



Engaging  
industry.

Enhancing  
education.

Inspiring  
students.



**MINNESOTA STATE**  
Centers of Excellence

**REPORT TO LEGISLATURE**  
**JANUARY 2019**



Workforce development is a priority at Minnesota State. In 2018, Chancellor Devinder Malhotra conducted partnership tours in communities statewide to promote efforts to solve workforce shortages and brainstorm new ways to address the challenges faced by Minnesota employers. In the Twin Cities area alone, approximately 62,250 workers would need to join the workforce above and beyond the number of workers projected by the Minnesota Demographic Center if the region hopes to keep pace with historic rates of growth.



Minnesota State’s eight Centers of Excellence work in partnership with employers, colleges and universities, schools, and communities to support six of the state’s leading industries.

INDUSTRY HIGHLIGHTS

AGRICULTURE

- Agricultural production and processing in Minnesota account for \$57.5 billion in sales and more than 147,000 jobs.
- In the U.S., Minnesota ranks: 5th in crop production; 5th in total agricultural production; and 8th in livestock production
  - The state ranks 8th in the number of farms and 10th in the number of USDA-certified organic farms

ENERGY

- Minnesota’s growing reliance on wind, solar and combined heat and power has created a need for smart grids and storage technologies that can harness renewable energies — and a workforce that can meet those challenges.
- Clean energy employment in Minnesota surged 78 percent between January 2000 - 2014.
  - Qualified technicians and engineers are in high demand in all types of generation, transmission, and distribution jobs

ENGINEERING AND ADVANCED MANUFACTURING

- With 320,000 workers, manufacturing is the state’s third largest employer.
- Current demand is very strong for industrial, civil, electrical, and mechanical engineers, with nearly 7,000 projected total openings between 2014 - 2024

INFORMATION TECHNOLOGY (IT)

- IT is part of Minnesota’s “Professional Technical and Management of Companies” sector — the state’s largest sector ranked by number of firms.
- IT careers will provide some of the highest rates of occupational growth from 2016 - 2026
  - There are 3,500 projected openings in computer networking with a growth rate of 6 to 8 percent over the next ten years

HEALTHCARE

- Healthcare is the state’s #1 industry, ranked by employment, with nearly 500,000 workers employed by healthcare organizations large and small.
- Largest occupations are registered and practical nursing, nursing aides and allied health treatment and support
  - Health care and social assistance jobs will grow by nearly 80,000 between 2016 - 2026, making it the industry sector with the largest growth

TRANSPORTATION

- Wholesale trade and transportation is the state’s second largest industry, by number of firms, and the fifth largest by employment sector.
- High-demand occupations include: automotive service technicians and mechanics, sales managers and representatives, truck drivers, and material movers
  - Over 5,000 additional jobs are projected for the transportation and warehousing sector between 2016 - 2026



Minnesota State Centers of Excellence: Partners to Minnesota Employers



Ron Anderson,  
Senior Vice Chancellor  
of Academic and  
Student Affairs

In 2005, the Minnesota Legislature appropriated funding to create targeted “Centers of Excellence” within the Minnesota State college and university system. Four centers were initially created to address the healthcare, manufacturing, applied engineering and information technology sectors, and drew together higher education, businesses, local communities, and K-12 schools to partner in creating a world-class workforce through innovative and collaborative programming. Based on the success of those efforts, four additional centers were added in 2012. These Centers serve the energy, transportation, northern agricultural, and southern agricultural sectors.

Today, Minnesota State Centers of Excellence continue to excel at engaging industry, enhancing education, and inspiring students. With 22 industry and education advisory organizations, the Centers engage more than 600 business leaders annually to discuss unique workforce challenges facing their industries and to partner with them to launch solutions. These partnerships enhance education and workforce development by inspiring students with hands-on career and skill exploration tools and events, through innovative educational models and new curriculum, and by expanding and strengthening the workforce pipeline through education and career pathways in K-12.

This report provides an overview of how the Minnesota State Centers of Excellence put the power of industry and education partnerships to work in developing Minnesota’s future workforce.

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# Engaging industry.

INDUSTRY SUPPORT AND GRANTS, NEARLY  
**\$13,000,000**  
IN THE PAST TWO YEARS

Centers are key connecting points to industries and businesses that support educational programs and youth outreach through donations of equipment, scholarship funds for students, and key collaborative leaders for large state and federal grants.

