Action Grant

Application

2020-2021

OFFICE OF CAREER, TECHNICAL, AND ADULT EDUCATION
NEBRASKA DEPARTMENT OF EDUCATION
301 Centennial Mall South, Lincoln, NE 68508

NEBRASKA COLLEGE OF TECHNICAL AGRICULTURE
404 East 7th Street, Curtis, Nebraska 69025

Dr. Larry Gossen, Dean

Jennifer McConville, Associate Dean

Jan Gilbert, Business Manager

Section 1: Application Overview

Workforce Development is the primary goal for the Nebraska College of Technical Agriculture (NCTA), nestled in the canyon country of Southwest Nebraska. Part of the University of Nebraska system, NCTA is a two-year institution with a statewide mission of preparing students for successful careers in agriculture, veterinary technology, and related industries. NCTA is known for its affordable tuition, high job-placement rate for its graduates, and for the success of student teams in competitive activities.

Preparation for students to enter the workforce is why we exist, and this grant application is designed to reinforce our mission. We know that while we are preparing students to enter the workforce directly upon graduation or completion of one of our certificate programs, we also know that we are preparing students for a lifetime of informed choices and for careers that do not yet even exist. Changes in technology and an ever-changing job market require students to be prepared to either move to a new job in their career or to change careers as the industry changes.

This application aligns with the findings of our reVISION process in regards to workforce demand needs in the region and the state, the need for systemic career development and awareness in high need, high skill, and high wage (H3) careers, and the need to maintain our scope, size and quality of instruction in a continuously changing industry. Our goals for this grant focus on recruitment of students to these H3 careers, providing cutting edge technology for high demand jobs, and create additional hands on, work-based learning opportunities in a potential pandemic environment where travel to onsite training facilities may not be available. We will also create opportunities for addressing barriers that many rural schools may have in providing training on current technology in agriculture.

Our goal is to prepare students for H3 careers. Utilizing the Nebraska Works website, the demand for workers in the various fields of Veterinary Technology, Vet Assistants, and Laboratory Animal Caretakers is estimated to be over 40 percent over the long-term projection. Agricultural Equipment Operators project an increased demand of nearly 10 percent, and the demand for welders is over eight percent. Agricultural careers in general show an increase in nearly every field. More importantly, self-obtained data from our industry partners indicates a desperate need for agronomists, crop scouts, seed salespersons, chemical applicators, and pest management consultants in the agronomy field. Our welding and irrigation technology partners are hiring our graduates at a pace that requires double to triple the number of graduates we can produce in a year.

Section 2: Key Objectives

Project 1: Current demand for agricultural welders is on the rise across the state of Nebraska as well as across state lines. Technology demands for current welding programs creates gaps in available training that can be provided to prepare industry-ready employees. We are currently expanding our welding program by doubling the size of the facility, increasing number and types of welders, planning on adding CNC plasma cutters, and designing additional hands on learning opportunities for students in the agricultural mechanics laboratories. By creating this new workspace in welding, and expanding into high-tech robotic welding, we hope to create a greater interest among students in the surrounding communities to meet the need for industry career opportunities.

Project 2: There are more jobs in Agronomy each year than there are graduates to fill them. The Agronomy department at NCTA has access to multiple land labs in the area for learning principles of

agronomy and related subjects. In an effort to inform high school and middle school students of the opportunities in agronomy, our agronomy professor will create an interactive mobile display to take to schools in the region to create an awareness of careers in plant and soil science and pest control as well as irrigation technology systems and natural resources. The goal will be to equip this mobile lab with technology and hands-on modules for students to experience agronomy firsthand.

Project 3: Providing hands on application in a lab setting when travel to an onsite destination is not possible will allow us to create a similar experience to real life in the equine health and veterinary technology areas. In times when travel is permissible, using real-life models to help prepare students for an experience prior to the actual hands-on application will provide additional opportunities for learning. For students with disabilities, having models for practice provides learning opportunities prior to exposing students to a live animal situation.

