

Archived Information

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Written Testimony - American Indian Science & Engineering Society
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Members of the Secretary of Education's Commission on the Future of Higher Education and members of the public here today, thank you for this opportunity to share some thoughts and recommendations on the future of higher education and American Indians pursuing science and engineering degrees.

I won't take what precious time I have here with you today to cover the unique and complex historical issues that still have direct impacts on Indian education today, but I will acknowledge that they exist and that Tribes themselves need to be full partners in addressing their educational needs.

I wish to highlight a few important facts:

1. Native Americans have a special trust relationship with the United States government that is governed by Treaties between sovereign nations; as a result there is a number of unique challenges as well as opportunities in addressing Higher Education as it pertains to American Indians, Alaska Natives. Federal policies play a distinct role in the delivery of education to American Indians.
2. Barriers exist with respect to participation in postsecondary education including; a legacy of distrust in the education system due to boarding schools and other historic practices seen as having a negative and assimilative effect, lack of preparedness for university or college, many first generation college students, feelings of social discrimination, isolation and loneliness at postsecondary institutions, unemployment and poverty making the cost of attending difficult, a lack of respect for cultural differences and often family demands on time and financial resources competing with school demands.
3. There are over 3 million Native Americans representing some 560+ tribes, each with its own unique culture. My contribution today is only one perspective from the experience of the American Indian Science & Engineering Society. We have successfully supported over 17,000 Native American students who have pursued degrees in the Science, Math, Engineering and Technology (STEM) disciplines.

Founded in 1977 as a non-profit organization by a small group of concerned Native American professionals, AISES provides opportunities for AI/AN to pursue their interests in science, engineering, math and technology. By providing a range of services whether they are in kindergarten or are at the height of their professional careers AISES plays a critical role in preparing the next generation of scientist and engineers.

AISES recognizes the Nation's and the Native communities' need for more American Indians in the fields of research, particularly in science, technology, engineering, and mathematics (STEM), and the related need for Native Americans to enter into the higher-technology workforce.

A current profile of the American Indian population from the 2000 Census would show 2,134,297 identifying themselves as American Indian/Alaskan Native; and 3,515,308 identifying themselves as American Indian/Alaskan Native in combination with one or more races since individuals may report more than one race. Therefore, American Indian/Alaskan Natives are 0.7% to 1.2% of the population depending on how they self identify.

According to the 2000 S&E statistics on the NSF website¹, there are 128,716 American Indian/Alaskan Natives enrolled in undergraduate higher education institutions with 70,723 considered to be full time. Of this total, about fifty percent are in 4-year institutions and the remainder in two year or tribal colleges. American Indian/Alaskan Native females are participating in higher education at a much higher rate than the males, and are more than 60% of the total enrollment and approach two-thirds of the enrollment at tribal colleges.

It is also reported in the NSF statistics the intent of American Indian/Alaskan Native freshmen to major in S&E fields is 31% which is close to the average with only Asian/Pacific Islander much higher at 42.1%. When this data is examined further, it shows that American Indian/Alaskan Native students enroll in Social/Behavioral Sciences (11.5%), Biological/Agricultural Sciences (7.9%), Engineering (7.5%), Computer Science (1.8%), Physical Sciences (1.7%), Mathematics/Statistics (0.4%). This demonstrates that the challenge of **creating a greater awareness of the opportunity/rewards** of the latter disciplines among native populations.

American Indians/Alaskan Natives enroll in higher education at a less than representative rate (0.7 %) for their representation in our national population (< 1 %). The statistics that show degrees granted **highlight the attrition at the undergraduate level** and the small overall attainment in graduate degrees. American Indian/Alaskan Native degrees as a percentage of the total show 0.67% of undergraduate degrees to this population; 0.6% in Natural Sciences; and about 0.5% in Engineering and Computer Science. At the graduate degree level, there is a dramatic drop off with about 0.25% of master's degrees awarded in Engineering and Computer Science earned by American Indian/Alaskan Natives, and 0.15% of doctorate degrees in Engineering (7 Total) and only one Computer Science doctorate earned by this group in 2001. An annual view of total doctorate degrees by discipline would show less than ten per year in Engineering, and only one or two per year in Computer Science and Mathematics. The 2003 Taulbee data shows that there are only 6 Native American Computer Science faculty members across 177 CS departments representing 4,195 faculty members.

In summary, there is a great need to increase the awareness of and participation in the Science & Engineering disciplines. This matters because it is a workforce/economic issue, an equity/fairness issue, and a creativity issue. To sustain a competitive national economy, it is critical that we realize full diversity participation in the SMET workforce of the future and the academic faculty of our colleges and universities.

