costs can be high for participants coming from remote villages or regions. In the MSA 2 model, school districts have covered students' transportation costs so far, sometimes with support from ANSEP funds. Although ANSEP asks parents to cover the cost and arrange for their child's transportation to Anchorage for MSA 1, ANSEP staff reported that this cost has not been an issue because ANSEP helps them find local organizations to support travel costs, such as schools or Native organizations. ANSEP covers all other costs for participation, including room and board, activities, and the personal computers for Computer Assembly.

## MENTORING

Middle School Academy offers participants exposure to YPMs and resident advisers (RAs), who are successful university or graduate students who serve as their chaperones in MSA 1. All are on track for STEM or other careers, which provides participants with effective role models, though perhaps not formal mentors. Some of the YPMs are Alaska Native. Participants reported mixed experiences with the YPMs, describing how some are more engaged than others but overall seeing them as a supportive presence. The RAs help participants with homesickness and other issues in the evenings.

MSA 2 offers a different model, in which the chaperones are teachers from participants' home schools. Having teachers from home schools gives participants some continuity and familiar faces, which may be comforting in the foreign context on campus. The MSA 2 model might also foster higher-quality interaction between teachers and students after the session. One K-12 partner described running into former participants in the hallways of his school and observed that students felt a stronger bond to the teachers after the Middle School Academy experience. ANSEP does not facilitate formal continuation of connections between chaperones and their team members after the sessions.

## RECOGNITION EVENTS

ANSEP staff seek to reinforce the impact of the component by scheduling recognition events where participants have an opportunity to share their achievements with their families. There is a closing ceremony at the end of the two-week MSA 1, which staff invite parents to attend. ANSEP staff also invite former Middle School Academy alumni to attend ANSEP's annual banquet. Such events give Middle School Academy participants a glimpse of the larger ANSEP model and a sense of being embedded in its community.

## Evolution

Middle School Academy has evolved since its original implementation in 2010, notably expanding from a summertime model focused on bringing together participants from all over the state, to become a model that has decentralized to individual school districts and takes place during the school year. The program began through support from the Bernard Harris Foundation and ExxonMobil, and the Bernard Harris Foundation-influenced curriculum continues to shape the design of the Middle School Academy activities—for example, by requiring equal representation across grades and genders for the 54-student sessions. So far, ANSEP has implemented the MSA 2 model with two school districts: Mat-Su School District in the Anchorage suburbs and the more rural LKSD. ANSEP leadership see the new model—which moves much of the costs, recruitment, and chaperone staffing to the districts—as crucial to their vision of expanding Middle School Academy and creating a larger and continuous pipeline of talented Alaska Native youth to steer through high school, into the University of Alaska, and onto STEM career tracks.

ANSEP's strategic plan envisions running 12 academies per year as soon as 2016 and supporting around 650 participants per year. The \$6 million award from Alaska's Department of Education and Early Development, discussed in chapters 5 and 7, will provide most of the support for this plan. ANSEP leadership and staff began designing the details and logistics for implementation during the 2013–14 school year. ANSEP staff plan to run eight Middle School Academy sessions in fiscal year 2015 (five funded by the state award) and 12 over fiscal years 2016 and 2017 (eight funded by the state award).

Further, ANSEP staff have discussed linking state educational records in a way that is conducive to tracking ANSEP applicants' and participants' advancement, which would be helpful for reporting and monitoring purposes. As discussed in earlier chapters of this report, ANSEP leadership is working on making operational adjustments, such as hiring additional staff and securing additional dorm and academic facilities, to support a year-round Middle School Academy program.

As Middle School Academy has evolved, ANSEP staff have learned how to adapt to a middle school-age participant base. Since staff were used to working with university and high school participants, taking on the younger students posed a challenge at first. K–12 partners and ANSEP leadership described how ANSEP staff members were perhaps unprepared to deal with younger students; they had to learn quickly how to manage the classrooms and deal with disciplinary and other unfamiliar issues. ANSEP staff members said they benefited from their experience with the Mat-Su School District teachers by learning some basic techniques and approaches to working with that age group. K–12 partners who have been involved in multiple MSA 2 sessions observed that between 2013 and 2014, ANSEP made a number of changes to rules and style to accommodate young adolescents' needs. For example, it added rules prohibiting energy drinks and the use of smart phones, introduced structured evening activities, and started using standard catch

phrases to capture participants' attention and get them to focus on the instructor. ANSEP staff also modified the chaperone experience to give the teachers more free time in the evenings and more advance information on teaching plans and schedule, both by having an advance meeting with chaperones and by providing material on an internal website. ANSEP has also made significant changes for the participants: for the first time, in 2014 participants were required to provide daily reflections on their experiences, as well as group reflections on a website accessible to their parents, a practice that gives students an opportunity to process their experiences and communicate with their families. In 2014, ANSEP equipped participant teams with iPads to use during the session to support their experience.

# Chapter 12

## Component: STEM Career Explorations

ANSEP launched STEM Career Explorations in summer 2013 after ANSEP leadership saw a gap in the pipeline for participants between Middle School Academy and their next chance to return to ANSEP during high school. STEM Career Explorations provides an opportunity for participants who previously attended a Middle School Academy to return to the UAA campus for a five-day residential camp in which they focus on a particular STEM field. This component allows participants to renew their dedication and enthusiasm to the ANSEP community and to STEM study.

### Recruitment and Selection

ANSEP staff encourage former Middle School Academy participants and their families to submit applications for STEM Career Explorations (Career Explorations), both at the time the participants complete Middle School Academy and throughout the year. To recruit students, ANSEP staff reach out to Middle School Academy alumni through social media such as Facebook and direct e-mail contact. In 2014, Career Explorations admitted 108 students. In 2013, 81 students applied during a very short application period, 54 were admitted, and 15 were placed on the waitlist. Those who applied in 2013 were mostly from the 2012 Middle School Academy cohort, but some who applied had completed Middle School Academy sessions as long ago as 2010.

The application process and selection standards for Career Explorations are similar to those in Middle School Academy. The main differences in the application are that Career Explorations applicants do not need letters of recommendation, and applicants write a 250-word essay responding to a different question. As with Middle School Academy, staff use a standard rubric for participant selection, with the first criterion being that students are on track to complete Algebra 1 by the end of eighth grade and have strong grades and test scores, based on their transcripts and their application materials. The second criterion is Alaska Native background, although students do not need to be Alaska Native to attend Career Explorations. As in Middle School Academy, Career Explorations consists of 54 participants. According to ANSEP administrative records, in 2013, there were 25 male participants and 29 female participants, 80 percent of whom were Alaska Native and 35 percent of whom were from rural or semi-urban areas.

# Component Activities

The STEM Career Explorations component has no purely academic training aspect. The session focuses on the hands-on experiential learning that participants experienced during their Middle School Academy session, building on it in a specific STEM topic area. Similar types of experiential training are provided, including hands-on learning, soft skills development, group work and team building, career preparation, and college navigation activities. The component includes all the supports that were described for Middle School Academy (see chapter 11).

## Experiential Training

### HANDS-ON LEARNING

Career Explorations does not include explicit academic training; participants do not have assignments and do not earn academic credit. Participants are, however, expected to continue to progress during the school year toward completing Algebra 1 by the end of eighth grade.

Instead of an academic focus, participants in Career Explorations are re-exposed to STEM concepts through an intensive, five-day experiential module that engages a specific STEM topic area. The middle school director determines the topic area based on the interests of instructors who are available to teach each session. An instructor (or two-instructor team) who is a professor or professional with expertise in a STEM field leads each Career Explorations session. The same instructor teaches the entire session and is given substantial autonomy to develop the curriculum and run activities. The middle school director, who works closely with the instructor throughout the week, oversees the entire session. The sessions combine lectures and lessons on the topic together with hands-on activities that allow participants to apply their new knowledge. In 2013, the Career Explorations topic was aerospace design. In 2014, the first session focused on geolocation and three-dimensional computer modeling, and the second session focused on permafrost engineering.

Participants in the first two years of Career Explorations did not know the topic of the session until they started, but some participants expressed in later focus groups that they would have liked to have had a choice in topic. ANSEP staff are considering having separate science and engineering sessions in the future that would allow participants to choose.

Participants from the permafrost session described in focus groups how the Career Explorations experience compares with classes at their home schools. They observed that the instructor ties together the

material across the week in a way that makes the concepts easier to understand than in lessons at home. They appreciated the opportunity to learn “bonus” material that may be useful in the future.

---

*“In school ... it feels like you're trapped in a way, but at ANSEP it feels like you're free.” –STEM Career Explorations participant*

---

Participants also made comparisons with their experiences in Middle School Academy. They emphasized the narrower focus and higher intensity of the Career Explorations session. As in Middle School Academy, participants write daily reflections on their experiences. Those who write particularly detailed and thoughtful reflections are rewarded with prizes, such as credit at the UAA bookstore.

#### **SOFT SKILLS, CONFIDENCE, AND PUBLIC SPEAKING**

Career Explorations also seeks to reinforce the soft skills taught during Middle School Academy by focusing on public speaking, personal reflection, and group work. Participants give multiple presentations throughout the session, including a capstone presentation on the last day, in which they summarize their experiences in front of other participants and their families. In observations, participants in one session became notably more comfortable speaking in front of a crowd between the second day of the session and the final presentation. In their daily reflections, participants wrote about the importance of speaking skills and reflected on how much they had improved over the course of the session.

#### **GROUP WORK AND TEAM BUILDING**

Similar to Middle School Academy, the 54 participants are organized into nine groups of six, with three boys and three girls if possible. These groups sit at tables, do learning and recreational activities, and present together throughout the session. A youth peer mentor who provides significant individual attention to group members monitors each group. Several participants wrote in their reflections about the importance of teamwork. Some connected the lessons about teamwork to their potential for success in future projects, in employment, or more broadly.

Career Explorations consists of more than classroom learning and activities. Participants also socialize and build community through recreational activities, such as completing a scavenger hunt, watching movies, or working through obstacle courses. They also take a field trip to the planetarium, which many cited as a highlight of the session.

## CAREER PREPARATION

The reflections of many participants in Career Explorations demonstrated that they think about the relevance of what they are learning for their future education and careers. ANSEP encourages participants to think about their futures in STEM by inviting industry professionals in fields such as engineering, biology, geology, and medicine to have lunch with the participants and talk with them about their careers. Participants are encouraged to ask questions that leverage the knowledge and expertise of the instructors.

---

*“I’ve heard that there are very few female engineers. I would like to become an engineer when I grow up to help that fact become false.” -STEM Career Explorations participant*

---

ANSEP staff members and participants in other components also teach participants about the next stages in the multistage ANSEP model and encourage them to apply. One day in each session, Career Explorations participants eat lunch with high school Acceleration Academy participants who had previously completed Middle School Academy. They learn about ANSEP’s high school–level components and about how to move through the stages of ANSEP’s model. In the final presentations for the session, the middle school director requires participants to describe how they will continue with ANSEP. Many participants knew about the high school–level components, including the internship opportunities in Summer Bridge.

## COLLEGE NAVIGATION

Career Explorations participants stay in the Alyeska Wing of the UAA dorms in the evenings, eat in the university cafeteria, and are again exposed to the campus living experience, where they have an opportunity to learn valuable lessons. Some reported that they forgot important items and had to figure out how to obtain them or make do without, while others talked about plumbing problems, long cafeteria lines, and other residential challenges they are likely to face in college. Overall, participants reported that living in the dorms is a fun experience and that they enjoy “college life.”

## Supports

All of the supports described in the Middle School Academy chapter (chapter 11) are also part of STEM Career Explorations, with one difference being the cost of participation. Although the Career Explorations sessions are free, families must cover the cost of transportation to and from Anchorage. ANSEP staff

acknowledge that this cost can be a challenge, because the session is short and transportation in Alaska is quite expensive. Some families can get financial assistance from community-based organizations.

Participants in focus groups reported how one of the highlights of Career Explorations for them was the opportunity to meet new people. Some have existing friendships from Middle School Academy, while others grow close during the Career Explorations session. Participants spend a great deal of time in their groups, which is mostly a positive experience, though some expressed that they would prefer to choose their group mates. Many participants reported having meaningful peer experiences and being disappointed to leave on the last day.

## Evolution

STEM Career Explorations began in 2013, following the recognition by ANSEP staff that some Middle School Academy participants would benefit from returning to campus and reconnecting with the ANSEP community during their middle school years, during the gap before they are eligible for Acceleration Academy. ANSEP leadership will continue to modify the specific operations of STEM Career Explorations as the component continues and potentially grows to accommodate increasing numbers of former Middle School Academy participants. One potential modification for future sessions is to split the sessions into science and engineering topics, so that participants could choose topics that match their interests.

# Chapter 13

## Component: Acceleration Academy

Acceleration Academy is the next stage in the ANSEP multistage model, giving high school-age participants college preparatory coursework and supports to ensure that they continue on the STEM education path. Acceleration Academy is a five-week summer session on the UAA campus for high school students, during which they can earn college credit through intensive summer college courses and gain hands-on STEM experience. Participants benefit from a college residential experience, supports and activities, peer socialization, and college scholarships to reward completion (see figure 1.1).

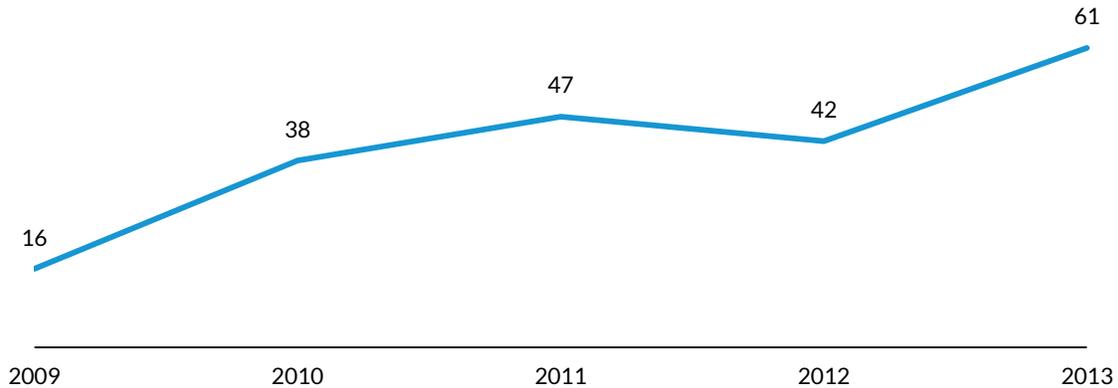
### Recruitment and Selection

Participants are eligible to enroll in Acceleration Academy the summer after 8th grade through 11th grade if they have completed Algebra 1 with a grade of C or higher, are interested in STEM careers, and plan to attend the University of Alaska. Some participants may enroll during the summer after their senior year if they are not accepted to Summer Bridge, though staff do not anticipate ANSEP continuing to accept seniors to Acceleration Academy in the future. Participants are encouraged to return to Acceleration Academy for multiple summers.

ANSEP staff reported that in 2014, over 100 students applied and approximately 70 percent were admitted to Acceleration Academy.” Unlike for the middle school programs, ANSEP has no gender or grade distribution guidelines for Acceleration Academy participants. Figure 13.1 shows how enrollment in Acceleration Academy has grown since its inception, from 16 students in 2009 to 61 in 2013. (Administrative data for summer 2014 were not available.)

FIGURE 13.1

### Growth in Acceleration Academy Enrollment, 2009–13



Source: ANSEP administrative data.

### Outreach and Recruitment

Participants from previous precollege components such as Middle School Academy or Career Explorations are encouraged to continue with ANSEP, and they are given first preference in admission. Staff target participants who completed previous components and invite them to apply by e-mail and by postal mail. Staff also recruit new students from schools throughout the state by going on recruitment visits. ANSEP staff used Computer Assembly as a key recruitment strategy in the past. Beginning in summer 2013, the number of high school visits decreased, as staff concentrated on building up the middle school components. Some high schools with strong ANSEP partnerships offer application workshops for Acceleration Academy alongside other ANSEP components and other academic summer programs.

Acceleration Academy participants in focus groups conducted in summer 2014 reported hearing about ANSEP through a variety of outlets. Some were told about the program by faculty at their schools. Some were participants in a partner program, STEM Ready, through the Lower Kuskokwim School District (described in chapter 7). Others had participated previously in alternative STEM enrichment programs, such as Alaska Summer Research Academy at the University of Alaska Fairbanks. Some were encouraged by parents who saw ANSEP commercials or by friends or siblings who were alumni of an ANSEP component. Participants reported being motivated by the opportunity to earn college credit in high school, to earn scholarships toward college, to experience college living, and to gain experiences that will look good on a résumé and aid future employment. Many said that they were interested in participating because ANSEP was presented as a very challenging academic experience.

Applicants are required to submit an application packet that includes a written application, a 500-word essay, two written recommendations from current math and science teachers, college placement test results, and a current high school transcript provided by the school district. The essay topic varies every year; in 2014, the essay asked applicants how they would contribute to the future of Alaska. ANSEP accepts the Accuplacer, ACT, and SAT college placement exams. Students can take the Accuplacer test for \$18 at the UAA campus or with a proctor if they live in a remote location and cannot travel to Anchorage. Applicants who have previously participated in ANSEP do not need to retake the college placement exam, but they do need to reapply and submit new recommendations (though these could be similar to the recommendations submitted for previous sessions). Upon admission, participants complete paperwork and are assisted in registering for classes at UAA, and they also complete a survey about their interests in science versus engineering.

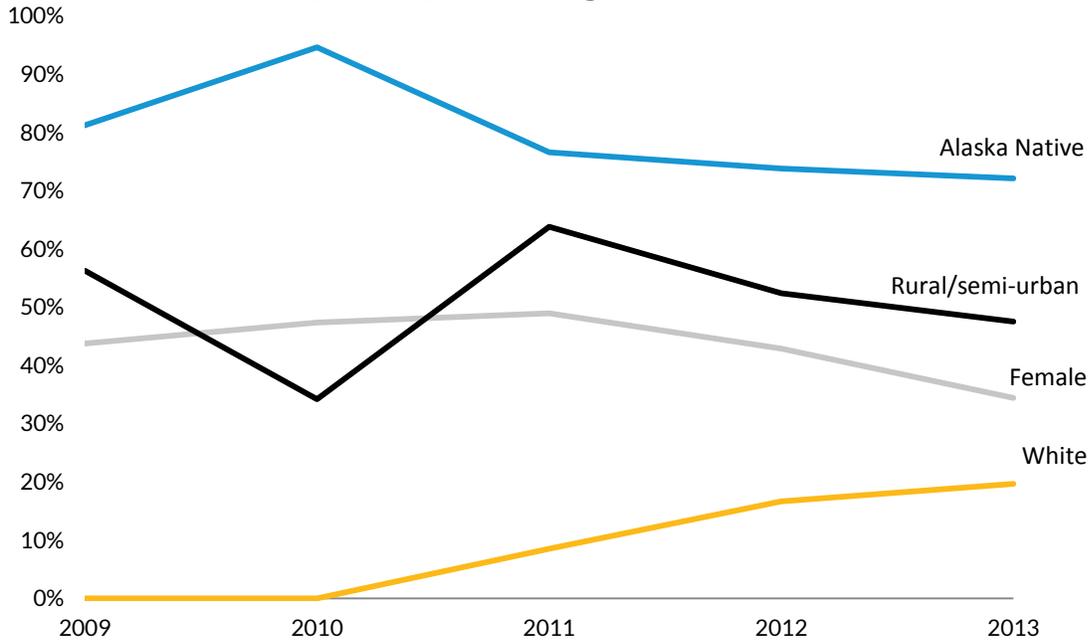
## Participant Characteristics

Participants in Acceleration Academy are most commonly between their junior and senior years of high school. In earlier years, ANSEP admitted only juniors, but over time they have admitted more sophomores and freshmen. In the 2013 session, 18 percent of participants were recent freshmen, 28 percent were sophomores, 39 percent were juniors, and 15 percent were seniors. Only 15 of 135 participants (11 percent) who completed Acceleration Academy between 2009 and 2012 returned for a second summer, but this number is likely to increase over time as more students participate in Acceleration Academy earlier in high school.

Figure 13.2 shows the trends in select Acceleration Academy participant demographics over time based on ANSEP administrative data. Acceleration Academy participants are more likely to be Alaska Native than are participants of Middle School Academy or STEM Career Explorations. However, the proportion of Natives in Acceleration Academy has decreased slightly over time, while the proportion of participants who are white has increased. Students from rural or semi-urban communities are strongly overrepresented. The majority of Acceleration Academy participants are male, a trend that has continued since the academy began.

FIGURE 13.2

### Acceleration Academy Participant Demographics



Source: ANSEP administrative data.

Current participants reported that Acceleration Academy is enjoyable but noted the importance of being committed to ANSEP and having high motivation to learn about math and science. The focus group participants reported that those who had applied and attended at their parents’ urging rather than out of their own initiative had a less satisfying experience in the program. Participants in focus groups said that they have tried to encourage friends from their home communities to participate, but some were skeptical about taking math and science classes during the summer, and others were unsure whether they would be eligible if they were not Alaska Native.

## Component Activities

Like the middle school–age components, the Acceleration Academy component also draws on many of the activities that have been identified as important for STEM youth programs. It combines academic training—specifically math, STEM, and writing coursework—with experiential training activities to prepare participants for STEM college majors and careers. As in the other components, experiential training includes hands-on learning, college navigation activities, soft skills development, and team building. Supports include mentoring and advising, recitation sessions, peer supports, and financial supports and scholarships.

## Academic Training

The primary focus of Acceleration Academy is to help participants make academic progress by taking college-level courses for college credit during the summer session on the UAA campus. ANSEP staff work with participants to help them register at UAA. Before summer 2013, participants generally took two college-level, credit-bearing courses, one in math and one in science. ANSEP permitted a minority of participants to enroll only in math or only in science courses. As of summer 2013, participants took one college-level, credit-bearing math class that meets for two hours every weekday morning for five weeks. Instead of a second full college-level course, Acceleration Academy participants do STEM activities in the afternoons three days a week. Beginning in summer 2014, participants also took a writing class for two hours, two days per week.

University credit for math courses may be applied to general education requirements or major requirements or may fulfill prerequisites; the specifics vary depending on the class completed during Acceleration Academy. Some participants also receive credits at their high schools for science, math, and writing classes. ANSEP staff have worked with several large schools and school districts, such as Mt. Edgecumbe High School and the Anchorage School District, to ensure that the math credits will count for high school requirements. Participants said they are excited about the opportunity to earn college credit, and they expressed pride that they are considered college students while still in high school.

---

*"I am one of the only people in my family who have gone on to college and I started at 16!"*  
*-Acceleration Academy participant*

---

### MATH CLASSES

Because Acceleration Academy takes place at the same time as Summer Bridge, university professors teach the math courses to both Acceleration Academy and Summer Bridge participants together in the same classrooms. The courses offered are intermediate algebra, college algebra, trigonometry, Calculus 1, Calculus 2, and differential equations. The differential equations course is usually taught with the regular summer class for undergraduate students at UAA. The courses are designed to match the content and rigor of regular undergraduate classes, although the time frame is accelerated to fit into a shorter time period. The format is different from the standard university introductory lecture-style classes, with smaller class size and more personal attention.

Over time, the locations of the class meetings and the numbers and types of participants enrolled have changed. Class meetings moved from the ANSEP Building to college academic buildings to help participants focus and to open up space in the ANSEP Building for other summer activities. Class sizes have increased for some classes, ranging from 10 to 15 participants in some classes but up to 20 or 30 participants in intermediate algebra. This increase in class size is partially a product of increasingly mixed cohorts. Acceleration Academy and Summer Bridge participants began to co-enroll in classes in 2013. According to instructors, the shortened sessions and larger classes have reduced the amount of personal attention instructors can pay to each participant and limited the time for interactive activities to reinforce the material. ANSEP staff are working to optimize the scheduling, acknowledging that some participants and professors found it to be too accelerated.

Math professors reported that they try to make the experience more interactive than a traditional college class through activities such as group problem-solving at the white board. Some professors have participants develop a session-long project that they test at the end of the summer. Though the teaching approach might be slightly different, the material is identical to traditional college courses, using the same exam, similar homework, and the same textbooks. Participants receive a letter grade at the end of the math course that goes on their college transcript. However, if they are at risk of failing, the instructor encourages participants to withdraw or change their status to audit the course (in which case they do not receive credit). In some cases, ANSEP has been so successful at accelerating participants that several are completing significant portions of the math curriculum requirements for a STEM major, including differential equations, before their senior year of high school.

Returning participants in Acceleration Academy expressed in a focus group that the format of the math class bridges the gap between high school and college experiences. They said that the professors are approachable and that questions are encouraged, whereas that type of interaction is more challenging in college classes.

## STEM ACTIVITIES

Participants took two credit-bearing college courses per session until 2013, when ANSEP introduced the hands-on STEM activities and replaced the science course with Introduction to Engineering. In 2014, ANSEP dropped the Introduction to Engineering course to allow participants more team building time, and the STEM activities were broken out for participants with engineering versus science interests. ANSEP staff make the engineering or science designation at Acceleration Academy admission, and in general, participants are assigned to and remain in the same track throughout the session. However, some are able to switch tracks early in the session if they think they were not properly placed. Participants expressed that the tracking is valuable because it allows the STEM material to be more targeted and better customized to

their needs and interests, though they also worried about being separated from their friends. College professors also lead the STEM activities.

### WRITING CLASS

ANSEP staff say that the writing class is meant to reinforce reading and writing skills; give participants an opportunity to practice public speaking; and address some college-readiness skills that participants had been lacking in previous sessions, such as time management, note taking, and stress management.

Participants in a focus group expressed that the writing class was easier than the classes they would have to take in high school. However, they thought they could be doing something better with that time that would be more relevant to their STEM interests.

## Experiential Training

### HANDS-ON LEARNING

As part of the STEM activities, participants engage in hands-on experiential learning to explore and reinforce STEM concepts. Engineering participants take field trips to places such as the Anchorage airport, where they can see the concepts they are learning applied in the real world. The science participants interact with many guest speakers who contextualize the science content by sharing insights from their STEM careers.

Many Acceleration Academy participants enter the program having already built a computer through a Computer Assembly session. However, for those who have not, ANSEP intends for every Acceleration Academy participant to build a computer prior to, during, or immediately after the Academy. ANSEP permits participants to keep this computer if they pass trigonometry, physics, and chemistry by high school graduation.

### COLLEGE NAVIGATION

Participants spoke extensively in focus groups about appreciating the opportunity to get the “college experience” in Acceleration Academy. They have the opportunity to practice time management—balancing class time, homework, socialization, dorm life, and other priorities in a structured schedule and with the benefit of strong supports, as discussed in the following section.

Parents who were interviewed reflected on the value of their children learning to navigate the university campus while still in high school. The development of self-reliance was a strong theme among participants as well, and they discussed in focus groups how ANSEP helps them learn how to manage their problems without their parents watching over them.

---

*“Most people who go to college right after high school don’t anticipate how much responsibility and how much loneliness they’re going to experience by being in college.... They usually expect it to be like high school with just a bigger campus. It’s not—you’re all by yourself, you don’t know anyone in your classes, you’re not going to know anyone else. You’re not going to know your teachers. You’re not going to see them every day. They’re not going to help you if you have problems unless you go up and ask them every single time.... You learn self-reliance.”*

*-Acceleration Academy participant*

---

Many participants value the college dorm experience, seeing it as an opportunity to acclimate to being away from home as well as to build friendships with peers. Living in the Alyeska Wing of the UAA dorms helps participants develop their planning and time management skills. They are responsible for getting themselves up in the morning in time to get ready, eat breakfast, and arrive at class at 8:00 a.m. In addition, the dorm experience provides a context for making personal connections and building friendships; participants tell stories of staying up late with friends in the dorms. Sometimes socialization comes at the expense of sleep and homework, and participants report challenges of balancing social and homework time.

### SOFT SKILLS AND CONFIDENCE

Many participants also talked about managing stress, as they work to meet competing demands. However, they recognized that stress is a common feeling in college and that learning to manage it will make them more successful in high school, college, and beyond.

A consistent emphasis throughout the ANSEP components is building participant confidence, particularly related to public speaking. The ANSEP curriculum continues to emphasize public speaking in Acceleration Academy. During the 2014 session, all participants did a public speaking project at the end of the session as part of the writing class.

### TEAM BUILDING

Team building is an important aspect of Acceleration Academy. Each Acceleration Academy session begins with an orientation field trip to Seward, where participants take a sightseeing boat tour of the Kenai Fjords and participate in team building activities. ANSEP reinforces team building through group work assigned during the STEM activities and in other scheduled events, which take place during daily activities, at Friday meetings, during the evening, or on weekends—sometimes in conjunction with Summer Bridge participants. Popular activities include playing paintball, riding go-carts, and going to the museum and the movies.

On weekdays when Acceleration Academy participants do not take part in STEM activities, ANSEP staff organize exercise and cultural activities. One staff member leads trail runs twice a week. Popular cultural activities include Native dancing and Native games. Employer partners also noted the team building activities among high school participants and considered them to be important for participants' development.

## Supports

### MENTORING AND ADVISING

While participants are acclimating to college life, ANSEP offers them a variety of supports. Although youth peer mentors (YPMs) do not monitor the high school participants as closely as the middle school participants, they are available for mentoring and support as needed, and they direct team building activities. As described in chapter 3, on staffing, most YPMs are University Success participants, and a number of them are alumni of ANSEP precollege components. Resident advisers (RAs) monitor participants in the dorms and provide mentorship and support in the evenings, when issues of homesickness might arise. Some YPMs and RAs were part of the summer 2014 Acceleration Academy Facebook group, through which they have maintained contact with participants throughout the year.

ANSEP leadership or staff may also serve as informal mentors, providing further guidance and support. For example, all high school participants interact with the University Success manager to receive assistance in registering for classes.

### RECITATION SESSIONS

Participants attend daily recitation sessions led by YPMs. These structured study and homework sessions take place every evening, Monday through Thursday, for two and a half hours and on Sunday for one and a half hours. The YPM in charge is meant to be a facilitator who can help explain and reinforce learning concepts. It was observed that recitation sessions are not uniformly well organized, and many classrooms are left unsupervised for extended periods. Participants in focus groups said that different recitation leaders provided different experiences and that some sessions served more as an independent study hall, while other sessions were more effective for socializing than for studying.

### PEER SUPPORTS

Through the team building experiences, structured and unstructured social activities, joint study in class and recitation groups, and the experience of living in the dorms together, participants develop a network of academically focused peers. This opportunity is particularly important for a group of participants whom

staff describe as mostly naturally introverted and likely to have trouble finding other smart, motivated participants in their high schools. Participants reported how the sense of community built by ANSEP is crucial to achieving academic success and building personal confidence. Both participants and parents were pleased that participants could establish a social group engaging academically motivated peers.

---

*“One of the coolest things is ... you know how in a normal high school you have different groups of students: one group that likes to try to excel in everything that they do, one group that just tries to meet the standard, some that just don’t care. I always thought of myself as being a part of that group that likes to excel in whatever gets thrown at me, and I used to think I was the only one who felt like that in a lot of the schools that I went to. But being a part of ANSEP I was introduced to a lot of other people who felt the same way.” -Acceleration Academy participant*

---

#### FINANCIAL SUPPORTS AND SCHOLARSHIP

ANSEP covers all costs of attendance, including transportation to Anchorage. Participants who complete Acceleration Academy receive a \$2,000 scholarship toward the University of Alaska. However, participants who perform especially poorly or who consistently do not submit homework can lose this scholarship. For those who receive the scholarship—the vast majority of participants who complete Acceleration Academy—it is provided during their first year of college if they enroll at a University of Alaska campus.

## Evolution

Acceleration Academy was initially called Junior Academy when it was launched in 2009 and was primarily focused on participants who were completing their junior year of high school. ExxonMobil was the founding partner that provided early funding for this component; currently, a number of funders support Acceleration Academy. ANSEP created the component as ANSEP leadership struggled with the problem of students coming in to the university unprepared for college-level coursework, oftentimes with high grades on their high school transcripts but low skill levels in content that they had covered in their home schools. ANSEP enrolled the first cohort of participants as a pilot initiative to learn if high school students could benefit from the summer college experience and gain proficiency in math and science. The Summer Bridge component (see chapter 14), which was already in operation, provided a model, but Acceleration Academy focuses on the academic preparation activities only, rather than integrating a STEM internship.

Acceleration Academy has expanded to serve students as early as the summer before their first year of high school, and participants are encouraged to return for multiple summers in order to advance academically and establish a stronger connection with the ANSEP community. The curriculum of Acceleration Academy has evolved as the component has expanded. Over time, the focus shifted to be on both academic preparation and hands-on STEM experiences and to include more general college readiness and study skills. The addition of the STEM activities was motivated by the staff's view that "it would be good to get these students a little more aware of the different career options and get them more engaged in those science and engineering activities rather than spending their whole day going to class and studying for class."

Some support structures have changed marginally. Staff decided to add more cultural and team building activities and participant free time into the schedule in response to participants' feedback that they were feeling overwhelmed with the heavily charged academic schedule.

ANSEP staff anticipate that Acceleration Academy will grow to 100 participants per session and that two sessions will be offered, one focused on science and one focused on math. This approach will ameliorate some of the need for higher-level math offerings because participants who already have exceptional math achievement can then focus on their science skills. In addition, staff will divide some activities by participant grade level to maintain smaller subcohorts. Staff indicated that though facilities and resources limit the size of Acceleration Academy, including the number of teachers available for each session. As cohorts get larger, staff are concerned about the risk that participants will not get individualized staff attention.

Other possible changes relate to strengthening supports and reinforcing the ANSEP pipeline. One plan under consideration is to modify the role of YPMs in the future so that each participant would be assigned a specific mentor. This provision would make it easier for high school participants to reach out for advice and help. Another staff initiative is to convince the university to expand the registration window so that participants can fill out university applications and apply for freshman-year housing during the summer between their junior and senior years of high school. This approach would result in participants committing even earlier to attend UA and to continue with ANSEP, thus keeping them on their STEM educational path.

# Chapter 14

## Component: Summer Bridge

Summer Bridge is the last component before participants enter college for a STEM bachelor's degree. It was the first addition to the original ANSEP university-level component, as ANSEP leadership found that many incoming STEM majors participating in University Success were underprepared for rigorous college-level coursework. Many incoming freshmen also faced difficulties in the transition from rural lifestyles and communities. The session takes place during the summer before freshman year and combines academic coursework with a paid internship in a STEM workplace. This is meant to prepare participants to successfully transition both academically and socially into the university, and it provides them work experience and exposure to STEM career fields. The Anchorage-based track places interns with employers in Anchorage, while the field-based track places interns at sites around the state (see figure 1.1).