**22**  
ADVISORY COUNCILS  
WITH MORE THAN  
**600**  
MEMBERS

Many of Minnesota's largest employers and industry associations serve on Center advisory councils and partnership groups.

## HIGHLIGHTS



### ENERGY

#### Energy to Lead

The Energy Center of Excellence is guided by an education-industry partnership with 70 representatives from the state's major utilities, labor organizations, rural electrics, and state agencies, among others.

- The industry partnership helped develop an Energy Science Trailer that serves as a mobile classroom
- In 2017 - 2018 the trailer visited 12 high schools and provided hands-on learning to 800 students



### TRANSPORTATION

#### MNCARS

The Transportation Center of Excellence convened a cross-sector of industry automotive industry representatives to help fund and create the MNCARS movement:

- To help students, parents, counselors and career influencers overcome misconceptions and to get excited about automotive careers
- To encourage students to explore education options at Minnesota State
- To connect industry to classrooms, career fairs, and work-based learning
- MNCARS website has had 54,000 visitors

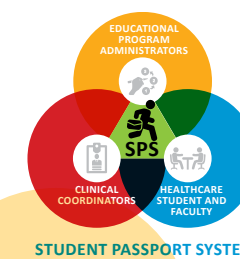


### ENGINEERING

#### Manufacturing Workforce Partnership

The Engineering Center of Excellence invites engaging and pertinent speakers to address the industry, education and state representatives who attend meetings of the Minnesota Manufacturing Workforce Partnership. Recent topics have included:

- Building strong partnerships for work-based learning
- Best practices for hiring veterans and formerly incarcerated individuals



### HEALTHFORCE MINNESOTA

#### The Clinical Coordination Partnership (TCCP)

The HealthForce Center of Excellence created TCCP to help streamline the complex process of scheduling and tracking nursing student clinical experiences.

- More than 55 schools and 64 hospitals and clinical sites are now member partners
- Efforts to bring similar efficiencies to advanced-practice health programs are being piloted



### ADVANCED MANUFACTURING

#### 360 eTech Online

An online educational program developed by the Advanced Manufacturing Center of Excellence that employers use to teach basic and advanced skills in production technologies and welding.

- Offers flexible and convenient delivery options
- Aligned with a national, industry-recognized credential, allowing employees to earn college credit and enhance eligibility for promotion



### INFORMATION TECHNOLOGY

#### MN Cyber Institute

A cutting-edge simulation and training platform that was launched in partnership by the IT Center of Excellence and Metropolitan State University, the MN Cyber Institute:

- Delivers hyper-realistic training scenarios for instructing and certifying cyber security experts
- Is sponsored by Elbit Systems of America and powered by its Cyberbit subsidiary



### AGRICULTURE, NORTH AGCENTRIC

#### Farm Finance Workshop

AgCentric convened eight workshops for industry partners with a stake in farmer financial sustainability, including Farm Business Management, Farm Service Agency, MN Independent Bankers, MN Bankers Association and MN Department of Agriculture.

- More than 250 people attended 8 workshops around the state
- Industry and education partners shared their strategies for helping farmers in distress



### AGRICULTURE, SOUTH

#### John Deere Combine Simulators

The Agricultural Center of Excellence, South helped Riverland Community College acquire a combine simulator that gives students the opportunity to "operate" sophisticated combines without damaging crops or machinery. Based on their success, a second simulator is planned for South Central College and donations from Hormel Foundation (\$25,000) and Compeer Financial (\$10,000) will be leveraged with state funding.

# Enhancing education.

## HIGHLIGHTS

MINNESOTA STATE  
EDUCATED NEARLY  
**400,000**  
STUDENTS

CENTERS SUPPORTED  
**525**  
TEACHERS AND FACULTY WITH  
INSTRUCTIONAL MATERIALS  
AND CAREER AWARENESS  
EVENTS

*"The information was extremely relevant to our STEM curriculum and authentic to the learning experience I want for our students."*

High school  
educator/E3  
workshop attendee

*"Created long-lasting relationships that will benefit us in our future careers as educators."*

CASE-Institute-  
Certified Educator



### ENERGY

#### Energy Education for Educators (E3)

The Energy Center of Excellence launched an "educate the educator" (E3) program that includes:

