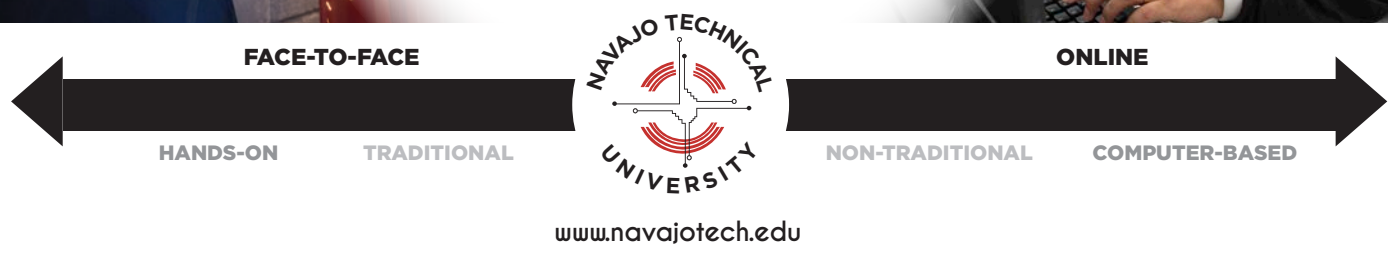




EXCELLING IN THE **NEW** NORMAL



2020 ANNUAL REPORT



Environmental Science and Natural Resources graduate (fall 2020) Olson Thomas completes an assignment online in the foreground of a poem by Navajo Nation Poet Laureate Dr. Laura Tohe. Thomas was using NTU's Wi-Fi since his home in Mariano Lake, NM had poor connectivity.

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NTU IS ACCREDITED WITH THE HIGHER LEARNING COMMISSION.

10 year Approval 2018

SPECIAL PROGRAM ACCREDITATIONS WITH:



Commercial Baking, Culinary Arts



Electrical Engineering, Industrial Engineering



Carpentry, Construction Technology, Electrical Trades and Welding



REVISITING OUR PURPOSE



Navigating the new normal required coordination across all facets of Navajo Technical University's day-to-day operations. Fortunately the University had finalized its 2020-2025 Strategic plan at the end of 2019 allowing for a focused approach when the plan went into effect in January. At the same time, the University also revised its mission, vision, and philosophy to reflect its new goals.

MISSION, VISION, AND PHILOSOPHY

NTU changed its mission, vision, and philosophy after a two-year series of listening sessions with students, faculty, staff, community members and the Board of Regents organized by the Committee for Institutional Effectiveness (CIE).

MISSION: Navajo Technical University honors Diné culture and language, while educating for the future.

VISION: Navajo Technical University provides an excellent educational experience in a supportive, culturally diverse environment, enabling all community members to grow intellectually, culturally, and economically.

PHILOSOPHY: Through the teachings of Nitsáhákees (thinking), Nahátá (planning), T'ina (implementing), and Siihasin (reflection), students acquire quality education in diverse fields, while preserving cultural values and gaining economic opportunities.

STRATEGIC PLAN 2020-2025

The Board of Regents approved a new strategic plan that will be implemented at all NTU locations for the next five years. The priorities in the plan were established from information collected at listening sessions held by the CIE over two years at each of NTU's five locations. The plan aimed at strengthening the culture and integrity of NTU; increasing the diversity of Navajo communities; and improving the university with a variety of innovative programs.

The strategic plan includes six priorities:

- Academic Excellence
- Financial Services
- Communication and Institutional Research
- Infrastructure
- Development of Instructional Sites
- Sustainability

A LOOK INTO NTU: ADVOCATING FOR ACADEMIC EXCELLENCE SINCE 1979

A snapshot of Navajo Technical University.

59 ACADEMIC PROGRAMS

2 Master degrees, 13 Bachelor's degrees, 21 Associate degrees, and 23 Certificates.

28 PHD/EDD FACULTY

6 American Indian faculty

13:1 STUDENT TO FACULTY RATIO

52% AMERICAN INDIAN FACULTY

42 Diné

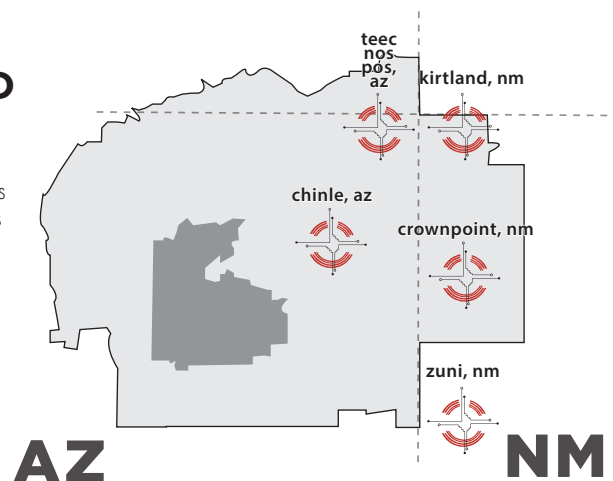
240 DEGREES CONFERRED

2020 (spring and fall)

3 Master degrees
24 Bachelor's degrees
85 Associate degrees
121 Certificates
7 GEDs

5 LOCATIONS

Crownpoint, NM
Chinle, AZ
Teec Nos Pos, AZ
Kirtland, NM
Zuni, NM





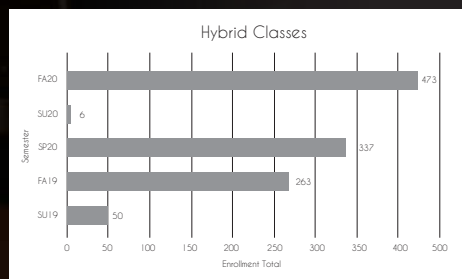
EXCELLING IN THE NEW NORMAL

INTRODUCTION TO THE YEAR OF CHANGE

The 2020 university year has been the most challenging year in Navajo Technical University's history. Spring 2020 enrollment, as has been customary at NTU, was down slightly from Fall 2019 enrollment, but was showing an increase over Spring 2019 enrollment. By Fall 2020, however, enrollment was considerably off compared to Fall 2019 numbers. In January of 2020 news of COVID-19 was just starting to be a concern, primarily, as far as anyone knew, impacting China. By late February President Elmer Guy was chairing meetings about the growing threat of the virus in the Navajo Nation and to colleges and universities nationwide. By May the COVID-19 Response Team had moved all courses online and the campus was closed except for essential workers tasked with deep cleaning and maintaining campus operations. Selected administrators continued to work from campus based upon their responsibilities, but the university's normal operations had been turned upside down.

From March 16th when the first COVID-19 cases began emerging on the Navajo Nation until the first peak of infections on May 14th, NTU's staff and students were responsible for doing heroic work. In some ways the university was well positioned to handle the emergency that overwhelmed all of higher education in the United States. Dr. Coleen Arviso, Director of E-Learning, had worked with the Information Technology Department to create one of the finest set of E-Learning tools in the Southwest. Best Value Schools, a national ranking service, had identified NTU as having the fourth best E-Learning platform among New Mexico's colleges and universities. The E-Learning environment in place at the beginning of the COVID crisis, along with the technology infrastructure created by the Internet to the Hogan Project, was available for expansion when that became necessary as the Navajo Nation faced one of the worst outbreaks in the United States.

THE TRANSITION IN COURSE DELIVERY



The pandemic shifted courses from being offered primarily face-to-face to either online or hybrid. As a result, enrollment declined in face-to-face courses, while hybrid courses saw an increase of over 200 students. Online course enrollment has remained steady given HLC accreditation requires review and approval for all online programs.



At the beginning of the pandemic many NTU employees were trained on how to conduct deep cleaning of facilities. Pictured above is custodial staff members Tony Johnson, Sherry Enrico, and Christianna Platero.



NTU collaborated with the New Mexico Department of Health to host a drive-thru testing event on its Crowpoint campus in May. Several similar events were held throughout the year for NTU's campus community, especially after holiday breaks.



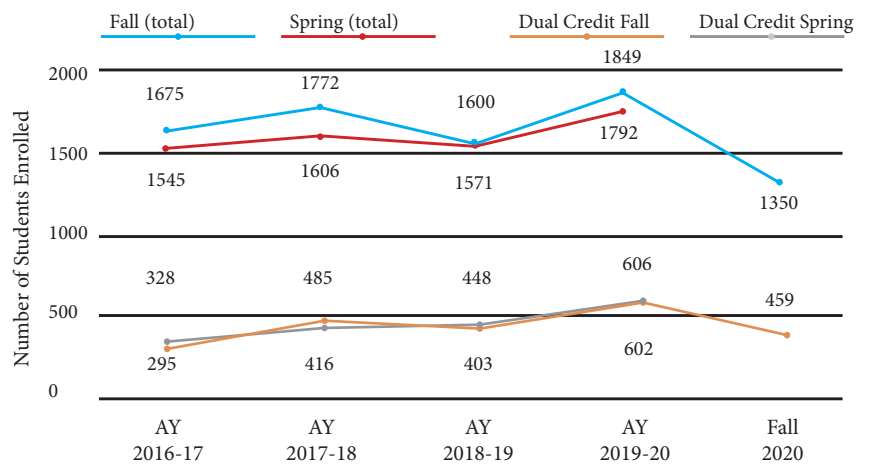
When the Navajo Nation began receiving large donations in May from individuals and organizations from across the world there was a need to document the donations before distributing them to communities in need. NTU's Community Emergency Response Team volunteered to assist in the effort, which was centralized in Window Rock, AZ and coordinated by Navajo Nation leadership and the National Guard.

The majority of professors and instructors at the Crownpoint campus and the Chinle, Teec Nos Pos, Zuni, and Bond Wilson instructional sites had never taught a completely online course, however. Most of the students had not taken online courses either, and no one was familiar with how to prepare the university's dorms and other facilities for use during a pandemic. Dr. Colleen Bowman was also newly hired as the Provost, and Jason Arviso had just been promoted to Vice President of Operations. The challenges facing administrators new to their position were unprecedented.

Still, after the President and the Board of Regents agreed to move all classes online, faculty worked long hours mastering the technologies involved. The IT Department started to increase the number of hot spots where students in places both near the campuses and instructional sites and further off could access online content. An aggressive program was started to provide as many students as possible with the tools they need to get online and keep up with their classes.