### Recruitment and Selection

ANSEP staff and leadership view Summer Bridge as a valuable opportunity for students to enter its University Success component and the University of Alaska, so they put considerable effort into recruitment and selection to identify candidates who will continue in the multistage model. The program size is limited, with only about 25 participants per summer, and its mission is to match participants' career interests with appropriate internship assignments and tracks. Since it was founded in 1998, Summer Bridge has grown steadily from fewer than 10 participants per year in the initial six years to roughly 25 students per year since 2007 (see figure 14.1). In 2014, the program received 40 to 45 applications.

Staff members use e-mail and letters to contact alumni of previous components and invite them to apply; they also recruit new students through school visits and media such as Facebook. ANSEP staff want to identify participants who will be successful, and they make individual contacts to encourage particular students to apply. Many of the Summer Bridge participants in 2014 focus groups had participated in earlier ANSEP components, and several said that ANSEP staff had visited their schools. According to analysis of ANSEP student records, 19 percent of all Summer Bridge participants had participated in an earlier ANSEP component. Between 2010 (the year after Acceleration Academy began) to 2013, 45 percent of Summer Bridge participants participated in an earlier ANSEP component (see chapter 17 for the outcomes study results). Most of those who were not previously involved in ANSEP said in focus groups that they had family members who had participated in ANSEP or encouraged them to apply.

FIGURE 14.1

## Growth in Summer Bridge Enrollment

1998-2013



**Source:** ANSEP administrative data.

**Note:** The exact number of participants in the early years may have some error due to incomplete documentation.

To be eligible for Summer Bridge, students must already be on track for completing a STEM degree. They must be high school seniors planning to enroll at UA in a STEM major and be ready to take calculus or other higher-level math courses. Applicants must submit an application form, a current résumé, three letters of recommendation, an academic transcript with grades and SAT, ACT, or Accuplacer scores, and a personal essay. Participants reported that the application process was somewhat complicated, but they thought the opportunity that Summer Bridge offered, in particular the exciting internship possibilities, was worth the considerable effort.

Summer Bridge consists of two distinct tracks, engineering and science, and a different ANSEP staff member manages each one. ANSEP staff first review all materials and interview applicants by phone. They then follow up with a second, more detailed interview and contact references. Staff designed the process to identify candidates whose interests align with internship opportunities and who are likely to succeed in their internships. Interview protocols include questions about applicants' academic and employment background, interests, flexibility and working styles, preferences for field or office work, and limitations or preferences for fieldwork options. Staff say that finding good fits for all positions is sometimes difficult, and they try to be creative and flexible. Some internship hosts conduct additional interviews with a selection of candidates; one reported that if they had two slots for interns, for example, ANSEP staff would send them four candidate options. Other employer sponsors accept ANSEP staff's choice of candidate.

The issue of Summer Bridge being limited to Alaska Natives came up in the focus groups; some participants expressed their perception that acceptance as a non-Alaska Native is more difficult but still possible. One parent said that both she and her child were worried that ANSEP would not admit him because he is neither an Alaska Native nor a previous ANSEP participant, but she noted that it motivated her child to work even harder to be competitive for the program. Some intern partners were not aware

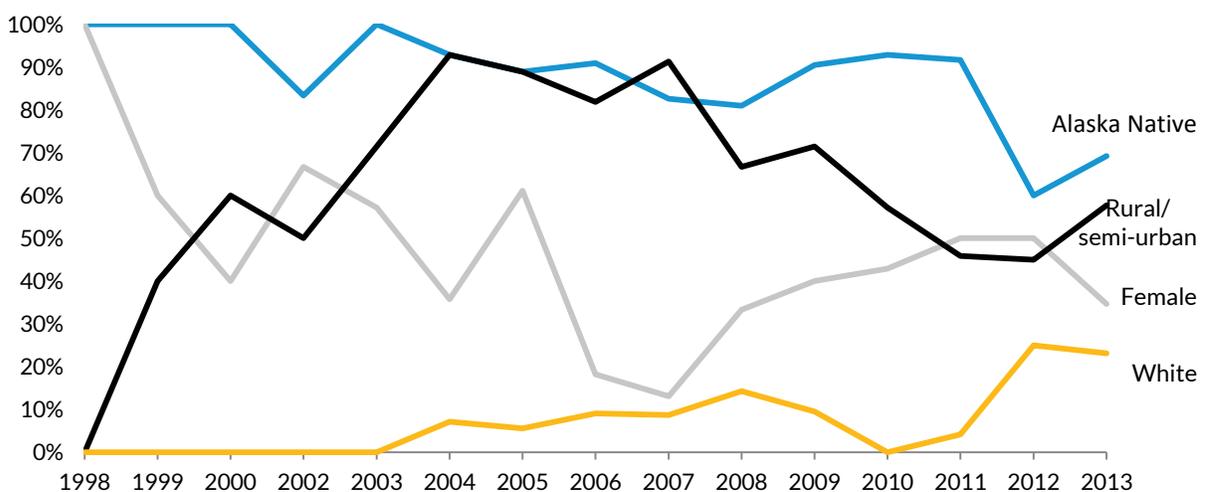
whether Summer Bridge is open to non-Alaska Natives, and one thought that the participation of non-Natives indicated that ANSEP was not receiving enough qualified Native applicants.

## Participant Characteristics

Over its history, Summer Bridge has primarily served Alaska Native students. For its first three years, participants were exclusively Native, and through 2011 this proportion remained between 80 and 100 percent (see figure 14.2). In 2012 and 2013, however, a higher number of white students participated, constituting approximately one-fourth of participants in those years. ANSEP has successfully recruited rural and semi-urban students to Summer Bridge; they make up 66 percent of all participants since 1998. Rural and semi-urban participation increased through the early 2000s, peaking at 93 percent in 2004, but the proportion started to decline in 2005. Of all Summer Bridge participants, 41 percent have been women. The gender balance has shifted from year to year, and in some years the population has been equally split or majority female.

In general, participants are high achievers and are on track for entering UA in a STEM major. In the 2013 session, 92 percent of Summer Bridge participants placed into a college-level math course upon entry to the program. Participants' preparation level has increased over time (see figure 14.3), as shown in the available data (2010 to 2013); at least half have placed into college-level math in every year.

**FIGURE 14.2**  
**Summer Bridge Participant Demographics**  
 1998-2013



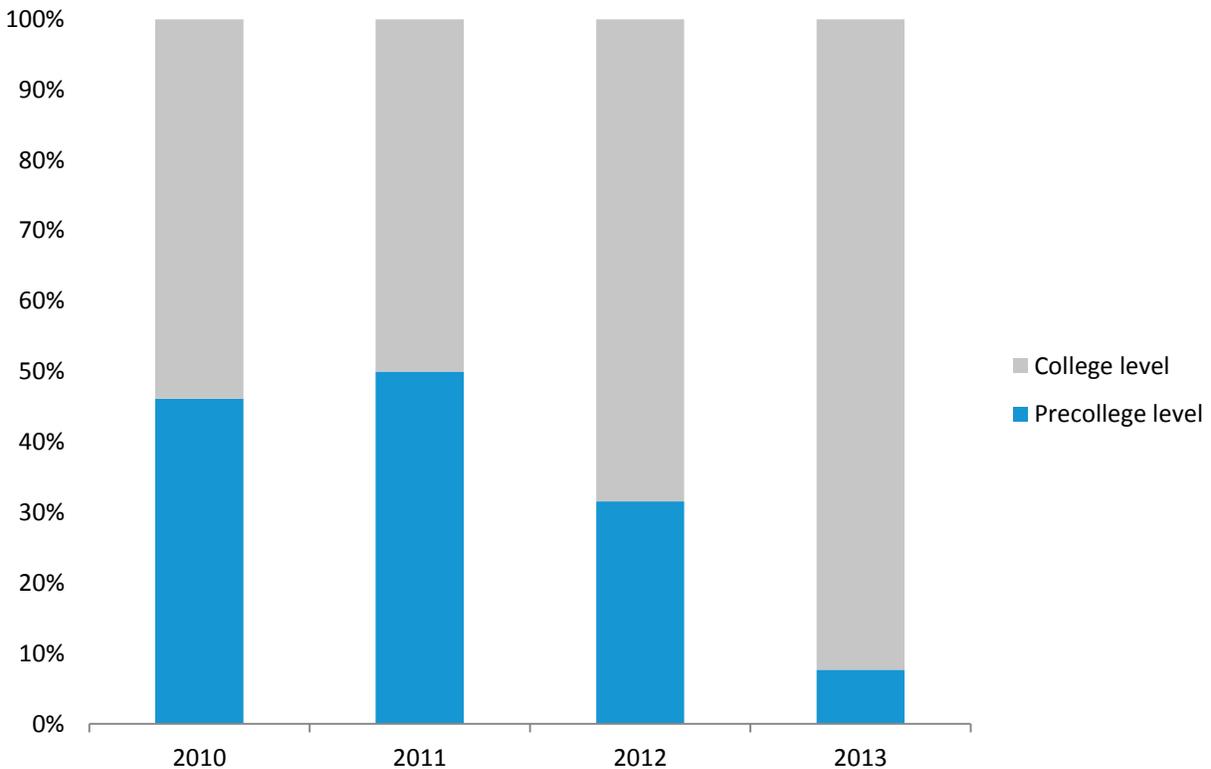
**Source:** ANSEP administrative data.

**Note:** Percentages exclude students for whom demographic information is not available.

FIGURE 14.3

## Summer Bridge Participant Preparation Level

2010-13



**Source:** ANSEP administrative data.

**Notes:** Three students did not take a math course. They are excluded from the percentages.

## Component Activities

The Summer Bridge component combines academic training with experiential training through STEM internships, which develops STEM career identity and soft skills. Summer Bridge also has college navigation activities, and participants experience the same supports as provided to Acceleration Academy participants, such as recitation sessions and team building activities, as well as mentoring and advising, peer supports, and financial supports and scholarships.

### Academic Training

Alongside the STEM internship, the core activity of Summer Bridge is preparatory mathematics coursework to prepare participants for their freshman year. Summer Bridge participants take math coursework

alongside Acceleration Academy participants. Courses are taught by UAA professors and count for university credit. In addition to class time, participants also attend daily recitation sessions led by youth peer mentors (YPMs), who are often University Success participants.

Summer Bridge participants used to take courses for eight to nine weeks, focusing on coursework in the morning and their internships at Anchorage organizations in the afternoon. When the field-based participant track began in 2008 (described in more detail below), those participants took courses for five weeks and spent the rest of the Summer Bridge session at their internships around the state. In 2013, ANSEP staff decided to put both the field-based and Anchorage-based participants on the same course scheduling with a five-week math course session. ANSEP also reduced the length of course sessions to five weeks to accommodate the university summer course schedule and make hiring professors easier. One faculty instructor indicated that participants would benefit if they had more class time, allowing more participatory learning. The instructor preferred the earlier approach of meeting with participants every day for the entire summer, rather than the current five weeks. Several other stakeholders also agreed that rushing participants through coursework is not a good idea and that getting through an entire semester of university-level coursework in such an accelerated period is challenging.

## Experiential Training

### INTERNSHIPS

In addition to academic coursework, the second core activity of Summer Bridge is a paid internship with an employer partner in a STEM industry. Participants take part in one of the two versions of the Summer Bridge experience. For the Anchorage-based program, participants live on the UAA campus for the entire session, taking classes in the morning for the first five weeks and participating in an internship in the afternoon in downtown Anchorage. After the first five weeks, they work at their internship sites full-time for the next five weeks. These internships take place in an office environment and provide participants hands-on exposure to corporate office culture. Employer sponsors ask participants to do various administrative and analytic tasks. Most Anchorage-based internships are in engineering, but increasingly some are in biology fields.

For the field-based program, participants spend five weeks at UAA, where they take safety and other courses in addition to their math coursework. They then spend four weeks away from Anchorage, working with scientists and engineers in the field. The training offered includes the Alaska-based Learn to Return curriculum, which includes topics on bear awareness, gun safety, aviation safety, CPR (cardiopulmonary resuscitation) and first aid, wilderness survival, delayed responder, aviation and helicopter, and underwater egress. Field-based Summer Bridge participants emphasized that these training courses and associated

credentials would strengthen their résumés. The field internships provide participants with professional STEM experience. Field internships primarily employ students planning to pursue a science degree, but some are planning to study engineering. Participants are included in the end-of-program celebration.

Internships offer a testing ground for both participants and employers to identify whether a participant is a good fit for long-term employment. Staff and partners described how, by becoming familiar with an organization and its culture, participants can “imprint” and choose to stay, or they could also learn that they would be a better fit elsewhere. Employers recognize, however, that not every intern will ultimately become an employee. The goal is to create a “candidate pool” they can draw from in the future.

---

*“[Employers] want diversity. They want students to come back and work for them in their permanent workforce....They want students to intern with them, get to know their individual missions, learn that they have a desire to work with that specific agency and then come back and work for them. That’s their ultimate goal.” -ANSEP staff member*

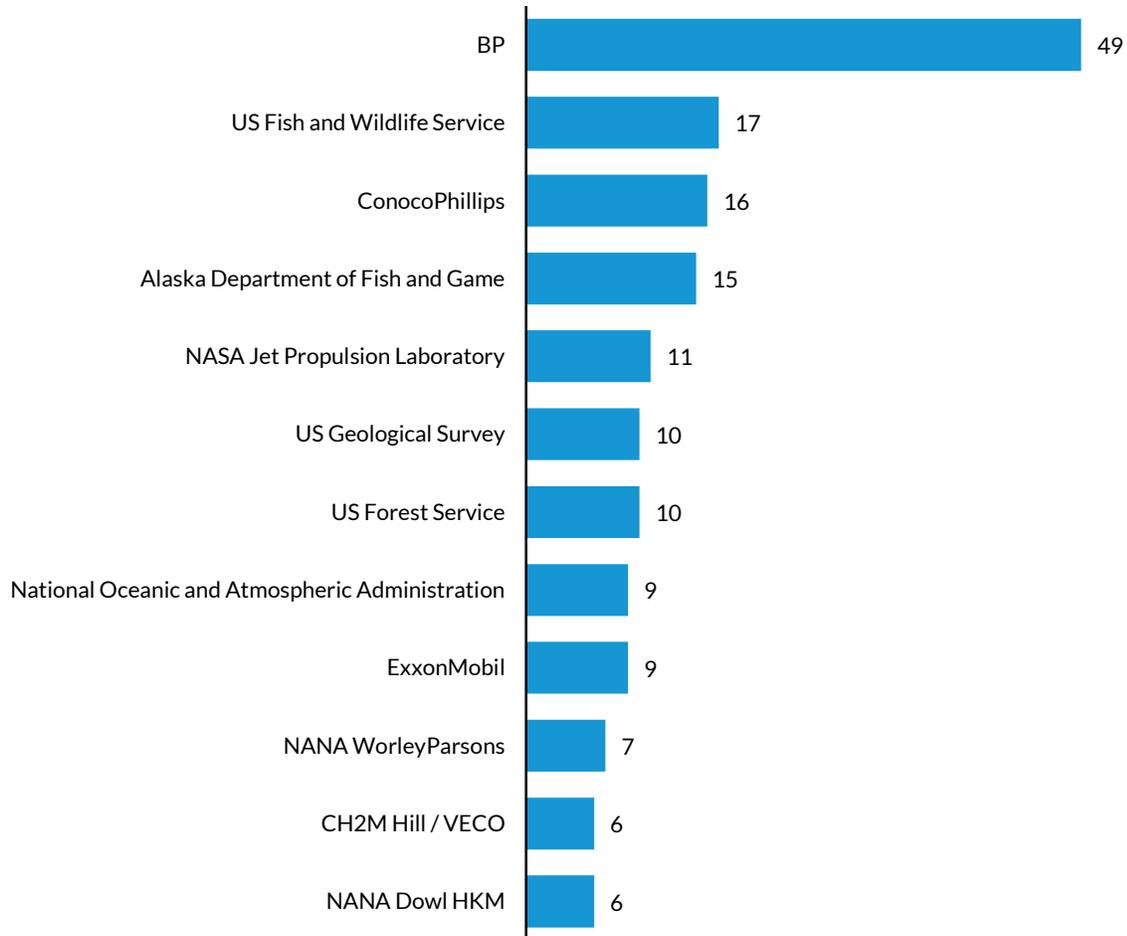
---

Several key employers sponsor a large number of Summer Bridge internships. In particular, BP, which was the first partner in 1998, has hosted nearly one-fourth of the 199 internships as of 2013. Figure 14.4 lists the top internship sponsors between 1998 and 2003.

FIGURE 14.4

### Top Summer Bridge Internship Employers

1998-2013



Source: ANSEP administrative data.

#### VARIATION IN INTERNSHIP EXPERIENCES

Experiences in internships vary widely across different partner organizations and across the internship mentors within those organizations. At several partner sites, the lead liaisons or mentors are ANSEP alumni themselves. Employer partners reported that they have to invest time and attention to identify appropriate projects that are suitable for participants' skill level and are useful for their organization. Some organizations that have been involved with Summer Bridge longer have developed customized internal operations for their Summer Bridge interns. For example, BP hosts a one-hour orientation for all incoming Summer Bridge participants.

Employers described a learning process that is taking place within organizations and for individual internship mentors. Some internship hosts described modifying their Summer Bridge approach over time, often based on feedback from the interns themselves. Several described experimenting with how to assign appropriate tasks and mentors; how to manage interns' workflow; and how to provide orientation, guidance, and feedback.

Internship hosts commented that participants bring different experiences and skills to their internships; some interns need more supervision and management, while others transition very quickly into the workplace rhythm, and some are more comfortable than others with asking questions and navigating the office environment. Employer partners expressed that the quality and fit of participants varies; some fit in well and thrive, while others are less successful.

Participants described the same variation. Some were enthusiastic about their Summer Bridge internship and saw it as a first step on their intended career track, while others said they did not have a good fit or found their mentors to be inexperienced. Some participants said that mentors gave them assignments that did not correspond well with their research or career interests.

#### STEM CAREER EXPOSURE AND IDENTITY

Employer partners see the internship as an opportunity to expose participants to an organization's particular work and business culture, as well as the terminology and content knowledge of the specific field, whether in oil drilling, space exploration, marine biology, or another STEM field. Many internship hosts said they do not expect a significant output from participants, who are still too early in their development to bring much technical skill or experience to their summer internship. They reported that Summer Bridge participants are often new to working in an office environment and have minimal skills, unlike other summer interns, who are often midway through their university studies. However, some partners did highlight significant contributions from previous Summer Bridge interns. For example, one partner at the US Fish and Wildlife Service described a successful project in which Alaska Native Summer Bridge participants developed a proposal of recommendations to inform a federal subsistence board about how rural communities understand subsistence. Stakeholders and participants expressed that the quality of Summer Bridge internship experiences varies considerably, and some participants are assigned "busy work" while others are given higher-quality projects.

Some partners expressed that the rural backgrounds from which many participants originate offer a stark contrast to their internship experience. One employer partner described that the internship was an exceptional opportunity for rural participants; although participants might be intimidated by the low level of ethnic diversity at these firms, the partner observed that the program "tried to build up that confidence that you can go after whatever job you want; it doesn't matter who's doing it right now." Summer Bridge is

designed to allow participants to develop an identity—perhaps previously foreign to them—as a STEM professional. The Summer Bridge brochure articulates this goal clearly: “Solidify your vision of a career as a scientist or engineer.”

Several participants noted that the internship provided a valuable addition to their résumés as well as opportunities to connect with employers and try out a career that they might want to pursue in the future. Participants sometimes find that they do not fit well with a chosen organization or field, which can provide useful experience to clarify their future STEM path. Events such as presentations from industry partners and the Summer Bridge closing ceremony also allow repeated networking opportunities with potential employers.

### DEVELOPMENT OF SOFT SKILLS

ANSEP staff have designed the professional, academic, and social experiences in the component so that participants develop soft skills that will serve them well in their STEM career. Summer Bridge exposes participants to a working office or field environment, where they learn about expectations that they would not have understood otherwise. These expectations relate to appropriate dress and professionalism, punctuality, time management, and communication with colleagues and supervisors. Some employer partners described that some participants had to adapt significantly to the work setting, while others were well prepared from day one. Employers were not aware whether ANSEP staff had provided any sort of training or preparation for participants, though some Anchorage-based firms were aware that their interns took math courses in the morning.

As in the other components, ANSEP specifically prioritizes building up participants’ verbal communication skills. At the end of the summer, participants all make presentations describing their internship experiences in front of ANSEP staff members, fellow participants, and partner sponsors. Some internship sponsors assist participants with the preparation and even do trial runs to provide advance feedback.

## Supports

Summer Bridge provides a guided transition to university life, providing the one-on-one attention, peer supports, advising, mentorship, and navigation tools that assist participants with their transition to freshman year. Many participants are from rural communities and have never been in a city or on a college campus before.

---

*“I live in a small village with only 800 people and we don’t get much experience of college life and major road systems and it’s helped me boost my confidence about what I want to do in the future.” -Summer Bridge participant*

---

## **Mentoring and Advising**

Mentors are not a formal part of Summer Bridge, although some employer partners do formalize the relationship with internship project mentors. The national partnership director, who coordinates all internships with state and federal agencies, stays in touch with Summer Bridge participants and advises them in later internship and job planning. Other ANSEP leaders offer informal mentorship as well, as do University Success participants, who may serve as recitation leaders and can serve as positive role models for participants.

In addition to the formal or informal mentorship, ANSEP’s University Success manager meets with all participants during the term at least once, scheduling meetings around their class and internship schedules, in order to assist with admissions and financial aid for the upcoming fall semester at the UA campus they plan to attend. Staff members and participants say that this customized service is more personalized than the advising participants would receive through standard UA services. ANSEP intends for this advising to ease participants’ transition into the University Success component. Participants view Summer Bridge as an effective transition and a “head start” with University Success. Advising also can have a strong effect on participants’ trajectories; one participant noted that she changed her intended major after finding out that her first choice was not eligible for University Success support. As of summer 2014, the University Success manager also provides a College Success and Readiness workshop where she addresses issues such as study skills and time management.

## **Peer Supports**

Some Summer Bridge participants are the only students from their villages who are on track for advanced math or science degrees, so developing an academically oriented, high-achieving peer group is a valuable support as they pursue challenging coursework and make the transition to university life. Peers have the opportunity to support each other as they study together in class and recitation groups, through structured and unstructured social activities, and as they experience living in the dorms together. Many participants are experiencing campus life for the first time, with the exception of the Mt. Edgecumbe graduates and the

19 percent of Summer Bridge participants who previously participated in precollege components. Social activities, some of which are required, include weekly Friday dinners at Anchorage restaurants and recreational weekend activities such as hiking, museum visits, paintball, go-karts, Native dancing, and volunteering. Social activities reinforce the team building and sense of community that ANSEP tries to build over the course of the session. Participants in focus groups said that they appreciate the opportunity to interact with other high-achieving, STEM-oriented students from Native or rural communities, and they reported developing friendships that will carry into freshman year and beyond.

Participants attend daily recitation sessions led by University Success participants, as described for Acceleration Academy. As described in chapter 13 regarding Acceleration Academy recitation sessions, it was observed that recitation sessions are not uniformly well organized. Participants reported that the quality varies depending on the recitation leader.

## Financial Supports and Scholarships

All costs of Summer Bridge attendance are covered by ANSEP, including transportation to Anchorage. ANSEP further facilitates participants' transition into University Success by providing a \$5,000 scholarship that is applied to their account at UA during their freshman year, in installments of \$2,500 per semester. ANSEP also covers the meal costs for former Summer Bridge participants who choose to live in the Alyeska Wing at UAA during their freshman year. ANSEP recently implemented an initiative (in 2012 and 2014) to cover all additional expenses for those Summer Bridge participants who are also Alaska Performance Scholarship recipients living on campus.

Employer internship partners sponsor Summer Bridge participants; ANSEP receives \$12,000 per intern which goes toward their college scholarship and participation expenses. In addition to the scholarship, Summer Bridge internships are often paid. This assistance is important in part because many participants describe having other opportunities to work and earn high wages doing seasonal work during the summers or needing to contribute to their family's subsistence living. One employer partner reported paying \$10 per hour to Summer Bridge interns, but another is required to hire interns as unpaid volunteers because of internal organizational requirements.

## Evolution

The Summer Bridge model was developed at the University of Washington, and ANSEP leadership adapted it for the Alaska context. Since its launch in 1998, Summer Bridge has expanded, and since 2007, it has

supported approximately 25 participants each summer. Summer Bridge was the component that ANSEP first began to expand beyond its original engineering focus, an overall trend that now applies to all ANSEP components.

In the early years of the component, students' low level of academic preparation posed a challenge. ANSEP leadership identified an issue with participants coming into Summer Bridge from high school with high grades but a low skill level in content that they had covered in their home schools. To address this challenge, ANSEP staff began to use Accuplacer, a college placement exam, to better assess participant placement. This standard was then also used for Acceleration Academy beginning with its launch in 2009. In addition to this modification of assessment, the staff, over time, modified their approach to the coursework during the Summer Bridge session. The component session initially required all participants to take Calculus 1, but staff moved to provide a wider range of classes to accommodate the varying skill levels of incoming participants.

ANSEP staff will continue to modify the Summer Bridge component. They are considering cutting the math class for participants who are already prepared to take Calculus 1 in college. Instead, the Summer Bridge experience would focus on the internship, college readiness, and social and professional development. Following this shift to soft skills training, ANSEP staff added the College Readiness class in 2014 after seeing that students were entering University Success without appropriate stress management and time management skills.

Staff see Summer Bridge as a good entry point for new partners, because it is a very successful program that gives employers a flexible way to develop a pipeline of talented future employees. The Summer Bridge model provides flexibility for different employers; for example, BP has developed a customized program called Summer Bridge 2 (see chapter 15). ANSEP staff reported that they are considering expanding the Summer Bridge component to a larger number of participants, but securing additional sponsored internships may be a challenge.

# Chapter 15

## Component: University Success

University Success was ANSEP’s starting point and founding component, designed to increase the success of rural and Alaska Native students in Alaska’s STEM pipeline. It is the program’s longest-standing component and the key stage at which earlier ANSEP participants become trained STEM professionals. University Success provides a comprehensive set of supports to undergraduate students enrolled in science and engineering majors at the University of Alaska (UA) at its Anchorage, Fairbanks, and Southeast campuses. University Success fosters the success of participants by providing a range of academic, financial, and social supports and by requiring participants to meet high academic standards, complete summer STEM internships, and actively participate in a learning community (see figure 1.1).

### Recruitment and Requirements

In addition to the recruitment methods described in chapters 11 through 14, including reaching out to alumni of previous components and engaging in general outreach and marketing efforts, ANSEP University Success also accepts STEM undergraduate students who have not been previously involved with ANSEP. According to participants and stakeholders, “walk-on” participants—that is, those who join ANSEP for the first time in college—learn about the program through other students or are referred by academic departments or other university services. On-campus organizations, such as Native Student Services at UAA, are particularly likely to refer STEM students who are Alaska Native or come from a rural background. Among alumni survey respondents, more than two-thirds learned about ANSEP once they were already on the UAA or UAF campus. Of those who learned about ANSEP at UA, 64 percent heard about it from another student, 31 percent were referred by Native Student Services (at UAA) or Rural Student Services (at UAF), 20 percent were referred by a faculty member or academic adviser in their academic department, and 48 percent heard about it directly from ANSEP staff members. University stakeholders expressed that ANSEP has effectively recruited Alaska Native and rural students to UA and has started to change the culture on the campuses by demonstrating that these students can be successful. In some cases, ANSEP staff have formally partnered with other university efforts to recruit this population, as described in chapter 7, on ANSEP partnerships.

University Success is open to all students with STEM majors on any of the three participating campuses (UAA, UAF, and UAS), and ANSEP staff consider any student who completes the requirements to be a participant in University Success. Walk-on University Success students are eligible to participate in

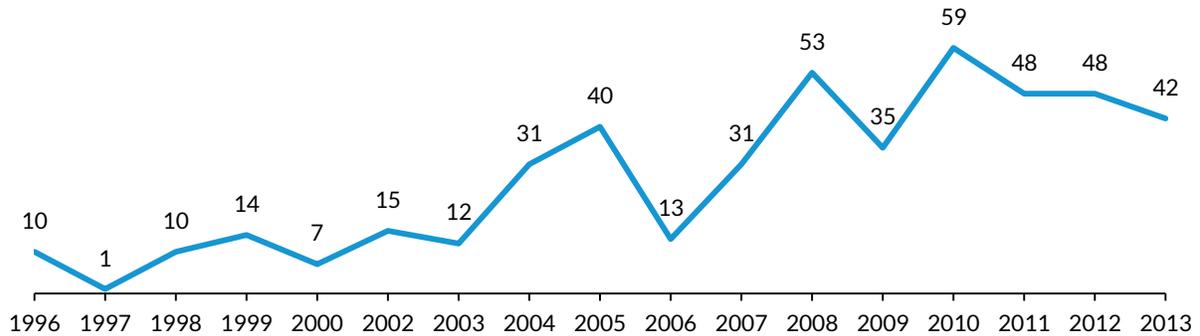
meetings and other supports, but they cannot receive a scholarship until they have fulfilled the ANSEP requirements for two consecutive semesters. All students who previously participated in an ANSEP component and who are enrolled in a STEM major on a UA campus are immediately part of University Success in their freshman year once they sign a contract. All incoming participants sign a contract stating that they understand the requirements (see box 15.1). According to the Urban Institute's analysis of ANSEP administrative records going back to 1996, over half of University Success full participants<sup>5</sup> receive scholarships during their first or second semester of UA enrollment, which indicates that they have participated in prior components. Of those who receive ANSEP scholarships, Alaska Native and Native American participants are more likely to receive money their first or second semester than non-Native participants. In addition, UAA participants receive scholarships in their first two semesters more frequently than do UAF participants (61 percent of UAA participants compared with 46 percent of UAF participants). It is not unusual for participants to first receive ANSEP scholarships after being enrolled at UA for several years: over one-fifth of participants first receive money during their seventh semester or later.

Figures 15.1 and 15.2 show participation in University Success over time. In this and all subsequent figures, full University Success participation is defined as receiving a scholarship of at least \$1,000 from ANSEP in a single semester. Figure 15.1 presents the number of new participants joining University Success every year; the year refers to when a participant first received a scholarship of \$1,000 or more. The total number of new participants has grown from 10 in 1996 to a peak of 59 in 2010; there were 42 new participants in 2013. Figure 15.2 shows the total number of students receiving ANSEP scholarships in a given year, representing the size of the program each year. Growing from just 10 participants receiving scholarships in 1996, ANSEP awarded scholarships to 150 University Success participants in 2012 and to 130 in 2013.

Figure 15.3 displays full participation in University Success (number of students receiving scholarships) over time, by campus. Participation at both UAA and UAF has grown significantly, with fluctuations from year to year; Anchorage participants have outnumbered those from Fairbanks in every year, though the numbers started to converge in 2011. The first University Success participant from UAS received a scholarship in 2010.

FIGURE 15.1

### New University Success Participants by Year of First Scholarship Receipt 1996-2013

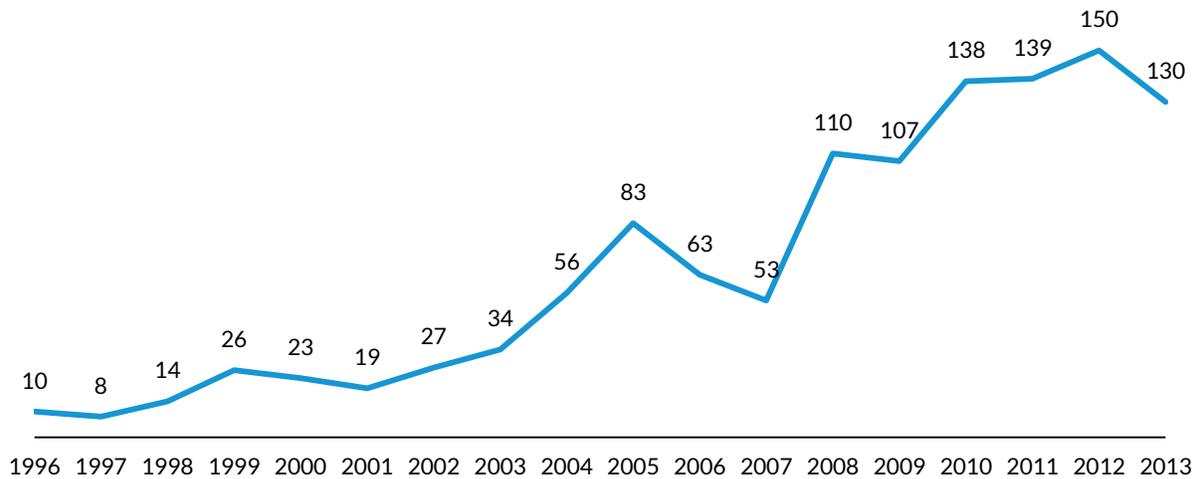


Source: ANSEP administrative data.

Notes: Year of first participation refers to the year the student first received a scholarship of \$1,000 or more. Students may have received smaller scholarship amounts in previous years, but they were not full participants until they received the full scholarship amount. Scholarship information is unavailable for University of Alaska Fairbanks in 2007.

FIGURE 15.2

### Total Number of University Success Participants by Year 1996-2013



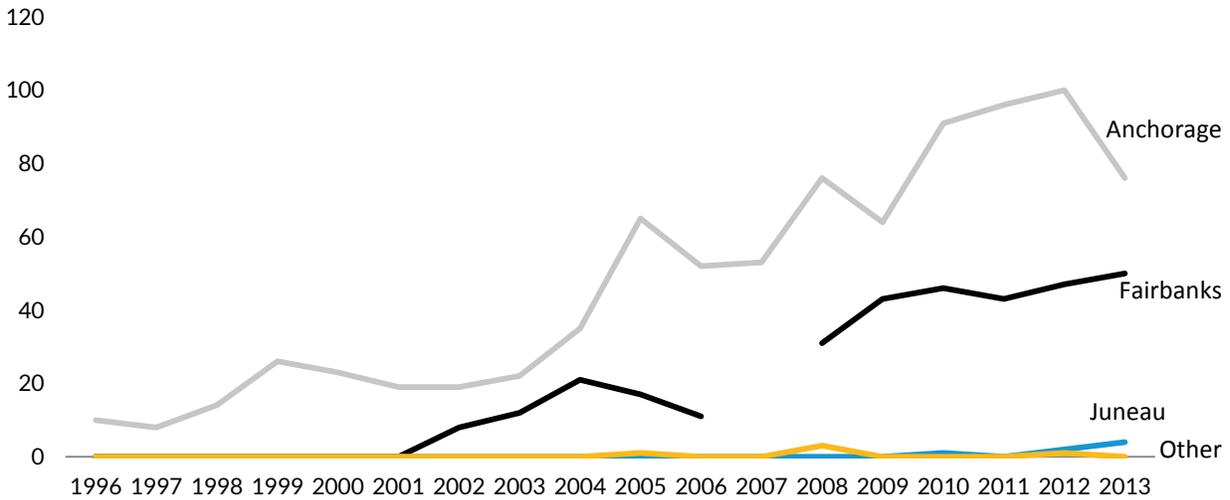
Source: ANSEP administrative data.