- E3 Workshops that help teachers bring math and science classroom instruction alive
- Free classroom presentations, curriculum, lab kits, and industry tours
- Access to the Energy Trailers that bring complete instructional kits and curriculum guides to high schools across the state



### ADVANCED MANUFACTURING

#### Innovations in Online Education

The Advanced Manufacturing Center of Excellence used a National Science Foundation grant to launch a new online program for production and welding technologies. This innovative eTECH program:

- Is currently offered through 10 Minnesota State colleges
- Provides a flexible curriculum to meet needs of high school, college, and working-adult students



### TRANSPORTATION

#### Subaru University

The Transportation Center of Excellence has partnered with Subaru of North America to bring OEM-level training to Minnesota.

- Subaru donates engines, online curriculum, vehicles and equipment
- Five Minnesota State colleges and two high schools implemented the program in 2018
- Instructors and students have access to factory-level training and Subaru certification
- Local Subaru dealers provide student internships, open houses, and career events



### INFORMATION TECHNOLOGY

#### Advancing the State of IT Curriculum

The IT Center of Excellence partnered with 11 Minnesota State colleges and universities to launch new IT curriculum in 2019.

- 56 flexible learning modules were developed in cybersecurity, data science, agile development and career readiness for IT professionals
- Industry provided critical input into the competencies and learning experiences that faculty used to create the curriculum



### ENGINEERING

#### Supporting Learn Work Earn

The Engineering Center of Excellence is an active supporter of the Minnesota Advanced Manufacturing Partnership's Learn Work Earn project, which is designed to:

- Help adult workers, unemployed, and veterans learn advanced manufacturing skills in mechatronics, machining, and welding
- Incorporate prior learning and speed transitions from training to degree completion and employment



### AGRICULTURE, NORTH AGCENTRIC

#### Taking Ag Education to New Heights

AgCentric is helping Minnesota State colleges to enhance their agricultural science programs with innovative new offerings including:

- Training and certification in the operation of unmanned aerial systems or drones using a hybrid online and in classroom format
- New online courses, including "Intro to Agriculture," which explores eight career pathways and "Farm Business Management Essentials" for agricultural producers



### HEALTHFORCE MINNESOTA

#### No Nursing Program Left Behind

When a number of Minnesota State nursing programs were struggling to meet deadlines for new accreditation standards, the HealthForce Center of Excellence:

- Supported Minnesota State nursing faculty with webinars, curriculum reviews, professional development, and mock site visits
- Helped 100 percent of eligible practical and registered nursing programs to meet the 2018 deadline to apply for candidacy



### AGRICULTURE, SOUTH

#### The CASE for Developing Ag Educators

A key player in the introduction of the Curriculum for Agricultural Science Education (CASE) that is now used nationwide, the Agricultural Center of Excellence, South hosted three CASE Institutes last summer that:

- Demonstrated how to maximize the effectiveness of CASE in the classroom
- Certified 12 percent of the teachers nationwide who attended CASE Institutes in 2018

Inspiring  
students.

## HIGHLIGHTS



### ENERGY

#### Building a Legacy of Success

Dakota County Technical College has five graduates from the Legacy Program enrolled in an Electrical Lineworker diploma/degree program that will qualify them for jobs with \$54K base pay. They are assured interviews with Xcel Energy who partnered with the Energy Center and the Legacy Program to provide workforce skills training and wraparound services at their inner city high schools.



### TRANSPORTATION

#### Nitro-X Automotive Camp

Nitro-X is a youth summer camp where middle school students learn about advances in automotive and vehicle technology alongside industry experts and high school and college instructors. Students experience hands-on technical skills with a healthy dose of career awareness.



### ENGINEERING

#### Engineering the Future

The Engineering Center of Excellence hosts many K-12 outreach and educational events, including: Engineering Academic Days at Minnesota State University, Mankato, for women, Latino, and Pan-African Students; STEM career readiness days for 7th grade students; and Supermileage Challenge for middle school students among many others.



### HEALTHFORCE MINNESOTA

#### Scrubs Camp

Since 2008, the goal of Scrubs Camp is to get students excited and interested in pursuing a career in health sciences, and to come home motivated and focused on how school prepares them for these rigorous careers. At camp, students interact directly with working professionals in diverse healthcare fields to learn about jobs they have probably never heard of. Through field trips, students see professionals in action using the latest healthcare technologies.