Project 4: To prepare students for future jobs, cutting edge technology is required. Opportunities to provide real life experiences add to the credibility of the program in recruitment of new students into various CTE areas. Finally, with the recent shutdown of colleges across the nation, virtual learning has caused serious problems for technical programs like those offered at NCTA. Innovative teaching strategies require technology to provide the same experience for students not able to attend live events or classes.

These projects relate directly to the CTE strategic priorities of Systemic Career Development, Work-Based Learning, Student Achievement, and even Middle School CTE.

Section 3: Project Activities

Project 1: Expansion of Agricultural Mechanics Welding Program

The purchase of a Yaskawa Motoman AR700 Welding Robot with YRC 1000 Robot Controller and MotoSIM Touch YRC software package meets the following Perkins V reVISION application goals and strategies:

Element 1: *Career Development* – Strategy 1: *Grow agricultural industry partnerships and develop a structure for collaborative career exposure and recruiting.*

Element 2: Workforce Alignment – Strategy 2: *Develop a better connection with special populations and non-traditional students to effectively communicate available opportunities in the agricultural industry.*

Element 3: Size, Scope, and Quality of Implementing CTE Programs of Study – Strategy 1: *Maintain technology guided by assessment necessary for providing current, high-quality technical education in our agribusiness management, agronomy, equipment, animal science and veterinary technology programs.*

There are multiple community colleges in Nebraska and the region that offer welding programs. Our goal in expanding our welding program is to provide something different that relates directly to our industry partners in agricultural systems as well as hands-on application of skills in direct agricultural related careers. While the Department of Labor numbers may not show a direct need for welders in Southwest Nebraska, several of the top H3 careers are related to or require welding skills. Our industry partners in the region are contacting us regularly to provide them with trained technicians with welding experience and applicable skills. The availability of these careers is a major point we share with area high schools in recruiting their students to our campus. In addition, as we pursue alternative funding sources

through industry and foundation donations, this grant from a federal source would provide additional buy-in for our program goals as we work with these other sources. This acquisition would provide a springboard for additional welders and high-tech equipment.

As we work with area high schools in Southwest Nebraska, there are multiple opportunities to attract underserved populations of students in various racial and ethnic groups that would be attracted to our expanded welding program. Early talks have begun with the Lexington High School Agricultural Education and Skilled Trades programs to create partnerships and alignment of programs. The addition of a robotic welder also offers opportunities for students with physical handicaps to achieve skills in H3 careers. Using the MotoSim software designed for education, students can create robotic applications including programming, modeling, and diagnostics in a simulation environment. MotoSim Touch provides the ability for the student to toggle between a virtual pendant or a hardware pendant. The program can be saved to a flash drive so that the student can move their program from the simulation environment to the classroom robot. The expansion of our program will provide us with a better opportunity to create interest in the welding career field for all students.

The Agricultural Mechanics Advisory Committee has provided feedback that identifies our need to expand this program and recommends adding additional technology to our equipment to align with industry standards more closely. The skills developed in programming the robotic welder can be applied to other robotic applications that many of our industry partners currently use. This includes Cloud Ceramics in Concordia Kansas, Stutzman Greenhouses in Yoder Kansas, Reinke Manufacturing in Deshler Nebraska, and MetalQuest in Hebron Nebraska.

Project 2: Mobile Agronomy Engagement and Recruitment Lab

The purchase of a Freedom, 8.5 X 26 foot Mobile demonstration unit with NCTA and industry partners logo external wrap meets the following Perkins V reVISION application goals and strategies:

Element 1: *Career Development* – Strategy 1: *Grow agricultural industry partnerships and develop a structure for collaborative career exposure and recruiting;* Strategy 2: *Strengthen the awareness of careers available in agriculture with technical, post-secondary education through improved relationships with guidance counselors/career advisors.*

Element 2: Workforce Alignment – Strategy 2: *Develop a better connection with special populations and non-traditional students to effectively communicate available opportunities in the agricultural industry.*

Industry partners in Agronomy are consistently contacting our program chair regarding the need for agronomists and employees with a background and training in plant and soil science and range management. Through our reVISION study, we identified the need to be more connected with school counselors and agricultural education programs to share career opportunities. The purchase of a 26-foot unit with finished interior and easy ramp access would allow us to take our agronomy program on the road to various schools, career fairs, conventions and provide an onsite exhibit on campus for visiting students. An attractive wrap to advertise NCTA, industry partners, and various agronomic careers would add excitement and draw attention to the unit as it is set up in parking lots and exhibition spaces.