There were almost insoluble challenges. How do you teach welding online without any welding equipment? A lot of students, and even professors, have had to climb up hills with their laptop computers in order to find a signal even with hot spots created by the IT Department and proceed to do their coursework or teach out in the wilderness. Not everyone has had an easy time adapting to the new realities even after NTU was able to open earlier than normal in August and finish finals before Thanksgiving for the Fall semester. Still, overall, because of everyone's heroic efforts, the university is continuing to operate at a high level, albeit with a smaller Fall enrollment. A lot of students earned their degrees at both the Spring and Fall commencements, in part because of the testing regimen at each of NTU's sites, deep cleaning managed by the maintenance staff, security operations, online/in-classroom teaching by faculty, and work by the entire NTU workforce to increase safety protocols for everyone involved.

Navajo Technical University Headcount Enrollment Trend, AY 16/17 - Fall 2020



AY= Academic Year (fall and spring semesters)

Student enrollment at NTU was on an upward trend prior to COVID-19, but like most institutions, saw a decline in 2020. A survey conducted indicated that there was a general hesitancy to re-enroll given the pandemic. The drop in enrollment applied to both NTU's general student population and dual credit students.



Transitioning learning to online required not only educating students about NTU's online platform, but faculty and staff as well. NTU's IT department hosted in person tutorials in April, before switching to online trainings over Zoom, for the remainder of the year. The trainings covered topics like email and Google services to navigating Moodle and MyNTU.



When the pandemic hit the Navajo Nation in March, several of NTU's services went online as employees worked remotely. NTU's library services promoted its online database to assist students, but also opened at 10% capacity during finals week to assist students requiring computer access.



Communication was a crucial element to curbing the pandemic and keeping the public informed about updates from the local, state, and national levels. NTU's radio station, 107.3 KCZY, helped disseminate much of this information, as did NTU's website and social media sites.

ADDRESSING COVID-19: A TIMELINE

It's the role of any tribal college and university to go above and beyond to assist students given the context in which we operate and our obligation to student success. Under normal circumstances, TCUs bear the responsibility of addressing matters of access and equity, and the pandemic has only amplified that obligation. The main obstacle NTU faced from the onset of the pandemic was understanding the circumstance of each of our students, and what it would take to transition 1,200 students to distance learning.

Over the past three years, NTU has developed a better idea of what this would entail after making an institutional commitment to better understand barriers that prevent students from graduating. The experience was beneficial in understanding internal areas for improvement, but also personal circumstances that have prevented students from completing their education. Transportation issues or lack of connectivity would often contribute to such obstacles, but also things as reasons involving child care or family obligations. Each circumstance would contribute to class absences, forcing many students to stop out, or ultimately drop out.

Given this experience, there was a general idea of what students would need to complete the spring semester when the pandemic reached NTU. Fortunately, the pandemic reached just before spring break, which allowed for two weeks of necessary planning on how to address the new normal.

MARCH

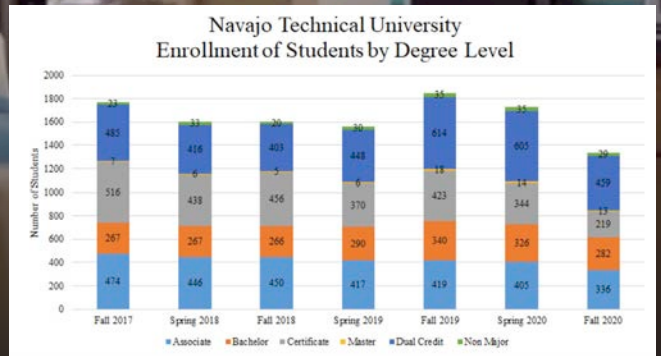
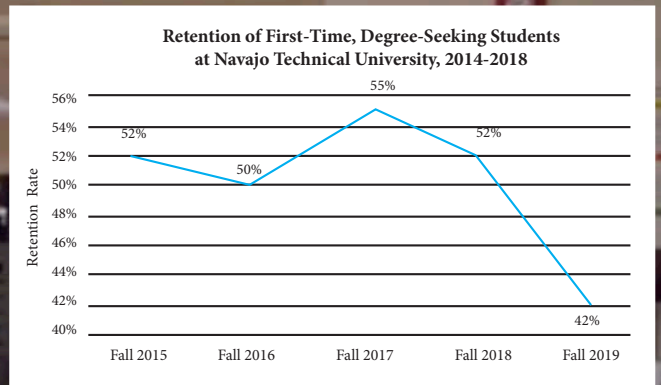
Since historical data showed a large majority of students would have issues with connectivity, a decision was made to not only focus on online delivery, but on how coursework could be delivered to students by email, phone, or hard copy. Residential housing was shut down to NTU's student body after the spring break, but accommodations were made for students with housing insecurities. A COVID-19 Response Team was established.

Behind the scenes requests were made to accrediting agencies for temporary waivers to offer online courses. A request was also put into the FCC that would allow NTU to serve as its own service provider to use its wireless Internet infrastructure to connect students. The measure was twenty years in the making with NTU's Internet to the Hogan project.

APRIL

CARES funding wasn't available at the beginning of April so the focus was on how instruction would be delivered to close out the semester. This included detailing how various services would transition online, such as library services, residential, and tutoring. NTU's food services began issuing food boxes for pick up for those on campus. What aided in the transition was a robust online learning environment that was established over the past five years. The learning environment included resources such as 24/7 tutoring service and membership in the National Council for State Authorization Reciprocity Agreements to deliver courses country-wide.

Parking lot hot spots were established at NTU's Crownpoint, Chinle, and Zuni locations to accommodate online learners, and gas cards were made available so students could access the hot spots. Extensive PPE was ordered and a re-entry plan for finals was developed with guidance from NTU's nursing program and local health officials. Buildings, such as NTU's gymnasium, were repurposed to accommodate larger classes.



NTU's fall-to-fall retention rate dropped 10% as a result of the pandemic. A large majority of student decline came from NTU's certificate programs. Many of the certificate programs required at least some face-to-face instruction, which caused hesitation to enroll among students. Nursing majors also were stuck in a hard place as they couldn't complete clinicals to close out their program.

MAY

The beginning of May was important because a system was established to disburse CARES aid to students needing funds to finish the semester. The goal was to provide funding relief for every student. Full-time students would receive \$625 and part-time students would receive \$350. Since the funds were only available to Pell eligible students, American Indian College Fund money was used to cover non-eligible students. A stipulation was made with the funds that students had to take a survey to help gauge student need during the pandemic.

The survey was revealing as it indicated 1 in 4 students didn't have access to a computer or Internet connectivity at home. The survey also indicated that over 40 percent of NTU's student body had to travel over 40 miles to access an instructional site. As a result, the gas card program was expanded and the Homework Express - a hard copy delivery system utilizing NTU's fleet department - was established. 75 percent of students indicated they would utilize the service if it existed so the University ran vans to Gallup, Window Rock, Farmington, and Pueblo Pintado. The survey also indicated that 1 in 5 students connected to the Internet with their phone, so funds were used to help pay phone plans.

The other focus of May was preparing for finals week and insuring the safety of students that had to return to complete the semester face-to-face, most notably the Trade and lab based programs. A drive-thru testing event was scheduled with the New Mexico Department of Health, and planning called for an extended three-week finals window. The Student Union Building was designated as testing space with proctors that could sanitize space in between tests. At the conclusion of finals, a virtual commencement was hosted to celebrate spring graduates.

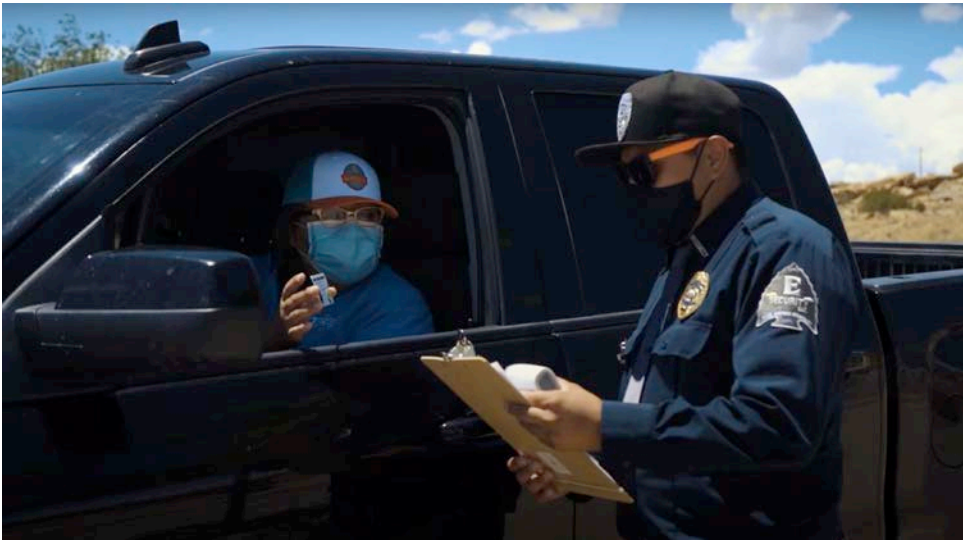


1 OUT OF 4

NTU students do not have access to the Internet or a computing device at home.

30%

of NTU students have to travel 40 miles or more to access a NTU location.



Security played a key role in monitoring who came and left NTU's sites throughout the year. Entry onto main campus required a mask, temperature check, and current NTU ID. Visitors without an ID were required to sign in for purposes of contact tracing.



CULINARY ARTS AND BAKING PROGRAMS DONATES TO LOCAL FOOD PANTRY

In April, Director of Food Services Bob Witte, CEC, delivered a check to the Community Pantry food bank in Gallup, NM to provide relief to community members amidst the COVID-19 pandemic. The \$2,000 check was donated on behalf of the New Mexico Chapter of the American Culinary Federation.

Both NTU's Culinary Arts and Commercial Baking programs were reaccredited by the ACF in 2019 after earning initial accreditation in 2011. The ACF is the largest chefs association in the nation with over 17,000 members representing nearly 200 chapter throughout the United States. NTU's Culinary Arts and Commercial Baking programs are the only at a tribal college and university to hold accreditation with the ACF, and one of two existing programs in the state of New Mexico. NTU will apply to be a sub chapter of the ACF in 2021.