### ADVANCED MANUFACTURING

#### “Dream it. Do it.”

Manufacturing results included:

- 187 manufacturers hosted tours of their manufacturing operations
- 89 schools participated
- 2,640 students attended
- 25,071 total participants



### INFORMATION TECHNOLOGY

#### Helping Girls Get Into IT

SPARCS is a technology program designed to help middle and high school girls in Minnesota to:

- Learn and understand career opportunities in IT
- Explore and build skills in different types of technology tools and applications
- Meet women technology professionals and engage with IT employers
- Make friends with other female “techies”
- Explore IT career pathways and prepare for college



### AGCENTRIC | AGRICULTURE, SOUTH

#### “Career Connections Tent”

FFA “Career Connections Tent” is an opportunity to reach nearly 3,000 students to discuss career and education opportunities in agriculture, food and natural resources. Faculty and staff from Minnesota State assist students ‘under the tent’ to find the right program for their interests. Held annually in partnership with the University of Minnesota, students can also visit the Agriculture Technology Trailer, a showcase for new agriculture technology related to Animal Science, Agronomy, Precision Agriculture, Horticulture and much more.



NEARLY  
**3,900**  
YOUTH AND COLLEGE  
STUDENTS ATTENDED CAMPS  
OR PARTICIPATED  
ON TEAMS

CENTERS SPONSORED  
**211**  
EVENTS THAT REACHED  
**62,000**  
PARTICIPANTS

## Innovations that work.

*“Working with RealTime Talent and the Centers of Excellence at Minnesota State gives you the opportunity to take coordinated action around closing the skill gap in a particular industry or region.”*

*Bryan Lindsley,  
Executive Director, MSPWin*

While each Center innovates on behalf of a single industry, there is also a willingness to bring what’s working at another Center or in other industries to the attention of our partnership councils. We share best practices, as well as curriculum, tools and technologies, developed for the betterment of Minnesota and the nation.

### AGRICULTURE, SOUTH

#### AgriGrowth Job Exchange

Developed by RealTime Talent and hosted by the Agricultural Center, South, The AgriGrowth Job Exchange is a cutting-edge job-matching platform that systematically aligns job seekers and employers based on their answers, skills and resume, much like an online dating site. It will transform how employers and candidates connect with each other during the job and internship search process.

### AGRICULTURE, NORTH AGCENTRIC

#### Drone Technology Workshops for Educators

Unmanned Aircraft Systems, or UAS, are creating exciting, new educational and career opportunities. Workshops in summer 2018 provided secondary and post-secondary educators with an introduction to UAS and geospatial technology as well as the tools to incorporate them into existing STEM education. Participants continue to have access to resources, curriculum and faculty expertise following the workshop.

### ENGINEERING

#### The Lean Manufacturing Initiative

The Lean Manufacturing Initiative, sponsored by the Engineering Center, is a curriculum that teaches “lean” or continuous improvement concepts and tools. Designed to create more value with fewer resources, lean manufacturing will be an essential strategy for addressing workforce shortages. This innovative curriculum prepares participants to partner with industry to host Lean events on production floors.

### HEALTHFORCE

#### Healthcare Core Curriculum (HCCC)

High school instructors and healthcare professionals are using this innovative co-teaching model to offer a Healthcare Core Curriculum that exposes high school students to various careers and skills in healthcare to prepare them for employment and/or earn college credits. Eleven colleges also offer the Healthcare Core Curriculum to current college students.

### INFORMATION TECHNOLOGY

#### Cybersecurity Curriculum Initiatives

In 2018, the IT Center partnered with Metropolitan State University to pursue significant grants from the National Science Foundation and the National Security Administration totaling \$1.1 million to support cybersecurity curriculum initiatives. The funding supported faculty and program development and the IT Center provided leadership and project management support.

### ENERGY

#### Renewable Energy Research

The Minnesota Energy Center received a \$5.5 million grant from the Xcel Energy Renewable Development Fund to stimulate research and the development of renewable electric energy technologies in Minnesota. The goal is to fund high-quality research projects that further the growth, development, and delivery of renewable electric energy technologies in the state.

### TRANSPORTATION

#### Innovative industry partnerships

Industry partnerships enhance transportation education and address workforce shortages. The “Luther Loves Techs” program combines a scholarship and part-time, work-based learning at Luther dealerships. The Fiat Chrysler Automotive Corporation supports a partnership between Minnesota State technical colleges and participating Chrysler Jeep Ram dealerships to develop certified and skilled technicians.