NCTA is committed to the furnishing of the mobile unit with a variety of interactive displays for students grade 5 through 12 and would all be handicapped accessible for multiple disabilities. Early conversations

with industry partners have indicated a strong future opportunity to assist with equipping the unit with the following displays:

- Soil box with a transparent side in which several company's soil moisture sensors would be placed and visible.
    - Data could then be pulled up on a smartphone/computer screen
- Water recycling box that would have a few different designs of irrigation nozzles for demonstration and wired for smartphone monitoring and control
- Two irrigation control boxes with touch screens
- Sprayer nozzle water recycling box for demonstration wired for automated control demo's
- Planter row unit with an electric seed delivery drive wired to the planter monitor/controller
- Two large screen TV monitors that could be mounted to easily display all the above examples of data/monitoring screens.
- Along with additional industry donations to enhance the interest of agronomic careers

Regardless of any additional industry donations, the NCTA Grant Leadership Team is committed to funding the additional technology to complete the mobile lab project.

Project 3: Animal Science and Veterinary Technology simulation models

Purchase of an Equine Palpation/Colic Simulator, Female K-9 urinary catheter training mannikin, K-9 BhS simulator, and a K-9 IV, IM, SQ trainer meets the following Perkins V reVISION application goals and strategies:

Element 2: Workforce Alignment – Strategy 2: *Develop a better connection with special populations and non-traditional students to effectively communicate available opportunities in the agricultural industry.*

Element 3: Size, Scope, and Quality of Implementing CTE Programs of Study – Strategy 1: *Maintain technology guided by assessment necessary for providing current, high-quality technical education in our agribusiness management, agronomy, equipment, animal science and veterinary technology programs.*

The animal science and vet tech programs at NCTA are very proud of our use of live animals in hands-on situations for training our students. Our school farm provides ample opportunities for use of school animals as well as arranging for loaned animals for our students to practice. Thus, when situations exist that prevent us from being as hands on as normal, it is imperative that we have other options for creating a similarly vibrant experience.

Another challenge with working directly on live animals is that many of our students are not from a farm background and the very first time they have had an exposure to many animals is when they arrive on campus. To work directly on a live horse for the very first time is unnerving at best and downright terrifying at worst. Using models to practice before moving to a live animal is a great way to introduce the technique in a non-threatening way, ensuring the student can be successful with the process, generating confidence in their ability to succeed, and then transferring that new found skill onto a live animal creates even greater pride in their ability.

In addition, students with either visual, physical, or other disabilities are often disadvantaged to learn these skills in a lab using live animals and the fear factor is often multiplied. Providing simulation models provides a hands-on experience that can still be an experience that allows for student success.

Finally, simulators make it possible to take a life like experience into a classroom in a high school, to a career fair, or during a field day when working with middle and high school students. This provides additional opportunities for recruitment of students into these agricultural career fields. Only a few colleges in the United States are using some of these models so having cutting edge technology available for our students makes a great recruiting tool.

Even these models take maintenance and continued replacement of parts that get constant use. NCTA is fully committed to adding the cost of these supplies to our regular operating budgets for these departments.

Project 4: Update technology in Animal Science and Veterinary Technology departments

Purchase of equipment to improve quality of educational experiences in Animal Science and Vet Tech meet the following Perkins V reVISION application goal and strategy:

Element 3: Size, Scope, and Quality of Implementing CTE Programs of Study – Strategy 1: *Maintain technology guided by assessment necessary for providing current, high-quality technical education in our agribusiness management, agronomy, equipment, animal science and veterinary technology programs.*

Element 6: *Work-Based Learning* – Strategy 1: *Grow and improve the practicum structure and develop assessment strategies to connect practicum experiences to student career readiness*.