Note: Full University Success participation is defined as receiving a scholarship of at least \$1,000 from ANSEP in a single semester. Scholarship information is unavailable for University of Alaska Fairbanks in 2007.

FIGURE 15.3

### Total Number of University Success Participants by Campus

1996-2013



Source: ANSEP administrative data.

Notes: Figure shows number of participants receiving scholarships in a given year, by campus. Scholarship information is unavailable for University of Alaska Fairbanks in 2007.

ANSEP staff emphasize that the performance requirements (shown in box 15.1) are crucial to the University Success model, articulating a commitment to requiring high academic achievement from all participants. However, some participants indicated that staff do not apply the requirements consistently across participants and across campuses; in particular, UAF participants had the perception that participants at UAA were held to less stringent standards. Observations revealed that participation in Friday meetings and in weekly recitation groups was approached flexibly in practice, and in focus groups participants expressed confusion about attendance requirements. For example, ANSEP staff at UAA may excuse participants from Friday meetings if they have unavoidable conflicts. At UAF, in contrast, staff permit participants to miss only three meetings per semester; the UAF weekly meetings are scheduled specifically to avoid class conflicts.

---

## BOX 15.1

### Requirements for University Success

Participants must meet the following requirements:

- Pursue a full-time BS in approved STEM field
- Maintain a grade point average of 2.5 with no grades below a C in their major
- Attend weekly meetings
- Attend weekly recitation study groups
- Join a professional society, for example, American Indian Science and Engineering Society (AISES), American Society of Mechanical Engineers (ASME), Engineers without Borders, or Alaska Native Science/Math Education (ANSME)
- Submit a current résumé
- Complete an approved eight-week summer internship with a partner organization in their field of study

Additional requirements for walk-on participants at UAA are as follows:

- Complete a general education course on Alaska Native issues
- Secure five recommendations from current participants, three of whom must have participated in one of the precollege components

**Source:** ANSEP program documents.

---

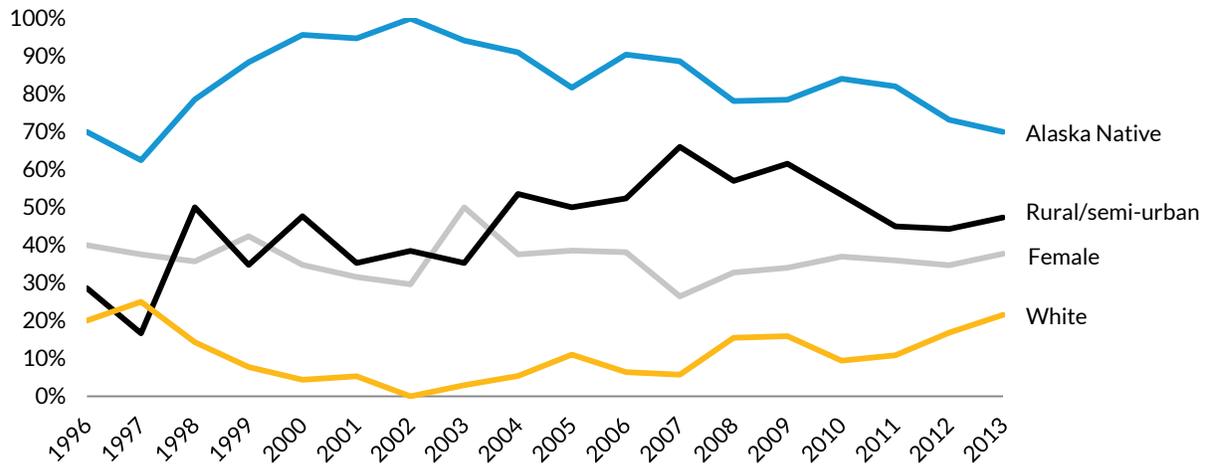
## Participant Characteristics

As observed with earlier components, some stakeholders were not aware that ANSEP is open to students in any STEM major regardless of ethnic background. Participants in focus groups also said that they did not expect University Success to be open to non-Alaska Natives but quickly learned that it was. Although Alaska Native students have always represented the majority of full participants (the yearly average is 83 percent), figure 15.4 shows that, in general, the proportion of white participants has increased over time, to 22 percent in 2013. According to alumni survey responses, the most common Alaska Native group affiliations are Athabaskan/Athabaskan, Inupiaq, Yup'ik/Cup'ik/Chup'ik, and Aleut/Alutiiq/Suqpiq/Sugpiaq/Unangax/Unangan (see figure 15.5).

Annually, between 26 and 50 percent of University Success participants have been women; throughout the history of the component, 38 percent of all participants have been women. Between 17 and 66 percent of participants annually have come from rural and semi-urban areas. Both of these proportions have fluctuated over time. The alumni survey indicated that 44 percent of respondents have parents who have

worked in STEM or related occupations, and 75 percent have parents who have worked in STEM or related industries, particularly construction and health care. Thirty-nine percent have parents who have worked in education.

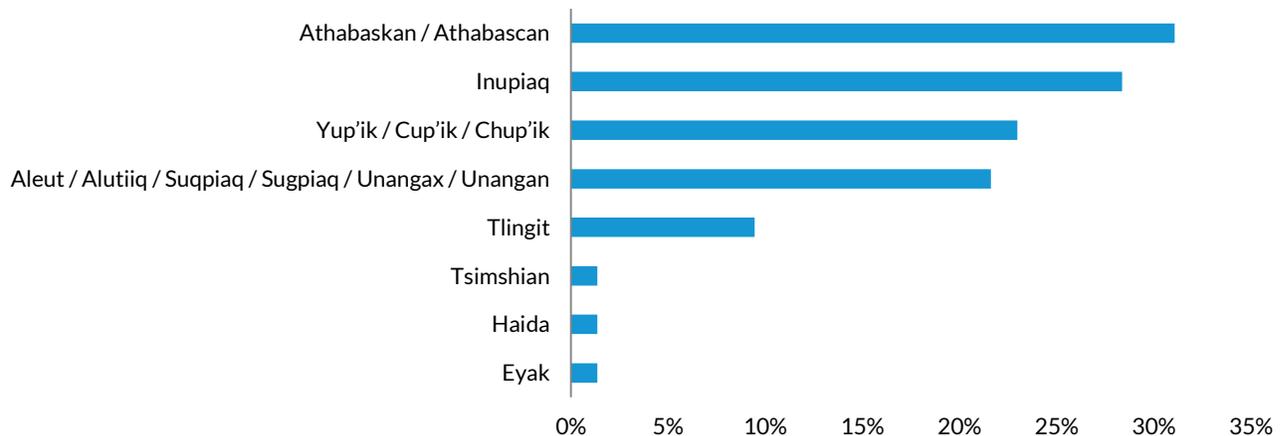
**FIGURE 15.4**  
**University Success Participant Demographics**  
 1996-2013



**Source:** ANSEP administrative data.

**Notes:** Figure shows number of participants receiving scholarships in a given year. Percentages exclude students for whom demographic information is unknown.

**FIGURE 15.5**  
**University Success Alumni Alaska Native Group Affiliation**



**Source:** Alumni survey.

**Notes:** Results for respondents identifying as Alaska Native (N= 74). The sample includes respondents who did not receive scholarships from ANSEP. Respondents could select more than one affiliation.

# Component Activities

The University Success component combines academic training supported by weekly recitation groups, with experiential training through STEM internships and other employment opportunities. University Success participants access a range of supports, including facilities (at UAA only), weekly meetings, advising, financial support and recognition events, and peer supports.

## Academic Training

### SELECTION OF MAJORS

The University Success component depends on university campuses where participants are enrolled in approved degree programs. ANSEP requires that participants pursue a bachelor of science degree. ANSEP staff noted that students often switch majors as they proceed through coursework, and some participants who begin with ANSEP while enrolled in an approved STEM major become ineligible when they choose a nonqualified major. ANSEP staff said that psychology and business are both common alternative majors. The outcomes study results described in chapter 17 provide details on the field of study of ANSEP participants. Overall, the vast majority of University Success participants who have graduated either started and remained in STEM degrees or started in unknown or non-STEM majors and completed a STEM major with the support of University Success. Participants who switch from a STEM major can still access the ANSEP Building and attend weekly meetings, but ANSEP does not consider them University Success participants, and they are not eligible for scholarship support.

The selection of specific majors is important to employer stakeholders as well, and many are aware that campuses offer different majors in STEM fields. Petroleum engineering, for example, is a highly in-demand field that is available only at UAF. Many stakeholders reported that the quality of the engineering program is stronger at UAF than at UAA, and they also view UAF as a stronger STEM research campus.

Stakeholders generally felt—and participants agreed—that engineering majors in ANSEP are better supported than science majors, although respondents agreed that this situation is improving. One parent noted that she thought her child would have to study engineering if he joined ANSEP, and then she was surprised and pleased to learn that his specific field of interest was supported by ANSEP.

### RECITATION SESSIONS

Mandatory weekly recitation sessions are designed to (1) provide a smaller, more supportive learning environment in contrast with the large introductory lecture-style classes, (2) provide additional academic assistance to participants enrolled in very challenging coursework, and (3) foster team building and a

community of learning for participants. At UAA, recitation groups are composed primarily of participants who are taking the same class in a given semester. The University Success manager tries to ensure that participants enroll in the same section of large classes so that their schedules and assignments will align, though this approach does not always work smoothly, according to participants. Some reported in focus groups that recitation sessions sometimes are a mix of participants from different sections of the same course, which means they may have different assignments or tests to prepare for in a given week. Participants also reported that they do not always attend recitation sessions, that the sessions are of varying value and quality depending on the leader, and that some leaders take a casual approach to documenting attendance or may be absent. UAA staff have recognized some inconsistency in implementation of recitation sessions in regard to recording attendance and class format. In 2013, the University Success manager contacted all the participants who had not met attendance requirements to clarify requirements. She also began regular training with recitation leaders at the beginning of each semester.

Many University Success participants reported that they appreciate the recitation groups and find them very helpful for getting through challenging material and finding study mates, though participants also study with each other outside of recitation groups. Participants spoke in focus groups about reaching out to more senior University Success participants to learn from their experience in a particular course. This type of collaboration between participants takes place regularly in the ANSEP Building at UAA and can happen in other spaces on campus, such as the library at UAF, which has no dedicated ANSEP study facilities. This community support mechanism is a key feature of the model and is designed to support the transition and retention of participants coming from small, rural high schools.

Implementation details of the recitation groups continue to evolve as the program changes. Some science major participants said that it is easier to provide full recitation coverage for engineering majors, who share more courses in common. The growing variety of supported majors in the sciences poses a logistical challenge for covering all the courses with which participants might need support. Participants expressed concern that the recitation model does not cover several science fields because those classes do not have enough ANSEP students, especially in the middle and upper levels. UAF has experimented with the structure of recitations, initially using graduate students as recitation leaders and then switching to UAA's approach of using current University Success participants. UAF participants described their recitation groups, with perhaps 40 participants, as being larger than those at UAA. UAF recitation sessions also differ from those at UAA in that they combine different classes and serve as more of a study hall than as a targeted, course-specific review session.

## Experiential Training

### INTERNSHIPS

Summer paid internships are an important element of the University Success component. Participants credited ANSEP with giving them access to internships and eventual employment, although, as in Summer Bridge, experiences in internships varied. Finding approved internships is the responsibility of the participants, although ANSEP staff advertise opportunities by e-mail, at the weekly meetings, and through informal advising and mentoring channels.

A wide range of industry internships is available to participants. Among the alumni survey respondents, the most popular University Success internship placements were with oil companies: BP, Alyeska Pipeline, and VECO/CH2M HILL. ANSEP also considers research internships with professors on campus to be valid, as well as summer positions as a youth peer mentor (YPM) or other staff position for an ANSEP precollege component. As described in chapter 3, YPMs serve as chaperones and counselors for the various precollege activities that take place at UAA.

---

#### BOX 15.1

### Summer Bridge 2

Some partner organizations have changed internal processes to accommodate the ANSEP multistage model and provide repeated experiences to participants. For example, BP has expanded on Summer Bridge to create a multisummer internship experience for participants whom they see as prospective employees. To create this, several ANSEP alumni worked with human resources to develop Summer Bridge 2, which brings Summer Bridge participants back to BP for a second summer after their freshman year, and potentially again the following summer. BP's standard internship model does not welcome university freshman or sophomore students as interns, so Summer Bridge 2 provides a way for BP to continue to support promising interns once they move from Summer Bridge into University Success. This continuity is meant to ensure that interns gain repeated exposure and full integration into the BP environment by the time of graduation.

Similar to the challenges they may experience in the recitation sessions, science participants expressed that the internship and job opportunities advertised were more numerous for the engineering majors. ANSEP staff noted that they have a harder time identifying new sponsors to cover the wide range of science fields that participants are pursuing; that is, demand for engineers is high in the lucrative energy sector, whereas organizations that have biology and other opportunities do not have funds available to sponsor interns. Although staff tell participants that they will receive scholarship support only if they do internships

at sponsoring organizations, in some cases ANSEP staff have worked to identify funds from other sources to support participants who could not find a sponsored position. One participant reported that finding internships at approved sites that matched a particular interest in medical or biological science was very difficult.

## ANSEP EMPLOYMENT

In addition to the internships, some ANSEP participants take on teaching duties as recitation leaders or lab assistants, activities that enhance their professional development as they serve as role models for the more junior participants. Generally, ANSEP staff members approach participants who have been successful and ask whether they are interested, though some participants volunteer for the positions. ANSEP student employees were paid \$10.50 per hour at UAA and \$13.00 per hour at UAF in 2013, though the number of hours covered may vary between the campuses. If they return for a second consecutive semester at UAA, they are granted a \$0.50 raise.

## Supports

### FACILITIES SUPPORTS

As described in chapter 4, the ANSEP Building at UAA provides space for participants to study alone or in groups, hold recitations and meetings, and meet with ANSEP staff. Other resources are also available, such as a computer lab, free printing, books and laptops students can check out, and a kitchen equipped with food and coffee. Participants in UAA described the building as central to their University Success experience. In contrast, UAF does not have dedicated space, and the three staff members are housed in different locations across campus; the half-time academic adviser sits in the Rural Student Services office.

Among UAA alumni survey respondents who were on campus after construction of the ANSEP Building, the vast majority (97 percent) visited the building more than once a week, and nearly three-fourths (74 percent) visited every day.

University Success participants may also choose to live in the Alyeska Wing of the UAA dorms. Participants reported studying together in the lounge there as well; they spoke of it as a secure space where the ANSEP community identity is strong. There is no equivalent at UAF connected to the University Success program, although UAF does have specialty housing for Native and rural students.

---

*“The stocked kitchen and computer lab at the ANSEP Building were a huge tool that helped me immensely. I would say that offering a kitchen and providing food was a better use of money than most scholarships. It met a real need in my life at that time.” -University Success alumnus*

---

## WEEKLY MEETINGS

The weekly meetings provide the core structure for participants, giving them a consistent opportunity to see other participants; talk to ANSEP staff members; and connect with employer partners and professors advertising internships, jobs, and research opportunities. ANSEP staff encourage participants to take advantage of the networking opportunity by being assertive and introducing themselves to employers after the meeting. Participants said that the meetings are helpful for hearing announcements from other participants and from staff members and for learning about career options. When no employer or research is being presented, the meeting may be used for team building or cultural activities. The meetings at UAA are held on Fridays for one hour, whereas at UAF they are on Tuesdays and last 30 minutes to avoid conflicts with any potential class time. UAF does not have dedicated space that can host the large meetings, and the currently available facilities are strained to capacity to serve the expanding size of the UAF program. In fall 2013, up to 80 or 90 participants were attending the weekly meetings at UAF.

Regular meeting attendance is required for participants to stay in good standing with ANSEP and to receive scholarship money. The research analysis of meeting attendance records, going back to 2004 for UAA and 2008 for UAF, shows that 76 percent of full participants attended more than half of all meetings during the semesters they received scholarships, and only 4 percent attended every meeting. Fairbanks participants have higher average attendance than Anchorage participants; UAF participants attended 70 percent of weekly meetings on average, compared with 62 percent among UAA participants. Attendance records are maintained by different staff members at the different campuses, however, so the records may not be exactly comparable.

## ADVISING

The ANSEP staff and leadership provide advisory support to participants, with a full-time academic adviser at UAA (the University Success manager) and a half-time adviser at UAF. UAA participants felt that the full-time University Success manager provides them more personalized advice than they receive from the standard academic advising in their academic departments or other university services. They are not required to meet with the University Success manager, but all participants come in at least once per semester to drop off their contracts, and many come in to get assistance with course decisions, enrollment,

financial aid, and other issues. At UAF, the half-time adviser is coappointed with Rural Student Services. The directors of the UAF and UAA programs and other ANSEP staff members also play a role in advising and mentoring, though informally. One participant at UAA shared that the ANSEP executive director had required that all freshmen e-mail him their weekly schedules at the start of the semester in fall 2013; some seemed to appreciate this time management coaching effort. The executive director is an important mentor and leader for participants.

Although both UAA and UAF have other university resources and support services for students—some targeted at Alaska Native and rural students—focus group participants confirmed that many ANSEP participants prefer ANSEP staff advising. Alumni survey respondents were asked how often they sought assistance from ANSEP staff and from other resources, such as academic departments, Native Student Services or Rural Student Services, or Career Services. ANSEP staff were the most popular resource, with 78 percent of respondents saying they sought assistance from a staff member at least once per semester. By contrast, 66 percent of alumni turned to their academic department and 34 percent turned to Native Student Services or Rural Student Services at least once in the semester.

#### RECOGNITION, SCHOLARSHIP, AND AWARDS

At ANSEP's annual banquet in January, ANSEP leadership recognize and thank partners for their contributions and also recognize University Success participants by presenting a number of special awards to recognize notable achievements. Participants expressed excitement about attending and participating in the annual banquet, in particular UAF participants. At the banquet, ANSEP gives awards to participants for highest grade point average, completion of an organic chemistry or differential equations course, and leadership (an award nominated by other participants). Small monetary rewards of about \$250 accompany the award certificates.

Participants who complete all University Success requirements are granted a \$2,500 scholarship each semester. Those who completed high school components receive scholarship support in their first year. ANSEP also pays food costs for those living in the Alyeska Wing and may cover other costs under certain circumstances. Several participants in the focus groups expressed confusion about how much scholarship money they were receiving and what ANSEP would and would not cover in terms of room and board. Analysis of available ANSEP scholarship records indicated that participants receive an average of \$10,988 over their time in University Success, about \$2,803 per semester (shown in table 15.1). Anchorage participants receive more funds overall and more per semester than Fairbanks participants, and Native participants receive more than white participants. Some of the differences in total scholarship receipts are explained by duration patterns: Alaska Native students tend to participate in University Success for more semesters (4.1 semesters of full participation on average, compared with 2.7 semesters for white participants). However, Fairbanks participants' duration is similar to that of Anchorage participants (3.6

semesters of full participation on average at UAF, compared with 3.9 at UAA). The cross-campus differences are at least partly a result of the fact that participants who have done precollege components receive additional scholarships, and these students are much more likely to enroll at UAA. Of University Success participants who have done precollege components, 74 percent received their first scholarships at UAA, compared with only 24 percent at UAF.

TABLE 15.1

### Total Scholarships Received During ANSEP Participation by Select Characteristics

	Total average \$ all ANSEP semesters	Total average \$/semester in ANSEP	Avg num semesters of any scholarship amount	Avg num of semesters of full scholarship amount
<b>All students, all years (n=470)</b>	\$10,988	\$2,803	3.9	3.7
<i>Campus of first scholarship</i>				
Anchorage (n=333)	\$11,520	\$2,889	4.0	3.9
Fairbanks (n=129)	\$9,941	\$2,545	3.9	3.6
Juneau (n=6)	\$7,164	\$4,001	1.8	1.7
<i>Ethnicity</i>				
Alaska Native (n=353)	\$11,871	\$2,975	4.0	4.1
Native American (non-AK) (n=13)	\$12,518	\$2,912	4.3	4.1
White (n=79)	\$7,777	\$2,310	3.4	2.7
Other (n=22)	\$8,795	\$1,971	4.5	2.7
<i>Gender</i>				
Male (n=293)	\$11,420	\$2,768	4.1	3.9
Female (n=176)	\$10,314	\$2,859	3.6	3.5

Source: ANSEP administrative data.

For many University Success participants, ANSEP is not the only source of funding. Among alumni survey respondents, 92 percent reported receiving financial support from non-ANSEP sources during their time as an undergraduate (see box 15.2). The most popular sources were Native corporation and education foundation scholarships (54 percent), Pell grants (47 percent), federal loans (40 percent), UA Scholars (39 percent), and state loans (27 percent). The \$11,000 UA Scholars award is given to the top 10 percent of all graduating seniors from all high schools in Alaska.

#### BOX 15.2

### Alumni Perceptions of University Success Supports

The alumni surveyed during summer 2014 reported that the most important reason they joined and stayed in University Success was the scholarship, followed by peer support and academic support. Peer support

was highlighted as a key factor for a higher proportion of Anchorage alumni than Fairbanks alumni: 48 percent of UAA alumni versus only 24 percent of UAF alumni indicated that peer support was one of the most important reasons for joining ANSEP. Alumni placed the connection to Alaska Native culture and community, career planning support, and employment during college as some of the lesser important reasons they joined the program. Alumni saw ANSEP's help in navigating the university as the least important reason to participate.

Alumni were also asked to rank the activities that had the most impact on their academic and professional success. Similar to the reasons they joined, alumni highlighted scholarships as well as formal and informal peer studying opportunities as the biggest influences on their success. When considering their career development, alumni felt that connections to potential employers that ANSEP facilitated were the most important, followed by summer internships and weekly meetings.

When asked to elaborate on their experiences, many alumni highlighted the connections to other STEM majors for support in completing difficult coursework. Several UAA participants mentioned the importance of the ANSEP Building. Alumni also expressed how much they valued the Alaska Native cultural references and traditions, which are central to ANSEP.

---

## PEER SUPPORTS

The facilities, activities, and requirements described above promote peer-to-peer support and social integration, which provide a sense of welcoming and community to participants who may be disconnected from their villages, families, and communities while they pursue STEM study. The community supports and connections to other STEM majors assist participants in completing challenging coursework and establishing a safe social space and shared learning community on campus. Many participants said that ANSEP provides them with a social network. Alumni also credit ANSEP's community and team spirit for helping them get through and succeed in college. Many expect to be in contact with other former participants throughout their careers as well.

---

*“Most definitely, that’s probably my favorite thing about ANSEP. They let you get to know your future employer, but they also let you get to know your most likely future coworker.” -University Success participant*

---

# Evolution

University Success began in 1995 as an initiative to foster the success of Alaska Native students studying engineering fields at UAA. In its early years, the component consisted of scholarships and an informal support system to provide a sense of community and moral support to those students, who were underrepresented at the university level and in STEM fields. As the component grew in size and attracted additional STEM industry partners and sponsors, University Success (1) evolved to include a wider range of services for participants, including summer internships and a physical space on the Anchorage campus; (2) expanded into other STEM majors, such as biology and chemistry; and (3) expanded to operate at two additional UA campuses. The construction of a dedicated ANSEP Building on the UAA campus in 2002 provided key facilities for participants and staff members. As University Success expanded and leadership developed the precollege components to build out the ANSEP multistage model, the size of the staff increased from one engineering professor at UAA to a large dedicated staff (see chapter 3).

Although University Success initially focused only on engineering students, it expanded to include other STEM majors and fields in 2008-09. ANSEP leadership is often approached about and is considering expanding the focus to additional fields, such as ANSEP business or ANSEP teaching options. Recent high-level discussions in the University of Alaska system have taken place on the topic of using ANSEP to address the critical gap of homegrown STEM teachers in Alaska's K-12 system, which experiences high teacher turnover and insufficient resources in a geographically dispersed context. ANSEP leadership reports that recent new funding from Alaska's Department of Education and Early Development (DEED) (see chapter 5) may provide support for an expanded mission to produce STEM teachers for Alaska's public schools.

ANSEP has firmly established its expansion to other UA campuses, such as Fairbanks, where administrative and academic practices are largely based on the Anchorage model, with some modifications to suit the campus context. However, resource inequity is an important issue given that the UAF program has grown to include 50 full participants in 2013, and as many as 90 participants attending weekly meetings. A small program was launched at UAS (Juneau) in 2012, which so far supports seven participants, with four full participants in 2013.

The number of participants has increased over time, challenging the capacity and potentially some of the core values of the program, according to ANSEP leadership. The leadership expressed concern in particular about the growing representation of non-Native participants and the challenge of ensuring the Alaska Native identity and community. ANSEP leadership at UAA made several modifications to the requirements as a result of the growing numbers, in the fear that the learning community was being stretched. ANSEP staff at UAA now require walk-on participants to complete a general education course on Alaska Native issues and to secure five recommendations from current participants—three of whom must

have participated in one of the precollege components. These requirements are intended to keep out participants who want scholarship support but are not invested in the community values.

# Chapter 16

## Component: Graduate Success

Graduate Success is the final component in the multistage model of the Alaska Science & Engineering Program (ANSEP). This component supports participants who choose to continue their postsecondary education by pursuing master's, doctoral, or other professional degrees in science, technology, engineering, and math (STEM) fields at the University of Alaska (UA) or partner institutions elsewhere in the United States. It provides financial and other supports to develop leaders for STEM industry organizations and the faculty of UA (see figure 1.1).

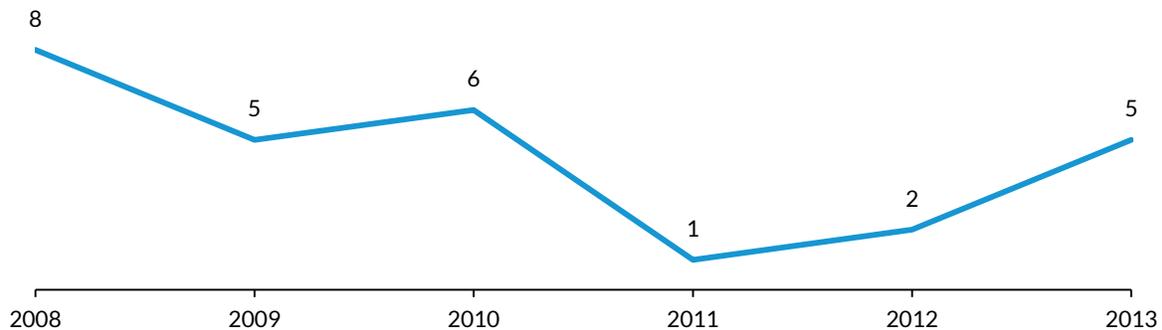
### Recruitment, Application, and Requirements

Graduate Success is the smallest of ANSEP's components, with a total of 27 participants over the component's history. From 2008 to 2013, between one and eight new graduate students have joined each year (see figure 16.1). The type of graduate degree supported by the Graduate Success component varies from campus to campus. The University of Alaska Fairbanks (UAF) is the only site with Graduate Success participants who are pursuing PhDs; the University of Alaska Anchorage (UAA) supports participants seeking MA degrees, as well as MD degrees with a biomedical research focus in collaboration with the University of Washington. Two Graduate Success participants also are currently supported by what ANSEP calls "Grow your own PhD." This variation on Graduate Success allows participants to pursue their PhDs at other universities, with the intention of returning to Alaska. The two participants who ANSEP is currently supporting through this program are slated to return to UAA as tenure-track faculty members. As of 2013, seven participants had completed their master's degree (four at UAA and three at UAF), and two have completed PhDs at UAF.

FIGURE 16.1

## Graduate Success Participation

2008-13



**Source:** ANSEP administrative data.

**Note:** Does not include students who withdrew their application to Graduate Success.

All of the Graduate Success participants for whom ethnicity is known are Alaska Native or Native American. Graduate Success has a larger percentage of women than all other ANSEP components, with 62 percent. Of the total participants, 25 percent have come from rural or semi-urban areas.

ANSEP staff informally recruit individuals who are likely to participate in Graduate Success, and they help candidates enroll in the component. Most participants were previous University Success participants, though that is not a requirement. Similar to University Success, Graduate Success participants sign a contract stating that they understand the requirements of the component, which include successful completion of academic coursework, attendance at weekly meetings, research sharing, and additional leadership activities as appropriate to their field of study. ANSEP staff may ask Graduate Success participants to share their research or attend events to represent ANSEP, such as the American Indian Science and Engineering Society conference.

## Supports

All Graduate Success participants receive tuition funding and additional financial supports for conference travel, supplies, and research. ANSEP staff work with university and funder administration to ensure tuition costs are covered. Only Alaska Native and American Indian students are eligible for financial support from the Alfred P. Sloan Foundation, which supports this component through the Sloan Indigenous Graduate Partnership Initiative. ANSEP staff communicate with the foundation to ensure that requirements are fulfilled and grants and stipends are provided. Participants who are eligible for Sloan Foundation funding also receive a fellowship stipend: \$38,000 for PhD students and \$32,000 for master's students. Of the 141

alumni survey respondents, 12 indicated that they participated in Graduate Success in pursuit of a graduate degree. Of those 12 alumni, all reported receiving financial support from ANSEP. Eight of the 12 survey respondents reported receiving financial support to attend conferences.

Some participants work toward a degree part-time while continuing to work full-time in their field of interest, and ANSEP staff report being flexible with requirements to accommodate their schedules. Graduate Success support may supplement participants' support from other resources, such as their employers. Several employer stakeholders expressed in interviews that they provide their employees with tuition assistance for graduate study.

Graduate Success supports participants as they pursue challenging advanced degrees. Those who are studying on UA campuses attend the weekly University Success meetings, and some at UAA choose to lead recitation sessions for the University Success participants. ANSEP leadership at UAA, UAF, and University of Alaska Southeast are the lead advisers for their campuses.

Graduate Success also aims to encourage technical and professional skills that are relevant for STEM academic career development, such as developing research proposals, conducting independent research, producing technical papers, and making presentations at conferences. Academic mentors guide those pursuing a PhD; ANSEP staff do not have a significant role in their academic training. However, 8 of the 12 survey respondents who have participated in Graduate Success said that they received advising from ANSEP staff on course selection, choice of degree, or professional skills, and 8 respondents received mentorship through Graduate Success. ANSEP may convene dinner meetings or occasional meetings between Graduate Success participants and ANSEP leadership. ANSEP staff are planning to develop better peer supports and more frequent meetings of the Graduate Success participants to make their experience distinct from the University Success activities.

## Evolution

ANSEP currently supports several participants who are pursuing PhDs outside of Alaska with the expectation that they will return to the state upon completion of their degrees and become faculty members in the UA system. These individuals may take leadership positions in the ANSEP staff structure, and they will likely provide additional management, advising, and mentoring support to the University Success program and other ANSEP programming at UAA.

# Part III. Outputs and Outcomes

# Chapter 17

## Program Outputs and Participant Outcomes

This report has explored the operational activities and components that make up the Alaska Native Science & Engineering Program (ANSEP) at the University of Alaska (UA) campuses, their implementation and their evolution. This chapter presents the research team's analysis of the components' outputs and outcomes at the student participant level over time to determine ANSEP's progress toward reaching the goals of the six components.

### Introduction

This chapter reviews primary findings from quantitative analysis of the following sources:

- ANSEP's administrative data on individual participants' academic progress for every component and course completion for all precollege components.
- Data on course completion, advancement within majors, and degree completion, including information on grade point average (GPA) and graduation rates from datasets of UA's Banner software system that contain enrollment, registration, and completion for all UA coursework and degree programs. Banner data were collected by ANSEP and provided to the evaluation team to supplement the program's administrative records for University Success participants.
- Information on graduate study, employment, and income in science, technology, engineering, and math (STEM) occupations after completion of UA degrees, which was collected through the online alumni survey conducted by the Urban Institute during summer 2014. ANSEP staff provided contact information for a subset of the alumni population for whom current contact information was documented.

Further information on the data sources, methods of analysis, and limitations of interpretation are provided in e appendix A.

This chapter is organized according to both the level of results for each component (that is, by outputs versus outcomes) and the data sources (ANSEP administrative and Banner data versus alumni survey responses) in the following structure:

- **Outputs.** As described in ANSEP’s logic model, outputs are measures of the programmatic accomplishments of component processes. For example, math course completions and course-level advancement are outputs of ANSEP’s precollege components for middle school and high school students, and degree attainment (including conferral of degree, cumulative GPA, and time to degree) are outputs of university-level components. Short-term outcomes such as advancement within participants’ academic careers before university or across ANSEP components are included in that section as well. The analysis provides information for all component participants across ANSEP’s history to the extent that records and supplementary data were available and usable.
- **Outcomes.** Outcomes are the longer-term conditions for participants who have participated in and completed ANSEP’s University Success program are described in the third section, particularly with regard to postundergraduate employment and graduate study rates. Information is provided for the sample within the population of 227 known ANSEP participants who have graduated with a bachelor’s degree from one of the UA campuses.<sup>6</sup> This sample includes only the alumni survey respondents who consented to having their undergraduate administrative and academic records linked to their responses (104 respondents). Because full participation, output, and outcome information is available only for a group of ANSEP participants (that is, the consenting respondents to the alumni survey for whom comprehensive administrative and Banner data are available) and not the full population of ANSEP participants to date nor a comparison group of non-ANSEP participants, the tabulations reported here are preliminary evidence of University Success outcomes only; thus, they should not be interpreted as the University Success program’s impacts on student participants or the impacts of any specific University Success activity. However, the discussion references the data presented in the context section of this report (chapter 2) to provide suggestive benchmarks against which these outcomes are compared.
- **Institutional Outcomes.** Information from the alumni survey regarding respondents’ perceptions of their ANSEP participation as well as other outcomes, such as current ANSEP alumni activity, are provided as further preliminary evidence of ANSEP’s broader influence and achievement. This information is reported for all alumni survey respondents.

Ultimately, this chapter provides preliminary evidence of ANSEP’s achievements within its individual components, as well as the progress toward meeting its ultimate goals of increasing the rates and levels of achievement of Alaska Native and rural students in STEM college preparation at UA and in subsequent STEM professions. This discussion provides some measure of ANSEP’s objective of effecting “systemic

change in the hiring patterns of Alaska Natives in science and engineering” (ANSEP Component Report 2012).<sup>10</sup>

## Component Outputs

Outputs are the measures of immediate results from the components’ activities. Typical output measures include satisfactory program completion; completion at a given achievement level (for example, a course grade or a cumulative GPA); educational advancement, including enrollment and graduation; and movement to a following ANSEP component. These are distinct from outcomes, which are the measures of subsequent achievement, such as employment and income. The outputs are presented below by component.