### ADVANCED MANUFACTURING

#### 360 eTECH

The 360 eTECH program helps students prepare for an exciting career in modern manufacturing by completing online coursework at their high schools and attending weekend welding skills labs at nearby colleges. In spring of 2018:

- Five students graduated with a college certificate
- Two graduates earned 16-credit Production Technologies certificates
- Three students earned 30-credit Welding Technology certificates

## Moving forward.

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The Centers of Excellence and its partner colleges and universities continue to move forward with innovative programs to grow Minnesota’s workforce and to meet critical industry needs.

### AGRICULTURE, SOUTH

#### Agricultural Lender Support Workshops

In 2018, the Agricultural Centers introduced a new Lender Support Workshop component to existing Farm Business Management programs available at eight Minnesota State colleges. These programs give current and future farmers access to online courses and degree programs, career pathway exploration tools, the AgriGrowth Job exchange and, most recently, perspectives on agricultural borrowing and lending.

### AGRICULTURE, NORTH AGCENTRIC

#### Down on the Farm

Stress factors, including financial problems, market uncertainties and production challenges are on the rise for Minnesota farmers. That’s why the Minnesota State Agricultural Centers are partnering with the Minnesota Sheriffs’ Association, Department of Agriculture and mental health specialists to offer free, stress-management workshops across the state.

### ENGINEERING

#### Advanced Career STEM pathway

In a unique partnership with the Southern Regional Education Board, the Engineering Center is implementing a new Advanced Career STEM pathway program in 2019. It provides high school students with multiple career pathways and technical education in areas such as aerospace engineering, global logistics, energy, and health informatics — and positions Minnesota as a leader in Career Technical Education.

### HEALTHFORCE

#### Expanding Capacity and Impact

To address looming healthcare workforce shortages, HealthForce is working to increase:

- Capacity by providing simulation education for faculty and industry personnel
- Diversity of students and faculty at Scrubs camps
- Numbers of senior caregivers through a new Caring Careers Start Here campaign that will launch with a series of “Open Hearts, Open House” showcases in February 2019

### INFORMATION TECHNOLOGY

#### IT Exploration Curriculum

The IT Center of Excellence is launching a newly updated online IT curriculum for high school students that aligns to state and national standards. Teachers can use this curriculum to give a hands-on way to explore all career areas of information technology. Goal: 200 school districts using the curriculum by the end of 2021.

### ENERGY

#### On The Road Again

The Energy Center of Excellence hopes to grow student knowledge of diverse energy careers by going on the road (literally) with a second energy trailer. Teachers who attend the Center’s E3 workshops will be better prepared to take advantage of the classroom materials provided in the trailer and to teach a classroom curriculum that blends science and energy.

### TRANSPORTATION

#### Center for Autonomous Technologies

Autonomous control is starting to make its way into cars, semi-trucks, tractors, planes and other modes of transportation. The Transportation Center is cultivating education and industry partners to help launch a new center that will guide student and faculty research and education in these new technologies.

### ADVANCED MANUFACTURING

#### Groundbreaking Technological Education

The Advanced Manufacturing Center recently submitted a five year, \$7.5 million proposal to the National Science Foundation, Advanced Technological Education program (NSF-ATE). If selected, Minnesota would be the only advanced manufacturing center for NSF-ATE in the U.S. Proposal objectives include:

- Expanding digital badge pathways to include medical device manufacturing
- Increasing diversity by partnering with tribal colleges, translating curriculum into multiple languages, and recruiting women and veterans to advanced manufacturing
- Developing new partnerships with national manufacturing and education organizations



## MINNESOTA STATE

### About Minnesota State

Minnesota State is the fourth largest system of state colleges and universities in the nation.

The power of the system is harnessed by each Center of Excellence by designing employer partnerships among Minnesota State colleges and universities with relevant programs and expert faculty.

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**MINNESOTA STATE**  
Centers of Excellence

*Engaging industry.  
Enhancing education.  
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Minnesota State Centers of Excellence is an initiative of Minnesota State Colleges and Universities

Strategically located throughout the state, the Minnesota State Centers of Excellence drive workforce innovation through education and industry collaboration - and provide thought leadership on workforce development in their respective industries.

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