To keep our Animal Science Department and Veterinary Technology program on the cutting edge and to maintain accreditation from the AVMA, our goal is to be proactive in the purchase of high-tech equipment. Our most immediate needs for this equipment include the following.

1. ClearVet Converted Imaging system with 12-month remote phone support and training: The AVMA recommends this equipment. Manufacturer support and training for the first 12 months is included in the prices of the unit and is mandatory due to the high technical skill required to operate the system. This will allow students to have the hands-on experience with state-of-the-art equipment used by most private practice veterinarians. The technology allows for elimination of film processing, faster, almost immediate real time image display, computerized filing of radiographs, no odors or hazardous waste materials, eliminates chemicals, film, and processor. It is capable of transmitting images via e-mail. The ability for students to master the use of this technology permits higher employability for students following graduation.
2. Pixem Robotic Camera and tripod with livestreaming capability: This piece of equipment will allow us to conduct virtual clinics, teaching in an applied setting and film with one person if necessary. This type of tool would dramatically increase the opportunity to reach students (current and perhaps future students) as we could include participants from anywhere around the globe that can access the internet. We could also use this tool to create new and innovative teaching strategies, to include recording of labs, clinics, or class and in some settings, we could also connect with other industry professionals live. This tool would provide for an entirely new way to teach. We, at current, cannot teach many of the livestock classes on-line because there really is no way to replicate or include a student unless they are physically present. With a tool like this, we could create innovative teaching methods to include students virtually if needed. Examples of where these could be used would be for Livestock Judging Camp and Equine Clinics.

As with other projects, NCTA is committed to the continued maintenance and ongoing upgrades to this equipment through department budgets.

Section 4: Commitment & Capacity

The NCTA Action Grant leadership team will be made up of the Deans, Dr. Larry Gossen and Jennifer McConville; Agronomy professor Dr. Brad Ramsdale; Welding instructor Dan Stehlik; Animal Science professor Joanna Hergenreder; Veterinary Technology professor Barb Berg; Business Manager Jan Gilbert; a member of each department's advisory council. Once the grant has been awarded and funds have been approved, Jan Gilbert will monitor the purchase of each item identified in the grant. The leadership team will meet as often as needed to ensure the overall projects are progressing on schedule.

The projects identified in this grant will cost more than the requested amount in this grant, primarily the welding expansion. Additional expenses regarding the purchase, installation, training, and licensing of the robotic welder will exceed $16,000. NCTA is committed to the success of each project and will commit the necessary resources required to ensure the sustainability of each.

The expansion of the agricultural mechanics welding program is a long-term project that has already been supported by a generous donation from an alumnus through the University of Nebraska Foundation. The next phase of this donation will be engaged in 2021 and will continue to support additional changes to the program. Previous donations have also been made by the Eighmy Foundation, and additional funding will be sought in the fall of 2020 for another grant to continue this work. There are no commitment letters for these sources as the timeframe for these grants is yet to come. Additional support for the Agricultural Mechanics program has been received from industry partner Reinke Manufacturing. This continuing partnership will also be an important contributor for ongoing expansion in the irrigation technology curriculum. Talks have also begun with Valmont for providing training on their equipment and technology.

Industry partners have also shown verbal interest in the possibility of supporting the mobile agronomy engagement lab. The expected contributions of industry will be sought but are not required for the success of the lab. NCTA is financially committed to the success of the lab and adding the necessary technology required to furnish the unit.

Ongoing commitment of NCTA will ensure the purchase of consumables and replacement parts for the Animal Science and Vet Tech simulation models.