Signage was an important tool in helping guide students through buildings and reminding the general public of safety mandates while on campus. The signs included a QR code that directed individuals to NTU's website where they could learn more information about COVID and precautions the University was taking to ensure student safety.

JUNE

The transition to summer provided administrators the opportunity to reflect on the spring semester and implement policies that could address safety concerns involving COVID-19. In June, an Emergency Management Plan was developed as well as a protocol for reporting COVID. An Infectious Disease Policy and an HVAC Inspection Plan went before the board of regents and both were approved. Administration also made the decision to adjust the fall calendar to operate as a 15-week condensed semester. The new schedule would have the first day of class begin a week early, but would have students finished with their coursework prior to the Thanksgiving break.

The new calendar was communicated to faculty, who were then asked to develop two syllabi - one planned for a normal semester and one that could be used if learning had to transition online. Faculty were also asked to submit their classroom schedules to plan for space under the new hybrid learning environment. Adjustments were then made in NTU's data management system, Jenzebar, in order to reflect the part online, part in-person schedule.

JULY

Campus signage (pictured right) was developed to inform summer semester students of the updated rules and CDC guidelines enforced on campus. A re-entry plan was submitted to the New Mexico Governor's office detailing safety protocols for each of NTU's departments and services and how safety would be enforced. The decision was made by Administration to also offer a 50% fall tuition program to alleviate financial burdens to students. The waiver was offered to both undergraduate and graduate students.

AUGUST

Classes began on August 10th as Administration previously planned in June. The purpose of the change in start date was to minimize instruction hours during the cold winter months. Videos were made by an IT-New Media alumni informing each of NTU's instructional sites of the adjusted fall semester. Services available to accommodate learning under the hybrid learning environment were also communicated. The videos were used to run television commercials to inform the public of the various measures NTU has taken to ensure safety as well.

SEPTEMBER

Labor Day weekend was the first holiday of the fall semester and was of concern given the potential of social gatherings that would take place. NTU provided COVID tests for residential students returning to campus and employees were required to get tested before returning to work. Gas cards were supplied to employees to attend a free testing event at Casamero Lake, NM, if necessary.

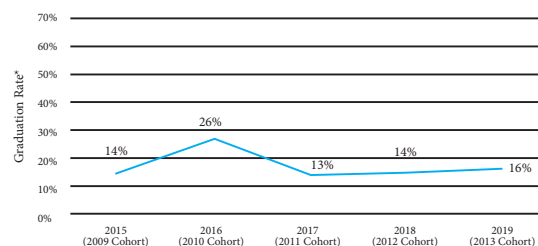
OCTOBER

CARES funding was utilized to hire a COVID education specialist in early October. The specialist was tasked with coordinating COVID awareness activities and educating the NTU community about prevention. Presentations developed by the coordinator included topics on washing your hands, grocery shopping, self-reporting, and vaccines and testing. Work was also done to develop a personal protective supplies stock pile and a screening checklist. An Online Continuity Plan was established by NTU's e-learning director. The plan was designed to ensure faculty and students would be prepared to continue to provide and access critical online learning functions if a significant disruption interrupts or diminishes access to essential online learning resources.

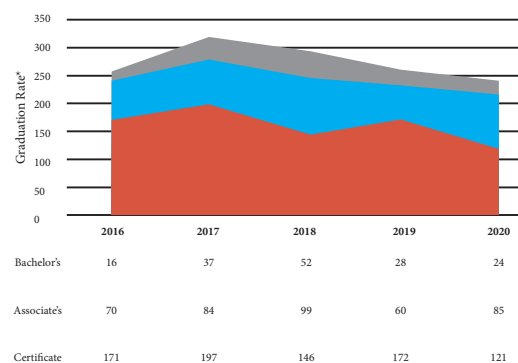
NOVEMBER

Another drive-thru COVID testing event was hosted on NTU's main campus after Halloween to ensure a safe learning environment for the few weeks of the semester. Additionally, a testing team was established on campus that could administer the Blanix COVID test. A second round of CARES student relief funding was issued to Pell eligible students prior to finals. The funding was intended to help students complete the semester, but also prepare for the winter break if necessary. When the semester finished, the COVID Response Team and the NTU maintenance department coordinated a deep clean of each of NTU's sites.

Navajo Technical University's Graduation Rate, 2015 -2019
First Time Enrolled Students, Source: IPEDS



Degrees Conferred, 2016-2020



NTU's graduation rate experienced a consecutive year of increase. Graduation rate is calculated by IPEDS as first time enrolled students completing their degree or certificate within 150% of starting their program. Under the formula, a certificate should be obtained in 1.5 years, an associate degree within 3 years, and a bachelor's degree within 6 years.





FOCUSING ON STUDENT SUCCESS

Over the last several years NTU has been focusing its attention and resources on improving student success outcomes. The work included establishing programs like Emergency Aid and offering tuition free developmental education courses during the summer. In 2020, NTU continued many of those programs, including the Leadership, Enrichment and Advancement Program, while refining processes like the University's early alert system. NTU also introduced intersession courses to help students graduate in a timely manner.

COMPLETION RETENTION EFFORTS

Intersession Courses

To improve completion and retention rates, NTU implemented a three-week intersession program that was hosted in between spring, summer, and fall semesters. Intersession courses were designed for students needing one or two classes to complete their degree or certificate program. The courses were also designed for students who had to unexpectedly stop out from their studies in order to address COVID related matters.

Leadership, Enrichment and Advancement Program (L.E.A.P)

NTU offered for the first time a virtual Leadership, Enrichment and Advancement Program (L.E.A.P) for first-time enrolled students. Students earned credit in College Success Skills (SSC-100), Reading and Writing Skills (ENGL-098), and Intermediate Algebra (MTH 1215), to help prepare for the fall semester.

Early Alert Referrals

NTU created a schedule for early alert referrals. Faculty checked at the end of 3rd, 6th, 9th, and 12th week of each semester for students who are not on track to get a grade of "C" or better in class, so academic advisors can help the students early in the semester before it becomes too late to get a passing grade. This effort is part of NTU's involvement with Achieving the Dream (ATD).

Student Debt Reduction Team

One of NTU's long-term problems is the amount of debt students accumulate and then have trouble paying off as they work toward their degrees. This not only hurts the university financially, but also ends up ending the academic careers of too many students. A Student Debt Reduction Team was established and asked to come up with methods for helping students handle the debt they accrue.

Transportation

When COVID-19 hit the Navajo Nation in early March, the Transportation Department played a critical role in helping students persist by operating a homework delivery service known as the Homework Express. The service proved essential given NTU's rural location and effective given how suddenly the virus made its way across the Four Corners region.

"Everything kind of just stopped," stated NTU Fleet Coordinator Byron Charlee. "There was a lot of fear because no one really knew."

In the midst of the madness, NTU's daily transportation routes stopped, which on a normal day, included routes that extended to Farmington, Pueblo Pintado, Thoreau, Gallup, and Tohatchi. Routes also ran to Window Rock and Chinle for Arizona-based students. Immediately, Charlee and his staff turned their attention to a possible fall re-opening by reviewing safety protocols from state, tribal, and national guidelines. It was during this planning that they were approached with the idea for the Homework Express, a service they were prepared to fulfill.

"We do it for the students and staff," explained Charlee, whose drivers can cover up to 150 miles a day on their routes, not including transporting students and staff to various events. "We're all working together and that's the best thing that happened. We're not helpless. We take care of each other."

Ten students utilized the Homework Express in the spring with assignments delivered as far as Sundance, NM. Today, only two students are utilizing the service while NTU's drivers have assumed their normal routes. The drivers' new normal requires operating at 50 percent capacity, taking daily temperature reads, and enforcing mandatory masks. Drivers are separated from passengers by a shower lining divide that can fit the shape of each van and be removed for cleaning after each use.



Fleet management was instrumental in transporting students to class and running the Homework Express to deliver hard copy assignments to students without Internet access.

STUDENT RELIEF BY THE NUMBERS

\$638,825

DIRECT STUDENT PAYMENTS

18 70

**WIFI ACCESS
POINTS**

**MIFI
DEVICES**

663 142 448

**USB
DRIVES**

**\$25 GAS
CARDS**

**COMPUTING
DEVICES**

\$13,034.69

EMERGENCY AID FUNDING

Gas, food, housing, vehicle repairs, and utilities.

NTU JOINS THE CGIU NETWORK

NTU joined other leading universities around the world when it became a member of the Clinton Global Initiative (CGI) University Network in December. NTU is the first TCU to be a part of the global initiative, which consists of higher education institutions and professionals who mentor and provide guidance to student innovators and entrepreneurs on their respective campuses.

Support is at the center of the student-centered network, which also serves as a distinct global professional development opportunity for administrators and/or professors. University staff members from around the world connect through the network by sharing best practices and lessons learned in the spaces of social innovation, entrepreneurship, leadership, career services, and civic engagement.

Now that NTU is a member of the CGI University Network, students are able to apply for the CGI University student program. The year-round program offers students the opportunity to participate in activities involving leadership development, skills training, and partnership building. Selected students are also invited to participate in the CGI University Annual Meeting, where commitment makers across the world come together to learn how to turn ideas into action.



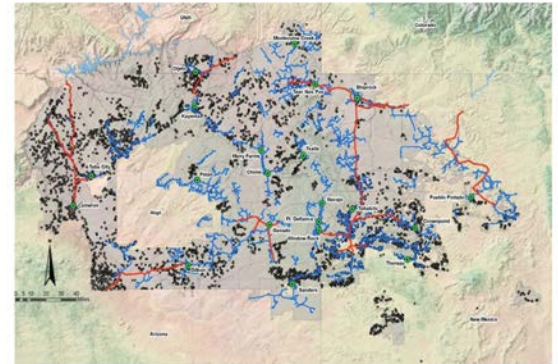
A COMMUNITY-BASED APPROACH TO EDUCATION

While the pandemic caused NTU to reevaluate how it could better function internally to best fit the needs of students, it also caused the University to figure out how it could best use its position to impact the communities it serves. Several projects were developed in 2020 to serve the long-term needs of the Navajo Nation and the Four Corners Region.