### Middle School Academy

Middle School Academy is the ANSEP component that reaches furthest down into the K-12 educational path, yet it is also the most recent component to be added to the ANSEP model. For that reason, only a limited number of years’ worth of information is available. Data were available for analysis only from 2010 to the data collection point in early 2014. Because the primary goal of the component is to increase the number of middle school students who have completed Algebra 1 by the end of eighth grade, the sample of participants for whom output information is available is further limited by the fact that many of these participants are still in middle school. As table 17.1 shows, 263 of the 479 Middle School Academy participants, or 54.9 percent, had completed eighth grade at the point of analysis.

When one looks only at this group of students who have completed eighth grade, the data show that 77.2 percent of Middle School Academy participants enrolled in and successfully completed Algebra 1 by the end of their eighth-grade year. This completion rate cannot be attributed solely to Middle School Academy; as discussed in chapter 11, on Middle School Academy implementation, the vast majority of participants are at or above grade level in math prior to participating. However, this completion rate is interesting in view of the overall state context described earlier in this report, in which 48.8 percent of Alaska Natives who enroll in Algebra 1 pass the course, compared with 68.6 percent of white students similarly enrolled.

TABLE 17.1

## Middle School Academy Math Levels at Eighth Grade Completion

2010-14

Year	Participants		Status of 8th grade completion and known math completion			Math level at 8th grade completion <sup>a</sup>	
	Total participants	Alaska Natives	Participants who have completed 8th grade	Participants who have not yet completed 8th grade	Participants with unknown math completion	8th grade completers at Algebra 1 or higher	8th grade completers below Algebra 1
2010	50	19	47	0	3	42	5
2011	52	38	48	0	4	35	13
2012	112	76	70	36	6	56	14
2013	159	131	71	86	2	51	20
2014	106	75	27	78	1	19	8
<b>Total</b>	479	339	263	200	16	203	60
<b>Group total (%)</b>	<b>100.0</b>	<b>70.8</b>	<b>54.9</b>	<b>41.8</b>	<b>3.3</b>	<b>77.2</b>	<b>22.8</b>

**Source:** ANSEP administrative records.

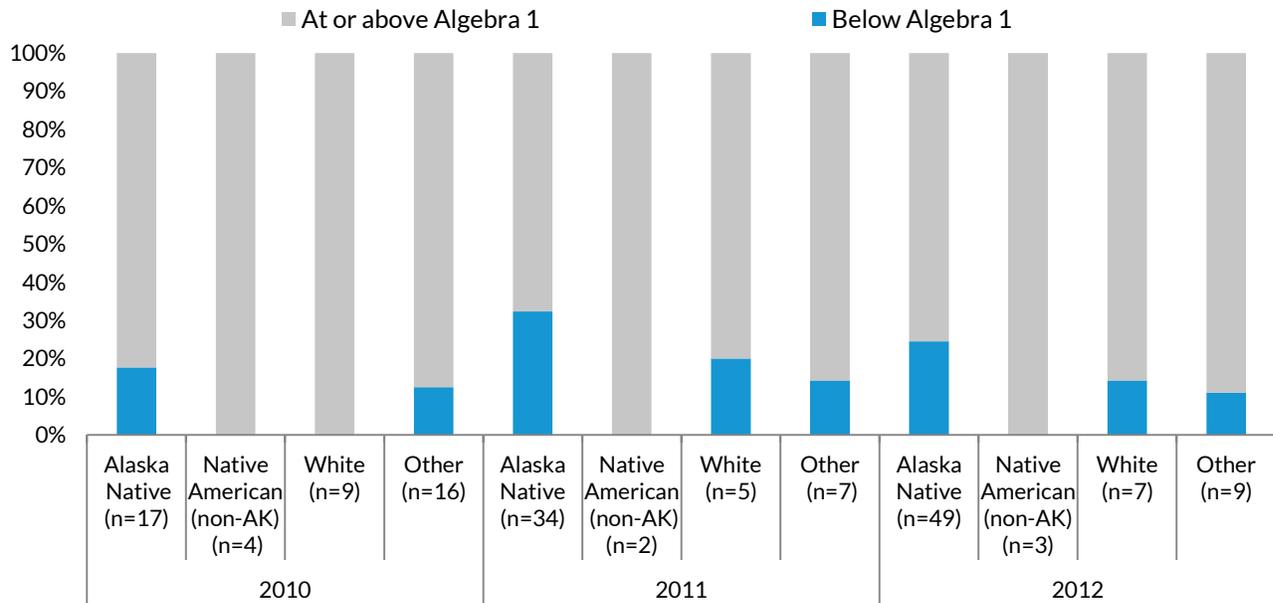
**Notes:** Information on Middle School Academy is only available through early 2014 and does not include all participants from that year.

<sup>a</sup> Percentages exclude participants with missing school math level information and who have not yet completed eighth grade.

Furthermore, Alaska Natives and American Indians make up an estimated 11.7 percent of Alaska's students who take Algebra 1 before or during eighth grade, and only 8.9 percent of those pass—rates well below the group's 24.2 percent share of the state's students. Indeed, the Algebra 1 completion rates of Middle School Academy participants by race (figure 17.1) show that Alaska Native participants still have completion rates slightly lower than their Middle School Academy peers of other races, even though Alaska Natives make up the bulk of participants. This difference suggests the continued need for academic preparation assistance for this group at this grade level.

FIGURE 17.1

**Middle School Academy Math Completion Rates (by End of Eighth Grade) by Race**  
2010-12



**Source:** ANSEP administrative data

**Notes:** Excludes students for whom ethnicity is unknown and students who did not take a math course. Includes repeating students as multiple observations. There are 15 repeating students among all participants.

Another output of Middle School Academy, beyond the objective of increasing Algebra 1 completion rates by eighth grade, is application and admittance to the next ANSEP component—STEM Career Explorations.<sup>7</sup> The admittance and participation rates for different groups are described in the STEM Career Explorations discussion in chapter 12. Though not an explicit objective, participation in the following component, Acceleration Academy for high school students, is another expected Middle School Academy output of ANSEP’s multicomponent conceptual model. However, Middle School Academy’s recent introduction has produced only a few cohorts who are eligible for Acceleration Academy; as table 17.2 shows, only Middle School Academy cohorts from 2010 and 2011 have a majority who are in high school and are therefore eligible to enter Acceleration Academy.

TABLE 17.2

## Middle School Academy and STEM Career Explorations Pipeline to Acceleration Academy

Percentage

Year of Middle School Academy participation	Middle School Academy participants eligible for AcA as of 2013	Middle School Academy participants in AcA in 2013 or earlier
2010 ( <i>n</i> = 50)	100.0	2.0
2011 ( <i>n</i> = 52)	67.3	9.6
2012 ( <i>n</i> = 112)	33.9	0.0
<b>Total (<i>n</i> = 214)</b>	<b>57.5</b>	<b>2.8</b>

**Source:** ANSEP administrative records.

**Notes:** AcA = Acceleration Academy. Eligible participants include those who had completed Middle School Academy and had completed eighth grade in or by summer 2013.

Of the 2010 and 2011 Middle School Academy cohorts, only 2.0 percent and 9.6 percent, respectively, have entered Acceleration Academy, though this low rate is complicated by the fact that most Acceleration Academy participants until recently were high school juniors, delaying the continuity from the Middle School Academy participants. Given the evolving nature of the model and the recent establishment of the precollege components, the connection between middle school and high school components within ANSEP's vision for a STEM pipeline has not yet been fully realized.

## Acceleration Academy

Acceleration Academy aims to advance participants in their high school math or science coursework in order to improve their college math and science preparedness and encourage them to enroll in college. Outputs for Acceleration Academy, then, include (1) math and science course completions within Acceleration Academy, (2) math and science course advancements within high school educational trajectories after Acceleration Academy course completions, and (3) enrollment in college.

Courses are considered completed if a participant completed and received a grade of C or higher in a course taken during Acceleration Academy. On the basis of this definition, table 17.3 shows the overall rates for the component across all years, with an average 78.8 percent completion rate for participants who took a math course and 85.2 percent completion rate for participants who took a science course. (In the past, participants generally took both a math and a science course, though some exceptions were permitted. As described in chapter 13, the component has modified the approach to course requirements over time.) The average overall completion rate of any course among participants in all years is 95.1 percent (including participants who took both but completed only one course of study).

When one compares this completion rate across racial groups, a pattern emerges that is similar to, though not as pronounced as, that found in Middle School Academy. Although the small numbers of non-Native participants and the limited number of years prohibit more robust analysis, completion rates of both math and science coursework among Alaska Native participants who took those courses tended to be lower or similar to other participants in the early years of Acceleration Academy, with improvement in more recent years. Figure 17.2 depicts these patterns for math course completions, and figure 17.3 depicts those for science course completions.

For the second expected set of outputs regarding advancement along Acceleration Academy participants' math or science trajectory, the analysis uses additional data on participants' math or science coursework at their home schools prior to participation in Acceleration Academy. For most participants, home school math and science curricula and levels are not available. Regardless, tables 17.4 and 17.5 present data regarding participant completions for those who (1) repeated their home school course at Acceleration Academy, (2) took the next level after the home school course they had just taken, and (3) had no home school information available.

TABLE 17.3

## Acceleration Academy Course Completion

2009-13

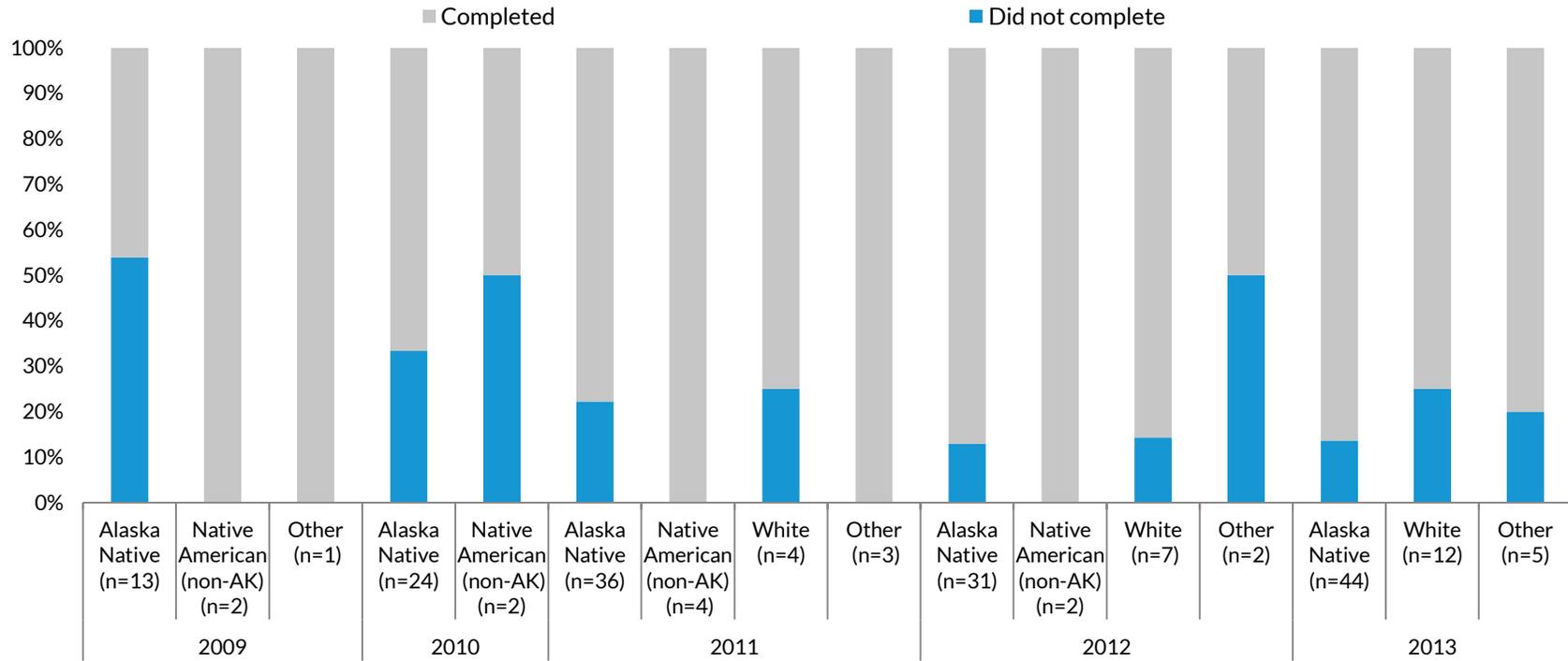
Year	Total participants	Math course participants	Math course completers	Math course completion (% of math participants)	Science course participants	Science course completers	Science course completers (% of science participants)	Math <i>or</i> science course completers	Math <i>or</i> science course completers (% of total participants)
2009	16	16	9	56.2	16	13	81.3	16	100.0
2010	38	27	18	66.7	38	34	89.5	34	89.5
2011	47	47	38	80.9	47	37	78.7	43	91.5
2012	42	42	36	85.7	41	35	85.4	41	97.6
2013	61	61	51	83.6	61	54	88.5	60	98.4
<b>Total</b>	<b>204</b>	<b>193</b>	<b>152</b>	<b>78.8</b>	<b>203</b>	<b>173</b>	<b>85.2</b>	<b>194</b>	<b>95.1</b>

**Source:** ANSEP administrative records.

**Notes:** Includes repeat participants as multiple observations. Number of repeating Acceleration Academy participants = 15. In some years, some participants took only a math or a science course or both. Completion = passing the assigned Acceleration Academy math or science course within the Acceleration Academy term with a grade of C or higher.

FIGURE 17.2

Acceleration Academy Math Course Completion by Race, 2009–13

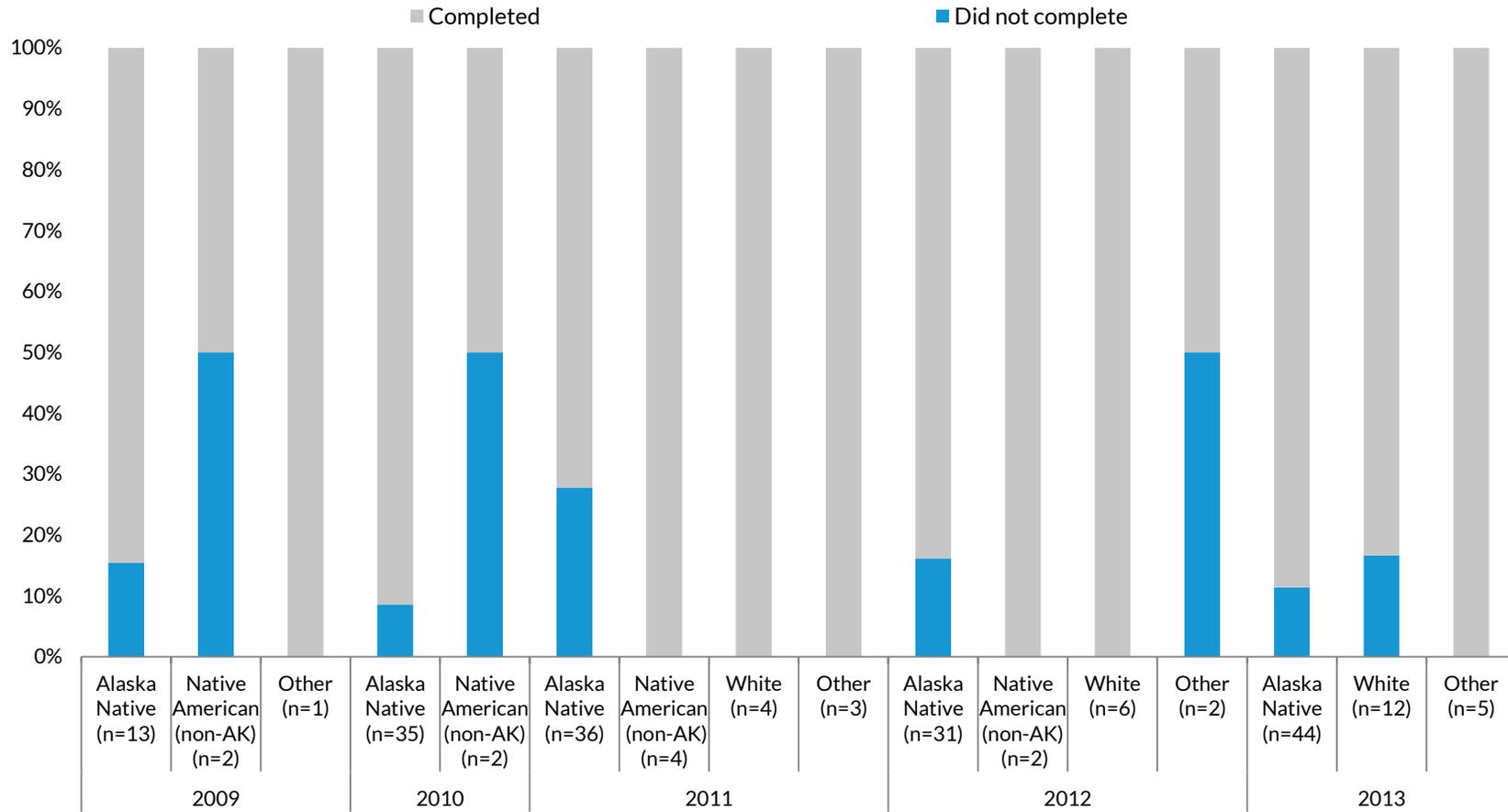


Source: ANSEP administrative records.

Note: Excludes students for whom ethnicity is unknown and students who did not take a math course. Includes repeating students as multiple observations. There are 15 repeating students among all participants.

FIGURE 17.3

Acceleration Academy Science Course Completion by Race, 2009–13



Source: ANSEP administrative records.

Note: Excludes students for whom ethnicity is unknown and students who did not take a math course. Includes repeating students as multiple observations. There are 15 repeating students among all participants.

TABLE 17.4

**Math Advancement of Acceleration Academy Participants**

Year	Math participants	AcA math course repeats level from previous high school year		AcA math course advances level from previous high school year		Unknown high school math		Total math cohort (%)
		Completed AcA course (%)	Did not complete AcA course (%)	Completed AcA course (%)	Did not complete AcA course (%)	Completed AcA course (%)	Did not complete AcA course (%)	
2009	16	0.0	0.0	37.5	25.0	18.8	18.8	100.0
2010	27	14.8	0.0	37.0	18.5	14.8	14.8	100.0
2011	47	23.4	4.3	23.4	4.3	34.0	10.6	100.0
2012	42	16.7	2.4	7.1	0.0	61.9	11.9	100.0
2013	61	0.0	0.0	0.0	0.0	83.6	16.4	100.0
<b>Total</b>	<b>193</b>	<b>11.4</b>	<b>1.6</b>	<b>15.5</b>	<b>5.7</b>	<b>51.8</b>	<b>14.0</b>	<b>100.0</b>

**Source:** ANSEP administrative records.

**Notes:** AcA = Acceleration Academy. Includes repeat participants as multiple observations.

TABLE 17.5

## Science Advancement of Acceleration Academy Participants

Year	Science participants	AcA science course repeats level from previous high school year		AcA science course advances level from previous high school year		Unknown high school science		Total cohort (% of total)
		Completed AcA course (% of total)	Did not complete AcA course (% of total)	Completed AcA course (% of total)	Did not complete AcA course (% of total)	Completed AcA course (% of total)	Did not complete AcA course (% of total)	
2009	16	6.3	0.0	68.8	6.3	6.3	12.5	100.0
2010	38	0.0	0.0	65.8	5.3	23.7	5.3	100.0
2011	47	6.4	0.0	61.7	8.5	10.6	12.8	100.0
2012	41	2.4	0.0	31.7	2.4	51.2	12.2	100.0
2013	61	0.0	0.0	0.0	0.0	88.5	11.5	100.0
<b>Total</b>	<b>203</b>	<b>2.5</b>	<b>0.0</b>	<b>38.4</b>	<b>3.9</b>	<b>44.3</b>	<b>10.8</b>	<b>100.0</b>

**Source:** ANSEP administrative records

**Notes:** AcA = Acceleration Academy. Includes repeat participants as multiple observations.

On the whole, of those participants for whom home school math-level information is available, most take a math or science course that advances them from their previous level. Moreover, the overwhelming majority of participants complete the course at Acceleration Academy.

Analysis of math course completion during Acceleration Academy informs an understanding of the third output: college preparedness. The research team categorized math level based on whether a course would be defined by UA as college level (at or above MATH 107 in UA’s course offerings), or precollege level (that is, below MATH 107, College Algebra). Table 17.6 shows that, on average, almost half of Acceleration Academy participants who take and complete math coursework are taking courses that would be defined as appropriate for college-level students. If one assumes that many of the precollege math courses are typical of college preparation courses that are normally provided in high school (that is, beyond geometry but before calculus), this rate of course completion suggests that many of the Acceleration Academy participants are on the path to college preparedness.

TABLE 17.6

**Acceleration Academy Math Course Completion by Math Level (Precollege and College)**  
2009–13

Year	Math course completers	Math course completers in precollege math (%)	Math course completers in college math (%)
2009	9	0.0	100.0
2010	18	50.0	50.0
2011	38	63.2	36.8
2012	36	55.6	44.4
2013	51	56.9	43.1
<b>Total</b>	<b>152</b>	<b>53.9</b>	<b>46.1</b>

**Source:** ANSEP administrative records

**Notes:** Includes repeat participants as multiple observations.

Given that across all high schools in Alaska, American Indians and Alaska Natives make up only 15.6 percent of the students enrolled in Algebra 2, 10.3 percent in Advanced Math, and 5.3 percent in Calculus, Alaska Native students face a considerable curricular gap in view of potential university-level STEM study.

A clear indicator of whether Acceleration Academy participants have become college ready is whether they enroll in the subsequent components of ANSEP at the college level—Summer Bridge and University Success. Among Acceleration Academy participants who are age-eligible for Summer Bridge to date, a notable portion have gone on to participate in the program. Those rates are higher than continuation rates between Middle School Academy and Acceleration Academy. Table 17.7 shows the rates at which Acceleration Academy participants in different starting cohorts are eligible to participate in Summer Bridge and the rates at which eligible participants do participate. More than one-third (36.4 percent) of

Acceleration Academy participants who are age-eligible for Summer Bridge have participated in Summer Bridge, though the rate of flow between the components across cohorts appears to be decreasing from an early high of 62.5 percent in 2009 to 19.1 percent in 2011..

TABLE 17.7

**Acceleration Academy Pipeline to Summer Bridge**

First year of AcA participation	AcA participants age-eligible for Summer Bridge 2013 or prior (% of total AcA participants)	AcA participants who participate in Summer Bridge (% of those age-eligible)
2009 ( <i>n</i> = 16)	100.0	62.5
2010 ( <i>n</i> = 36)	100.0	41.7
2011 ( <i>n</i> = 47)	100.0	19.1
2012 ( <i>n</i> = 36)	61.1	45.5
<b>Total</b>	<b>89.6</b>	<b>36.4</b>

**Source:** ANSEP administrative records

**Notes:** AcA = Acceleration Academy. Includes repeat participants as single observations. Eligibility is determined by graduation year. Students who participated in Acceleration Academy before 2013 and graduated in spring 2013 or earlier are eligible to have participated in Summer Bridge in 2013 or earlier.

Many Acceleration Academy participants who choose not to participate in Summer Bridge are still college bound. As table 17.8 shows, a significant majority—79 percent—of Acceleration Academy participants who are college eligible have applied to UA. Of this group of applicants, 85.2 percent were admitted and 86.2 percent of admitted participants have already enrolled. These high rates of retention of precollege ANSEP participants do not account for Acceleration Academy participants who went on to other colleges outside of Alaska. Including those students likely places the rate of all Acceleration Academy participants entering college—most of whom are Alaska Native high school students from across the state and from various academic backgrounds—even higher than the UA rate.

TABLE 17.8

### Acceleration Academy Pipeline to University of Alaska

First year of AcA participation	Total participants	AcA participants age-eligible for college (% of total AcA participants)	AcA participants who apply to UA (% of college- eligible participants)	AcA participants who are admitted to UA (% of those that apply)	AcA participants enrolled in UA (% of those admitted)
2009	16	100.0	87.5	92.9	100.0
2010	36	100.0	91.7	72.7	87.5
2011	47	100.0	74.5	94.3	90.9
2012	36	97.2	62.9	86.4	89.5
2013	54	51.9	85.7	83.3	65.0
<b>Total</b>	<b>189</b>	<b>85.7</b>	<b>79.0</b>	<b>85.2</b>	<b>86.2</b>

**Source:** University of Alaska Banner admissions reports

**Notes:** AcA = Acceleration Academy; UA = University of Alaska. Includes repeat participants as single observations. Based on University of Alaska admissions records and course registration records. Students who were not admitted withdrew their application, were academically disqualified, or are currently in admissions review. Summer Bridge

Like Acceleration Academy, Summer Bridge's immediate objective with regard to academic achievement is to have participants complete designated coursework as well as a STEM internship. Completing precollege math coursework is critical for ensuring preparedness. In addition, Summer Bridge's coursework is also meant to provide a head start on completion of STEM degree requirements in terms of both academic development and college credit. Therefore, key outputs of Summer Bridge are math course completion, internship placement, and continuation rates of participants moving directly into UA STEM courses.

Table 17.9 shows the math placement and completion rates for Summer Bridge participants from 2010 through 2013, the group for whom detailed data are available. The table compares participants who took math courses at precollege and college levels. Completion rates between precollege and college level participants varied widely, with a trend over time of increasing completion of those at the precollege level. Though there are too few years of Summer Bridge information available for analysis and too few participants in each cohort to note a long-term trend, the lower rate of completion in recent years for college-level participants compared with their precollege-level peers suggests that some gaps persist in preparation, even among the more advanced participants, which may carry into participants' first year at college. Full internship placements and completions were consistent throughout Summer Bridge because this activity is a requirement of participation.

TABLE 17.9

### Summer Bridge Course Level Placement and Completion

2010-13

Year	Math participants	Math course placement		Math course completion (%)		Receiving college credit (%)
		Precollege	College	Among precollege	Among college	
2010	28	12	14	25.0	64.3	46.2
2011	24	12	12	58.3	100.0	79.2
2012	20	6	13	100.0	76.9	84.2
2013	26	2	24	100.0	66.7	69.2
<b>Group total (%)</b>	<b>100.0</b>	<b>33.7</b>	<b>66.3</b>	<b>56.3</b>	<b>74.6</b>	<b>68.4</b>

**Source:** ANSEP administrative records

**Notes:** Does not include participants who did not take math courses.

As the bridge to UA STEM undergraduate degrees, Summer Bridge has largely met its objective: 98.7 percent of Summer Bridge participants were admitted to degree programs at UA after their Summer Bridge experience (table 17.10). (See appendix C for the list of STEM degree programs.) However, a smaller proportion, 76.7 percent, entered into BS degree programs in STEM majors (among those whose entry-level information was available to researchers). A portion of participants (3.5 percent) entered STEM majors leading to other degree types, and a sizable portion (12.3 percent) entered non-STEM majors (for example, STEM-related fields such as health care sciences). Though the coursework, internships, and orientation activities offered through Summer Bridge were likely helpful to all of these groups, the participants' movement into different academic tracks at early stages in their undergraduate careers suggests that ANSEP—and Summer Bridge, in particular—are portals for entry into UA for a wider population than students who are committed to BS degree STEM careers.

TABLE 17.10

**Summer Bridge Pipeline to University of Alaska**  
1998-2013

Year	Participants	Entered UA	Entry degree			
			STEM BS	STEM non-BS	Non-STEM	Unknown
1998	1	1	0	0	1	0
1999	5	5	2	0	2	1
2000	5	5	2	0	1	2
2002	6	6	4	0	2	0
2003	7	7	3	0	3	1
2004	14	14	11	1	0	2
2005	18	18	14	0	3	1
2006	11	11	11	0	0	0
2007	23	23	21	0	1	1
2008	21	21	14	1	6	0
2009	21	20	14	1	2	3
2010	28	27	23	2	1	1
2011	24	24	19	2	2	1
2012	20	19	17	0	2	0
2013	26	26	19	1	2	4
Total	230	227	174	8	28	17
<b>% of all participants</b>	<b>100.0</b>	<b>98.7</b>	<b>76.7</b>	<b>3.5</b>	<b>12.3</b>	<b>7.5</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** BS = bachelor of science; UA = University of Alaska; STEM = science, technology, engineering, and math. Participants are classified as non-BS or non-STEM unless ANSEP records or UA admissions records indicate a BS degree. If ANSEP records indicate STEM, but not BS, that person is categorized as STEM non-BS. Categorization of STEM majors is included in appendix C.

## University Success

University Success is the first and one of the largest of the ANSEP components and the one that aligns most directly with the UA mission of serving undergraduates in the state of Alaska.<sup>8</sup> As noted in the literature review presented in chapter 1, interventions for increasing the number of minority STEM professionals and for decreasing the gaps in STEM employment have focused largely on the university stage. Some research has defined success at the undergraduate level simply as completion of a degree. Other work measures the achievement level (such as GPA) or pace (time to degree) as additional information on completion. Because University Success aims to affect all of these outputs, this report tracks both measures of general retention and degree completion and measures of achievement toward degree completion.

For all of these measures, information was available for only University Success participants, and not for a comparison group of nonparticipants. In some cases, information for participants classified as “partial” is included; as noted earlier in this chapter, several students never received a full University Success scholarship (of \$1,000 or more) in any semester but received minor funding and may have participated in

some University Success activities, such as weekly meetings. For a better understanding of the size of this population, table 17.11 breaks down these groups by ANSEP touch—that is, between full participants (those who received a minimum of \$1,000 in ANSEP funding in at least one semester) and partial participants (those who received some financial support but no more than \$1,000 in any semester)—and by graduation status. It is important to note that ANSEP has supported many university students over its existence, and there have been over 200 university graduates who were involved in ANSEP in some way according to ANSEP records.

TABLE 17.11

**University Success Participation by Graduation (BS or BA Degree Completion) and Enrollment Status**

	Graduates	Currently enrolled or not completed degree	Total
Full participants	177	293	470
Partial participants	50	26	76
<b>Total</b>	<b>227</b>	<b>319</b>	<b>546</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** BA = bachelor of arts; BS = bachelor of science.

Full participants received at least one scholarship of \$1,000 or more in a single semester. Partial participants received some financial support but did not meet the threshold requirement to be considered a full participant. Graduates are participants who earned a bachelor’s degree at University of Alaska. Scholarship information for University of Alaska Fairbanks 2007 was not available and is not included in analysis. For the purposes of most output discussions in this section and the outcome discussions later in this chapter, the focus will be primarily on full participants, divided between the 177 University Success graduates and the 293 currently enrolled or noncompleting students.

**DEGREE COMPLETION**

If one uses the receipt of a BS or BA degree eight years after first enrollment as a cutoff, the data show that 66.4 percent of all University Success participants to date have completed (34.7 percent) or are currently enrolled (31.7 percent) in STEM BS degree programs (table 17.12). An additional 0.8 percent of participants are enrolled in or have completed STEM programs that yield a BA or another non-BS degree. Thirteen percent of participants have earned or are enrolled in non-STEM degrees. Compared with the 52.6 percent retention rate over an average of 10 years for Alaska Natives at UAA in all fields, this combined completion and continued enrollment rate is positive. Among graduates, 92 percent receive STEM BS degrees.

TABLE 17.12

**Total University Success Participant Completion Status by STEM BS Degree***Full participants only, percent*

	Completed ( <i>n</i> = 177)			Currently enrolled ( <i>n</i> = 207)				No degree ( <i>n</i> = 86)
	BS degree	STEM non-BS degree	Non-STEM degree	BS degree	STEM non-BS degree	Non-STEM degree	Unknown degree type	No degree earned
Total	34.7	0.2	2.8	31.7	0.6	10.2	1.5	18.3
Status group	92.1	0.6	7.3	72.0	1.4	23.2	3.4	100.0

**Source:** ANSEP administrative and scholarship records and Banner matching.

**Notes:** *N* = 470. BS = bachelor of science. No degree means that the participant has not earned a bachelor's degree and eight years of enrollment have passed. Categorization of STEM majors is included in appendix C.

Four additional patterns regarding completion rates are noteworthy. The first involves the rate at which participants have not completed their degrees within eight years after their first UA enrollment—that is, 18.3 percent of all University Success participants, historically. Although many of these participants may still be occasionally enrolled, may be planning to return to UA enrollment, or may have transferred to other schools outside of UA, several may simply have dropped out altogether. The lack of information about this group prevents any conclusive findings regarding the decisions behind their status.

Additional exploration of the completion data, however, suggests that many of these students' level of participation in University Success was relatively limited; over two-thirds of these who did not complete their degree (69.8 percent) participated in ANSEP's University Success program for only one or two semesters (table 17.13). In contrast, the number of semesters of University Success participation by students who graduated with BS degrees ranged from one semester (13.5 percent of participants who completed a BS degree) to over nine semesters (20.2 percent of participants who completed a BS degree). Moreover, the majority of University Success participants who eventually received non-STEM degrees participated in ANSEP fewer than four semesters, with the likely reason being that they switched their major.

TABLE 17.13

### University Success Completion Rates by University Success Semesters of Participation

Percent of degree completion group

University Success participation	Degree completed			
	BS degree (n= 163)	STEM non-BS degree (n= 1)	Non-STEM degree (n= 13)	No bachelor's degree from UA (n= 86)
1 semester	13.5	0.0	15.4	46.5
2 semesters	16.0	0.0	15.4	23.3
3–4 semesters	20.2	0.0	30.8	12.8
5–6 semesters	16.6	0.0	30.8	9.3
7–8 semesters	13.5	0.0	7.7	3.5
9 or more semesters	20.2	100.0	0.0	4.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** N= 263. BS = bachelor of science. Table includes full participant graduates and noncompleters and does not include participants currently enrolled for fewer than eight years. Categorization of STEM majors is included in appendix C.

The low number of semesters of involvement in University Success among participants who do not complete their degree within eight years does not necessarily explain their lack of degree completion because ANSEP requirements disqualify students who have poor performance from further participation. That is, poor performers in the short term are more likely to leave ANSEP as well as fail to complete their undergraduate degree in the long term. However, the relatively large share of ANSEP undergraduates who do not complete their degrees suggests that these participants may experience gaps in supports or services or they may face other barriers to completing their undergraduate education.

A second pattern of interest in ANSEP's completion rates for undergraduate degrees comes in the disparities between the completion rates of Alaska Native participants and other racial groups. Alaska Natives make up the vast majority of University Success participants—over three-fourths of all participants historically and currently (see chapter 15). As table 17.14 shows, Alaska Native participants in University Success are more likely to not complete their degrees after eight years (22.1 percent) or to enroll in non-STEM degree programs (11.9 percent) compared with most other racial groups, particularly white participants (6.3 percent not completing and 2.5 percent current students in non-STEM majors).