Section 5: Budget Proposal

Activity Budget: Activity # __1_		
Expenditure	**Unit Cost**	**Total**
Salaries – Specified by Position (Object Code 100)		
NA		
Employee Benefits – Specified by Position (Object Code 200)		
NA		
Professional & Technical Services – (Object Code 300)		
NA		
Other Purchased Professional Services – (Object Code 400/500)		
NA		
Supplies— including Operational Equipment - (Object Code 600)		

Yaskawa Motoman AR700 Welding Robot with YRC 1000 Robot Controller and MotoSIM Touch YRC software package (approximately two thirds of cost requested by grant)	61,176.00	41,810.00
	Subtotal	41,810.00
Capital Assets– (Object Code 700)		
NA		
	ACTIVITY TOTAL	$41,810.00

Activity Budget: Activity # __2__		
Expenditure	**Unit Cost**	**Total**
Salaries – Specified by Position (Object Code 100)		
NA		
Employee Benefits – Specified by Position (Object Code 200)		
NA		
Professional & Technical Services – (Object Code 300)		
NA		
Other Purchased Professional Services – (Object Code 400/500)		
NA		
Supplies— including Operational Equipment - (Object Code 600)		
2020 Freedom 8.5'X26' mobile demonstration unit with plywood interior, LED light package	14,895.00	14,895.00
	Subtotal	14, 895.00
Capital Assets– (Object Code 700)		
NA		
	ACTIVITY TOTAL	$14,895.00

Activity Budget: Activity # __3__		
Expenditure	**Unit Cost**	**Total**
Salaries – Specified by Position (Object Code 100)		
NA		
Employee Benefits – Specified by Position (Object Code 200)		
NA		
Professional & Technical Services – (Object Code 300)		
NA		
Other Purchased Professional Services – (Object Code 400/500)		
NA		
Supplies— including Operational Equipment - (Object Code 600)		
Vet Simulator Equine Palpation Colic Simulator with Equine Neck Venipuncture w/intramuscular injection	32,000.00	32,000.00
Female K-9 urinary catheter training mannikin	1,500.00	1,500.00
K-9 IV, IM, and SQ trainer	1,500.00	1,500.00
K-9 BhS simulator with breath and heart sounds	2,100.00	2,100.00
	Subtotal	37,100.00
Capital Assets– (Object Code 700)		
NA		
	ACTIVITY TOTAL	$37,100.00

Activity Budget: Activity # __4__		
Expenditure	**Unit Cost**	**Total**
Salaries – Specified by Position (Object Code 100)		
NA		
Employee Benefits – Specified by Position (Object Code 200)		
NA		
Professional & Technical Services – (Object Code 300)		
NA		
Other Purchased Professional Services – (Object Code 400/500)		
NA		
Supplies— including Operational Equipment - (Object Code 600)		
ClearVet Converted Imaging system with 12 month remote phone support and training. Manufacturer support and training for the first 12 months is mandatory due to the high technical skill required to operate the system.	4,995.00	4,995.00
Pixem Robotic Camera with tripod, livestreaming capable	1,200.00	1,200.00
	Subtotal	6,195.00
Capital Assets– (Object Code 700)		
NA		
	ACTIVITY TOTAL	$6,195.00

Budget Summary

Salaries

Activity 1		$_____
Activity 2		$_____
Activity 3		$_____
	Subtotal	**$___0_____**

Employee Benefits

Activity 1		$_____
Activity 2		$_____
Activity 3		$_____
	Subtotal	**$____0____**

Professional & Technical Services

Activity 1		$_____
Activity 2		$_____
Activity 3		$_____
	Subtotal	**$____0____**

Other Purchased Services

Activity 1		$_____

Activity 2		$_____
Activity 3		$_____
	Subtotal	**$____0____**

Supplies & Materials/Operational Equipment

Activity 1		$41,810.00
Activity 2		$14,895.00
Activity 3		$37,100.00
Activity 4		$6,195.00
	Subtotal	**$100,000.00**

Capital Assets

Activity 1		$_____
Activity 2		$_____
Activity 3		$_____
	Subtotal	**$____0____**

	Grand Total	**$100,000.00**