MOU AIMS TO RESTORE USABLE WATER TO THE NAVAJO NATION

In September, NTU president Dr. Elmer J. Guy and New Mexico Tech (NMT) president Dr. Stephen Wells signed a Memorandum of Understanding (pictured below) to improve access to drinking water in remote locations on the Navajo Nation that lack pipeline and municipal water systems (pictured right). The two-year agreement will focus on locations that have access to tanks or water wells that provide water unsuitable for human or animal consumption, but have water that can be purified.

Collaboration between the two institutions is expected to draw layered benefit to the region. Aside from improving access to clean water, the project will also lend itself to education where NTU students can be trained in drinking water standards and sampling filtration units that benefit agriculture, livestock, and day-to-day consumption. At the same time, NMT will develop water treatment units at a commercial scale and utilize its expertise and technology to serve a need on the Navajo Nation. The initiative will create economic opportunities related to commercializing filtration technology throughout the region. Filtration units must be self-contained with on-site maintenance, so training will emphasize inspection and assuring operational effectiveness of each unit. Training will also be provided in installation and troubleshooting.



Legend

- Economic Growth Centers
- Homes w/o Water
- Proposed Pipeline
- NTUA Water Mains

Homes without water on the Navajo Nation

Above is a map of homes without water on the Navajo Nation. This map is the reason NTU went into partnership with New Mexico Tech and PESCO to install water filtration equipment testing facilities on the Navajo Nation.





Crownpoint Chapter vice president Leonard Perry and Attila Bality of National Park Service document a hooghan structure along Teepee trail in Crownpoint.

PROJECT SEEKS TO FORMALIZE TRAILS TO IMPROVE HEALTH AND COMMUNITY-CENTERED OUTCOMES

For the last several years, NTU has been in collaboration with the Crownpoint Chapter and National Park Service to formalize walking trails in town. The project began as a means to better connect the community's various resource centers, like NTU, the chapter house, and IHS, but with COVID, a greater need was identified in helping improve health and community-centered outcomes.

Virtual work sessions with community entities were held throughout the year via Zoom to discuss how the functionality of the trail system could be maximized. Hard copy packets were distributed throughout Crownpoint where members of the community could give feedback on the proposed network. New partners were also brought in on the project, including the University of New Mexico's Prevention Research Centers "Healthy Places-Happy People" initiative.

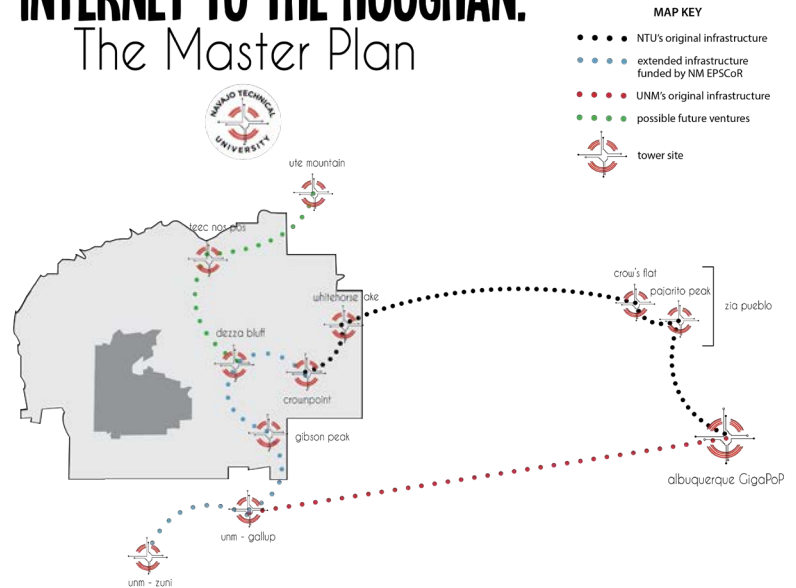
Input from the sessions helped form a comprehensive plan for the trails network, which was proposed to the Crownpoint Chapter in November and passed as a resolution. The project will next seek to finalize its plan before going after funds to get the network developed.

COLLABORATING ON FOOD-ENERGY-WATER TECHNOLOGIES

A new collaboration was established with the University of Arizona and NTU's Engineering faculty to explore opportunities for collaboration on food-energy-water technologies and technical training.

This is all part of the Board of Regents approved effort to expand the Navajo Center for the Environment, which has generated an effort to build a Chinle lab and classroom building and several proposals for funding this year. Legislation for funding in Arizona is being led by NTU alumni Arizona Representative Myron Tsosie (District 7).

INTERNET TO THE HOOGHAN: The Master Plan



IT MAKES PROGRESS WITH MULTIPLE PROJECTS

NTU IT is completing its first National Science Foundation (NSF) ScienceDMZ hardware and software infrastructure. The NTU team has been working closely with senior network engineers from the Front Range Gigapop (FRGP) of the University Corporation for Atmospheric Research center in Colorado. Through this research collaboration, both teams have been developing knowledge about high-performance networking, server design, large scale science data management, and network performance monitoring in rural America. Through this partnership, NTU and FRGP designed, proposed, and implemented a 100 Gbps layer two fiber-optic network connection to New Mexico's only Internet locker at 505 Marquette downtown Albuquerque. This directly connects to significant content delivery providers from Denver to El Paso to Los Angeles to Seattle to Chicago and the East Coast. Other parts of the implementation include a 5 Gbps upgrade to NTU Chinle's Internet connection and a 5 Gbps layer two fiber optic interconnections between NTU Crownpoint and NTU Chinle. The is part of the project to build an infrastructure long-term for a Navajo Nation Giga pop at NTU, linking NTU and the Navajo Nation to the major information highways around the world.

NTU IT also has led an NSF CC research project in partnership with Northern Arizona University's (NAU) IT department. In this project, tribal colleges and universities have engaged throughout the Southwest region of the United States. Tribal colleges participating include:

- Diné College
- Tohono O'odham Community College
- Southwestern Indian Polytechnic Institute
- Institute of American Indian Arts (IAIA)
- A:shiwi College and Career Readiness Center (NTU Zuni)

The project has allowed participating members new insight into high-performance networking, server design, large scale science data management, and network performance monitoring.

As a regional technological leader for the Navajo Nation, NTU has also embarked on several community initiatives to attempt to solve the homework gap issues on Navajo during this pandemic. The projects include connectivity over Citizens Broadband Radio Service (CBRS) and a single pane, single sign-on solution for all students from K to 16 using EDuRoam.



SCHOOL OF DINÉ STUDIES OFFERS CONTINUING EDUCATION PROGRAM TRANSLATING FOR THE 2020 ELECTION

At the beginning of the year NTU partnered with the Navajo Nation Human Rights Commission and the Navajo Interpreters Association to offer a continuing education program that trained Navajo speakers to interpret and translate terms and procedures used in elections. The five-week program was taught on weekends and provided continuing education credit for students translating election information essentials and developing uniform terminology.

The program was a result of a lawsuit the human rights commission filed against San Juan County in Utah for not lack of information about voting or aiding voters in the Navajo language. As a result, NTU also partnered with the Rural Utah Project, the Navajo Nation Bar Association, the Navajo Nation Department of Justice, and the Office of Navajo Nation Scholarships and Financial Aid.

“This program is born out of the need for Navajo-speaking people to be counted and represented when they cast their ballots, explained associate professor Dana Desiderio of NTU’s School of Diné Studies.

TRADE PROGRAMS TACKLE PROJECTS THAT BENEFIT NTU AND THE COMMUNITY AT LARGE

The Trades programs, for years, have done projects related to their degree program on campus and in the Navajo community. The work allows for students to apply what they’re learning in the classroom in a real world setting while benefiting the general population. The approach brings layered benefit to the students, including a deeper investment in their studies as the work often benefits the communities in which they come from.

Some of the projects undertaken this year are:

- Welding students made, delivered and bolted down a safe for a daily deposit box for NTU’s Finance Department.
- Construction Tech students:
 - Built a patio for students to dine outside
 - Completed community projects like dog houses for stray dogs that people had adopted
 - Completed surveying projects within the community
 - Chinle has taken students weekly into the community to build block fences and pour concrete for Chinle residents.
- Electric students wired several community hooghans.
- Auto Technician students repaired several community members’ automobiles.
- Culinary Arts students delivered several caterings, studying how to start their own businesses in the process.



Trade programs have been a part of NTU’s identity since it opened in 1979. Instructors Shawn Piechowski-Begay and Verna Casamero are seen above working with their Automotive Technology and Welding Technology students.



Jerrison Martin of Crownpoint, NM makes cuts in a piece wood while working on NTU's Crownpoint campus in November.

STUDENTS WORK WITH NAVAJO SOLUTIONS TO CONSTRUCT BATHROOM ADDITIONS FOR RESIDENTS IN THE CHUSKA REGION

Five Trade majors were employed with Navajo Solutions to construct bathroom additions for elders in the Chuska region of the Navajo Nation. The project occurred during NTU's winter break and had students traveling with an instructor each day from NTU's Crownpoint campus to just outside Naschitti, NM. The students were required to take temperature checks and sanitize their equipment prior to traveling to the work site. Upon arrival, CDC guidelines were strictly followed.

The students represented NTU's Construction Technology, Electrical Trades, and Welding programs and were recommended by Trade faculty. The group was tasked with building frames for the bathroom additions while Navajo Solutions ran water lines and solar power to the remote houses. Much of the construction occurred on site; however, certain tasks had to take place on NTU's campus in Crownpoint, like building roof trusses. The structures would then be transported to the Chuskas the following day.

"I wanted to help my Navajo people so I got involved," explained Electrical Trades major AB Barbone of Crownpoint, NM. Barbone had a 30 year career as a plumber with Navajo Housing Authority before attending NTU to get his certification in electrical.

Instructors assisting with the project included Construction Technology instructor Tom Bebo and Welding Technology instructor Chris Storer.



Construction Technology instructor Tom Bebo provides guidance to students as part of the bathroom addition project with Navajo Solutions. Navajo Solutions was created to provide hands on training in professional trades leading to permanent job placement.



MOVING FORWARD WITH INFRASTRUCTURE PROJECTS

Several major infrastructure projects were in motion heading into 2020 after the University secured funds from the states of New Mexico and Arizona and the Navajo Nation. The pandemic put a halt to many of these initiatives, but others – such as NTU's Chinle site's Academic Building – continued until completion.

