UNITED TRIBES TECHNICAL COLLEGE

VIRTUAL TOWN HALL

Advancing STEM Workforce Preparation and Research Capacity at Tribal Colleges and Universities

May 13, 2021

12:30 – 3 pm (Eastern)

Leander R. McDonald, PhD
President

What role do you see for TCUs broadly in building the next generation of STEM workforce? What role do you see for institution specifically in this effort?

- UTTC roots are in workforce development; thus, institutional efforts must be continued to be focused on providing STEM education specific to STEM careers.
- When we look at the workforce in general for tribal communities, we see higher percentages of tribal members in executive and entry level positions. The middle level positions, which are many times the infrastructure for our communities, is an opportunity for STEM education.
- The benefit of growing our own by TCUs educating community members is that they already live there, they are familiar with our cultures, and they are able to share at the scholarly and grassroots levels.

What are your institution's goals in advancing STEM workforce preparation? How are you building these goals into your strategic plans/vision? What has this meant for your institutional mission?

- Nearly all tribal communities receive funds from the Environmental Protection Agency (EPA), Bureau of Reclamation, Bureau of Indian Affairs Realty, and Tribal Land Realty, to support professional positions within our lands.
- Unfortunately, many of the middle level positions that require credentials are filled by non-tribal members who may not reside in our communities. Not to say that they are doing a bad job, just saying that tribal members are more likely to work and live within our communities, which provide an indirect benefit as tribal youth see the benefit of education in the positive role models of these educated individuals.

What are your institution's goals around building research capacity? How are you building these goals into your strategic plans/vision?

- The 2020-2025 UTTC Strategic Plan reinforces the importance of advancing STEM workforce preparation by fostering a culture of research in STEM.
- Our goals for the next five years are to:
  - 1) provide research opportunities for students;
  - 2) have faculty develop research proposals and publications;
  - 3) provide research and service internships opportunities for our students; and
  - 4) collaborate with intra- and inter-disciplinary partners such as tribal, industry, and higher education in research and service projects.

What kind of infrastructure/supports has your institution put in place or working to put in place to support your workforce prep and research efforts?

- The pandemic forced all faculty to become proficient in providing courses in an online environment during the Spring 2000 then they transitioned to a virtual synchronous platform (Zoom) classroom for Fall 2000 and Spring 2021. We've advanced our colleges several years in the use of technology for the provision of courses and these efforts will be maintained into the future in the form of Hyflex courses.
- The pandemic funds provided the IT infrastructure that we would not have otherwise had. UTTC moved from 100 Mbs to 10 Gig or 100 times faster.
- UTTC has Associate of Applied Science degrees in Environmental Science and Pre-Engineering. We also have a Bachelor of Science in Environmental Science.
- All three of these programs have dedicated classroom and lab space to fulfill the course and program requirements.
- We have articulation agreements in place for the Pre-engineering with North Dakota State University and South Dakota School of Mines and Environmental Engineering with NDSU.
- UTTC is also working on a course sharing agreement with our fellow North Dakota TCUs. The NDATC have also signed a MOU with the NDUS to share computer information technology courses for credit with a goal of building the North Dakota information technology workforce.
- We're interested in course sharing for Engineering, because we have one faculty member and two programs.
- The majority of courses the other TCUs are interested in sharing from us are Engineering, Chemistry, advanced Maths (e.g. Calculus I, II and III), and Elementary Ed.

What do you see as key challenges/barriers to implementing these efforts?

- A primary challenge is to recruit and retain STEM faculty to teach our range of courses.
- We're located in Bismarck, ND and there are two other colleges in town, so there is some competition for faculty. We lost an English faculty last year as Bismarck State College offered him $20,000 more than he was making here. Then we lost our Automotive Tech instructor to one of the dealerships as they offered him double what he was making with us.
- We continually have at least one position open in one of the STEM faculty positions. This year the open positions have been in Chemistry and Math. We'll fill a position then another position will come open.
- I believe this issue is even more prevalent among our four sister TCUs in the state is they are located in rural poverty areas with housing shortages. Very hard to recruit and retain employees in these environments. Summarily, recruitment, retention, and competitive salaries.

What investments/resources are still needed to advance STEM workforce preparation and/or build research capacity at your institution? How are you working to bring those investments/resources in?

- UTTC has made a commitment to provide competitive salaries and we participate in the Federal Employee Health Benefits (FEHB) program that provides a range of health plans at minimal cost to the employee. We have worked hard to provide a healthy and safe work environment.
- First, I believe this has to be the foundation for recruiting and retaining all employees. Secondly, we need to have a core STEM working group to take advantage of available opportunities to obtain funds to build STEM instruction and research capacity.
- Examples are the Tribal Colleges and Universities Program (TCUP), National Science Foundation (NSF), and North Dakota Established Program to Stimulate Competitive Research (EPSCoR).

What advice do you have for TCU leaders/administration/faculty who are looking to emulate the advances you have made in your STEM efforts?

- The general model for building programs is to have a vision for what we would like to see happen.
- Seek funds to implement that vision and do not be afraid of going after the smaller pots at the beginning. The smaller pots of funds will help build the history necessary to go after the higher amounts.
- This model requires a time and financial investment by the institution or department and requires the principal investigator to have some knowledge of grant writing.
- If not available internally, external consultants are readily available to assist for a fee. Whoever the lead person is coordinating these activities would potentially be the PI and would work closely with the consultant to begin building capacity for themselves and the TCU.
- The PI should not be disappointed if they don't make the score the first time around, many of the requests for proposals can be complex because of the specificity sought out by the funding agency. Take the refusal and the comments and wait for next year then apply again. After all, we are lifelong learners!

How can external stakeholders support your STEM efforts? How can they most effectively engage with your institution?

- I have appreciated the technical assistance workshops provided by a variety of federal funding sources to access their funding and I have appreciated those tribal entities who have gone after funding to provide technical assistance to the tribal nations.
- We need to learn how to fish not be provided a fish. This approach strengthens our ability to control our destiny and allows us to pay it forward by passing this knowledge to our current and future partners and relatives.

Leadership begins here.

UNITED TRIBES
TECHNICAL COLLEGE

Questions/Comments

Leander R. McDonald, PhD, President

Email: president@uttc.edu

Tel: 701-255-3285