TABLE 17.14

### University Success Completion Rates by Ethnicity

Percent of ethnic group

Ethnicity	Completed			Currently enrolled				No degree
	BS degree	STEM non-BS degree	Non-STEM degree	BS degree	STEM non-BS degree	Non-STEM degree	Unknown degree type	No degree earned
Alaska Native ( <i>n</i> = 353)	28.3	0.3	2.3	32.6	0.8	11.9	1.7	22.1
Native American (non- AK) ( <i>n</i> = 13)	23.1	0.0	7.7	30.8	0.0	30.8	0.0	7.7
White ( <i>n</i> = 79)	54.4	0.0	5.1	30.4	0.0	2.5	1.3	6.3
Other ( <i>n</i> = 22)	77.3	0.0	0.0	22.7	0.0	0.0	0.0	0.0

**Source:** ANSEP administrative records and University of Alaska Banner records.

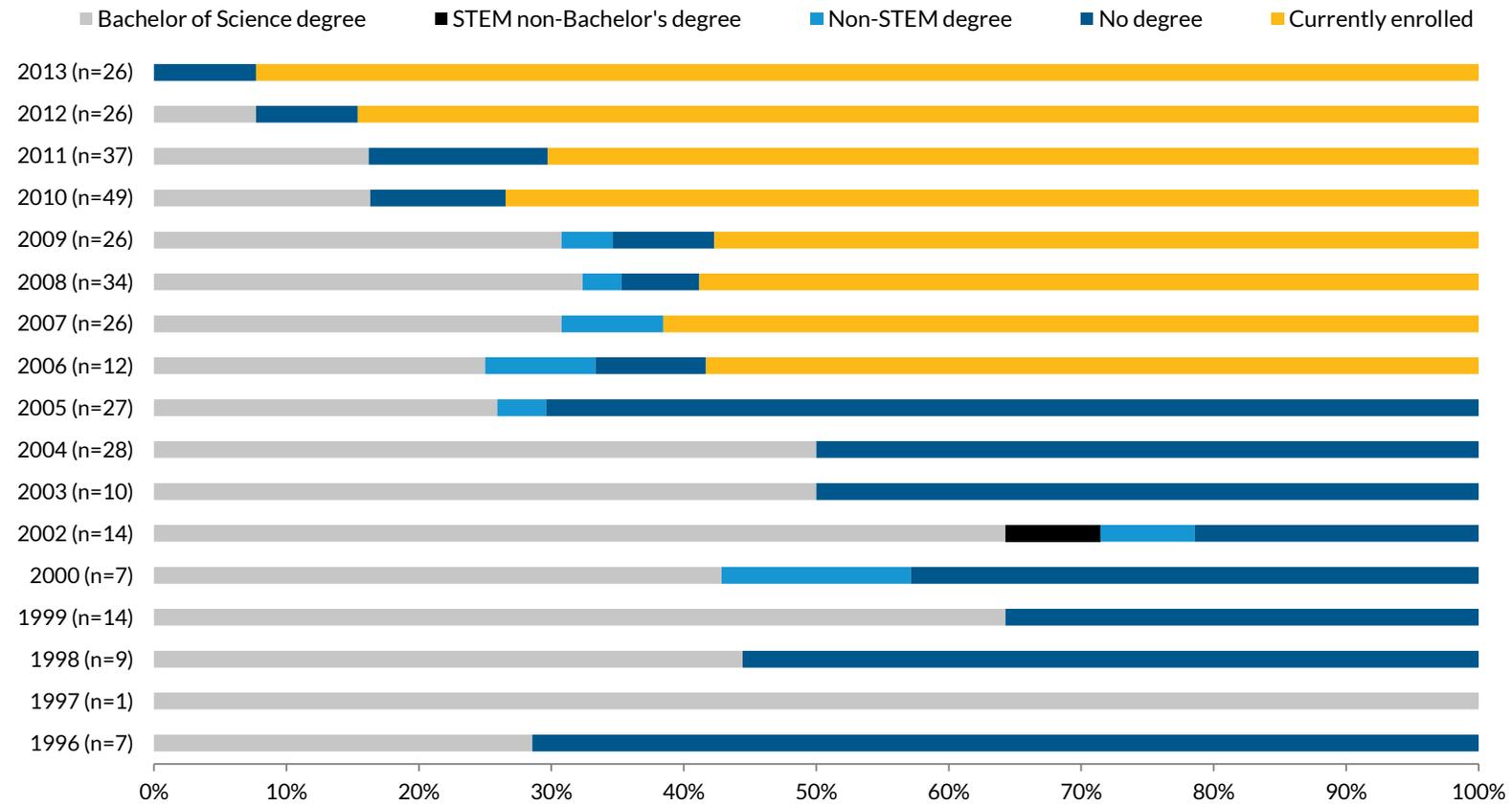
**Notes:** *N* = 467. BS = bachelor of science. Table includes full participant graduates, noncompleters, and currently enrolled participants for whom ethnicity is known. Categorization of STEM majors is included in appendix C.

Figures 17.4 and 17.5 depict the differences in completion rates between Alaska Native and white participants across University Success cohorts, where a cohort is defined by the year when participants first received a full scholarship of at least \$1,000.<sup>9</sup> When one looks at participants before 2006 (the year before which participant cohorts are categorized as not completing within eight years), comparable distributions of degree completion within eight years from first UA entry for Native and white participants are seen though the population of white participants in these years is low.

FIGURE 17.4

### University Success Completion Rates by Year of First ANSEP Participation

Alaska Natives Only



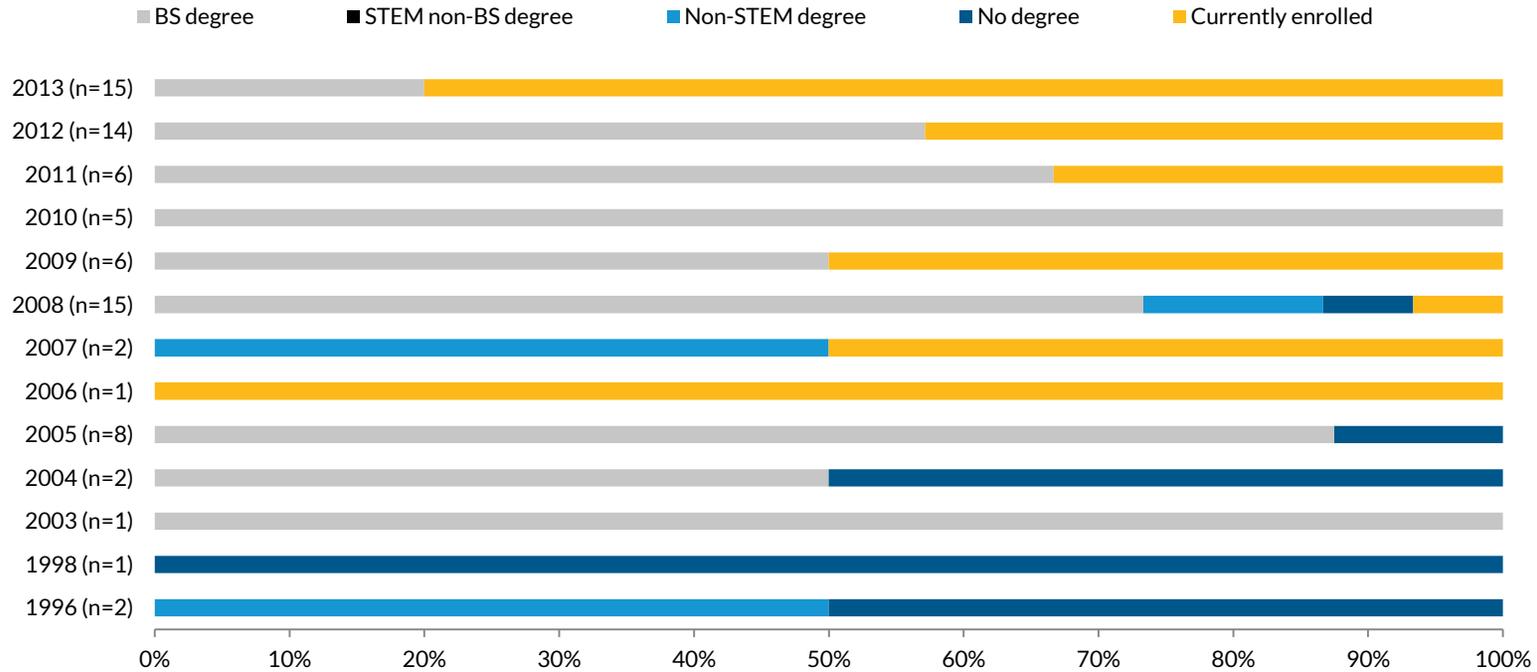
Source: ANSEP scholarship records and Banner data.

Notes: BS = Bachelor of Science. Some years are missing because there were no students receiving their first full ANSEP scholarship in those years. Data include full participant graduates, noncompleters, and those enrolled during the year. N= 353.

FIGURE 17.5

### University Success Completion Rates by Year of First ANSEP Participation

Whites Only



Source: ANSEP scholarship records and Banner data.

Note: BS = Bachelor of Science. Some years are missing because there were no students receiving their first full ANSEP scholarship in those years. Data include full participant graduates, noncompleters, and those enrolled during the year. N = 79.

The third additional finding regarding degree completion of participants in University Success involves the increasing rate of University Success participants who enter non-STEM majors at some point in their UA experience. This group includes only 7.3 percent of the participants who have graduated to date, as shown in table 17.12, but 24 percent of those who continue to be enrolled (not including any ongoing students who have passed the eight-year milestone and who are classified separately from current enrollees).

A review of University Success participants by year (table 17.15) shows the trend of more participants leaving STEM degrees peaking in the 2006 cohort, with 38.5 percent of the cohort going into non-STEM fields (7.7 percent of graduates plus 30.8 percent of current enrollees). This proportion of non-STEM participants has decreased in recent years, though the participants who recently started in University Success may still decide to transfer majors.

In an examination of changes in majors over time (table 17.16), a substantial proportion of participants who entered ANSEP in 2006 and 2007 left engineering majors at some point in their undergraduate years and entered either other STEM fields or non-STEM fields. In contrast, in subsequent years (from 2008 onward), many participants left non-STEM fields or changed their undeclared major status and entered engineering and science. This pattern holds true across UA campuses and across ethnic groups.

Table 17.17 shows changes of major by the point of entry into ANSEP along a participant's undergraduate career. For example, "first semester" participants entered ANSEP in their first semester on campus—including Summer Bridge graduates—whereas "later semester" participants did not enter ANSEP until past their eighth semester on campus. Almost all of the participants who started in ANSEP at or near the beginning of their UA undergraduate career have stayed in STEM majors; among first semester ANSEP participants, 87.1 percent declared STEM majors at enrollment, and 86.9 percent have either graduated or are currently still enrolled in STEM majors. Though the findings do not necessarily address the same group of participants, they suggest some persistence in major selection. The proportion of first semester participants who were undeclared or were non-STEM majors but who have subsequently graduated is similar to the proportion of participants who are still studying non-STEM majors.

TABLE 17.15

### University Success Participant Completion Status by STEM BS Degree by First Year of University Success Participation

Full participants only, percent of total cohort group

Cohort year (year of first scholarship receipt)	Completed			Currently enrolled				No degree
	BS degree	STEM non-BS degree	Non-STEM degree	BS degree	STEM non-BS degree	Non-STEM degree	Unknown degree type	No degree earned
1996	20.0	0.0	20.0	0.0	0.0	0.0	0.0	60.0
1997	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	40.0	0.0	0.0	0.0	0.0	0.0	0.0	60.0
1999	64.3	0.0	0.0	0.0	0.0	0.0	0.0	35.7
2000	42.9	0.0	14.3	0.0	0.0	0.0	0.0	42.9
2002	60.0	6.7	6.7	0.0	0.0	0.0	0.0	26.7
2003	58.3	0.0	0.0	0.0	0.0	0.0	0.0	41.7
2004	51.6	0.0	0.0	0.0	0.0	0.0	0.0	48.4
2005	42.5	0.0	2.5	0.0	0.0	0.0	0.0	55.0
2006	23.1	0.0	7.7	23.1	0.0	30.8	7.7	7.7
2007	32.3	0.0	9.7	35.5	0.0	12.9	9.7	0.0
2008	45.3	0.0	5.7	28.3	0.0	15.1	0.0	5.7
2009	40.0	0.0	2.9	31.4	0.0	17.1	2.9	5.7
2010	25.4	0.0	0.0	47.5	0.0	16.9	1.7	8.5
2011	25.0	0.0	0.0	43.8	0.0	20.8	0.0	10.4
2012	27.1	0.0	0.0	54.2	6.3	8.3	0.0	4.2
2013	9.5	0.0	0.0	78.6	0.0	4.8	2.4	4.8
2014	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
<b>Total (%)</b>	<b>34.7</b>	<b>0.2</b>	<b>2.8</b>	<b>31.7</b>	<b>0.6</b>	<b>10.2</b>	<b>1.5</b>	<b>18.3</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** BS = bachelor of science. No degree means that the participant did not earn a bachelor's degree eight years after enrolling. *N*= 470 full participant graduates, noncompleters and currently enrolled. Categorization of STEM majors is included in appendix C.

TABLE 17.16

### University Success Participant Majors at Enrollment and at Graduation or Most Current

Percentage

Cohort year (year of first scholarship receipt)	Science		Technology		Engineering		Math		Health		Other	
	Major at first enrollment	Major at grad or current										
1996	NA	0	NA	0	NA	66.7	NA	0	NA	0	NA	33.3
1997	NA	0	NA	0	NA	100	NA	0	NA	0	NA	0
1998	0	0	33.3	16.7	33.3	83.3	0	0	0	0	33.3	0
1999	0	0	0	0	36.4	90.9	0	0	0	0	63.6	9.1
2000	0	0	0	33.3	40	33.3	0	0	0	0	60	33.3
2002	12.5	0	12.5	0	25	75	0	8.3	0	0	50	16.7
2003	0	0	0	0	87.5	88.9	0	0	0	0	12.5	11.1
2004	16	9.1	12	13.6	48	68.2	4	4.5	0	0	20	4.5
2005	3.7	0	0	8.6	74.1	85.7	0	0	0	0	22.2	5.7
2006	0	0	0	11.1	81.8	55.6	0	0	9.1	0	9.1	33.3
2007	7.1	10.7	7.1	0	78.6	67.9	0	3.6	0	0	7.1	17.9
2008	7.5	15.2	5	4.3	55	65.2	5	2.2	0	0	27.5	13
2009	28.6	28.6	4.8	7.1	47.6	50	0	0	0	0	19	14.3
2010	25.5	25	3.9	3.8	52.9	55.8	0	1.9	3.9	1.9	13.7	11.5
2011	18.9	35	10.8	2.5	43.2	52.5	0	2.5	5.4	0	21.6	7.5
2012	22.5	28.9	2.5	4.4	57.5	64.4	0	0	0	0	17.5	2.2
2013	11.1	20.5	2.8	5.1	66.7	71.8	0	2.6	0	0	19.4	0
2014	0	0	0	0	100	100	0	0	0	0	0	0
<b>Total</b>	<b>14.2</b>	<b>17.2</b>	<b>5.1</b>	<b>5.3</b>	<b>57.4</b>	<b>65.7</b>	<b>0.9</b>	<b>1.8</b>	<b>1.4</b>	<b>0.3</b>	<b>21</b>	<b>9.8</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** NA = not available. Many participants' major at first enrollment ( $n = 352$ ) was not available compared with most recent ( $n = 396$ ). Categorization of STEM majors is included in appendix C. Grad = graduation.

TABLE 17.17

## Major at Enrollment and Major at Graduation (or Most Current) by University Success Entry Classification

Percentage

University Success entry point	Science		Technology		Engineering		Math		Health		Other	
	Major at first enrollment	Major at grad or current	Major at first enrollment	Major at grad or current	Major at first enrollment	Major at grad or current	Major at first enrollment	Major at grad or current	Major at first enrollment	Major at grad or current	Major at first enrollment	Major at grad or current
1st semester of UA enrollment	16.9	23.9	4.5	3.4	65.7	57.4	0	2.3	0	0	12.9	13.1
2nd semester of UA enrollment	6.9	0	6.9	4.8	58.6	66.7	0	4.8	3.4	0	24.1	23.8
3rd or 4th semester of UA enrollment	9.4	9.6	9.4	17.3	56.3	63.5	0	0	6.3	0	18.8	9.6
5th or 6th semester of UA enrollment	8.7	2.8	4.3	0	56.5	91.7	4.3	0	0	0	26.1	5.6
7th or 8th semester of UA enrollment	16.7	18.9	4.2	5.4	41.7	70.3	4.2	2.7	0	2.7	33.3	0
Later semester of UA enrollment	13.2	16.9	2.6	5.1	28.9	76.3	2.6	1.7	5.3	0	47.4	0

**Source:** ANSEP administrative records and University of Alaska Banner records.

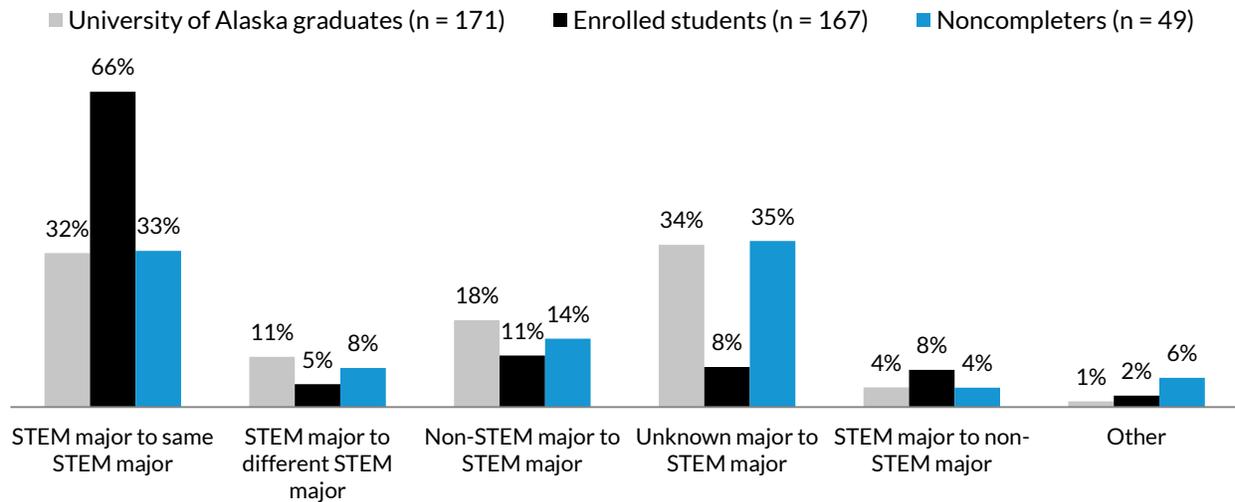
**Notes:** Total  $n = 347$  (known major at first enrollment) and 381 (known current or final major) respectively. Categorization of STEM majors is included in appendix C. Grad = graduation.

In contrast, many participants who enter ANSEP at later points in their undergraduate career are also coming from either undeclared or non-STEM majors but are subsequently graduating or continuing to study in STEM majors. (Before receiving support from ANSEP, a participant must be enrolled in a STEM major.) For example, 33.3 percent of participants who entered ANSEP in their senior year (that is, their seventh or eighth semester on campus) and 52.6 percent of participants who entered ANSEP even later (past their eighth semester on campus) were either undeclared or in non-STEM majors when they first enrolled at UA. Among these groups, however, only 1 percent have graduated or are studying outside of STEM fields. This finding suggests that ANSEP's activities and services may be working as potential incentives for UA students who start off in other majors to enter into STEM; however, without complete information on the rate of non-ANSEP students who change to STEM majors, it is not clear whether there may be a broader trend among UA students unrelated to ANSEP.

Figure 17.6 depicts the different paths for changes in major among three groups of ANSEP participants: those who have graduated, those who continue to be enrolled within eight years of first enrollment, and those who have not completed their degree within eight years. Among the participants who graduated, 43 percent started and ended in STEM majors, but 52 percent started in unknown or non-STEM majors and completed in STEM. Only 4 percent of these participants left their STEM majors and graduated as non-STEM majors. Currently enrolled participants have contrasting rates of changes and persistence in majors: 71 percent of current participants have started and remain in STEM majors, 19 percent have entered STEM from non-STEM majors, and 8 percent have left STEM. Because these University Success participants and non-ANSEP UA students are currently enrolled, many may choose to change their major later in their undergraduate career. Although these are different cohorts and participants' changes in major may be similar to UA students' who are not ANSEP participants, this suggests a general persistence in STEM as well as a high rate of movement by undergraduates *into* STEM at some point.

FIGURE 17.6

### Changes in Major by ANSEP Participants by Degree Completion Group



**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** Chart includes only those students who were full ANSEP participants at some point and does not include participants for whom final or most recent major is unknown. “Enrolled students” includes those enrolled at UA within 8 years of their first semester of enrollment. “Noncompleters” includes those who have not completed degrees within 8 years of their first semester of enrollment. “Other” includes students who were non-STEM at first enrollment, likely entered STEM (thereby participating in ANSEP), and returned to non-STEM majors.

Tables 17.16 and 17.17 also provide information for the fourth and final key finding regarding University Success degree completion outputs with regard to majors within STEM. Specifically, University Success participants are still primarily majoring in engineering fields, with a total of 65.7 percent graduating or currently enrolled in engineering across all University Success years. Science majors account for the next largest group of final or most recent majors within the STEM disciplines, with 17.2 percent of University Success participants. Technology programs are the final or most recent choice of 5.3 percent of University Success participants, followed by 1.8 percent in math. Few University Success participants (0.3 percent) leave STEM majors to enter health care–related fields, although 1.4 percent of University Success participants started out as health care majors when they first enrolled at UA (see appendix C for a list of UA majors).

#### UNDERGRADUATE ACHIEVEMENT

In addition to examining basic degree completion and enrollment rates, this section looks at GPA and time to degree, with higher GPA and lower time to degree equated with higher performance. The average cumulative GPA of all participants who have participated fully in University Success at any point in their undergraduate experiences is 2.98, with an average GPA of 2.92 among UAA’s University Success

participants and 3.13 among UAF’s participants.<sup>1</sup> This rate includes the final cumulative GPAs for all graduates, as well as the most recent cumulative GPAs for currently enrolled participants.

This overall GPA is slightly higher than the nationally estimated rate for American Indian/Alaska Native and Native Hawaiian/Pacific Islander STEM graduates (2.91), but lower than the estimated rate for STEM graduates of all races (3.20), as noted in chapter 2. Like national estimates, GPAs also vary by race within University Success. Table 17.18 shows the average cumulative GPAs for all University Success participants by racial group. Alaska Native participants have an average cumulative GPA of 2.86, American Indians (non-Alaska Native) have a group average of 3.06, white participants’ average is 3.30, and participants from other racial groups (including mixed-race participants not reporting any Alaska Native or American Indian race) have the highest average cumulative GPA of all groups at 3.43.

TABLE 17.18

**University Success Full Participants, Final or Most Recent Average GPA by Ethnicity**

	University Success ( <i>n</i> = 329)	Alaska Native ( <i>n</i> = 238)	Native American (non-AK) ( <i>n</i> = 7)	White ( <i>n</i> = 61)	Other ethnicity ( <i>n</i> = 22)
Total	2.98	2.86	3.06	3.30	3.43

Source: ANSEP administrative records and University of Alaska Banner records.

Similar to the analysis above, the Urban Institute examined GPA by semester of entry into ANSEP and by number of semesters of participation. Table 17.20 shows average GPAs for different groups by their point of University Success entry. Participants who entered University Success at or near their arrival to UA—that is, they had participated in an ANSEP precollege component that made them eligible for immediate participation—had cumulative group GPAs among the lowest of all entry point groups (2.79 and 2.65, respectively, for first semester and second semester groups).

TABLE 17.19

### Final or Most Recent GPA by University Success Entry Classification

University Success entry point	Average GPA in group
Entered in first semester of UA enrollment ( <i>n</i> = 129)	2.79
Entered in second semester ("freshman") ( <i>n</i> = 20)	2.65
Entered in third or fourth semester ("sophomore") ( <i>n</i> = 45)	3.02
Entered in fifth or sixth semester ("junior") ( <i>n</i> = 33)	3.20
Entered in seventh or eighth semester ("senior") ( <i>n</i> = 34)	3.24
Entered in later semester ("continuing student") ( <i>n</i> = 54)	3.25

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** *N* = 315 full University Success participants. Point of University Success entry unavailable for several participants. GPA = grade point average.

In contrast, the groups of participants who entered University Success later in their undergraduate careers had collectively higher average GPAs: participants who started in their senior year (seventh or eighth semester at UA) had an average GPA of 3.24, and participants who started in University Success even later (past the eighth semester at UA) had the highest average GPA, at 3.25. One possible explanation for these differences is that early entry University Success participants tend to have wider gaps in college preparedness upon entry, whereas later entry participants could be held to stricter eligibility requirements. Other possibilities are that later entrants came from majors (including non-STEM majors) with average GPA performance that is traditionally higher than STEM majors' or that all students' GPAs increase over time. Lack of information on non-ANSEP students limits the conclusions of this analysis.

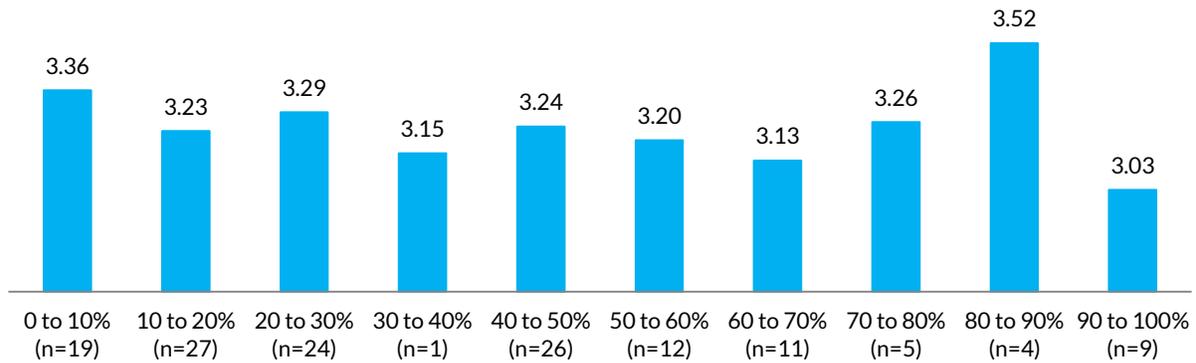
The amount of time spent in University Success is also an important consideration with regard to academic performance. To explore this effect, the research team constructed a measure of "intensity" for each participant that calculated the percentage of semesters they participated in University Success out of their total number of semesters enrolled (to the point of degree completion or to date). A low intensity percentage (such as below 10 percent) would mean a limited amount of time within University Success during a participant's undergraduate years, whereas a high intensity percentage (above 90 percent up to 100 percent) would mean that a student had participated in University Success throughout all or nearly all of his or her undergraduate career.

By this measure, the cumulative average GPA of ANSEP participants who graduated varied widely, as depicted by intensity group in Figure 17.7, and findings on the effects of intensity are inconclusive. For example, graduates who participated in University Success less intensely (that is, less than one-third of their undergraduate career) generally had higher GPAs than those with a higher percentage of intensity (between one-third and two-thirds of their undergraduate career). The variation is most pronounced among participants with the highest percentages of intensity. Though a small group, students who participated in University Success between 80 and 90 percent of their undergraduate career had the highest collective

average GPA of all groups, at 3.52 GPA). Yet the group that participated in University Success most intensely (above 90 percent of their undergraduate career) had the lowest collective average GPA, at 3.03. A reasonable hypothesis for this disparity is that University Success has both high- and low-achieving participants within their eligibility ranges. In all cases, further analysis will be needed as the large group of currently enrolled participants advances in their degrees.

FIGURE 17.7

**Average GPA among ANSEP Students, by Intensity of University Success Participation**  
*UA Graduates Only*



**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** N= 138. Data include ANSEP participants who have graduated from the University of Alaska for whom information was available. Intensity refers to the percentage of semesters spent as a University Success participant out of the total number of their enrolled semesters.

A final set of achievement outputs to consider is time to degree, measured by both tenure (the number of semesters in which the participant is enrolled) and duration (the number of semesters between the first semester of enrollment and degree completion or the present). For example, a participant who completes his or her degree in 10 consecutive semesters would have both tenure and duration equal to 10 semesters. A participant who stops out, that is, stops attending, for two semesters at some point but completes his or her degree in 10 semesters would have a tenure of 10 semesters and duration of 12 semesters.

Table 17.20 displays the ranges for University Success graduates, with total semesters for both the total enrollment and the total time from first enrollment. The mean times for these times to degree for all graduates are 12.9 semesters for total enrollment and 13.1 semesters for time from first enrollment. The majority of graduates (71.4 percent) took more than 11 enrolled semesters to graduate, or the equivalent of more than five years of study without summer enrollment.<sup>11</sup> Taking summer semesters and stop-outs into account, most (85.2 percent) graduates took more than 13 semesters from the time of first enrollment to graduation. With national estimates for the average time to degree at 59.83 months (or approximately 15 semesters, assuming four months per semester) for American Indian/Alaska Native and Native

Hawaiian/Pacific Islander STEM graduates and 52.93 months (slightly over 13 semesters) for all STEM graduates, University Success participants' rates appear to be slightly longer.

TABLE 17.20

**Total Tenure and Duration at UA (percentage of all full University Success Graduates)**

<b>Total number of semesters enrolled (tenure) or past (duration) at UA</b>	<b>Tenure</b>	<b>Duration</b>
≤4 semesters	1.7	1.1
5–8 semesters	10.3	1.7
9–10 semesters	16.0	2.3
11–12 semesters	25.7	9.7
13–14 semesters	16.6	22.9
15 or more semesters	29.7	62.3
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

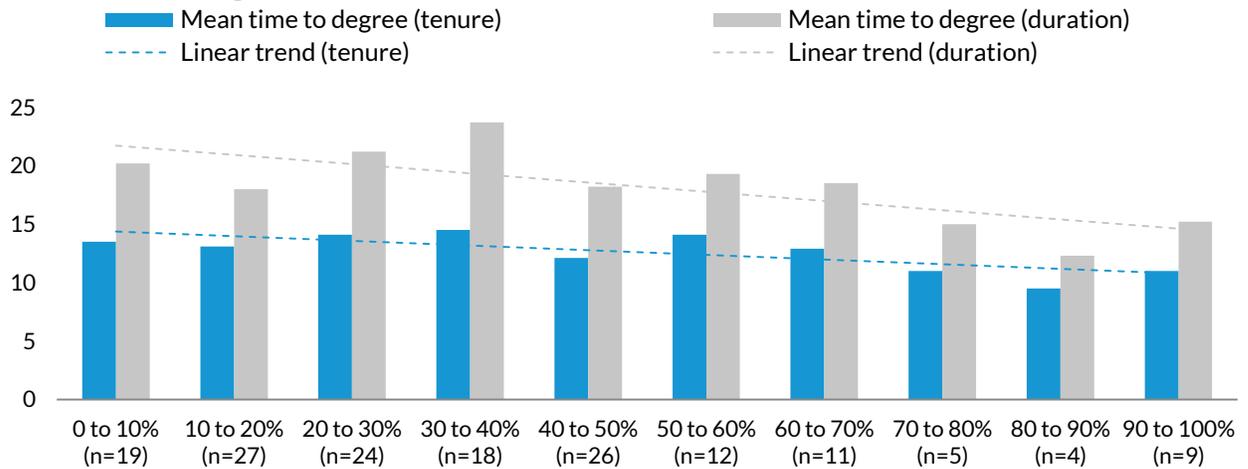
**Notes:** *N* = 175 graduated full University Success participants. UA = University of Alaska. Each year is counted as three semesters for duration, but summer semesters are counted as tenure only when a student is enrolled during them.

Differences in time to degree are noted across many other student characteristics within the University Success graduate population. For example, racial groups differ, with Alaska Native participants graduating in 13.9 enrolled semesters, on average, compared with 11.3 enrolled semesters for white participants. Yet differences by length of University Success participation suggest a pattern in which being more intensely involved with University Success is associated with a shorter time to degree.

Figure 17.8 shows University Success graduates' mean number of enrolled semesters and mean number of lapsed semesters since first enrollment by University Success intensity (the percent of semesters of participation in University Success out of their enrolled semesters). Across means of both tenure and duration, participants who were less intensely involved had higher times to degree, on the whole, than did participants who were more intensely involved. This relationship is depicted graphically in the descending trend line (linear mean estimates) across increasing intensity groups in figure 17.8. Students who participated less intensely also tended to take longer to complete their degree—that is, they may have stopped out more. For this reason, the gap between trend lines for tenure and duration decreases as intensity increases.

FIGURE 17.8

### Mean Time to Degree (Tenure and Duration) by Intensity of University Success Participation among Graduates



**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** N=155. Intensity refers to the percentage of semesters spent as an ANSEP participant out of the total number of enrolled semesters. Time to degree is measured in semesters.

Despite all of the outputs listed here, it is important to note that no set of outputs is available for comparison groups such as Alaska Native STEM graduates from UA that did not participate in University Success. Therefore, proposed explanations for outputs are only possibilities, and differences in groups described by their varying levels of participation in ANSEP cannot be causally attributed.

### Graduate Success

Like University Success, the primary output of Graduate Success is degree completion. To date, exactly one-third of all Graduate Success participants have completed their graduate degrees: seven MSs and two PhDs (table 17.21). If one includes the participants who continue to be enrolled in graduate programs, 88.9 percent of Graduate Success participants either have completed or are on their way to completing graduate degrees.

Because of the small number of Graduate Success participants overall and the often longer time required to complete graduate degrees, analysis cannot explore more than basic completion. However, it should be noted that not all Graduate Success participants are enrolled in traditional STEM fields: one student is pursuing an MD, and seven students are in project management degree programs.<sup>12</sup>

TABLE 17.21

### Graduate Success Participation and Completion Rates, 2008–13

Year of Graduate Success entry	Participants	Graduated (%)		Did not complete program at UA (%)	Currently enrolled (%)		
		MS degree	PhD degree		MS degree	PhD degree	MD degree
2008	8	37.5	0.0	12.5	37.5	12.5	0.0
2009	5	40.0	20.0	20.0	20.0	0.0	0.0
2010	6	33.3	16.7	16.7	33.3	0.0	0.0
2011	1	0.0	0.0	0.0	100.0	0.0	0.0
2012	2	0.0	0.0	0.0	100.0	0.0	0.0
2013	5	0.0	0.0	0.0	80.0	0.0	20.0
<b>Total (%)</b>	<b>100.0</b>	<b>25.9</b>	<b>7.4</b>	<b>11.1</b>	<b>48.1</b>	<b>3.7</b>	<b>3.7</b>

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** MS = master of science; UA = University of Alaska. Does not include participants who withdrew their application to Graduate Success. “Did not complete program at UA” includes participants who transferred, but not participants who never officially enrolled.