BUILDING PROJECTS AND PLANS

After opening the 6,000 square foot classroom building in Chinle during the fall 2019 semester, planning was initiated for several new projects that will be taking shape over the next couple of years. The project closest to completion is the metrology laboratory that will function in concert with the current Center for Digital Technology and the Advanced Manufacturing Lab.

Metrology is basically the science of measurement. It has gotten increasingly high tech in recent decades as the effort to become ever more precise in manufacturing, and efforts to embrace theoretical and experimental determinations in science and technology have driven discoveries and innovations that have both enhanced knowledge and applications useful to contemporary society.

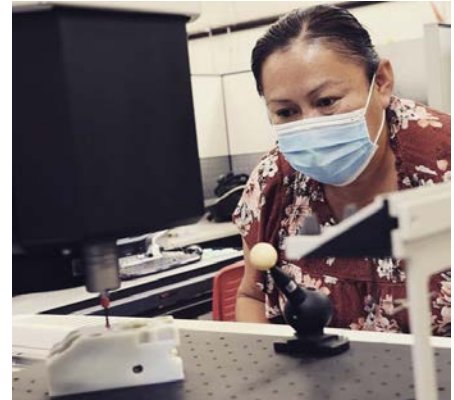
NTU has long been a leader in both training and education activities as well as research in metrology, and the new facility, funded partially by Economic Development Administration and the Navajo Nation, will improve its ability on three levels: 1) offering training for careers where metrology knowledge and skills are a major job component, 2) doing research in various aspects of high-level measurement, and 3) providing equipment and instrumentation for classroom use in STEM fields at NTU.

Work has also started on construction of a new 30,000 square feet classroom building to be located on the Crownpoint campus where modular classrooms have operated for a number of decades. Architectural and engineering plans are complete, several of the old modular classrooms have been moved, and groundbreaking will occur early in 2021.

At the NTU Veterinarian Teaching Hospital in Crownpoint one modular classroom and office building has started operating in support of the accredited Veterinary Technical associate degree, and two additional modular units that will provide classroom space for the new Animal Science baccalaureate degree are close to being renovated. These are buildings moved to make space for the new Crownpoint academic building. Planning has also started on establishing an equine genetics testing lab at the Veterinary Teaching Hospital complex.

One note about the Veterinary Technician associate degree program is that two more students have passed their exams and achieved certification. This is a program on the upswing.

The Trades programs have also been funded by the State of New Mexico to plan for a new classroom, laboratory, office complex in Crownpoint and the engineering faculty has started planning for an engineering laboratory and classroom building. Effort has also been underway to find funding for a Navajo Environmental Laboratory and Classroom building on the Chinle campus.



Lisa Willis of NTU's Center for Digital Technologies conducts a measurement in NTU's Metrology Lab.



Modular buildings were removed during phase I of NTU's 30,000 sq. ft. classroom building. COVID halted construction.



NTU's Chinle site's Academic Building finished construction in 2020.

GRAND OPENING OF THE ACADEMIC BUILDING IN CHINLE

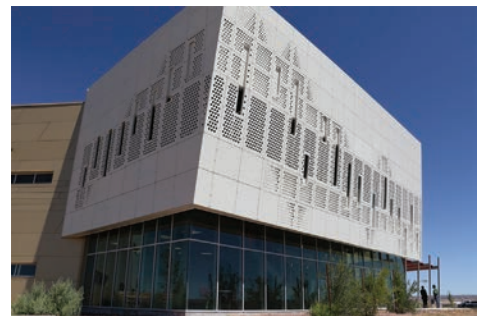
In September, NTU held a virtual grand opening for a new academic building at its Chinle instructional site. The celebration included speeches, a ribbon cutting ceremony, and a virtual walk through of the 20,000 sq. ft. building.

The structure is the second building to fill in NTU's 38-acre property after a 6,000 sq. ft. classroom building opened its doors in 2019. The academic building doubles the learning space at NTU's new location, which sits east of Chinle Health Services off Route 9. Of the ten classrooms housed in the new building, two are chemistry labs (*middle photo*) while four can be combined for larger lectures with adjustable walls. Tutoring and studying areas compliment the classroom space and a bookstore sits at the center of the building.

"It is the community and the students that drove us to this level," stated Chinle site director Arlena "Bo" Benallie in a ribbon cutting ceremony that was closed to the public on Sept. 3. Benallie was tasked in getting the instructional site started in 2006 by NTU President Dr. Elmer J. Guy with a budget of \$15,000.

"Fifteen thousand dollars and 14 years later, this is what we have," Benallie stated in the foreground of the two-story building that was designed to reflect the towering walls of Canyon de Chelly (*top photo*).

Design was at the forefront of the Academic Building, which was conceptualized by Indigenous Design Studio + Architecture and constructed by Nez FCI Native American, LLC. During the virtual grand opening, each company explained the process in realizing the building from concept to final construction. Insight was provided into the building's unique design, like incorporating an aluminum composite panel system to shade the building's skin while maximizing light and heat (*bottom photo*).





EXPANDING OUR ACADEMIC OFFERINGS

Academic excellence has been one of NTU's strategic priorities since 2015. The aim has been to improve the quality of education students receive at NTU while expanding research opportunities that have the potential to positively impact society at large.

NEW PROGRAMS COMPLIMENT EXISTING

The Institutional Actions Council (IAC) of the Higher Learning Commission (HLC) granted NTU's request to offer a Bachelor of Applied Science degree in Hotel and Restaurant Administration and an Associate of Science in Computer Science. The B.A.S. degree in Hotel and Restaurant Administration is the thirteenth four-year degree NTU has developed since 2011, and it will focus on preparing students to operate businesses on and surrounding the Navajo Nation. There are two hotels that are currently being established in Crownpoint and Shiprock, NM and each will contribute to a robust tourism economy that has thrived in the Four Corners region pre-pandemic. The addition of the Associate of Science in Computer Science offers students an introduction to algorithmic and mathematical processes that are applied to computer systems. The degree will offer a pathway in careers that can include artificial intelligence, software development, and operating systems.

"We have been working to expand our current programs offered at the University and we are excited to bring in more programs that meet standards of the workforce industry," explained Dr. Casmir Agbaragi, Dean of Undergraduate Studies at NTU. "The addition of Hotel and Restaurant Administration compliments our Culinary Arts program while the computer science degree supports our IT programs."

4-YEAR DEGREES DEVELOPED SINCE 2011

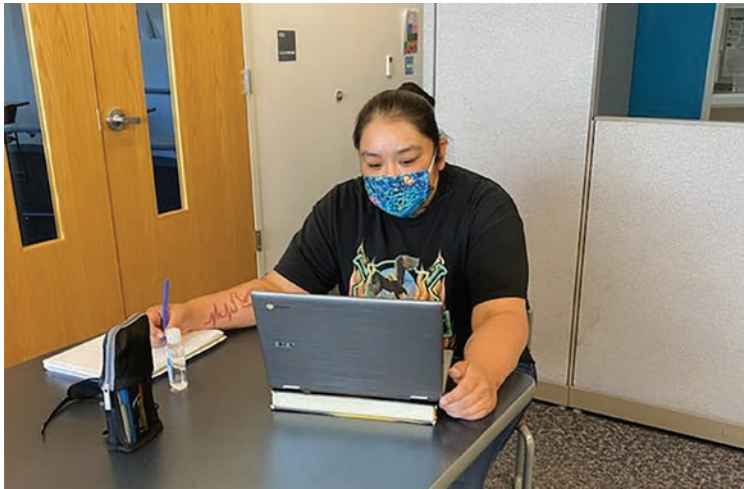
- B.A.S. - Advanced Manufacturing, 2011
- B.A.S. - Information Technology, 2011
- B.A.S. - IT-New Media, 2011
- B.A. - Diné Culture, Language & Leadership, 2012
- B.S. - Environmental Science and Natural Resources, 2012
- B.S. - Industrial Engineering, 2012
- B.F.A. - Creative Writing and New Media, 2013
- B.S. - Electrical Engineering, 2013
- B.S. - Early Childhood Multicultural Education, 2014
- B.S. - Biology, 2017
- B.A. - Business Administration, 2018
- B.S. - Animal Science, 2019
- B.A.S. - Hotel and Restaurant Administration, 2020

GRADUATE DEGREE APPROVED TO BE 100% ONLINE

The recently approved Master of Science degree in Management Information Systems (MS/MIS) is the first degree to be offered on the Navajo Nation completely online and the second graduate degree to be offered at NTU.

The field of Management Information Systems involves computerized information systems that generate data used by individuals or organizations to manage business operations. Information systems can include anything from a computer database that tracks retail purchases to a database that tracks transportation and logistics. While a degree in MS/MIS is most often associated with business, it also has relevance to government, healthcare, and law among other professional industries.

NTU's MS/MIS degree program curriculum follows the Global Competency Model for Graduate Degree Programs in Information Systems. Courses are intended to provide students with foundational competencies, as well as competencies in information systems and domains of practice.



NTU's Zuni instructional site at the A:shiwí College and Career Readiness Center serves as a resource for connectivity for students.

MOVING INTO THE DIGITAL WORLD

As part of the effort to strengthen online learning at NTU, an application was made to the Higher Learning Commission to strengthen the University's E-Learning accreditation. Then, after the pandemic hit and temporary approval was granted by HLC to offer all NTU classes online, a submission was made to accredit a number of undergraduate E-Learning programs, including a Bachelor of Arts in Business Administration, Associate of Arts in General Studies, Associate of Applied Science in Public Administration, Associate of Science in Mathematics, and an Associate of Applied Science in Accounting.

The HLC requires a separate accreditation for degrees offered entirely online from degrees offered through classroom attendance, and a decision was made to strengthen NTU offerings after the temporary approval from HLC expired.



MORE DEGREES IN THE PIPELINE, INCLUDING ACCREDITATION FOR NTU'S FIRST PHD

The National Science Foundation awarded NTU a \$2.5 million grant to support STEM instruction and research capacities. The grant will help expand NTU's engineering department by introducing a Bachelor of Science degree program in Environmental Engineering. The grant promotes STEM instruction and research. NTU will focus on uranium mine remediation and mitigation. Harry S. Whiting II, PE, Industrial Engineering Professor at NTU, is the principle investigator and aims to partner with outside organizations to assist in researching environmental issues. Partners will include higher education institutions and private industry.