AISES uses a "full circle of support," model which is an ecological model linking youth, adults, community and industry. In many ways, AISES is an extended family, a national

¹ NSF Science & Engineering Statistics at <http://www.nsf.gov/statistics/>

network of affiliated schools, college chapters at universities and professional members - connecting communities across a wide geographic area.

At the local level, strength through organized chapters within the university and local business community promotes resilience and leadership and mobilizes local resources designed to leverage opportunities and minimize attrition risk. Today AISES has over 160 college chapters, 13 professional chapters, 200 K-12 affiliated schools and over 3,000 individual members.

Important elements that have made our AISES Chapters and programs successful have included:

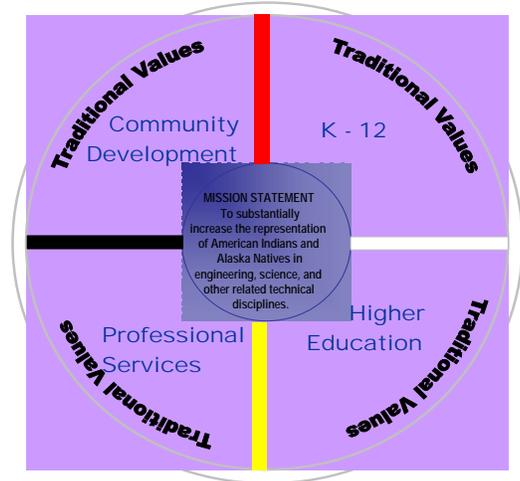
- Reaching students early and creating pathways to access circles of support within their own communities. This includes educational programming that creates continuity and networks between students, community and the STEM professions
- Reclaiming traditional American Indian scientific pursuits as an example for addressing current socio-scientific issues. Incorporating, supporting and promoting the profound contributions AI/AN have made to STEM fields throughout our history as well as currently.
- Encourage our member's to pursue research opportunities, bringing their unique perspective, knowledge and understanding of the world to generate new ideas and innovation.

Research in improving student motivation has shown that AI/AN students do better when their own communities and cultures are incorporated into education, when they have access to AI/AN teachers and professionals, and when they understand how learning objectives connect to their own communities. These elements are important in the success of all our membership from k-12, college chapters, professional chapters, as well as AI/AN communities and tribal nations

Recommendations:

1. Improve K-12 mathematics and science instruction by increasing the number of technically trained, teachers
2. Support more access programs such as summer college orientation programs targeting Indian students. Increase partnerships between school and communities, increasing trust, and exposing youth to opportunities.
3. Connect students early on with professionals and private industry to serve as role models, provide skill building experiences, mentors and connect students to the relevance of their field of study.

AISES "Full Circle of Support "



4. Establish “communities” of support within Higher Education institutions by increasing number of Native American faculty, encouraging other faculty to learn more about AI/ANs, having a liaison person in financial aide office that is familiar with tribal and BIA scholarship programs and supporting Native American groups/programs that provide mentoring and support
5. Develop research programs that engage and retain Native Americans in research that is relevant to their interests. Work to provide a less ethnocentric curriculum so that the Indian point of view is presented and so that American Indians and Alaska Natives are seen as contemporary as well as historical people.

I would also like to recommend that the Commission revisit some of the research and recommendations that resulted from the U.S. Secretary of Education's Indian Nations at Risk Task Force hearings in 1990 and 1991. A number of factors that were identified within that task force such as; inadequate curriculum, low teacher expectations, a lack of Native educators as role models, and "overt and subtle racism", unfortunately have not improved that significantly and continue to contribute to Native students having the highest high school dropout rate of any minority group in the United States. (Indian Nations at Risk Task Force, 1991).Washington, DC: U.S. Department of Education)

Lastly, it is important to acknowledge one of the most promising models of success in American Indian Higher Education today - the Tribal Colleges. There are now over 35 operating across the country. These tribal colleges were started because of the low success rate of Native students in mainstream colleges. They have successfully created accessible, affordable and graduation success for Native American students seeking higher education. Tribal colleges today are serving students who might not have had a chance or interest in going to college. If you have not already done so, inviting a Tribal College President or their national organization, the American Indian Higher Education Consortium, www.aihec.org would provide additional insight and recommendations to impact American Indian Students seeking higher education.

References:

www.nsf.gov/statistics/wmpd/race.htm

National Center for Education Statistics: American Indians and Alaska Natives in Postsecondary Education, (D. Michael Pave, et, al., 1998)

Background material included:

- Creating Role Models for Change: A Survey of Tribal College Graduates (American Indian Higher Education Consortium, 2000)
- American Indian/Alaska Native Education: An Overview (Jon Reyhner, Northern Arizona University, 2002)
- American Indian Science & Engineering Society, Annual Report 2004