## Multiple Components

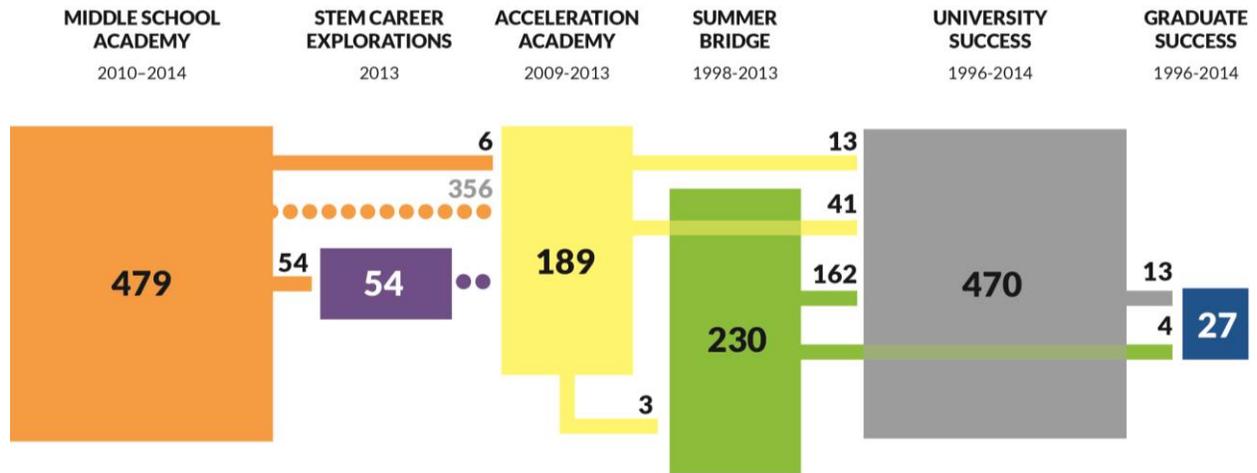
In almost every component, one output that is critical for ANSEP’s monitoring is the flow from that component to the next—that is, ANSEP’s pipeline. See figure 17.9 for a depiction of the ANSEP pipeline in its current state.

Among participants in the two last components before they enter a profession—University Success and Graduate Success—the analysis would expect to see high rates of participation in a previous component if the pipeline is working effectively. In fact, 46.8 percent of all University Success participants also participated in a previous component: 35.3 percent of all University Success participants participated only in Summer Bridge, 2.8 percent participated only in Acceleration Academy, and 8.7 percent participated in both.<sup>13</sup> Among all 27 Graduate Success participants, 63.0 percent participated in University Success and, of those participants, 23.5 percent participated in University Success and Summer Bridge.

As described in the ANSEP components chapters, ANSEP specifically recruits and accepts students who are predominantly Alaska Native, and has an eye toward gender and geographic equity in its middle school components. Multistage participation should carry these participants to later stages in the ANSEP pipeline.

FIGURE 17.9

### Participant Flow between Components



**Notes:** Dotted lines and gray number above it indicate the potential pipeline of recent Middle School Academy and STEM Career Explorations students who were not yet age-eligible for Acceleration Academy in 2013, the most recent year for which Acceleration Academy data are available. Participants are only counted once, even if they participated in a component multiple times.

Table 17.22 shows the demographic characteristics of students who participate in multiple components up to the University Success component. On the whole, the pipeline mirrors the overall rate in different components by race, with Alaska Natives making up the vast majority of participants who bridge to other components. However, more males (almost two-thirds for every component) continue along the pipeline than are generally in each of the originating components (for example, Acceleration Academy or Summer Bridge). This rate matches the overall population in University Success, with its 62.5 percent male population. Urban participants are only slightly more represented among pipeline group populations than their proportions in either the originating or the receiving components.

TABLE 17.22

## Multiple Component Participation by Demographics

Component mix	Total participants	Ethnicity (%)				Gender (%)		Urbanity (%)		
		AN	Native American (non-AN)	White	Other	M	F	Urban	Semi-urban	Rural
AcA to Summer Bridge	44	79.5	6.8	9.1	4.5	63.6	36.4	54.5	22.7	22.7
AcA to University Success	54	77.8	7.4	11.1	3.7	63.0	37.0	53.7	22.2	24.1
AcA and Summer Bridge to University Success <sup>a</sup>	41	78.0	7.3	9.8	4.9	63.4	36.6	58.5	19.5	22.0
Summer Bridge to University Success	207	84.5	3.9	9.7	1.9	60.9	38.6	34.8	27.1	38.2

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Notes:** AcA = Accelerated Academy. AN = Alaska Native.

<sup>a</sup> Includes participants from preceding two rows who participated in specific components.

In addition to bringing forward participants with particular demographic characteristics, the pipeline also brings along the participants with academic preparation and college readiness needs. For each of the different pipeline sources that feed into University Success, for example, the average cumulative GPAs of graduates and currently enrolled participants who participated in a previous component are consistently though only slightly lower than those of participants who did not enter through that pipeline (table 17.23). Though the numbers of pipeline participants is generally small in comparison with their nonpipeline counterparts, with the exception of Summer Bridge participants who move on to University Success, these differences suggest that ANSEP is targeting a wider pool of achievers—an arguably appropriate strategy.

TABLE 17.23

### Average Last or Most Recent Cumulative GPA in University Success by AcA Participation

Components	Average University Success GPA of group
Average of AcA to University Success participants ( $n = 25$ )	2.89
Average of non-AcA to University Success participants ( $n = 304$ )	2.99
Average of Summer Bridge to University Success participants ( $n = 125$ )	2.80
Average of non-Summer Bridge to University Success participants ( $n = 204$ )	3.10
Average of AcA and Summer Bridge to University Success participants ( $n = 22$ )	2.97
Average of non-AcA and Summer Bridge to University Success participants ( $n = 307$ )	2.99

**Source:** ANSEP administrative records and University of Alaska Banner records.

**Note:** AcA = Accelerated Academy; GPA = grade point average.

## Participant Outcomes

Whereas outputs are the short-term product of activities, outcomes are the activities' longer-term results. For ANSEP, the research team reviewed only outcomes for University Success participants because it is the longest-running component and therefore has enough history from which to detect long-term outcomes. University Success also has the most complete set of current contact information for former and current participants and explicit objectives related to long-term outcomes aimed at increasing the Alaska Native STEM professional workforce in Alaska. For assessment of ANSEP outcomes based on University Success graduates, three outcome categories are included:

- Participation in postundergraduate study in STEM fields
- Employment in STEM professions
- Income from STEM professional employment

Self-reported outcome data from the alumni survey conducted by the Urban Institute during summer 2014 provide the basis for this analysis. Where survey respondents consented, their outcomes were linked to their information in ANSEP's administrative data on University Success and the Banner data provided by ANSEP.<sup>14</sup> Because of the nonrandom sample, reported outcomes are likely overestimated. In all cases, results from these various sources are described by the above outcome categories, with tabulations noting the sources and sample population sizes used.

## Graduate Study

Table 17.24 shows various graduate enrollment responses among survey respondents who were full ANSEP participants based on matching with Banner data. The rate of respondents reporting ever enrolling in graduate school was 36.8 percent. This rate is substantially higher than the national estimate of 17.4 percent for American Indian/Alaska Native and Native Hawaiian/Pacific Islander undergraduate degree holders entering graduate school. Within the 36.8 percent group, 11.8 percent of the survey sample reported having completed graduate STEM or STEM-related degrees, and 21.1 percent reported continuing to be enrolled in graduate programs (17.1 percent in STEM or STEM-related programs).

TABLE 17.24

### Graduate School Enrollment and Completion Rates among Matched Alumni Survey Respondents

Percentage

Respondents reporting	Matched survey respondents
Ever enrolling in graduate school	36.8
Completion of a graduate degree	11.8
Completion of a STEM or STEM-related graduate degree	11.8
Continued enrollment in a graduate program	21.1
Continued enrollment in a STEM or STEM-related graduate program	17.1

**Source:** ANSEP alumni survey.

**Notes:** *N* = 76. Respondents are full University Success alumni (based on matching Banner data) who responded affirmatively to a survey question regarding graduate school enrollment.

To go beyond the basic outcome description and get a better sense of whether these graduate study rates were associated with any other factors, the research team tabulated specific University Success participation characteristics and demographic information. This tabulation was done only for the survey respondents who were matched with University Success data from ANSEP administrative records and Banner data and were determined to be full University Success participants at some point in their undergraduate careers. For different graduate study groups, the mean number of semesters was tabulated for the following:

- The length of time for fully participating within University Success, in total semesters
- The time to degree by total enrolled semesters (undergraduate “tenure”)
- The time to degree by total semesters from the semester of first enrollment (“duration”)
- The point of entry into University Success, measured by semester of entry from first semester of UA enrollment

Table 17.25 reports these results. Although potentially interesting patterns emerge across groups of differing graduate study completion, the only statistically significant difference ( $p < .05$ ) is between the mean number of graduates with University Success semester participation who never enrolled in graduate study (a mean of 5.2 semesters) and graduates with University Success semester participation who reported enrolling in graduate study at some point (7.0 semesters). This difference suggests that alumni who entered graduate study also participated in University Success longer.

TABLE 17.25

**Mean Semesters of Full University Success Participation, Tenure, and Duration for Various Postgraduation Graduate Groups, Matched Alumni Survey Respondents**

	Mean semesters of full University Success participation	Mean enrolled time to degree (tenure)	Mean total time to degree (duration)	Mean semester of University Success start <sup>a</sup>
Never enrolled in grad ( $n = 48$ )	5.2	12.7	18.7	6.7
Ever enrolled in grad school ( $n = 28$ )	7.1*	12.5	19.1	5.4
Completed grad degree ( $n = 9$ )	4.9	12.2	19.4	5.4
Continue to be enrolled in grad ( $n = 16$ )	7.8	11.7	17.3	
Completed STEM or STEM-related grad degree ( $n = 9$ )	4.9	12.2	19.4	5.8
Continue to be enrolled in STEM or STEM-related grad program ( $n = 13$ )	7.1	11.4	16.3	

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:**  $N = 76$  matched, full University Success respondents who responded affirmatively to a survey question regarding graduate school enrollment. Grad = graduate.

<sup>a</sup> University Success start noted from point of first undergraduate enrollment.

\* Significantly different from those never enrolled at  $p < .05$ .

Table 17.26 provides additional demographic information regarding the matched survey respondents within different graduate study groups. Of particular note in this information is that white alumni in this survey group reported higher rates of completing graduate degrees compared with other racial groups.

TABLE 17.26

## Demographic Characteristics of Matched Alumni Survey Respondents by Various Postgraduation Graduate Groups

Percentage

	Race				Gender		Urbanity			
	AN	White	Other	NA	F	M	Urban	Semi-urban	Rural	Out-of-state
Never enrolled in grad program ( <i>n</i> = 48)	58.3	31.3	10.4	0.0	33.3	66.7	60.4	18.8	16.7	4.2
Ever enrolled in grad program ( <i>n</i> = 28)	67.9	25.0	7.1	0.0	46.4	53.6	75.0	3.6	17.9	3.6
Completed grad degree ( <i>n</i> = 9)	55.6	33.3	11.1	0.0	77.8	22.2	77.8	0.0	11.1	11.1
Continue to be enrolled in grad program ( <i>n</i> = 16)	75.0	18.8	6.3	0.0	37.5	62.5	75.0	6.3	18.8	0.0
Completed STEM or STEM-related grad degree ( <i>n</i> = 9)	55.6	33.3	11.1	0.0	77.8	22.2	77.8	0.0	11.1	11.1
Continue to be enrolled in STEM or STEM-related grad program ( <i>n</i> = 13)	69.2	23.1	7.7	0.0	38.5	61.5	69.2	7.7	23.1	0.0

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** *N* = 78 matched, full University Success respondents who responded affirmatively to a survey question regarding grad school enrollment. Grad = graduate.

## Overall Employment and STEM Employment

According to the national estimates presented in chapter 2, 8.8 percent of American Indian/Alaska Native and Native Hawaiian/Pacific Islander college graduates are employed in STEM professions.<sup>15</sup> According to the survey responses (Table 17.27), 98.5 percent of University Success full participant respondents reported being employed within a year after graduation. The vast majority were employed by STEM or STEM-related employers, in STEM or STEM-related occupations, and in their undergraduate field of study (the last at a slightly lower rate). See Appendix D for definitions of STEM and STEM-related occupations and industries.

TABLE 17.27

## Employment Rates within One Year after Graduation among Matched Alumni Survey Respondents

Percentage

	Matched survey respondents
Not employed since graduation <sup>a</sup>	1.5
Employed within 0–3 months of graduation	65.7
Employed within 4–12 months of graduation	26.9
Employed more than 1 year after graduation	6.0
Employed in undergrad field after graduation ( $n = 67$ )	77.6
Employed by STEM or STEM-related employer after graduation ( $n = 65$ )	85.1
Employed in STEM or STEM-related occupation after graduation ( $n = 66$ )	86.6
<b>Total (<math>n = 67</math>)</b>	<b>100.0</b>

**Source:** ANSEP alumni survey.

**Notes:**  $N = 67$  matched, full University Success respondents who responded affirmatively to a survey question regarding grad school enrollment except where noted otherwise.

<sup>a</sup> Excludes graduate study.

Tables 17.28 and 17.29 provide additional information about these first-year employment groups, with table 17.28 comparing the groups by mean semesters of full University Success participation, total semesters enrolled at UA, total semesters lapsed since the first enrolled semester at UA through graduation, and the semester at which the participant entered University Success during his or her undergraduate career. None of the differences between employment groups are statistically significant ( $p < .05$ ). Table 17.29 provides demographic information about this group of survey respondents, with the only notable differences being that Alaska Native respondents tended to be overrepresented among graduate respondents who were employed early (within three months of graduation) and in non-STEM employers and non-STEM occupations.

These rates of employment persist after the first year since graduation as well. Table 17.30 shows that 98.6 percent of University Success full participant respondents reported being employed most recently. The vast majority were also still employed by STEM or STEM-related employers and in STEM or STEM-related occupations, at rates slightly lower than in their first employment within the year after graduation.

TABLE 17.28

**Mean Semesters of Full University Success Participation, Tenure, and Duration for Various Post-Graduation (One Year After) Employment Groups, Matched Alumni Survey Respondents**

	Mean semesters of full University Success participation	Mean enrolled time to degree (tenure)	Mean total time to degree (duration)	Mean semester of University Success start <sup>a</sup>
Not employed since graduation ( <i>n</i> = 1)	10.0	10.0	14.0	1.0
Employed within 0–3 months of grad ( <i>n</i> = 44)	6.0	12.4	18.9	6.5
Employed within 4–12 months of grad ( <i>n</i> = 18)	5.7	12.9	20.0	5.9
Employed more than 1 year after grad ( <i>n</i> = 4)	9.0	17.3	23.3	3.8
Not employed by STEM or STEM-related employer after graduation ( <i>n</i> = 8)	6.3	15.0	22.1	5.6
Employed by STEM or STEM-related employer after graduation ( <i>n</i> = 57)	6.1	12.6	19.2	6.2
Not employed in STEM or STEM-related occupation after graduation ( <i>n</i> = 8)	7.1	14.8	19.9	5.0
Employed in STEM or STEM-related occupation after graduation ( <i>n</i> = 58)	5.9	12.6	19.4	6.3

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** *N* = 67 matched, full University Success respondents who responded affirmatively to a survey question regarding grad school enrollment. Grad = graduate.

<sup>a</sup> University Success start noted from point of first undergraduate enrollment.

TABLE 17.29

**Demographic Characteristics of Matched Alumni Survey Respondents**

*For various post-graduation (one year after) employment groups, percentage*

	Race				Gender		Urbanity			
	AN	White	Other	NA	F	M	Urban	Semi-urban	Rural	Out-of-state
Not employed since graduation (n = 1)	100.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	0.0	0.0
Employed within 0-3 months of graduate (n = 44)	68.2	22.7	9.1	0.0	31.8	68.2	72.7	11.4	15.9	0.0
Employed within 4-12 months of grad (n = 18)	50.0	38.9	11.1	0.0	50.0	50.0	55.6	16.7	16.7	11.1
Employed more than 1 year after grad (n = 4)	50.0	50.0	0.0	0.0	25.0	75.0	75.0	25.0	0.0	0.0
Not employed by STEM or STEM-related employer after graduation (n = 8)	62.5	37.5	0.0	0.0	37.5	62.5	62.5	0.0	25.0	12.5
Employed by STEM or STEM-related employer after graduation (n = 57)	63.2	26.3	10.5	0.0	35.1	64.9	70.2	15.8	12.3	1.8
Not employed in STEM or STEM-related occupation after graduation (n = 8)	87.5	12.5	0.0	0.0	50.0	50.0	75.0	0.0	25.0	0.0
Employed in STEM or STEM-related occupation after graduation (n = 58)	58.6	31.0	10.3	0.0	34.5	65.5	67.2	15.5	13.8	3.4

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** N= 67 matched, full University Success respondents who responded affirmatively to a survey question regarding grad school enrollment. Grad = graduate; AN = Alaska Native.

TABLE 17.30

### Most Recent Employment Rates among Matched Alumni Survey Respondents

Percentage

	Matched survey respondents
Not employed since graduation <sup>a</sup> ( <i>n</i> = 74)	1.4
Most recently employed by STEM or STEM-related employer ( <i>n</i> = 74)	78.4
Most recently employed in STEM or STEM-related occupation ( <i>n</i> = 71)	81.7

**Source:** ANSEP alumni survey.

**Notes:** *N* = 74 matched, full University Success respondents who responded affirmatively to survey questions regarding current employment.

<sup>a</sup> Excludes graduate study.

Tables 17.31 and 17.32 provide additional detail for this group of matched survey respondents based on their most recent STEM employment status. No statistically significant differences ( $p < .05$ ) are noted in the mean semesters of ANSEP participation reported by different employment groups in table 17.31.

TABLE 17.31

### Mean Semesters of Full University Success Participation, Tenure, and Duration for Various Most Recent Employment Groups

Matched alumni survey respondents	Mean semesters of full University Success participation	Mean enrolled time to degree (tenure)	Mean total time to degree (duration)	Mean semester of University Success start <sup>a</sup>
Not employed since graduation ( <i>n</i> = 1)	10.0	10.0	14.0	1.0
Not employed most recently by STEM or STEM-related employer ( <i>n</i> = 15)	5.8	12.1	18.1	5.5
Most recently employed by STEM or STEM-related employer ( <i>n</i> = 58)	6.0	12.8	19.3	6.3
Not employed most recently in STEM or STEM-related occupation ( <i>n</i> = 12)	7.4	13.0	17.8	4.6
Most recently employed in STEM or STEM-related occupation ( <i>n</i> = 58)	5.7	12.6	19.2	6.3

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** *N* = 74 matched, full ANSEP respondents who responded affirmatively to a survey question regarding grad school enrollment.

<sup>a</sup> ANSEP start noted from point of first undergraduate enrollment.

TABLE 17.32

## Demographic Characteristics of Matched Alumni Survey Respondents for Various Most Recent Employment Groups

Percentage

	Race				Gender		Urbanity			
	AN	White	Other	NA	F	M	Urban	Semi-urban	Rural	Out-of-state
Not employed since graduation ( <i>n</i> = 1)	100.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	0.0	0.0
Not employed most recently by STEM or STEM-related employer ( <i>n</i> = 15)	66.7	26.7	6.7	0.0	46.7	53.3	60.0	6.7	26.7	6.7
Most recently employed by STEM or STEM-related employer ( <i>n</i> = 58)	62.1	27.6	10.3	0.0	36.2	63.8	69.0	13.8	13.8	3.4
Not employed most recently in STEM or STEM-related occupation ( <i>n</i> = 12)	83.3	8.3	8.3	0.0	41.7	58.3	75.0	8.3	16.7	0.0
Most recently employed in STEM or STEM-related occupation ( <i>n</i> = 58)	60.3	29.3	10.3	0.0	36.2	63.8	67.2	13.8	15.5	3.4

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records

**Notes:** *N* = 74 matched, full University Success respondents who responded affirmatively to a survey question regarding grad school enrollment.

## Income

As estimated in chapter 2, the mean income within one year of graduation of American Indian/Alaska Native and Native Hawaiian/Pacific Islander college graduates across all STEM fields in 2008 was \$43,257, slightly lower than equivalent employees overall (\$48,055).<sup>16</sup> As shown in table 17.33, the majority of matched survey respondents reported that they made at least \$40,000 in their first year of employment, with 44 percent earning the median salary band of \$40,000 to \$59,000 (not in constant dollars) and 51 percent making \$60,000 or more.

TABLE 17.33

### Annual Income Grouping of Post-Graduation Employment (1 year after) among Matched Alumni Survey Respondents

Percentage

Income	Matched survey respondents
<\$40K	12.5
\$40–59K	43.8
\$60–79K	28.1
\$80–99K	14.1
\$100K or more	1.6

Source: ANSEP alumni survey.

For current or most recent employment, incomes range even higher, though this does not account for difference in the length of employment (for example, first-year employees versus those who have graduated and been in the workforce longer). Table 17.34 shows that 65.3 percent of graduates responding to the survey and matched to records have incomes over \$60,000 in their most recent employment; 25 percent earn the median salary band of \$60,000 to \$79,000; 24 percent earn between \$80,000 and \$99,000; and 17 percent earn \$100,000 or more.

TABLE 17.34

### Annual Income Grouping of Most Recent Employment among Matched Alumni Survey Respondents

Percentage

Income	Matched survey respondents
<\$40K	16.7
\$40–59K	18.1
\$60–79K	25.0
\$80–99K	23.6
\$100–119K	6.9
\$120–139K	2.8
\$140–159K	4.2
\$160K or more	2.8

Notes:  $N = 72$  matched, full ANSEP respondents who responded affirmatively to survey questions regarding postgraduation income.

Source: ANSEP alumni survey.

For both first-year income (table 17.35) and most recent income (table 17.36), additional tabulations were performed with regard to mean semesters of University Success participation, tenure, duration, and ANSEP entry point.<sup>17</sup> Few trends, if any, are noted across all of these measures; within both their first year of employment and their most recent employment, graduates at different levels of income had participated in ANSEP at different levels of intensity, had wide-ranging times to degree, and started in ANSEP at varying points in their undergraduate careers. This lack of a pattern could suggest that incomes are based primarily

on other factors, such as the specific STEM occupation chosen or the nature of the employer. Again, however, the overall range of incomes among University Success graduates appears comparable to if not higher than national estimates for the targeted racial groups.<sup>18</sup>

TABLE 17.35

**Length of Full University Success Participation, Tenure, and Duration for First-Year Income Groups among Matched Alumni Survey Respondents**

	Mean semesters of full University Success participation	Mean enrolled time to degree (tenure)	Mean total time to degree (duration)	Mean semester of University Success start <sup>a</sup>
<\$40K ( <i>n</i> = 8)	4.6	12.8	16.8	5.6
\$40–59K ( <i>n</i> = 28)	7.5	13.3	19.5	7.0
\$60–79K ( <i>n</i> = 18)	5.3	12.6	20.8	
\$80–99K ( <i>n</i> = 9)	4.7	12.3	20.2	6.0
\$100K+ ( <i>n</i> = 1)	3.0	8.0	11.0	

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** *N* = 64 matched, full ANSEP respondents who responded affirmatively to survey questions regarding postgraduation income.

<sup>a</sup> Measured from point of first University of Alaska enrollment.

TABLE 17.36

### Length of University Success Participation, Tenure, and Duration for Most Recent Income Groups among Matched Alumni Survey Respondents

	Mean semesters of full University Success participation	Mean enrolled time to degree (tenure)	Mean total time to degree (duration)	Mean semester of University Success start <sup>a</sup>
<\$40K ( <i>n</i> = 12)	4.8	11.4	15.3	5.6
\$40–59K ( <i>n</i> = 13)	5.9	14.2	20.9	7.2
\$60–79K ( <i>n</i> = 18)	6.9	12.4	19.1	4.9
\$80–99K ( <i>n</i> = 17)	6.2	12.5	19.4	6.6
\$100–119K ( <i>n</i> = 5)	5.4	12.2	21.8	6.0
\$120–139K ( <i>n</i> = 2)	5.0	14.0	20.5	6.5
\$140–159K ( <i>n</i> = 3)	2.3	10.7	15.7	8.3
\$160K or more ( <i>n</i> = 2)	9.5	14.0	21.0	5.0

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** *N* = 72 matched, full ANSEP respondents who responded affirmatively to survey questions regarding postgraduation income

<sup>a</sup> Measured from point of first University of Alaska enrollment.

## Institutional Outcomes

In addition to providing information on ANSEP participants' long-term outcomes, the alumni survey also provides information on other systemic outcomes on the institutions that ANSEP's model targets. In particular, the survey responses shed light on outcomes—and ANSEP's potential role in changing those outcomes—in three categories:

- The climate for Alaska Native students at UA
- The climate for Alaska Native professionals in STEM industries and occupations
- Former participants' involvement in ANSEP's alumni programming

### Climate for Alaska Natives at the University of Alaska

As discussed previously, the implementation study collected evidence on stakeholders' view of ANSEP's role in improving the climate for Alaska Native students at the University of Alaska. University stakeholders describe ANSEP as contributing positively to changes in the climate for Alaska Native students since the program's founding.

This insight was corroborated by current participants and by the alumni survey. Among respondents answering questions on campus climate, the majority reported slight or significant improvements to the overall supporting environment for Alaska Native students (70 percent of respondents), improved access to academic supports for Alaska Native students (72 percent), and improved access to career planning and employment supports for Alaska Native students (70 percent) while they were UA undergraduates (table 17.37). Moreover, the vast majority (75 percent) reported strongly agreeing with the statement: “ANSEP’s work led to improvement in the overall supporting environment for Alaska Native students at my university.”

TABLE 17.37

**Perceptions of Change in University of Alaska Climate for Alaska Native Students,**  
*Percentage of alumni responses*

Responses to questions “While I was an undergraduate student at UA,	Worsened (1)	(2)	Did not change (3)	(4)	Improved (5)	Do not know	Total
...the overall supporting environment for Alaska Native students at my university.”	0.0	0.0	8.5	31.5	47.7	12.3	100.0
...access to academic supports for Alaska Native students at my university.” <sup>a</sup>	0.0	0.0	12.4	25.6	47.3	14.7	100.0
...access to career planning and employment supports for Alaska Native students.”	0.0	0.8	13.8	27.7	42.3	15.4	100.0

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Note:** UA = University of Alaska. Includes only survey respondents who completed the questions. *N* = 130 except where noted.

<sup>a</sup> *N* = 129.

## Climate for Alaska Native STEM Professionals

Whereas ANSEP has played a key role in creating an environment and supports for Alaska Natives and other rural students on UA campuses, the STEM industries into which ANSEP’s graduates enter involve a much wider group of stakeholders and interests. As a consequence, change could be more difficult to perceive, especially if respondents may or may not have noticed a negative climate for Alaska Native employees originally. As detailed in table 17.38, 46 percent of respondents reported no change in the overall environment for Alaska Native employees within their place of employment, and 43 percent reported no change in career advancement opportunities, for Alaska Native employees within their employer. This compares with those who noted improvement of any magnitude in the overall environment for Alaska Native employees within their place of employment or change in career advancement

opportunities (28 and 30 percent, respectively), and those who did not know either way (26 and 27 percent, respectively).

TABLE 17.38

**Perceptions of Change in STEM Employers and Industry for Alaska Native Employees**  
*Percent of Alumni Responses*

Responses to questions beginning with: "Since I began working,	Worsened (1)	(2)	Did not change (3)	(4)	Improved (5)	Do not know	Total
the overall supporting environment for Alaska Native employees at my employer..." <sup>a</sup>	0.0	0.0	45.5	12.4	15.7	26.4	100.0
access to career advancement opportunities and employment supports for Alaska Native employees at my employer..." <sup>a</sup>	0.0	0.0	43.0	14.0	15.7	27.3	100.0
the overall supporting environment for Alaska Native employees in my industry in general..."	0.8	0.0	30.4	24.8	13.6	30.4	100.0
access to career advancement opportunities and employment supports for Alaska Native employees in my industry in general..."	0.0	0.8	24.8	26.4	14.4	33.6	100.0

**Source:** ANSEP alumni survey.

**Note:** Includes only survey respondents who completed the questions. *N* = 125 except where noted.

<sup>a</sup> *N* = 121.

However, respondents reported some improvement in both the overall environment (39 percent) and their opportunities within the broader industry in which they work (40 percent), in contrast with those conditions in their individual employers. These collective rates are higher than those reporting no change in overall environment or in their opportunities within the broader industry (30 and 25 percent, respectively) or not knowing either way (30 and 34 percent, respectively).

Only 36 percent agreed that ANSEP's work has led to improvement in the overall supporting environment for Alaska Native employees at their individual employer, and 36 percent agreed that ANSEP's work has led to improvement in the access to career advancement opportunities and employment supports for Alaska Native employees at their individual employer. In contrast, 60 percent of respondents agreed that ANSEP's work has led to improvement in the overall supporting environment for Alaska Native employees in their general industry, and 58 percent agreed that ANSEP's work has led to improvement in the access to career advancement opportunities and employment supports for Alaska Native employees in their general industry.

In sum, these differences suggest that respondents may believe ANSEP's effects are more pronounced in terms of changing perceptions across the STEM industries, as opposed to the climate at individual workplaces.

## **ANSEP Alumni Activity Participation**

Finally, involvement in ANSEP's activities devoted to alumni is also a long-term program objective. It both supports the growth of key inputs in the short term (for example, fundraising, employer partners, and participant mentors) and leads to longer-term institutional changes in the STEM employers and the industry at large, as well as institutional improvements at UA. In this category of alumni participation, survey data also provide some insight.

In response to a question about frequency of participation in alumni activities, only 41 percent of respondents reported having never participated, while 39 percent reported participating at least once a year. Because contact information for conducting the survey was provided by ANSEP staff, survey respondents are potentially more likely to be enthusiastic ANSEP supporters and, hence, more likely to be involved in ANSEP alumni activities than the overall ANSEP alumni population. When one takes this sampling bias into consideration, the rate of participation is likely lower.

The survey also asked about particular alumni participation for those respondents who reported participating at any point. Key rates from those inquiries include the following:

- Eighty-three percent attend the ANSEP annual banquet.
- Fifty-one percent make financial contributions or donations.
- Thirty-six percent recruit ANSEP students for internships or positions at their employer.
- Twenty-seven percent volunteer as an ANSEP instructor, recruiter, internship mentor, or other.
- Twenty-four percent report attending an ANSEP weekly meeting to present to ANSEP students.
- Nineteen percent report attending the ANSEP annual fishing trip.

## Summary

Across multiple outputs and outcomes, this study has demonstrated notable achievements by ANSEP's participants in STEM education. From the advancement of precollege component participants in coursework and in their preparation for college to the increased rates of enrollment and degree completion in its undergraduate and graduate components, ANSEP has served its participants well, by enabling predominantly Alaska Native students to pursue accomplishments that often exceed those of other underrepresented minority college students in STEM education across the United States.

The collective findings are borne out by the Urban Institute research team's analysis of data provided by ANSEP's administrators, UA's educational records, and a survey of alumni. However, a few of the disclaimers about the findings and their interpretation noted in this chapter bear repeating. The nonrepresentative sample of alumni who received the survey, responded, and consented to having their academic records matched to their responses was small. That sample was complicated by the fact that several had been only partial participants in University Success (that is, they had never received a substantial scholarship from the program though they may have benefited from some ANSEP activities).

A more important disclaimer is that the study's findings should be interpreted only as outcomes for ANSEP's participants, rather than ANSEP's impacts on those outcomes. No data were available for a comparison group against whose outcomes those of ANSEP's participants could be measured, and the formation of an appropriate comparison group may not be possible. Benchmarks from broader groups noted in UA's retention and attrition reports compensated for the lack of output information from a comparison group, and national estimates of educational achievement, employment, and income among American Indian/Alaska Native STEM graduates provided information against which ANSEP's outcomes could be contrasted.

The ability to study a comparison group is critical for understanding the impacts of the intervention, because they represent the counterfactual condition—that is, the state of activities, their outputs, and outcomes if there were no intervention. To address this issue, the alumni survey provides some insight: several questions asked alumni to hypothetically name their academic and professional achievements had they not participated in ANSEP. Responses were generally consistent with regard to respondents' belief that they still would have achieved their noted results independently. Of survey respondents, 85 percent reported that they would still have pursued a four-year degree had they not participated in ANSEP; of those, 88 percent reported that they would have pursued a degree in a STEM field, and 86 percent reported that they still would have completed a four-year degree. Of survey respondents who said they would have pursued a four-year degree, 85 percent reported that they would have done so at a UA campus.<sup>19</sup> These responses are retrospective, self-reported depictions of hypothetical conditions and should themselves be

interpreted with caution. However, their high rates suggest that many other factors influenced participants' educational paths.

# Chapter 18

## Conclusions

With the Alaska Native Science & Engineering Program (ANSEP) in a major expansion phase, drawing lessons from its first 19 years to help inform its future is important. This evaluation report examines the program in depth and offers an initial study of participant outcomes to explore whether and how ANSEP has been successful in achieving its goals for individual participants; the Alaska K–12 and university educational systems; and the state’s science, technology, engineering, and math (STEM) industries. The findings from the study, in turn, have implications for ANSEP’s current and future programming, in addition to providing insights for other minority STEM programs and other policy efforts that address college preparation and STEM workforce development.

The following implications are not formal recommendations. Rather, they are meant to illuminate the connections between information presented in this report and internal discussions of ANSEP’s operations and mission. The majority of information reviewed is from the findings that come directly from the implementation and outcomes studies conducted by the Urban Institute. That information is supplemented with evidence from the literature review of STEM minority programs, as well as with a discussion about the educational and employment context.

### Operational Implications

Several key findings from the report relate to ANSEP’s operations. These findings are particularly significant given the expected growth in current components and possible additions of new components. The following are the key implications of the findings.

#### Organization of the ANSEP Model

As noted throughout the report, ANSEP is not a static, easily replicable program, although individual components may potentially be replicated. It is a dynamic and evolving model that continues to adapt as the program expands to a wider range of STEM fields, to additional University of Alaska (UA) campuses, and earlier into K–12 education. As part of the evaluation, the Urban Institute team developed an ANSEP logic model to understand the complete picture of the ANSEP design and to communicate it to internal and external stakeholders. As new components are considered or revised, referring back to the logic model may

help ANSEP ensure that any proposed new or improved activities or components will help the overall program meet its long-term goals (see figure 1.1). This view of the model is particularly true as ANSEP expands beyond the university level.