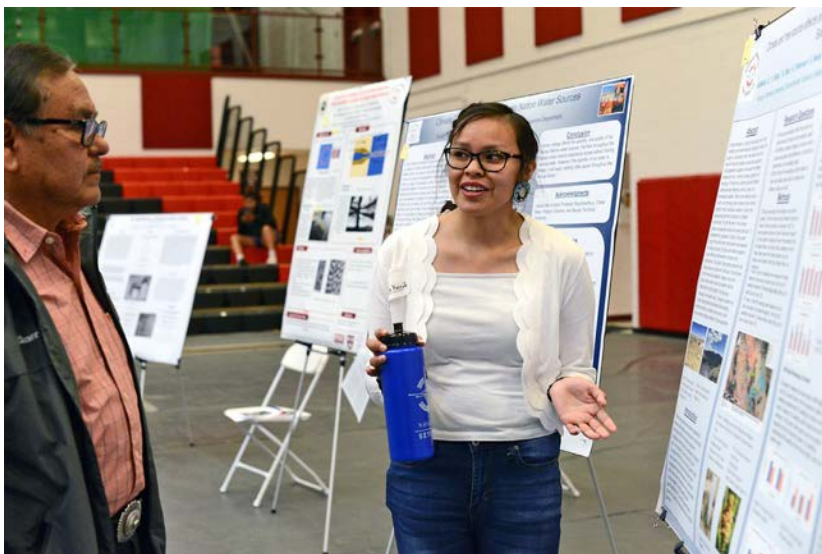
"It's a daunting task," said Whiting, noting the amount of data collection and analysis that needs to take place. "Our first priority is to update the maps we are currently using to locate problematic areas."

Other accreditation efforts underway include the development of a Master of Arts degree in Early Childhood Education, a Secondary Mathematics Education degree, and a PhD in Diné Culture and Language. The submission to the HLC in an effort to secure accreditation for NTU's first PhD program was finalized in 2020. This will be the first Tribal College and University PhD program if it is approved. The plan is to admit no more than 5 students as the first cohort within a semester if HLC approves the application. Since this represents a new degree level for NTU, the examination of the application by HLC is expected to be rigorous and may require additional work during 2021.

STUDENT RESEARCH COMPETITION

NTU's 8th Annual Research Day was held on March 5th and featured research, capstone, and science fair projects from students throughout the region. Twenty-six NTU students showcased their work, while 10 students representing St. Bonaventure School in Thoreau, NM used the event to prepare for the state regional science fair.

"Each year we bring together students from the region to display their research projects and offer them an incentive," said Dr. Casmir I. Agbaraiji, NTU Dean of Undergraduate Studies. "Our goal of Research Day is to promote student projects at all levels and for them to integrate other skills, such as public speaking, problem solving, and creative thinking, through their demonstrations."



Environmental Science and Natural Resources major Daylna Hannah presents her scientific poster to Dr. Elmer J. Guy at NTU's 8th Annual Research Day. Hannah placed 3rd at the event.

1ST ROBINSON TOM Biology

Efficiency of non-aqueous lithium-ion batteries by testing various related monomers and crosslinks coupled with an aqueous polymer gel electrolyte.

2ND JONATHAN CHINANA Electrical Engineering

Fabrication of Robotics for various functions on the Navajo Nation.

3RD DAYLNA HANNAH Environmental Science & Natural Resources

Drought and Climate Change Impacts.



THE CENTER FOR ADVANCED MANUFACTURING

For over fifteen years now NTU has steadily worked on an economic development strategy that has three elements: 1) engineering and related degree programs, 2) research, and 3) linkages with the private sector through provision of high technology manufacturing and metrology products and services and joint research projects. This year the Center for Digital Technologies has proposed a new branding strategy by requesting the Board of Regents to rename it as the Center for Advanced Manufacturing (AM).

The Center has hired five students who have earned NTU baccalaureate degrees into full-time positions as its efforts to complete projects associated with each of these three elements has achieved increasing levels of success. Each success has increased the Center's expertise and expanded its capabilities, and that is expected to further balloon as work continues.

Although COVID has impacted a large majority of NTU's operations, the Center remained open under strict CDC guidelines while carrying out its day-to-day functions. Fifty face shield head bands were printed in the Center for health care professionals in the Tuba City region with funds under a National Science Foundation grant. The project was in collaboration with IndigeDesign Collab in Phoenix and utilized a draft table to decontaminate and sanitize each face shield band.

The Center also virtually hosted the annual Advanced Manufacturing Summer Institute, a program developed as a residential experience where students from Tribal College and Universities (TCUs) across the country could learn the fundamentals of 3D manufacturing. Sixteen TCU students participated in the event over computer and ran AM machines at NTU's fabrication laboratory with NTU student intern surrogates. NTU is expected to host another summer institute in 2021.

SUMMER PROGRAMS GO DIGITAL

The AM Summer Institute wasn't the only summer event impacted by the pandemic. NTU's annual NASA Robotics Academy and the Summer STEM and Skills programs were also forced to go online. The Summer STEM and Skills program began in 2018 for dual credit students looking to pursue a higher education in the fields of construction, welding, culinary arts, baking, automotive technology, pre engineering, or business. The program emphasizes experiential education, which made the transition to remote learning challenging. Students were able to earn up to 9 credit hours in the four-week program, which was free to students. Tuition, books, and fees were covered by NTU.

The NASA Robotics Academy was in its second year of operation, but was able to transition online rather seamlessly. The Academy introduces participants to engineering design and programming, and utilized solidprofessor.com to host lessons. Kits that included an Arduino board, LED, breadboard, and a flash drive were mailed to each participant.

NTU also organized a NASA refresher course in July and December for K-12 teachers. The purpose of the course was to encourage students to consider a career in STEM program. Twenty K-12 teachers participated in the refresher course for STEM teachers.

FUTURE GROWTH OPPORTUNITIES IN ADVANCED MANUFACTURING

Area:	Market projection:
Additive manufacturing	\$7 billion to \$21.3 billion by 2020, at a 20% CAGR
Rapid prototyping	\$903 million by 2021, at a 26.8% CAGR from 2016 to 2021
Metrology services market	\$824.6 million by 2020
Non-destructive inspection technologies	\$11.39 billion by 2022, at a 8.3% CAGR from 2016 to 2022

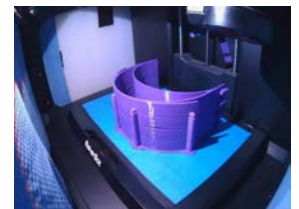
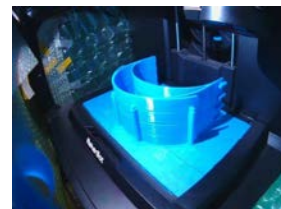
Industries that the Center is achieving success in, as well as the projected growth in those industries in the near future, are listed on the chart above.



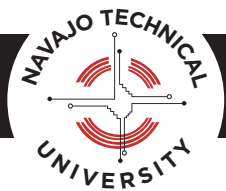
Joshua Toddy extracts a 3D metal print from NTU's Optomec LENS MTS 500 HY CA system. Toddy runs the machine for NTU's Center for Advanced Manufacturing.



Shane Tsosie programs NTU's EDM machine to make a cut of a 3D metal print. The machine uses electrical discharge utilizing a copper wire to make the precise cut.



NTU printed 50 face shield bands to be distributed to health care professionals in Tuba City. A stack of four headbands requires five hours of print time.

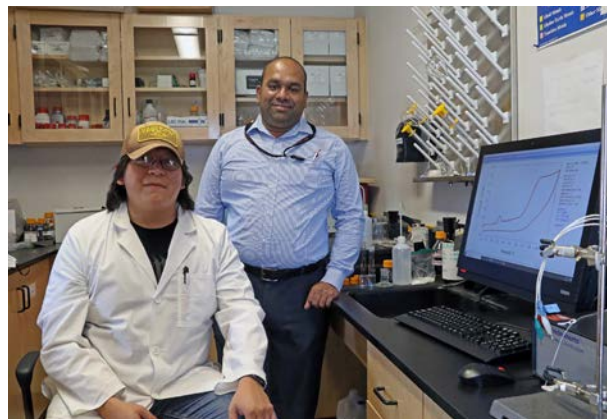


DIVING INTO RESEARCH

NTU's reputation has been growing nationally in recent years as efforts to broaden student and faculty research opportunities have expanded. Faculty have committed to getting their research published while also exposing students to the process of research.

FACULTY AND STUDENT RESEARCH ON ENERGY STORAGE SYSTEMS GETS PUBLISHED IN PRESTIGIOUS JOURNAL

Associate Professor of Chemistry Dr. Thiagarajan Soundappan and Biology graduate Robinson Tom were published in the *Journal of Power Sources* for their research activities related to non-flammable, aqueous gel electrolytes used to produce flexible aqueous lithium-ion batteries. Their research was conducted over the course of two summers under a faculty and student fellowship with the Army Research Laboratory (ARL) in Adelphi, MD. The research is significant compared to current non-aqueous lithium-ion battery technology and is noteworthy given it was accepted by the *Journal of Power Sources*, which has an impact factor of 8.247.



Robinson Tom (left) and Dr. Thiagarajan Soundappan.

Dr. Soundappan and Tom's research focused on ecofriendly, cost effective methods in making an energy storage system that could be low weight, non-flammable, and worn by soldiers to assist with missions in the battlefield. The first year of research worked at understanding interfaces within a battery where an electrolyte and electrode comes in contact, while year two took the knowledge gained from year one to test related monomers and crosslinks and their reaction with an aqueous polymer gel electrolyte. Results from the research showed that the choice of monomers and crosslinks affects the ability of the solution to form a solid gel. Increasing crosslinks allowed for more charge-discharge cycles, which translated to a higher capacity of the battery. It also allowed the battery to perform better at various temperatures, something useful in everyday application.

PROFESSOR'S PEER REVIEWED RESEARCH ON ALGAL PUBLISHED BY ELSEVIER



Dr. Abhishek RoyChowdhury is an assistant professor of Environmental Science at NTU.

Environmental Science and Natural Resources professor Dr. Abhishek RoyChowdhury was published by Elsevier for his peer reviewed work on Algal Research with five coresearchers from the Department of Civil, Environmental & Ocean Engineering at Stevens Institute of Technology. Elsevier is a Dutch publishing and analytics company that specializes in scientific, technical, and medical content. Algal relates to or is a characteristic of algae. In the study, Dr. RoyChowdhury and his colleagues sought to elucidate the toxicity response of microalgae by performing growth-inhibition assays using solutions of single compounds and mixtures of energetic compounds and heavy metals. The team used *Scenedesmus obliquus* as its model, which is a freshwater green microalga.

"I want to involve my students in various innovative research activities and/or real-world problem solving through my courses and research projects," stated Dr. RoyChowdhury. "I strongly believe that this approach will help those who are planning for a career in industry after graduation as well as those who are interested in pursuing an academic career to further explore the intricacies and complexities of anthropogenically mediated environmental systems."



LIBRARY BEGINS TO BUILD A LISTING/ COLLECTION OF FACULTY/ADMINISTRATOR BASED PUBLICATIONS AND BOOKS

One of the goals for NTU since it became a university in 2013 is to establish its credentials as a research university. The new Faculty Librarian, Mark Offtermatt, has started the effort to build the library's resources in a way that allows students and the Navajo community knowledge about, and in some cases the articles, essays and books, faculty publications. A sample of the publications either collected or listed to date is on display to the right.



Marla Price shelves a magazine publication in the NTU library.

An, S. A., Tillman, D. A., & Paez, C. R. (2015) Music-Themed Mathematics Education as a Strategy for Improving Elementary Preservice Teachers' Mathematics Pedagogy and Teaching Self-Efficacy. *Journal of Mathematics Education at Teachers College*, vol. 6, no. 1, pp. 9-24.

Becenti, Delores. Talking Circle. *Tribal College Journal*, Vol. 32, No. 2, Winter 2020, pp. 46 - 47.

Bunn, Chelsea. *Forgiveness*. Finishing Line Press, 2019.

Davis, Thomas. *Meditation on Ceremonies of Beginnings, the Tribal College and World Indigenous Nations Higher Education Consortium Poems*. Tribal College Press, 2000.

Davis, Thomas. *In the Unsettled Homeland of Dreams*. Winner of the Edna Ferber Fiction Book Award. All Things That Matter Press, 2019.

Henry Fowler, Katrina S. Rodgers, David Blake Willis (2020). Our Human-Centeredness Is Killing Us: A Case for Indigenizing Diversity Education, pp. 97-112.

K. A. Brauman, L. A. Garibaldib, S. Polasky, Y. Aumeeruddy-Thomas, Ph. S. Brancalion, F. DeClerck, U. Jacobi, M. E. Mastrangelo, N. V. Nkongolo, H. Palang, N. Pérez-Méndez, L. J. Shannon, U. B. Shrestha, E. Strombom, M. Verma. (2020). Global Trends in Nature's Contributions to People, www.pnas.org/cgi/doi/10.1073/pnas.2010473117.

Lin, Y., Abraham, J., RoyChowdhury, A., Su, T.-L., Braidia, W., & Christodoulatos, C. (2020). Ecotoxicological response of *Scenedesmus obliquus* to pure energetic compounds and metal ions found in wastewater streams from munitions manufacturing. *Algal Research*, 48, 101927.

Reidhead, Christine. (2020). A review of businesses that focus on markets vs. businesses that focus on products in association with market orientation. *Technium Social Sciences Journal*, 11, 203-209. <https://doi.org/10.47577/tss.v11i1.1610>

Reidhead, Christine. Impact of Organizational Culture on Employee Satisfaction: A Case of Hilton Hotel, United Kingdom. *Journal of Economics and Business*, Vol.3, No.1, 432-437.

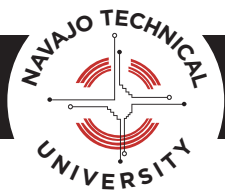
Reidhead, Christine. A Review of Ethical Leadership Practice and Corporate Social Responsibility Approach during COVID-19. *Scholars Journal of Economics, Business and Management*, Vol.7, Issue 9, 320-324. DOI: 10.36347/sjebm.2020.v07i09.006

Smoqi, Ziyad, Toddy, J., Halliday, H., Shield, Jeffrey E., Rao, Prahalada. (2020). Process-Structure Relationship in the Directed Energy Deposition of Cobalt-Chromium Alloy (Stellite 21) Coatings. *Materials and Design*, Vol. 197. <https://doi.org/10.1016/j.matdes.2020.109229>

Soundappan, Chunsheng Wang, Kang Xu. (2020). Gel electrolyte for a 4V flexible aqueous lithium-ion battery. *Journal of Power Sources*, 469, 228378. <https://doi.org/10.1016/j.jpowsour.2020.228378>

RoyChowdhury, P. Mukherjee, S. Panja , R. Datta, C. Christodoulatos, D. Sarkar. (2020). Evidence for Phytoremediation and Phytoexcretion of NTO from Industrial Wastewater by Vetiver Grass, *Molecules*, 2021, 26, 74. <https://dx.doi.org/10.3390/molecules26010074>.

D. Vinothraj, S. Ragavanantham, M. Saravanakumar, M. Vivekananthan, G.S. Sivagnanamani. (2020). Heat dissipation and inter-relationship between physical properties of moulding sand. *Materials Today: Proceeding*. (<http://www.sciencedirect.com/science/article/pii/S2214785320355085>) <https://doi.org/10.1016/j.matpr.2020.07.398>



ACCOLADES AND RECOGNITION

NTU NAMED TOP 5 ONLINE VALUE SCHOOL IN NM, RENEWED TO DELIVER COURSES NATIONWIDE

Days after it was announced that NTU was a top five online value school in New Mexico by BestValueSchools.org, NTU received notice that the National Council for State Authorization Reciprocity Agreements (NC SARA) renewed NTU's participation in an agreement that allows students to take coursework at NTU in states throughout the country.

The approval will pay a dividend for students in regards to accessing NTU's coursework from states outside of New Mexico and Arizona. NC SARA membership requires institutions to have necessary resources in place to supplement online learning, such as 24/7 tutoring. Such resources proved useful when NTU had to switch to an emergency distance education model in April as a result of pandemic.

"We are working on creating fully online programs with support resources," stated NTU's Director of E-Learning Dr. Coleen Arviso. "With this new situation we are improving and implementing best practices for both faculty and students."

NTU was recognized 4th out of 23 institutions of higher education in BestValueSchools.org's ranking, which evaluated tuition and graduation rates in addition to academic excellence and a devotion to non-traditional learning.

ELECTRICAL ENGINEERING PROGRAM RECOGNIZED FOR ITS VALUE

According to Affordable Schools, an online higher education resource, NTU's Bachelor of Science degree in Electrical Engineering (EE) ranked #18 as one of the top 50 most affordable electrical engineering degrees in the nation. The ranking evaluated three factors: affordability, class size, and graduation rates. NTU's EE program received accreditation from the Accreditation Board for Engineering and Technology (ABET) in 2018, which was noted in the ranking.

"We are honored for the high ranking. The number one ranking is our goal," said Dr. Peter Romine, Electrical Engineering department chair and associate professor at NTU. "We are pleased to be recognized for this and are looking to see more students in the program as the Engineering department continues to mature."



NTU Faculty Member of the Year Brian Connolly.

ENGLISH FACULTY MEMBER RECEIVES HIGH PRAISE FROM NTU'S STUDENT BODY

Third year English lecturer Brian Connolly was selected as Navajo Technical University's 2019-2020 Faculty Member of the Year by NTU's student body. The Faculty of the Year recognition is administered under the American Indian College Fund and comes with a \$500 award.

"My initial reaction was surprise," explained Connolly, who started at NTU in January 2018 as an adjunct instructor. "I'm only in my third year of teaching at the college level, and really didn't expect to be recognized like this considering the number of excellent, hard-working faculty members at NTU."

Prior to NTU, Connolly worked at his alma mater as the Director of Advanced Services at St. John's College in Santa Fe, NM. Connolly had earned his master degrees in Liberal Arts and Eastern Classics at St. John's, which he intended to utilize as an instructor. But rather than going into the classroom, he stayed in Santa Fe as a researcher and writer in St. John's fundraising department. In 2018, he learned about an opening at NTU and made his transition to academia.

"It seemed like a perfect opportunity to embark on the teaching career that I had always envisioned," recollected Connolly. "I'm glad I made the decision to come to Crownpoint,"

Connolly teaches students of all majors across three courses: Composition I, Composition II, and Professional and Technical Communication. Each course consists of first-time enrolled students, but there are a handful of returning and transfer students as well. To meet the diverse interests, Connolly takes a process-oriented approach to his instruction and focuses on methods of critical thinking that could help students respond to ideas they may encounter in their academic and working careers.

NTU AMONG TCUS TO RECEIVE DONATION

NTU was among the 384 organizations to receive a donation on behalf of author and philanthropist MacKenzie Scott to address systemic inequities faced by historically marginalized groups. Of the nearly \$4.2 billion donation, NTU received \$12 million to continue its efforts in providing pathways to gainful employment through higher education while introducing innovation and capacity building to the region.

"Tribal college and universities' responsibility extends far beyond the classroom, and we're humbled to be recognized for our efforts," explained Dr. Elmer J. Guy, NTU President. "This donation affirms the work we've been doing in educating our students while positively impacting the communities we serve. We're grateful for the gracious gift, which will be felt by communities throughout the Four Corners region."

Five Tribal College and Universities (TCUs) were gifted funds, including the Institute of American Indian Arts, Blackfeet Community College, Chief Dull Knife, Salish Kootenai College, and Turtle Mountain Community College. Other organizations receiving funds included food banks, relief funds, civil rights advocacy groups, legal defense funds, and those that support the most vulnerable.

BIOLOGY MAJOR ELECTED AISES REGION III REP

Biology major Jasmine Charley of Vanderwagen, NM was elected Region 3 Student Representative at the American Indian Science and Engineering Society's Spring Regional Conference. She is the first Navajo Technical University student to hold a position with the national society, which consists of seven regions throughout the United States and Canada.

As Region 3 Student Representative, Charley has served as the liaison between the National AISES Office and each of the 84 regional AISES chapters across the states of New Mexico, Arizona, Utah, and Colorado. It is Charley's responsibility to evaluate issues and concerns of students across the region and to make recommendations for ways to improve member services.