## **Organization of Components**

Like the overall ANSEP model, individual components have also evolved and been revised frequently, including changes in selection requirements, activity and training design and scheduling, staffing strategy, and collaboration with partners. Operational tweaks and adjustments are necessary for any program. However, these need to be based on solid evidence and monitored to ensure that the components continue to meet goals and contribute to the overall ANSEP model.

## **Target setting and Participant Definitions**

Two areas of particular note are target setting and participant definitions. Component targets have largely been aspirational, with operational plans and fundraising developed to support the aspirations, as opposed to targets that are based on current operational capacity. Structured planning may align operations and aspiration more tightly. Further, consistent monitoring of participants' achievements in components beyond enrollment and completion may allow for targets that are also better matched to outputs and outcomes.

The consistent definition and enforcement of participation evolved through each component's history. On the whole, changes were based on sound observation and programmatic need. In the case of University Success, some flexibility in definitions has also allowed for increased recruitment (such as allowing participants to experience University Success supports before they receive scholarships) as well as retention (providing additional advising and academic counseling for current University Success participants who face personal or academic challenges). Flexibility in participation also means that non-ANSEP students at UA can access ANSEP services, facilities, and nonscholarship resources at different points in their undergraduate careers.

The need to refine participation and its enforcement could help in understanding the costs of administering the program, for example, the difference in costs per student between a University Success full participant and one with temporary status. The refinements will also be useful for monitoring the academic progress of all current and potential participants, and their later outcomes.

## Operations across Locations

The report notes the challenges associated with implementing the University Success program at Fairbanks and other UA campuses without the facilities and staffing resources provided at the Anchorage campus. One aspect of these differences is that the actual benefits from ANSEP services are realized differently at each campus. Operational considerations for growth and expansion may include addressing the differences in University Success services to ensure that activities and resources meant to produce the component's stated objectives are provided consistently. In other words, the component's intervention should be fully defined and realized. This adherence will benefit monitoring and evaluation efforts, along with benefiting the participants at all sites.

## Staffing

Two findings regarding ANSEP's staffing emerged in the evaluation. The first deals solely with leadership—namely, the charismatic leader in Herb Schroeder, whose personality is central to the program, and who has developed the program's visibility and connections to significant funding resources. Building the leadership capacity within the ANSEP team through current sustainability planning has been a key component in ensuring the long-term success of the program and should continue to be a priority activity as the program grows further.

Second, within the current staff ranks, continued growth in staff size and facilities will be needed to accommodate the expansion plans for the model. Plans to increase the number of participants in the components requires maintaining consistent supports to all participants and ensuring fidelity to the model. Along with adding staff to satisfy current staff roles, ANSEP may consider adding new functions, such as STEM curriculum experts, to better integrate the components within a comprehensive pedagogical model.

## Institutional Context

In funding, organization, and mission, ANSEP has walked on new terrain for UA since its start. As noted in the report, the climate for the program at UA has and generally continues to be tense because of the program's significant resources and unique status; however, that tension has improved as ANSEP has won support from key university leaders. Further collaboration with academic departments and administrative units through curricular coordination, fundraising strategies, information system integration, shared public communications plans, and academic advising services may be needed to improve relations but also will ensure program sustainability and institutionalization. In many of these areas, ANSEP has begun

coordination. These activities can be increased with the shared knowledge that ANSEP serves a unique constituency in the UA family whose needs require distinct strategies and consideration.

## **Management Systems**

Fragmented and inconsistently maintained data systems across all of ANSEP's years of existence have not allowed for consistent tracking of participants across cohorts in components. Improving management systems is necessary to better monitor participation eligibility as well as to assess individual components' impacts on outputs and outcomes. In this evaluation, for example, these issues posed a significant challenge. This gap will continue to make it difficult to track students who participate in the pipeline of components (a necessary task for evaluation of the multicomponent ANSEP model) and to compare ANSEP participants with appropriately defined peer groups. In combination with clearer definitions of participation, for example, these systems will allow for comparisons of University Success participants' outcomes with those of non-ANSEP UA students. With the major expansion of Middle School Academy and the expected growth of the other components to support the growing pipeline, ANSEP's development of systems that consistently track participants (and, potentially, applicants) and allow for better performance monitoring will be even more important.

## **Pipeline Evaluation**

With the wide range of components that are now in place, reaching across primary-, secondary-, college-, and graduate-level education, ANSEP has developed a pipeline that will continue to serve a wide group of Alaska's students. However, the flow of students in the full pipeline has only begun. The evaluation described in this report focused on the activities and outputs of individual components (and the outcomes only of University Success) rather than the continuous pipeline because of the relatively recent establishment of the precollege components. Future operations should consider revisiting evaluation activities to better understand the pipeline's effectiveness. With the integration of management system improvements and the establishment of participant definitions, future evaluations may involve even more rigorous quasi-experimental research designs.

# Mission Implications

The evaluation and its findings also speak to five key themes related to ANSEP's overall mission to improve the educational and employment outcomes for Alaska Natives in STEM fields and ANSEP's fundamental strategies for accomplishing that mission.

## STEM

An obvious characteristic of ANSEP is its focus on STEM and STEM-related disciplines and occupations. Operationally, this focus has been realized with regard to not only participants and their coursework and selection of majors and but also STEM industry partners and their involvement. For the former, the evaluation found some differences in the types of services provided to certain STEM majors (specifically, engineers and technology majors) in relation to others (life and physical sciences and math majors). Additional consideration of the needs of participants in all STEM disciplines that are presented in this evaluation could help in identifying additional courses, internships, and mentors for the program.

With regard to industry partners, ANSEP has generally put forth an employer-centered model built on a wide range of partnerships with STEM organizations in the private and public sector. Those partners are important funders and also provide internships and other career exposure to link participants to STEM employment. These relationships make the program highly dependent on the strength of the specific industries in question. As with other workforce-related programs in the United States at both the technical training and college levels, ANSEP may be well served by regularly performing market assessments of STEM fields in Alaska to anticipate new fields (and potential new partnerships) while deemphasizing others whose employment potential may be waning. In some cases, this search may extend beyond traditional STEM fields as currently defined by the program should future market assessments dictate.

## Alaska Natives

At its core and in its name, ANSEP has targeted Alaska Native students in the state of Alaska. Although data were not available for Alaska Natives at UA before ANSEP's creation, stakeholders note that ANSEP's focus coincides with improved enrollment and retention of Alaska Native students. ANSEP is also believed to have improved the overall climate for Alaska Native students and UA's attention to this population.

Although ANSEP targets its recruitment to underrepresented groups in Alaska's STEM workforce, its programming is open to all students. This openness has been applauded by some ANSEP participants and other stakeholders, but it has been questioned by others who feel that the focus should continue to be only

on Alaska Natives. The evaluation does not make recommendations or offer conclusive findings that would support limiting or fully opening access to ANSEP's services and benefits. However, the review of the current conditions of Alaska Native youth provided in the report demonstrates an ongoing need to target this specific racial group. ANSEP may consider monitoring changes in the overall state population and the Alaska Native student population to continuously assess that need.

## Achievement Eligibility

ANSEP rewards students who are high achieving relative to their geographic and racial group cohorts, particularly in the precollege components. Rigorous academic standards drive eligibility and ongoing participation, leading to the perception of ANSEP as an honors program that leaves behind lower-performing students at almost all component levels. However, the evaluation found that many University Success participants, in particular those who have not participated in ANSEP precollege components, may suffer from academic and personal barriers to their degrees. Further, some ANSEP participants still do not meet academic goals or fail to continue to subsequent components. ANSEP may need to address this concern more directly as the program expands to include students with a wider range of achievement levels.

The literature review notes that many STEM preparation programs for underrepresented minority groups are conceptually designed as honors programs, but the programs ultimately also provide services for students who may not be as high performing as current ANSEP participants because of the philosophical mission of those programs to serve that population. Thus, ANSEP may seek to better understand the factors that may influence poorer outcomes for some students and consider how to deploy resources or influence public policy (in the case of the K-12 system) to better support their success. Matching services to individual needs may help ANSEP bring along all its target students to contribute to the program's goals.

## Educational Level

ANSEP started at the college level with its University Success component and has since expanded to the precollege and graduate levels. However, ANSEP is still institutionally placed within UA, with that institution's mission of providing college-level student education and outcomes. As the evaluation notes, ANSEP's approach offers important lessons for other STEM education programs for underrepresented minorities, *especially* in its engagement of students from middle school to graduate school. ANSEP has begun to address these differences with an institutional focus by coordinating with external partners, such as school districts across the state, funders, and government officials working at other educational levels. Because the administrative structure of Alaska's educational governance and funding varies by educational

level, ANSEP may explore alternatives to its current placement at the UA to address the various contexts through which its pipeline flows while ensuring continuity and connection throughout the pipeline.

## **Pedagogy**

As noted in this report, ANSEP combines academic and experiential learning with a wide range of supports, including all the key elements that have been identified in previous literature as valuable components of successful STEM enrichment programs. However, two areas in which ANSEP has not fully ventured are linking its pipeline pedagogically and proposing curricular reforms at the college level as other interventions have accomplished. Though ANSEP is organized as a multistage educational model—from middle school to postsecondary education and into the workforce—the various components are generally discrete and autonomous with regard to a comprehensive curriculum. To that end, current efforts by ANSEP to develop an advisory group will help better integrate curricula across components and incorporate employer perspectives, particularly in the precollege components.

With regard to curricular reform at the college level, ANSEP has used extracurricular activities as supplements to traditional college courses, but to date, it has not altered the nature of those courses. ANSEP borrows from the educational foundations laid by pioneers such as Raymond B. Landis, who argue for a different way of integrating underrepresented minorities—through curricular changes directly in STEM coursework—in addition to allocating more resources for integrating them. ANSEP may seek to develop parallel courses in coordination with UA to serve its University Success participants, particularly those who are not among the highest achievers.

# Appendix A

## Data and Methods

### Program Data

Program data included internal administrative records from administration at the University of Alaska Anchorage (UAA) and University of Alaska Fairbanks (UAF) that tracked detailed participation and outcomes information for participants in each component, including participation in weekly recitations and meetings, as well as scholarships for University Success participants. Staff of the Alaska Native Science & Engineering Program (ANSEP) also ran enrollment, registration, grade, graduation, and demographic reports on all participants using the Banner software system of the University of Alaska (UA) to capture more detailed enrollment information. Urban Institute researchers worked with ANSEP administrators to identify all potential sources of information and clarify missing data when possible. Data were collected from ANSEP's UAA and UAF staff over a period of several months.

The Urban Institute research team linked all data sources, including more than 140 administrative datasets and Banner reports, to identify full participants, match individual student records across multiple components, and compute outcomes. Wherever possible, researchers worked to verify ANSEP's internal administrative records with Banner records. When data were not fully available, researchers made reasonable assumptions based on their knowledge of ANSEP's programs, interviews with ANSEP staff, and other data sources, or they eliminated from parts of the analysis the students for whom full information was unavailable. For example, participant data before the mid-2000s were less detailed than in later years, so in some cases, students from earlier years are not included in specific tables and calculations, as noted.

Because of the mixed nature of ANSEP's participant data and record keeping since the program's start, the Urban Institute team could analyze only the data that the program and UA records provided. A later task in the evaluation will involve recommending information systems for future component reporting to help ensure the reliability of the data collected.

### Secondary Data

To provide context for ANSEP participants' outcomes, researchers pulled education and employment outcomes for STEM majors from the restricted-access files of the US Department of Education, National

Center for Education Statistics (2011a, 2011b), specifically the *2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09)* and the *2008–09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): First Look*. Tabulations were provided by Hal Salzman and David Hersh, from Rutgers University. These data are limited in terms of their sample size, in particular within ethnic groups, and so individual statistics may not be reliable, but they suggest overall patterns that are suggestive of group-level trends in education and employment.

As noted in the report, additional benchmarking data came from the US Department of Labor’s Bureau of Labor Statistics, with regard to occupational and employment rates, and the US Census Bureau’s American Community Survey (ACS) 2013 data for general demographic data and some occupational data. ACS one-year estimates are used primarily, except where information at the statistical area–level in Alaska was needed (in which case three- or five-year estimates were used). All tables and figures note specific data sources.

## Interviews and Focus Groups

Researchers conducted individual and group interviews with 81 individuals—54 individual interviews and 14 group interviews. Some interviewees were referred by ANSEP staff, who identified key stakeholders and partners.

Researchers interviewed all permanent ANSEP staff members at UAA and UAF, as well as some temporary summer staff members. The University of Alaska Southeast program in Juneau was not included in qualitative data collection. Eleven staff members were interviewed individually, and four were interviewed in pairs. Five key staff members were interviewed twice. Topics for these interviews varied on the basis of a respondent’s role, but they included typical work responsibilities, program goals, details of and views on program operations, and evolution of the program. Staff interviews lasted from 30 to 90 minutes, and all but one were conducted in person.

Researchers also interviewed ANSEP partners and nonpartner stakeholders at UAA, UAF, and in UA central administration. These individuals included administration staff for the UA system, administration staff for each campus and at individual schools and departments, STEM faculty members, and administration staff for other Native student services. Eighteen respondents were interviewed individually, and eight were interviewed in pairs. Interviews covered the context at the university in general, in particular for STEM fields and for Alaska Natives, as well as the STEM employment context. Interviews also included questions about interactions with ANSEP and ANSEP participants. Interviews lasted from 30 to 60 minutes, and all but six were conducted in person.

The team also conducted interviews with employer partners in STEM industry engineering and science fields in Anchorage and Bethel. These interviews included some volunteer instructors, internship mentors, ANSEP alumni, ANSEP parents, or others involved in organizational partnerships with ANSEP in other ways. Six respondents were interviewed individually, and four were interviewed in pairs.

Interviews were also conducted with teachers and administrators in two partner public school districts, Matanuska-Susitna Borough in suburban Anchorage and Lower Kuskokwim in and around Bethel. Seven respondents were interviewed individually and 14 in groups of two to four. One interview was by phone. Interviews focused on interaction with ANSEP, the context of STEM education in rural public schools, and the role and effect of ANSEP on students there. Eight individual stakeholders in Bethel and nearby villages who did not work in the public school system also were interviewed, six individually and two together. Many of these were also parents of ANSEP participants.

Urban researchers conducted focus groups with participants from each of the components: two with Middle School Academy participants (April), two with STEM Career Explorations participants (June), two with Acceleration Academy participants, and two with Summer Bridge participants (June). Two focus groups were conducted with UAF University Success participants (September) and four with UAA University Success participants (September and April). The two UAA University Success focus groups in April were with freshmen who had participated in a focus group at the start of their academic year in September; at the April focus group, they reflected on their first year at college. Focus groups addressed participants' backgrounds, the way they heard about ANSEP and their experiences in the application process, their reflections on different ANSEP activities and the way those activities influenced their development, their experiences with other programs and services, and their educational and career plans and aspirations. Focus groups generally included 10 to 12 individuals. For the middle school participants, focus groups lasted 60 minutes and were split by gender. High school participant focus groups lasted 60 minutes and were split between participants with previous ANSEP experience and those without. For the university participants, focus groups lasted 90 minutes and were split between freshmen and upperclassmen. ANSEP staff recruited focus group participants.

## Observations

Research staff also observed activities for each of the ANSEP components, including UAA and UAF University Success weekly meetings and UAA recitation sessions in September; Computer Assembly and small-group modules during a Middle School Academy in April; and classes and activities during STEM Career Explorations, Acceleration Academy, and Summer Bridge in June. Researchers recorded notes on

activities, including the material covered and the match with ANSEP component goals, the techniques used, the tone and approach, and participant engagement.

## Alumni Survey

To supplement administrative records and collect additional information on long-term outcomes, as well as perceptions of the program, researchers sent an online survey to all University Success alumni who had valid e-mail addresses, using contact information provided by ANSEP staff. (ANSEP staff conducted additional research to identify updated contact information for many respondents.) Researchers sent e-mail reminders and contacted respondents by phone to encourage survey completion. The survey took 40 minutes to complete and covered eight major areas or themes: (1) basic information about ANSEP participation, (2) K-12 educational history, (3) university educational history, (4) reflections on ANSEP University Success, (5) post-bachelor's degree educational history, (6) employment history, (7) community engagement and leadership, and (8) demographics.

According to ANSEP records, a total of 227 University Success participants have graduated from UA, 177 of whom were full participants (that is, they received at least a full ANSEP scholarship of \$1,000 or more at some point in their undergraduate career) and another 50 who never received full scholarships but were involved in ANSEP activities (partial participants).

ANSEP provided current contact information for 216 alumni. Of this group, 142 individuals responded during the online survey open period, for a final response rate of 65.7 percent (one response was dropped from the sample because it appeared to have been collected in error). Of the respondents, 105 consented to linking their Banner data to their survey responses. After linking the data, researchers determined that 78 of the 105 consenting respondents had been University Success full participants, 12 had been partial participants, and another 14 were not in ANSEP's scholarship records. Because of an inability to determine reasons for nonresponse, a nonresponse analysis was not feasible and the data presented here are not weighted. Table A.1 provides a breakdown from ANSEP records of the University Success graduating and current students, by full and partial status, since the component's start, in comparison with the alumni survey responses.

TABLE A.1

**Participation Rates in the Populations and Study Samples of University Success Participants and Alumni Survey Respondents**

	University Success participants	Currently enrolled or never graduated	Graduated (BS/BA)	Alumni survey respondents	Consenting alumni survey respondents
Source	<i>Administrative data and Banner</i>	<i>Administrative data and Banner</i>		<i>Survey</i>	<i>Survey matched to Banner</i>
Full University Success participants (> \$1000 scholarship in at least one semester)	470	293	177	NA	78
Not full University Success participants (But received some scholarship < \$1000)	76	26	50	NA	12
Non-University Success participants (No scholarship)	NA	0	0	1	14
<b>Total</b>	<b>546</b>	<b>319</b>	<b>227</b>	<b>142</b>	<b>105</b>

**Source:** ANSEP alumni survey, ANSEP administrative records, and University of Alaska Banner records.

**Notes:** BS = bachelor of science; BA = bachelor of arts; NA = not applicable.

## Analytical Variables

Using Banner and ANSEP administrative data, the Urban Institute research team compiled a list of key variables for analysis after matching and deidentifying participants per Institutional Review Board requirements. These are presented in table A.2.

Using responses from the alumni survey, researchers constructed additional variables for the primary outcomes of interest related to (1) graduate degree or enrollment in a STEM field after UA graduation; (2) employment within the first year after graduation and most recent employment, including STEM status; and (3) annual income in the first year after graduation and most recent employment, as shown in table A.3. Incomes were reported in the alumni survey by numeric categories rather than values, thereby limiting specific analysis, such as means.

TABLE A.2

## Output Variables of Interest

Variable	Description
id	Randomized ID (linked to alumni survey)
ethnic	Ethnicity category (Alaska Native, Native American [non-AK], White, Other, Not Available)
gender	Gender
rural_urban	Urbanity (by zip code)
aca_participant	Participated in Acceleration Academy
sb_participant	Participated in Summer Bridge
gs_participant	Participated in Graduate Success
us_participant	Received University Success scholarship of at least \$1000 at least once during undergraduate
anyscholarship	Received at least one scholarship of any amount while in undergraduate
campus	Current or graduating campus
entrypoint_us	Semester of first University Success scholarship (of \$1000 or more) within a participant's undergraduate career
semesters_us	Number of semesters of University Success scholarship receipt (of \$1000 or more)
num_scholarships	Number of semesters of University Success scholarship receipt (of any amount)
grad_status	Graduate (bachelor's degree) or not graduated
undergrad_tenure	Number of semesters enrolled in undergrad (until degree or most current semester)
undergrad_duration	Number of semesters from first semester enrolled in undergrad to present or graduating semester
intern	Received ANSEP internship in University Success
intern_org	Internship placement
meeting_percent	Average percent of meetings attended during semesters of scholarship receipt
meeting_attend	Categories of meeting attendance
scholarship_total	Total scholarship amount received (includes all scholarship amounts from any semester)
scholarship_avg	Average scholarship amount received per semester of scholarship receipt (includes all scholarships from any semester)
initial_major	Major at enrollment
final_major	Current major or major at graduation
initial_degreetype	STEM degree type
final_degreetype	STEM degree type

**Note:** STEM = science, technology, engineering, and math.

TABLE A.3

### Outcomes of Interest

Variable	Definition
grad_study	Graduate degree or enrollment in STEM field
employ_STEM	Current employment in STEM field
Income_current	Current or most recent annual income (in range)

**Note:** STEM = science, technology, engineering, and math.

## Documents and Materials

ANSEP staff also shared financial records, as well as survey results, individual written reflections from 2014 session participants, and miscellaneous internal records, such as sample interview notes. Researchers also collected internal documents, such as student contracts, and analyzed promotional materials shared and available on the ANSEP website.

# Appendix B

## Detailed Context Tables and Figures

TABLE B.1

## Industrial Composition of Alaska's GDP, 1997–2013 (% contribution of total GDP)

Industry	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Agriculture, forestry, fishing, and hunting	1.5	1.3	1.3	1.4	1.1	0.9	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7
Mining	22.0	13.5	13.2	16.7	14.1	15.4	16.4	20.4	25.9	30.8	33.5	37.0	28.7	29.2	32.0	31.0	29.5
Utilities	1.6	1.6	1.7	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.0	1.2	1.3	1.3	1.2	1.3
Construction	4.4	4.9	5.0	4.8	4.9	5.2	5.4	5.4	5.2	4.6	4.3	3.8	4.3	4.0	3.6	3.9	4.0
Manufacturing	3.5	4.8	3.7	3.2	3.4	3.2	3.6	3.6	3.3	3.2	3.3	3.2	3.7	3.0	2.7	2.8	3.0
Wholesale trade	2.7	3.0	3.0	2.8	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.0	2.1	2.1	1.9	1.9	2.1
Retail trade	4.9	5.5	5.5	5.2	5.1	5.3	5.2	4.8	4.5	4.1	3.8	3.4	3.9	3.7	3.4	3.5	3.5
Transportation and warehousing	11.4	12.3	12.2	11.3	15.4	10.9	10.6	10.2	8.8	8.5	8.7	8.9	9.0	10.1	10.4	10.7	10.9
Information	2.5	2.8	2.8	2.8	2.5	2.6	2.5	2.5	2.3	2.0	1.8	1.8	1.9	1.7	1.7	1.7	1.7
Finance, insurance, real estate, rental, and leasing	11.3	12.6	13.2	12.9	12.7	13.4	13.3	11.9	11.5	10.3	9.7	9.2	10.8	11.1	10.5	10.4	10.4
Professional and business services	5.3	5.8	5.9	5.7	5.7	6.1	5.7	5.5	5.3	5.0	5.0	5.1	5.8	5.7	5.6	5.8	6.2
Educational services, health care, and social assistance	4.0	4.5	4.7	4.8	5.3	5.7	5.8	5.8	5.4	5.1	4.8	4.6	5.5	5.5	5.4	5.6	5.8
Arts, entertainment, recreation, accommodation, and food services	2.7	3.0	3.3	3.3	3.2	3.4	3.3	3.2	3.0	2.8	2.6	2.4	2.5	2.5	2.4	2.5	2.6
Other services, except government	2.1	2.4	2.4	2.4	2.1	2.3	2.1	1.9	1.7	1.6	1.4	1.3	1.5	1.4	1.3	1.3	1.4
Government	20.2	22.1	22.0	21.1	20.6	21.7	21.5	20.4	19.1	17.9	17.1	15.9	18.4	18.0	17.1	17.2	17.1

Source: US Department of Commerce, Bureau of Economic Analysis, Regional Data.

Note: GDP = gross domestic product.

TABLE B.2

## Alaska Civilian Employed Population by Gender and American Indian/Alaska Native Population, 2013

Occupational group	Male			Female			Alaska Native			Alaska Native male			Alaska Native female		
	Total Alaskan	Total no.	% of occupation	Total no.	% of occupation	Total no.	% of occupation	% of Alaska Native population	Total no.	% of Alaska Native	% of total occupation	Total no.	% of Alaska Native	% of total	
<b>Total</b>	348,862	186,174	53.4	162,688	46.6	34,558	9.9	100.0	16,227	47.0	4.7	18,331	53.0	5.3	
<b>Management, business</b>	125,667	58,103	46.2	67,564	53.8	8,899	7.1	25.8	3,226	36.3	2.6	5,673	63.7	4.5	
<b>Computer, engineering, and science</b>	19,921	15,112	75.9	4,809	24.1	1,109	5.6	3.2	930	83.9	4.7	179	16.1	0.9	
<b>Computer and mathematical</b>	5,391	4,146	76.9	1,245	23.1	501	9.3	1.4	400	79.8	7.4	101	20.2	1.9	
Computer	5,014	3,947	78.7	1,067	21.3										
Computer and information	659	506	76.8	153	23.2										
Software developers and programmers	1,403	876	62.4	527	37.6										
Database and systems administrators	767	636	82.9	131	17.1										
Miscellaneous computer	2,185	1,929	88.3	256	11.7										
Mathematical science	377	199	52.8	178	47.2										
<b>Architecture and engineering</b>	8,582	7,064	82.3	1,518	17.7	430	5.0	1.2	412	95.8	4.8	18	4.2	0.2	
Architects, surveyors, and cartographers	892	780	87.4	112	12.6										
Engineers	5,347	4,290	80.2	1,057	19.8										
Drafters, engineering, and map technicians	2,343	1,994	85.1	349	14.9										

TABLE B.2 CONTINUED

Occupational group	Total Alaskan	Male		Female		Alaska Native			Alaska Native male			Alaska Native female		
		Total no.	% of occupation	Total no.	% of occupation	Total no.	% of occupation	% of Alaska Native population	Total no.	% of Alaska Native	% of total occupation	Total no.	% of Alaska Native	% of total
<b>Life, physical, and social science</b>	5,948	3,902	65.6	2,046	34.4	178	3.0	0.5	118	66.3	2.0	60	33.7	1.0
Life and physical scientists	3,381	2,273	67.2	1,108	32.8									
Life, physical, and social science technicians	1,386	944	68.1	442	31.9									
<b>Education, legal, service, and arts</b>	37,727	12,229	32.4	25,498	67.6									
<b>Health care practitioners and technical occupations</b>	18,207	4,550	25.0	13,657	75.0	429	2.4	1.2	10	2.3	0.1	419	97.7	2.3
<b>Service</b>	61,216	28,824	47.1	32,392	52.9	8,598	14.0	24.9	3,272	38.1	5.3	5,326	61.9	8.7
<b>Sales and office</b>	80,747	26,998	33.4	53,749	66.6	9,598	11.9	27.8	2,898	30.2	3.6	6,700	69.8	8.3
<b>Natural resources</b>	42,789	40,853	95.5	1,936	4.5	4,820	11.3	13.9	4,639	96.2	10.8	181	3.8	0.4
<b>Farming, fishing, and forestry</b>	3,724	3,368	90.4	356	9.6	745	20.0	2.2	691	92.8	18.6	54	7.2	1.5
<b>Construction and extraction</b>	24,162	23,072	95.5	1,090	4.5	2,743	11.4	7.9	2,616	95.4	10.8	127	4.6	0.5
<b>Installation, maintenance, and repair</b>	14,903	14,413	96.7	490	3.3	1,332	8.9	3.9	1,332	100.0	8.9	0	0.0	0.0
<b>Production, transportation, and material moving</b>	38,443	31,396	81.7	7,047	18.3	2,643	6.9	7.6	2,192	82.9	5.7	451	17.1	1.2

Source: 2013 American Community Survey one-year estimates.

Note: No. = number. Detailed information by sub-field is not available for Alaska Natives specifically.

TABLE B.3

## Median Household Income and Population for Total Population and Alaska Native Population by Alaska Census Region, 2008–12

Census borough or area	Median household income in past 12 months	Alaska Native median household income in past 12 months	Difference in median	% of households receiving cash public assistance or food stamps/ SNAP	% of population below poverty level	Total population	Alaska Native population	Alaska Native % of total population	Alaska Native % of population below poverty level
<b>Urban</b>									
Juneau City	78,947	51,733	27,214	9.7	6.3	31,636	3,560	11.3	37.6
Anchorage Municipality	76,495	50,095	26,400	11.5	7.6	291,470	19,326	6.6	13.1
Matanuska-Susitna	70,728	56,313	14,415	13.2	9.7	89,319	4,273	4.8	6.6
Fairbanks North Star	69,485	47,708	21,777	8	7.7	97,523	6,458	6.6	13.1
<b>Semi-Urban</b>									
North Slope	76,679	64,828	11,851	15.6	12.4	9,317	4,929	52.9	68.7
Kodiak Island	70,976	50,429	20,547	9.4	11.2	13,710	2,123	15.5	30.6
Valdez-Cordova	67,421	44,390	23,031	9	6.8	9,614	1,454	15.1	33.6
Sitka City	66,895	35,912	30,983	14	7.2	8,909	1,544	17.3	33.8
Ketchikan Gateway	59,736	46,743	12,993	14.4	9.9	13,525	1,824	13.5	22.9
Kenai Peninsula	59,421	43,793	15,628	10.8	8.9	55,474	4,453	8	13.9
Bethel	52,349	41,549	10,800	41.2	21.4	17,184	14,031	81.7	90.1
Nome	51,472	35,625	15,847	31.2	25.7	9,580	6,884	71.9	92.9

TABLE B.3 CONTINUED

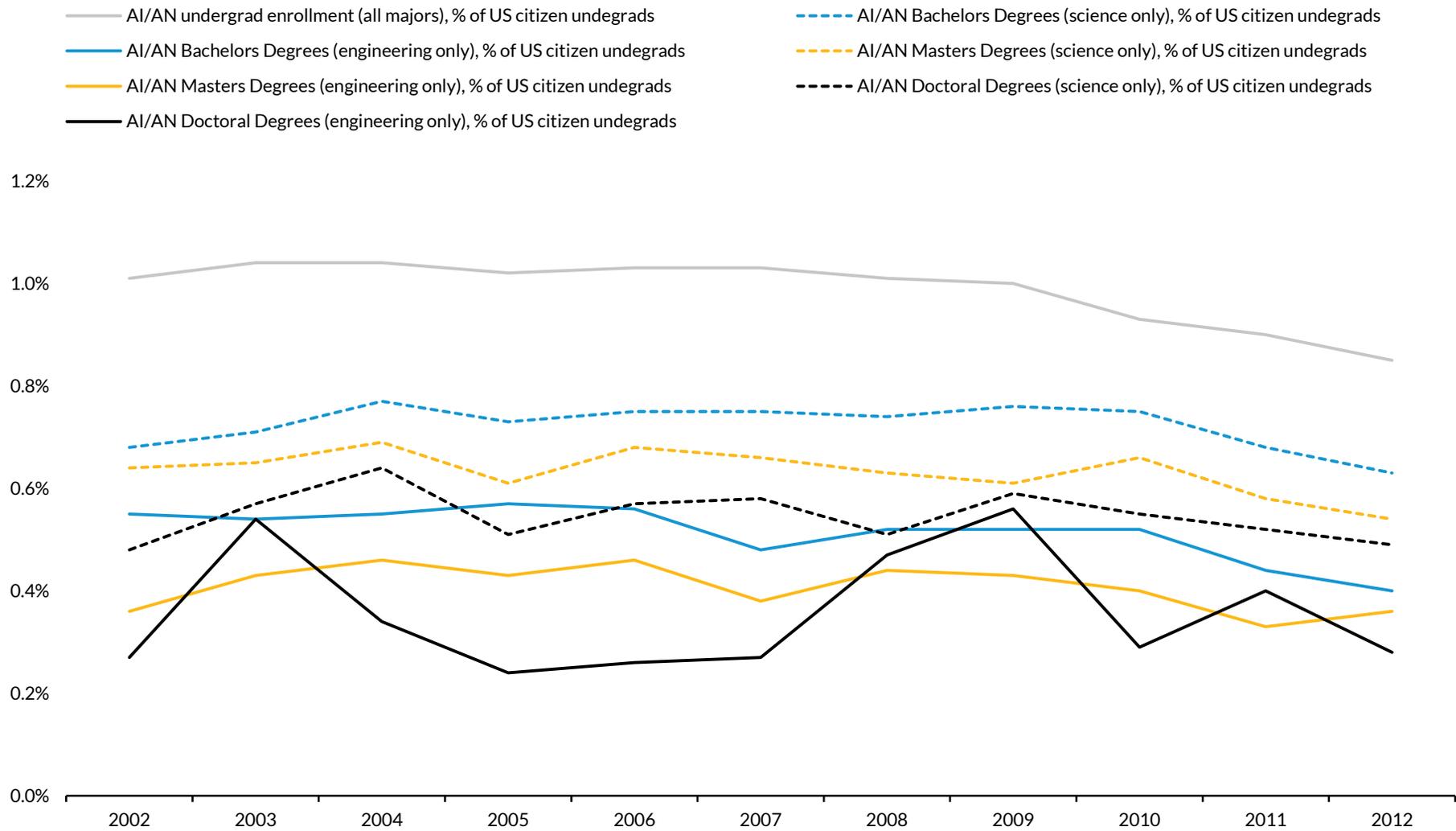
Census borough or area	Median household income in past 12 months	Alaska Native median household income in past 12 months	Difference in median	% of households receiving cash public assistance or food stamps/ SNAP	% of population below poverty level	Total population	Alaska Native population	Alaska Native % of total population	Alaska Native % of population below poverty level
<b>Rural</b>									
Bristol Bay	79,931	56,875	23,056	5.1	6.1	929	288	31	73.7
Aleutians West	77,292	42,344	34,948	8.5	9.9	5,507	837	15.2	23.6
Denali	74,044	49,375	24,669	5.9	9.7	1,917	75	3.9	14
Yakutat City	71,705	59,063	12,642	13.9	3.3	644	283	43.9	57.1
Skagway	71,583	71,563	20	0	4.8	1,050	17	1.6	0
Southeast Fairbanks	62,712	42,857	19,855	12	9.7	7,039	735	10.4	19
Petersburg	61,696	40,556	21,140	10.2	11.5	3,822	470	12.3	18.7
Northwest Arctic	60,870	52,634	8,236	34.7	18.9	7,601	6,146	80.9	88.6
Aleutians East	58,125	49,375	8,750	10.9	16.4	3,114	570	18.3	16.6
Dillingham	56,857	45,063	11,794	25.6	17.8	4,887	3,381	69.2	84.8
Haines	50,208	43,641	6,567	9.7	6.4	2,500	183	7.3	19.5
Lake and Peninsula	49,808	33,281	16,527	15.4	23.1	1,551	987	63.6	75.7
Hoonah-Angoon	48,942	26,830	22,112	19.8	13.7	2,153	767	35.6	58.1
Wrangell City	47,348	33,857	13,491	17.1	7.5	2,368	335	14.1	16.3
Prince of Wales-Hyder	45,774	43,654	2,120	24.4	13	5,603	2,311	41.2	42
Wade Hampton	40,608	37,979	2,629	58.5	29.5	7,556	6,843	90.6	94.9
Yukon-Koyukuk	35,559	28,289	7,270	36.1	22.8	5,637	3,889	69	74.8

**Source:** 2013 American Community Survey 2008–2012 five-year estimates.

**Note:** In order of highest median income for total population, areas above line are above Alaska median household income. Earlier estimates used to increase rural sample size, 2012 inflation-adjusted dollars. SNAP = Supplemental Nutrition Assistance Program.