"Being elected shows students that they can explore outside of their comfort zones and that they can do more than they think they are capable of doing," Charley stated. "Since I accepted the position, I've had two NTU students contact me about running for next year's term. That makes me proud to see that there are other students here on campus that would love to take on this role."





NTU MAKES HISTORY WHILE JOINING THE MAKER MOVEMENT

In March, NTU's Diné Maker Nation Faire made history by becoming the first Native American hosted event under the international Maker Faire name. Navajo ingenuity was on display at the event to the theme of, "The Evolution of Diné Makers," while detailing the art of making and how it has changed over time.

Exhibitors at the event included artists, hobbyists, entrepreneurs, and educators, while K-12 students from regional schools competed in a 3D Printing Product Challenge. In previous years, students were tasked to develop a 3D printed toy for the Navajo Head Start program, however this year, participants printed products for Navajo elders.

The Diné Maker Nation Faire was divided into five worlds according to the Navajo creation story. The first world, the black world, featured traditional forms of making. Brent Toadlena of Bida' Moccasins and Art was featured in the black world and gave a demonstration on preparing cow hide for use as moccasin soles. Other exhibits in the black world included weaving, making a Navajo bun, and breaking down the Navajo sentence structure. A kids' corner was also set up for arts and crafts.

The second world, the blue world, featured trade based forms of creation, such as welding, construction, and automotive. NTU's Automotive Technology program's Polaris UTV with a DynoJet quick-shift center was on display in the blue world. The third world was signified by yellow and featured forms of making regarding the reclaiming of identity. Artists, cosplayers, and chocolatiers were featured in the yellow world as well as a chili cook-off competition. NTU's New Media program provided fun for attendees with a green screen and photo props (*see right*).

The fourth world, the white world, featured modern day forms of making like 3D printing and solar technology. The world served as the bridge into the fifth world, or the glittering world, where the Innoventure Product Challenge was on display.



VIRTUAL COMMENCEMENT

NTU hosted a virtual commencement in the spring and fall in honor of graduates. The events were housed on NTU's website and streamed over the University's Facebook page so people throughout the world could join in on the celebration. The commencements were abbreviated and less formal than in-person graduations; however, they allowed for more participation from dignitaries and university officials to lend words of encouragement and congratulatory remarks. Dignitaries that participated in the events included Ben Ray Lujan, Tom Udall, Tom O'Halloran, Michelle Lujan Grisham, Deb Haaland, and Navajo Nation President Jonathan Nez.

Over 200 graduates were recognized across both celebrations. Graduates were asked to submit a video or photo of themselves thanking those that helped them achieve their accomplishment, which was then embedded into the live stream (*see photos below*). Each commencement was hosted by NTU's Enrollment Management department, and included contributions from NTU's Administration. Motivational speaker and model Dyami Thomas was the commencement speaker in the spring, while comedian and entrepreneur Tatanka Means addressed graduates in the fall. Each commencement can still be viewed on the NTU's YouTube channel.



Graduates were encouraged to submit photos with their degrees for NTU's virtual commencements in the spring and fall. The photos were used to provide individual recognition during the virtual program and to highlight student successes on social media.

ALUMNI UPDATES



JAYVION CHEE:

Former NTU Student of the Year Jayvion Chee graduated from Arizona State University with a Master of Advanced Study in Geographic Information Systems. His brother Teverrick also graduated with a B.S. degree in Environmental Science.



SANDIE JENKINS:

Veterinary Technology spring graduate Sandie Johnson passed her Veterinary Technician National Exam upon graduating in the spring. On November 20, she was offered a job at the San Juan Vet Hospital in Farmington, NM.



ROBINSON TOM:

Biology major Robinson Tom graduated in the spring and was hired as a lab assistant in NTU's wet labs in the fall. Tom was accepted as the first graduate to continue his education at Harvard University under the NSF PREM project.



Alayne Kinlacheeny (left) and Sheila Begay pose for a photo after taking home multiple metals for their chocolate sculpture.

NTU BAKERS SHOWCASE SKILLS AT ANNUAL CHOCOLATE FANTASY COMPETITION

After winning the People's Choice award at last year's annual Chocolate Fantasy competition in Albuquerque, NM, Baking majors Sheila Begay and Alayne Kinlacheeny returned in the spring in respectable fashion placing first for Most Artistic Sculpture and first for best tasting samples.

The chocolate structure mimicked an epic battle between a pair of wizards and a three-headed dragon that was guarding a castle's treasure. The piece was made entirely of chocolate with the exception of pulled sugar used to imitate fire.

FY 2020 FINANCIAL HIGHLIGHTS

Net operating results increased by 2% from 2019 to 2020 due to an increase in expenditures in Student Scholarship Payments, Student Services, and Instructional line items. Operating revenue fluctuated year-to-year due to enrollment, which affects tuition, federal student aid, and auxiliary enterprises. The non-operating activities revenue increased by 9 percent due to an increase in federal appropriations and other revenue funding, which resulted in a positive net asset of \$7.1 million for 2020.

REVENUES	2019, Audited	2020, Unaudited	%Change
Tuition and Fees, Net	\$ 751,502	\$ 913,434	22%
Auxiliary Enterprises	\$ 1,130,088	\$ 1,492,039	32%
Total Revenues	\$ 1,881,590	\$ 2,405,472	28%

EXPENDITURES	2019, Audited	2020, Unaudited	%Change
Instructional	\$ 7,284,351	\$ 8,294,585	14%
Student Services	\$ 1,978,692	\$ 2,364,642	20%
Academic Support	\$ 3,419,484	\$ 1,608,488	-53%
Public Services	\$ 692,467	\$ 908,130	31%
Student Assistance	\$ 787,605	\$ 1,642,138	108%
Institutional	\$ 8,674,903	\$ 8,798,887	1%
Auxiliary Services	\$ 4,767,883	\$ 4,931,088	3%
Depreciation	\$ 2,834,301	\$ 2,890,987	2%
Total Expenses	\$ 30,439,686	\$ 31,438,945	3%
Net Operating Results	\$ (28,558,096)	\$ (29,033,473)	2%

NON-OPERATING ACTIVITIES	2019, Audited	2020, Unaudited	%Change
Federal Grants and Contracts	\$ 25,599,241	\$ 30,116,329	18%
Government Appropriations	\$ 5,855,495	\$ 4,335,608	-26%
State/Tribal Grants and Contracts	\$ 1,113,304	\$ 95,398	-91%
Private Grants and Contracts	\$ 617,905	\$ 870,792	41%
Other	\$ 86,167	\$ 746,297	766%
Interest Income	\$ 61,794	\$ 62,412	1%
Total Non-Operating Activities	\$ 33,333,906	\$ 36,226,836	9%
Total Results	\$ 4,775,810	\$ 7,193,363	51%

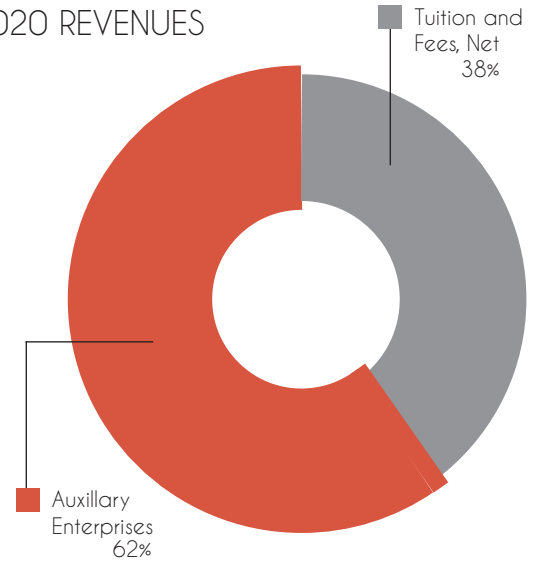
FINANCIAL AID OPPORTUNITIES EXPAND IN NM

The New Mexico Lottery Scholarship continued to be available in 2020 for students attending a tribal college or university after Gov. Michelle Lujan Grisham approved Senate Bill 407 in March 2019 to assist with educational expenses for students. The state also made available the New Mexico Opportunity Scholarship, which was designed for students pursuing degrees in healthcare, education, and other critical sectors as identified by the state.

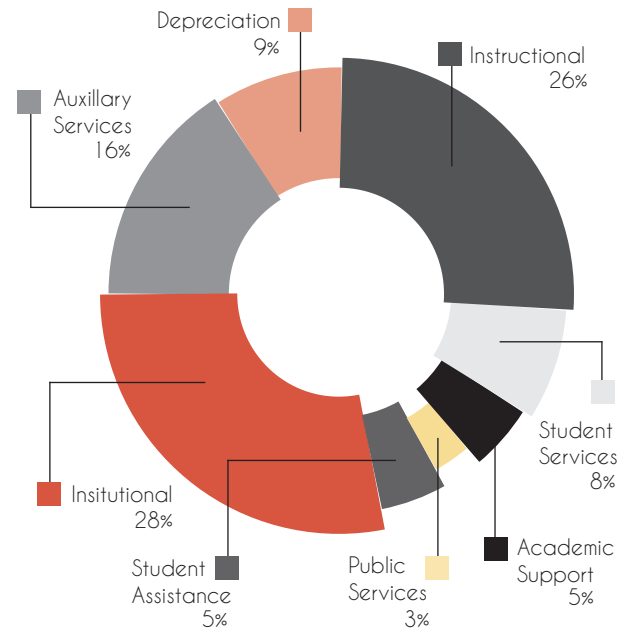
"This is a great opportunity for students to attend NTU and it benefits them more because they can get an education at a rate much lower than most colleges and universities in the state," explained NTU President, Dr. Elmer J. Guy. "Expenses for attending college has increased over the years and students need all the financial assistance that is available to them."

The New Mexico Lottery Scholarship awards eligible students \$1,020.00 per semester up to seven semesters or until the student graduates with a bachelor's degree. The New Mexico Opportunity Scholarship provides tuition and fee assistance for students enrolled in 2-year programs, including credit-bearing certificate or associate degree programs.

2020 REVENUES



2020 EXPENDITURES



2020 NON-OPERATING ACTIVITIES