FIGURE B.1

AI/AN Percentage of US Citizen Students by Post-Secondary Educational Attainment Rates, 2002-2012



Source: National Science Foundation, National Center for Science and Engineering Statistics, Special tabulations of US Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey and Completions Surveys.

# Appendix C

## Definition of STEM Majors Used in Outcomes Chapter

TABLE C.1

University Success STEM Majors at Admission and Graduation

Science	Technology	Engineering	Math	Health
■ Applied Physics	■ Aviation	■ Civil Engineering	■ Mathe-matics	■ Health Sciences
■ Biological Sciences	■ Technology	■ Computer Engineering	■ Premajor	■ Nursing Science
■ Biology	■ Computer Science	■ Electrical Engineering	■ Mathe-matics	■ Nutrition
■ Chemistry	■ Construction	■ Engineering		■ Premajor Health Science
■ Earth Science	■ Management	■ Geological Engineering		■ Premajor Nursing Science
■ Fisheries	■ Geography	■ Mechanical Electrical Engineering Consortium		
■ General Science	■ Environmental Studies	■ Mechanical Engineering		
■ Geological Science	■ Geomatics	■ Mining Engineering		
■ Geology	■ Medical Technology	■ Petroleum Engineering		
■ Geoscience	■ Premajor Technology	■ Premajor Civil Engineering		
■ Marine Biology	■ Premajor Computer Science	■ Premajor Computer Engineering		
■ Natural Sciences	■ Technology	■ Premajor Electrical Engineering		
■ Physics		■ Premajor Mechanical Engineering		
■ Premajor Fisheries		■ Premajor Mining Engineering		
■ Premajor Marine Biology		■ Premajor Petroleum Engineering		
■ Premajor Wildlife Biology and Conservation				
■ Wildlife Biology and Conservation				
■ Wildlife Biology				

**Note:** The table includes University of Alaska majors of the Alaska Native Science & Engineering Program (ANSEP) participants as categorized into the four science, technology, engineering, and math (STEM) categories plus health majors. This table is not a comprehensive list of STEM majors of ANSEP participants but rather is a list of relevant majors at admission to the University of Alaska and at graduation.

# Appendix D

## Definition of Graduate Degree and Employment Categories Used in Outcomes Chapter

TABLE D.1

## Graduate Degree Program Categories (from Alumni Survey)

STEM	STEM-related	Not STEM
<ul style="list-style-type: none"> <li>■ Applied Environmental Science and Technology</li> <li>■ Arctic Engineering</li> <li>■ Atmospheric Sciences</li> <li>■ Biochemistry and Molecular Biology</li> <li>■ Biology or Biological Sciences</li> <li>■ Chemistry</li> <li>■ Civil Engineering</li> <li>■ Computer Science</li> <li>■ Electrical Engineering</li> <li>■ Engineering Management</li> <li>■ Environmental Chemistry</li> <li>■ Environmental Engineering</li> <li>■ Environmental Quality Science</li> <li>■ Fisheries</li> <li>■ Geological Engineering</li> <li>■ Geology</li> <li>■ Geophysics</li> <li>■ Marine Biology</li> <li>■ Mathematics</li> <li>■ Mechanical Engineering</li> <li>■ Mineral Preparation Engineering</li> <li>■ Mining Engineering</li> <li>■ Natural Resources Management</li> <li>■ Oceanography</li> <li>■ Science Management</li> <li>■ Wildlife Biology and Conservation</li> <li>■ Biomedical Engineering<sup>a</sup></li> <li>■ Nanoscience and Microsystems<sup>a</sup></li> <li>■ Nanoscience and Microsystems Engineering<sup>a</sup></li> <li>■ Structural Engineering<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Health</li> <li>■ Medicine<sup>a</sup></li> <li>■ Medical Degree<sup>a</sup></li> <li>■ DDS<sup>a</sup></li> <li>■ Doctor of Osteopathic Medicine<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Business</li> <li>■ Education</li> <li>■ Project Management</li> <li>■ Communication and Leadership<sup>a</sup></li> </ul>

<sup>a</sup> Indicates a response written in by respondent.

TABLE D.2

**Employer Industry Categories (from Alumni Survey)**

<b>STEM</b>	<b>STEM-related</b>	<b>Not STEM</b>
<ul style="list-style-type: none"> <li>■ Oil, gas, other energy</li> <li>■ Engineering consulting</li> <li>■ Construction</li> <li>■ Transportation</li> <li>■ Mining or logging</li> <li>■ Fish and wildlife</li> <li>■ Other natural resources</li> <li>■ Other engineering field</li> <li>■ Information technology</li> <li>■ Aerospace<sup>a</sup></li> <li>■ Cadastral surveying (boundaries)<sup>a</sup></li> <li>■ Ecosystem science<sup>a</sup></li> <li>■ Electronic systems, Alaska Air National Guard<sup>a</sup></li> <li>■ Engineering research<sup>a</sup></li> <li>■ Environmental remediation<sup>a</sup></li> <li>■ Federal government, military and civilian projects<sup>a</sup></li> <li>■ Geographic information systems<sup>a</sup></li> <li>■ Metabolism research<sup>a</sup></li> <li>■ Military construction on a military base<sup>a</sup></li> <li>■ Natural Resources Division Mining Land and Water<sup>a</sup></li> <li>■ Plan review engineer<sup>a</sup></li> <li>■ Research<sup>a</sup></li> <li>■ Research and development<sup>a</sup></li> <li>■ Rotating equipment maintenance and installation<sup>a</sup></li> <li>■ Software engineering<sup>a</sup></li> <li>■ Telecommunications<sup>a</sup></li> <li>■ Water/wastewater<sup>a</sup></li> <li>■ Water/wastewater management<sup>a</sup></li> <li>■ Transportation, highway construction, structural engineering, landscape architecture, site development, waterfront engineering, and wastewater and water treatment<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Health/medical</li> <li>■ Health care<sup>a</sup></li> <li>■ Orthopedic surgery resident<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Teaching/education</li> <li>■ Academia<sup>a</sup></li> <li>■ Communications</li> <li>■ Engineering education<sup>a</sup></li> <li>■ Department of Defense<sup>a</sup></li> <li>■ Fishing<sup>a</sup></li> <li>■ Government contracting, supply<sup>a</sup></li> <li>■ Government project management<sup>a</sup></li> <li>■ Intellectual property<sup>a</sup></li> <li>■ Online retailer<sup>a</sup></li> <li>■ Professional services<sup>a</sup></li> <li>■ Tribal government<sup>a</sup></li> </ul>

<sup>a</sup> Indicates a response written in by respondent.

TABLE D.3

Occupation Categories (from Alumni Survey)

STEM	STEM-related	Not STEM
<ul style="list-style-type: none"> <li>■ Electrical or Computer Engineer</li> <li>■ Mechanical Engineer</li> <li>■ Chemical Engineer</li> <li>■ Civil or Environmental Engineer</li> <li>■ Petroleum Engineer</li> <li>■ Mining/Geological Engineer</li> <li>■ Biological/Life Scientist</li> <li>■ Physical Scientist</li> <li>■ Construction Manager</li> <li>■ Other Computer or Information Technology Occupation</li> <li>■ Project Engineer<sup>a</sup></li> <li>■ Software Engineer<sup>a</sup></li> <li>■ Neuroscientist<sup>a</sup></li> <li>■ Electronic Systems Technician<sup>a</sup></li> <li>■ Energy and Project Management<sup>a</sup></li> <li>■ Environmental Permitting<sup>a</sup></li> <li>■ Equipment Operator<sup>a</sup></li> <li>■ Gyro Survey Specialist for the Company<sup>a</sup></li> <li>■ Lab Tech<sup>a</sup></li> <li>■ Land Surveying<sup>a</sup></li> <li>■ Land Surveyor<sup>a</sup></li> <li>■ Public Works<sup>a</sup></li> <li>■ Surveyor<sup>a</sup></li> <li>■ Technician<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Health Care Practitioner or Health Care Technologist or Technician</li> <li>■ Doctor<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Teacher or Faculty</li> <li>■ Accountant<sup>a</sup></li> <li>■ Administrator<sup>a</sup></li> <li>■ Contract Specialist<sup>a</sup></li> <li>■ Data Collector<sup>a</sup></li> <li>■ Director<sup>a</sup></li> <li>■ Engineering Education<sup>a</sup></li> <li>■ Fishing<sup>a</sup></li> <li>■ Mentor<sup>a</sup></li> <li>■ Office Manager/Executive Assistant<sup>a</sup></li> <li>■ Paperwork<sup>a</sup></li> <li>■ Professional Services<sup>a</sup></li> <li>■ Staffa</li> <li>■ Youth Peer Mentor, Teaching Assistant<sup>a</sup></li> </ul>

<sup>a</sup> Indicates a response written in by respondent.

# Notes

1. Notable recent exceptions not cited earlier include a recent study using a propensity score–matched cohort to the Research Initiative for Scientific Enhancement (RISE) program participants (Schultz and others 2011), and an evaluation of the Biology Scholars Program at University of California, Berkeley (Barlow and Villarejo 2004; Matsui, Liu, and Kane 2003).
2. According to the Alaska Department of Labor and Workforce Development “Alaska Occupational Forecast 2012 to 2022” (<http://live.laborstats.alaska.gov/occfst/index.cfm>).
3. This figure and the remaining references to Alaska Natives in this chapter also include American Indians who are not Alaska Natives. American Indians/Alaska Natives is the standard categorization in the US Census, the American Community Survey, and the US Department of Labor Bureau of Labor Statistics.
4. The University of Alaska’s fiscal year runs from July 1 to June 30, with the year referring to the end year.
5. Urban Institute’s analysis of University Success participants considered students to be “full participants” if they had received \$1,000 or more in ANSEP scholarship funds during at least one semester of enrollment. This definition corresponds with ANSEP staff’s as those who comply with requirements and receive a scholarship. References to participant demographics and outcomes in this report will focus on this group when describing “University Success participants.”
6. According to ANSEP administrative records, 546 participants are known to have passed through ANSEP’s University Success component, with 470 being fully recognized ANSEP participants (that is, having received at least one scholarship of \$1,000 or more) and the remaining 76 having received only minor financial assistance or other resources. Of the 470 participants, 177 are recorded as having completed a BS or BA degree at UA, and 293 are currently enrolled or have not graduated. See appendix A for further discussion of the population in relation to ANSEP records and the Urban Institute’s alumni survey sample.
7. Due to the recent implementation of STEM Career Explorations, data were not available for analysis of the outputs of this particular component.
8. The cumulative number of Middle School Academy participants surpassed the number of full University Success participants in 2014. However, University Success is still the largest component if one counts participants who received scholarships of less than \$1,000.
9. In part I, cohorts are defined as the total number of participants in a given year. Because the focus 1 of part II is on time to degree, the different definition of cohort related to the first year of full ANSEP participation applies.
10. These averages were tabulated from Banner data for a population of 329 University Success full participant graduates and currently enrolled students.
11. The mean tenure for all University Success graduates is 12.9 semesters, or almost six and a half years without summer enrollment.
12. An additional student, who is noted from ANSEP discussions as being in an engineering educational program at another university, is not reported in Graduate Success datasets.
13. Data were tabulated for all University Success full participants except those in years 1996 through 1998, when no previous components existed (N = 449). The percentage of the group that had participated in both Summer Bridge and Acceleration Academy is not mutually exclusive of the single components.
14. According to ANSEP records, of the 227 University Success participants, 177 were full participants and another 50 never received full scholarships but were involved in ANSEP activities, particularly receiving less-than-full scholarships. ANSEP provided current contact information for 216 alumni. Of this group, 142 individuals responded during the online survey’s open period, for a final response rate of 65.7 percent, and 105 individuals consented to linking their Banner data to their survey responses. Upon further analysis of the 105 respondents after linking, researchers determined that 78 individuals had been full University Success participants, 12 had been partial participants, and another 14 were not in ANSEP scholarship records. Because of an inability to determine reasons for nonresponse, a nonresponse analysis was not feasible and the data presented here are not weighted.
15. In this group of American Indian/Alaska Native and Native Hawaiian/Pacific Islander college graduates, 11.2 percent are employed in health care, 64.7 percent are employed in other disciplines, 13.4 percent are unemployed, and 1.8 percent are not in the labor force, according to the estimates using the US Department of Education,

National Center for Education Statistics' 2008/09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): First Look (2011).

16. However, American Indian/Alaska Native and Native Hawaiian/Pacific Islander engineering graduates were estimated to have incomes of \$57,455 one year after graduation—a rate higher than the \$54,808 for engineering graduates overall.
17. Incomes were reported in the alumni survey by numeric categories rather than values, thereby limiting specific comparison.
18. Comparisons with estimates for average STEM salaries in Alaska are not possible because those data are available only for all professionals in those occupations, including those with decades of experience, as opposed to a more appropriate comparison to more recent graduates in STEM occupations in the state.
19. An additional 2.6 percent beyond the 84.5 percent reported that they would have attended another college campus in Alaska, and 12.9 percent reported that they would have attended another college outside of Alaska.

# References

- Ackermann, Susan P. 1991. "The Benefits of Summer Bridge Programs for Underrepresented and Low-Income Students." *College and University* 66 (4): 201–8.
- Alaska Department of Education and Early Development. 2013. "Alaska's Public Schools: 2012–2013 Report Card to the Public." <http://education.alaska.gov/reportcard/2012-2013/reportcard2012-13.pdf>.
- . 2014. "Public School Dropouts Grades 7–12." <http://www.eed.state.ak.us/stats/dropoutrates/dropoutratesbyethnicity.pdf>.
- Alaska Department of Labor and Workforce Development, Research and Analysis. 2012. <http://labor.alaska.gov/research/indfcst/indfcst.htm>.
- Alaska State Committee for Research. 2014. "To Build a Fire: The Alaska Science and Technology Plan." Alaska State Committee for Research, Fairbanks.
- Alexander, Baine B., Anne C. Burda, and Susan B. Millar. 1997. "A Community Approach to Learning Calculus: Fostering Success for Underrepresented Ethnic Minorities in an Emerging Scholars Program." *Journal of Women and Minorities in Science and Engineering* 3 (3): 145–49.
- Alfred, Lawrence J., Cathie Atkins, Michelle Lopez, Thelma Chavez, Vernon Avila, and Paul Paolini. 2005. "A Science Pipeline Pathway for Training Underrepresented Students in the Biomedical Sciences." *Journal of Women and Minorities in Science and Engineering* 11 (1): 45–60.
- Almeida, Deirdre A. 1999. *Postsecondary Financial Aid for American Indians and Alaska Natives*. Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools.
- Atkinson, Donald, R. Gregory Jennings, and Lorinda Liongson. 1990. "Minority Students' Reasons for Not Seeking Counseling and Suggestions for Improving Services." *Journal of College Student Development* 31 (4): 342–50.
- Barlow, Amy E. L., and Merna Villarejo. 2004. "Making a Difference for Minorities: Evaluation of an Educational Enrichment Program." *Journal of Research in Science Teaching* 41 (9): 861–81.
- Benjamin, Don-Paul, Stephan Chambers, and Gary Reiterman. 1993. "A Focus on American Indian College Persistence." *Journal of American Indian Education* 32 (2): 24–39.
- Benware, Carl, and Edward Deci. 1984. "Quality of Learning with an Active versus Passive Motivational Set." *American Educational Research Journal* 21 (4): 755–65.
- Brown, Lynn L., and Sharon E. Robinson Kurpius. 1997. "Psychosocial Factors Influencing Academic Persistence of American Indian College Students." *Journal of College Student Development* 38 (1): 3–12.
- Chemers, Martin M., Eileen L. Zurbriggen, Moin Syed, Barbara K. Goza, and Steve Bearman. 2011. "The Role of Efficacy and Identity in Science Career Commitment among Underrepresented Minority Students." *Journal of Social Issues* 67 (3): 469–91.
- Collea, Francis P. 1990. "Increasing Minorities in Science and Engineering. A Critical Look at Two Programs." *Journal of College Science Teaching* 20 (1): 31–34, 41.
- Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline. 2011. *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads*. Washington, DC: National Academies Press.
- Corporation for National and Community Service. 2012. *Volunteering and Civic Life in America 2014*. <http://www.nationalservice.gov/impact-our-nation/research-and-reports/volunteering-america>.
- Davis, Judith. 1992. "Factors Contributing to Postsecondary Achievement of American Indians." *Tribal College Journal* 4 (2): 24–30.
- Elliott, Rogers, A. Christopher Strenta, Russell Adair, Michael Matier, and Jannah Scott. 1996. "The Role of Ethnicity in Choosing and Leaving Science in Highly Selective Institutions." *Research in Higher Education* 37 (6): 681–709.
- Estrada, M., P. Hernandez, and P. W. Schultz. n.d. "I Can, I Am, I Believe and So I'll Stay: The Integration of Underrepresented Minority Students into STEM Careers." Unpublished manuscript.

- Estrada-Hollenbeck, Mica, Anna Woodcock, and P. Wesley Schultz. 2008. "A Leaky Pipeline? Minority Student Integration into the Scientific Community." Paper presented at the Society for the Psychological Study of Social Issues Conference, Chicago, IL, June.
- Fisher, Robert. 2014. *Invisible Student Scientists: How Graduate School Science and Engineering Programs Shortchange Black, Hispanic, and Women Students*. Lanham, MD: University Press of America.
- Fried, Neal. 2012. "Household and Personal Income: Recent Release Covers Range of Rural Areas." *Alaska Economic Trends* 32 (8, August): 14.
- Gainen, Joanne. 1995. "Barriers to Success in Quantitative Gateway Courses." In *Fostering Student Success in Quantitative Gateway Courses*, edited by Joanne Gainen and Eleanor Willemssen. San Francisco, CA: Jossey-Bass.
- Gándara, Patricia, and Julie Maxwell-Jolly. 1999. *Priming the Pump: Strategies for Increasing the Achievement of Underrepresented Minority Undergraduates*. New York: The College Board.
- Garrod, Andrew, and Colleen Larimore. 1997. *First Person, First Peoples: Native American College Graduates Tell Their Life Stories*. Ithaca, NY: Cornell University Press.
- Gasiewski, Josephine A., M. Kevin Eagan, Gina A. Garcia, Sylvia Hurtado, and Mitchell J. Chang. 2012. "From Gatekeeping to Engagement: A Multicontextual, Mixed Method Study of Student Academic Engagement in Introductory STEM Courses." *Research in Higher Education* 53 (2): 229–61.
- Gerald, Danette, and Kati Haycock. 2006. *Engines of Inequality: Diminishing Equity in the Nation's Premier Public Universities*. Washington, DC: The Education Trust.
- Ginorio, Angela B., and Jeri Grignon. 2000. "The Transition to and from High School of Ethnic Minority Students." In *Access Denied*, ed. G. Campbell, R. Denes, and C. Morrison (151–73). New York: Oxford University Press.
- Gloria, Alberta, and Sharon Robinson Kurpius. 2001. "Influences of Self-Beliefs, Social Support, and Comfort in the University Environment on the Academic Nonpersistence Decisions of American Indian Undergraduates." *Cultural Diversity and Ethnic Minority Psychology* 7 (1): 88–102.
- Gold, M. V., M. P. Deming, and K. Stone. 1992. "The Bridge: A Summer Academic Enrichment Program to Retain African-American Collegians." *Journal of the Freshman Year Experience* 4 (2): 101–17.
- Good, Jennifer, Glennelle Halpin, and Gerald Halpin. 1998. "The Affective and Academic Benefits for Mentors in a Minority Engineering Program." ERIC Document Reproduction Service ED429488.
- Graham, Mark J., Jennifer Frederick, Angela Byars-Winston, Anne-Barre Hunter, and Jo Handelsman. 2014. "Increasing Persistence of College Students in STEM." *Science* 341: 1455–56
- Grossman, Jennifer M., and Michelle V. Porche. 2014. "Perceived Gender and Racial/Ethnic Barriers to STEM Success." *Urban Education* 49 (6): 698.
- Guillory, Raphael M., and Mimi Wolverton. 2008. "It's about Family: Native American Student Persistence in Higher Education." *Journal of Higher Education* 79 (1): 58–87.
- Hackett, Edward, Jennifer Croissant, and Blair Schneider. 1992. "Industry, Academe, and the Values of Undergraduate Engineers." *Research in Higher Education* 33 (3): 275–95.
- Hadland, Jeff. 2004. "Alaska's 'Brain Drain': Myth or Reality?" *Monthly Labor Review* May. <http://www.bls.gov/opub/mlr/2004/05/art2full.pdf>.
- Hauptman, Arthur, and Patricia Smith. 1994. "Financial Aid Strategies for Improving Minority Student Participation in Higher Education." In *Minorities in Higher Education*, edited by Manuel Justiz, Reginald Wilson, and Lars Bjork (78–106). Phoenix, AZ: American Council on Education and Oryx Press.
- HeavyRunner, Iris, and Richard DeCelles. 2002. "Family Education Model: Meeting the Student Retention Challenge." *Journal of American Indian Education* 41 (2): 29–37.
- Hill, Alexandra, and Diane Hirshberg. 2006. "Alaska Teacher Supply and Demand: 2005 Update." Anchorage: UAA Institute of Social and Economic Research.
- . 2013. "Alaska Teacher Turnover, Supply, and Demand: 2013 Highlights." Anchorage: UAA Center for Alaska Education Policy Research.
- Holton, Brian E., and George K. Horton. 1996. "The Rutgers Physics Learning Center: Reforming the Physics Course for First-Year Engineering and Science Students." *Physics Teacher* 34 (3): 138–43.

- Hornett, Danielle. 1989. "The Role of Faculty in Cultural Awareness and Retention of American Indian College Students." *Journal of American Indian Education* 29 (1): 12–18.
- Hoxby, Caroline, and Sarah Turner. 2013. "Expanding College Opportunities for High-Achieving, Low Income Students." SIEPR Discussion Paper 12-014. Stanford, CA: Stanford Institute for Economic Policy Research.
- Hrabowski III, Freeman A., and Kenneth I. Maton. 1995. "Enhancing the Success of African-American Students in the Sciences: Freshman Year Outcomes." *School Science and Mathematics* 95 (1): 19–27.
- Hurtado, Sylvia. 1990. *Campus Racial Climates and Educational Outcomes*. Dissertation, University of California, Los Angeles. Ann Arbor, MI: University Microfilms International 9111328.
- Hurtado, Sylvia, and Deborah F. Carter. 1997. "Effects of College Transition and Perceptions of the Campus Racial Climate on Latino College Students' Sense of Belonging." *Sociology of Education* 70 (4): 324–45.
- Hurtado, Sylvia, M. Kevin Eagan, Minh C. Tran, Christopher B. Newman, Mitchell J. Chang, and Paolo Velasco. 2011. "'We Do Science Here': Underrepresented Students' Interactions with Faculty in Different College Contexts." *Journal of Social Issues* 67 (3): 553–79.
- Hurtado, Sylvia, Christopher B. Newman, Minh C. Tran, and Mitchell J. Chang. 2010. "Improving the Rate of Success for Underrepresented Racial Minorities in STEM Fields: Insights from a National Project." *New Directions for Institutional Research* 148: 5–15.
- Jackson, Aaron P., Steven A. Smith, and Curtis L. Hill. 2003. "Academic Persistence among Native American College Students." *Journal of College Student Development* 44 (4): 548–65.
- Jackson, Shirley A. 2003. *The Quiet Crisis: Falling Short in Producing American Scientific and Technical Talent*. San Diego: BEST.
- Jenkins, Melvin. 1999. "Factors which Influence the Success or Failure of American Indian/Native American College Students." *Research and Teaching in Developmental Education* 15 (20): 49–52.
- Keigher, Ashley, and Freddie Cross. 2010. "Teacher Attrition and Mobility: Results from the 2008–09 Teacher Follow-up Survey." NCES 2010-353. US Department of Education, Washington, DC.
- Landis, Raymond. B., ed. 1985. *Handbook on Improving the Retention and Graduation of Minorities in Engineering*. New York: National Action Council for Minorities in Engineering.
- Landis, Raymond. B. 1988. "The Case for Minority Engineering Programs." *Engineering Education* 78 (8): 756–61.
- . 1991. "Retention by Design: Achieving Excellence in Minority Engineering Education." National Action Council for Minorities in Engineering, New York.
- Larimore, James A., and George S. McClellan. 2005. "Native American Indian Student Retention in U.S. Postsecondary Education." In *New Directions for Student Services: Serving American Indian Students*, edited by Mary J. Tippecanoe-Fox, George S. McClellan, and Shelly C. Lowe, (7–32). Hoboken, NJ: John Wiley & Sons.
- Laursen, Sandra, Anne-Barrie Hunter, Elaine Seymour, Heather Thiry and Ginger Melton. 2010. *Undergraduate Research in the Sciences: Engaging Students in Real Science*. San Francisco: Jossey-Bass.
- Lowe, Anna, and Michael Toney. 2001. "Academic Advising: Views of the Givers and Takers." *Journal of College Student Retention* 2 (2): 93–108.
- Martz, Paul. 2014. "Alaska Industry Forecast 2012–2022: Health Care and Mining Will Lead Growth." *Alaska Economic Trends* (October).
- Maton, Kenneth I., Freeman A. Hrabowski III, and Carol Schmitt. 2000. "African American College Students Excelling in the Sciences: College and Postcollege Outcomes in the Meyerhoff Scholars Program." *Journal of Research in Science Teaching* 37 (7): 629–54.
- Matsui, John, Roger Liu, and Caroline M. Kane. 2003. "Evaluating a Science Diversity Program at UC Berkeley: More Questions Than Answers." *Cell Biology Education* 2: 117–21.
- Matyas, Marsha L. 1991. "Programs for Women and Minorities: Creating a Clear Pathway for Future Scientists and Engineers." In *Investing in Human Potential: Science and Engineering at the Crossroads*, edited by Marsha L. Matyas and Shirley M. Malcom (67–96). Washington, DC: American Association for the Advancement of Science.
- Merisotis, Jamie P., and Arnold M. Kee. 2006. "A Model of Success: The Model Institutions for Excellence Program's Decade of Leadership in STEM Education." *Journal of Hispanic Higher Education* 5 (3): 288–308.

- Moreno, Susan E. and Chandra Muller. 1999. "Success and Diversity: The Transition through First-Year Calculus in the University." *American Journal of Education* 108 (1): 30–57.
- Museum, Samuel D., Robert T. Palmer, Ryan J. Davis, and Dina C. Maramba. 2011. "Racial and Ethnic Minority Students' Success in STEM Education." *ASHE Higher Education Report* (Special Issue) 36 (6): 1–140.
- Nagda, Biren A., Sandra R. Gregerman, John Jonides, William von Hippel, and Jennifer S. Lerner. 1998. "Undergraduate Student-Faculty Research Partnerships Affect Student Retention." *Review of Higher Education* 22 (1): 55–72.
- Oakes, Jeannie, Tor Ormseth, Robert M. Bell, and Patricia Camp. 1990. *Multiplying Inequalities: The Effects of Race, Social Class, and Tracking on Opportunities to Learn Mathematics and Science*. Washington, DC: National Science Foundation.
- Pascarella, Ernest T., and Patrick T. Terenzini. 1991. *How College Affects Students*. San Francisco: Jossey-Bass.
- Palmer, Robert T., Dina C. Maramba, and Marybeth Gasman. 2013. *Fostering Success of Ethnic and Racial Minorities in STEM: The Role of Minority Serving Institutions*. New York: Routledge.
- Pavel, D. Michael, and Raymond V. Padilla. 1993. "American Indian and Alaska Native Postsecondary Departure: An Example of Assessing a Mainstream Model Using National Longitudinal Data." *Journal of American Indian Education* 32 (2): 1–23.
- Redmond, Sonjia P. 1990. "Mentoring and Cultural Diversity in Academic Settings." *American Behavioral Scientist* 34 (2): 188–200.
- Roehl, Roy F., II. 2010. "Correlation between Teacher Turnover Rates in the State of Alaska and Standardized Test Scores in the Area of Mathematics on the Standards Based Assessments/High School Qualifying Exam." Ph.D. diss., University of Alaska, Fairbanks.
- Rothwell, Jonathan. 2014. *Still Searching: Job Vacancies and STEM Skills*. Washington, DC: Brookings Institution. <http://www.brookings.edu/~media/research/files/reports/2014/07/stem/job%20vacancies%20and%20stem%20skills.pdf>.
- Santos, Susana J., and Elena T. Reigadas. 2002. "Latinos in Higher Education: An Evaluation of a University Faculty Mentoring Program." *Journal of Hispanic Higher Education* 1 (1): 40–50.
- Schroeder, Herbert P., and Linda P. Lazzell. 2013. "A Longitudinal Model to Increase the Enrollment and Graduation of Alaska Native/American Indian Engineering Undergraduates." Paper presented at the American Society for Engineering Education Conference, Atlanta, June 24.
- Schultz, P. Wesley, Paul R. Hernandez, Anna Woodcock, Mica Estrada, Randie C. Chance, Maria Aguilar, and Richard T. Serpe. 2011. "Patching the Pipeline: Reducing Educational Disparities in the Sciences through Minority Training Programs." *Educational Evaluation and Policy Analysis* 33: 95–114.
- Sharp, Laure, Brian Kleiner, and Jot Frechtling. 2000. *A Description and Analysis of Best Practice Findings of Programs Promoting Participation of Underrepresented Undergraduate Students in Science, Mathematics, Engineering, and Technology Fields* Report NSF 01-31. Arlington, VA: National Science Foundation.
- Shotton, Heather J., E. Star Oosahwe, and Rosa Cintron. 2007. "Stories of Success: Experiences of American Indian Students in Peer-Mentoring Retention Programs." *Review of Higher Education* 31 (1): 81–108.
- Springer, Leonard, Mary E. Stanne, and Samuel S. Donovan. 1999. "Effects of Small-Group Learning on Undergraduates in Science, Mathematics, Engineering, and Technology: A Meta-Analysis." *Review of Educational Research* 69 (1): 21–51.
- Stimpfle, Erik, and Todd Mosher. 2011. "Science, Tech, Engineering, and Math Knowledge-Based Workers in Alaska." *Alaska Economic Trends* (February 2011). <http://laborstats.alaska.gov/trends/feb11art1.pdf>.
- Summers, Michael F., and Freeman A. Hrabowski III. 2006. "Preparing Minority Scientists and Engineers." *Science* 311: 1870–71.
- Tinto, Vincent. 1993. *Leaving College: Rethinking Causes and Cures of Student Attrition*, 2nd ed. Chicago: University of Chicago Press.
- Trippi, Joseph, and Harold E. Cheatham. 1991. "Counseling Effects on African American College Student Graduation." *Journal of College Student Development* 32 (4): 342–49.
- University of Alaska Anchorage. 2014. *Fact Book 2013–14*. Anchorage: University of Alaska Anchorage.

- Urban Institute. 2005. *Evaluation of the National Science Foundation Louis Stokes Alliances for Minority Participation Program*. Washington, DC: National Science Foundation.
- US Commission on Civil Rights, Alaska Advisory Committee. 2002. *Racism's Frontier: The Untold Story of Discrimination and Division in Alaska*. Washington, DC: US Commission on Civil Rights.  
<http://www.usccr.gov/pubs/sac/ak0402/main.htm>.
- US Department of Education. 2010. Civil Rights Data Collection, 2009–10 National and State Estimations.  
[http://ocrdata.ed.gov/StateNationalEstimations/Projections\\_2009\\_10](http://ocrdata.ed.gov/StateNationalEstimations/Projections_2009_10).
- US Department of Education, National Center for Education Statistics. 2011. *2008/09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): First Look*. Washington, DC: US Department of Education.
- US Department of Education, National Center for Education Statistics. 2011a. *2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09)*. Washington, DC: US Department of Education.  
[http://nces.ed.gov/pubs2012/2012246\\_1.pdf](http://nces.ed.gov/pubs2012/2012246_1.pdf).
- . 2011b. *2008/09 Baccalaureate and Beyond Longitudinal Study (B&B:08/09): First Look*. Washington, DC: US Department of Education. <http://nces.ed.gov/pubs2011/2011236.pdf>.
- US Department of Labor, Bureau of Labor Statistics. 2014. "Quarterly Census of Employment Wages (QCEW): January–March 2014." Alaska Department of Labor and Workforce Development, Research and Analysis Section.

# About the Authors

**Hamutal Bernstein** is a research associate in the Income and Benefits Policy Center at the Urban Institute, where her research focuses on workforce development, science and engineering education and employment, immigration and integration, and evaluation work.

**Carlos Martín** is a senior research associate in the Metropolitan Housing and Communities Policy Center at the Urban Institute, where he leads research and evaluations on the physical qualities of housing and communities, and the industry that builds them.

**Lauren Eyster** is a senior research associate in the Income and Benefits Policy Center at the Urban Institute, where her research focuses on innovative workforce development programs and how to best evaluate and learn from them. Most recently, Eyster has examined industry-focused job training and career pathway initiatives implemented through the workforce investment system and at community colleges. She studies how these programs can best provide education and training to different groups such as laid-off workers, youths, low-income individuals, and older workers. She also researches how systems and various stakeholders can collaborate to help these individuals find and retain jobs.

**Theresa Anderson** is a research associate in the Income and Benefits Policy Center at the Urban Institute, where she works primarily on completing evaluations of workforce development programs. She has worked on evaluations of programs such as the Health Profession Opportunity Grants, Accelerating Opportunity, Family-Centered Community Change, and the Alaska Native Science & Engineering Program. She has expertise on a wide range of social assistance programs and is skilled in mixed-methods research.

**Stephanie Owen** is a research associate in the Income and Benefits Policy Center at the Urban Institute, where she focuses on topics related to workforce development. She is currently working on the National Implementation Evaluation of the Health Profession Opportunity Grants Program, which aims to train low-income individuals in health care jobs, as well as an evaluation of the Alaska Native Science & Engineering Program.

**Ananda Martin-Caughey's** research focuses on higher education and workforce development. Previously, Ananda was an associate at O-H Community Partners, a public interest consulting firm in Chicago, where she worked on projects relating to urban development, homelessness, diversity and inclusion, and small business financing. Ananda graduated from Harvard University in 2013 with a degree in government and economics. She has interned for the US Senate and the US Department of Labor





2100 M Street NW  
Washington, DC 20037

[www.urban.org](http://www.urban.org)