



Engaging  
industry.

Enhancing  
education.

Inspiring  
students.



**MINNESOTA STATE**  
Centers of Excellence

REPORT TO LEGISLATURE  
**JANUARY 2021**



# MINNESOTA STATE

## Centers of Excellence

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.

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**In 3 years, the U.S.  
will lack 55 million  
skilled workers.**

**Who do you think will:**

- Keep Minnesota's lights on?
- Fix our cars, planes and trains?
- Keep us fed and our farms sustainable?
- Care for an aging population?
- Staff our 8,000+ manufacturing plants?
- Keep our IT on the cutting edge?
- Maintain our northern forests?
- Engineer the products of tomorrow?

**With 30 colleges, 7 universities, 54 campuses,  
and more than 375,000 students, Minnesota  
State is playing a critical role in addressing  
that shortfall.**



**MINNESOTA STATE**  
Centers of Excellence

*Engaging industry. Enhancing education. Inspiring students.*

**Minnesota State hosts eight Centers of Excellence** — each serving a major industry that faces serious workforce shortages. 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.

**Explore the Minnesota State Centers of Excellence at [www.minnstate.edu/coe](http://www.minnstate.edu/coe) or contact a Center directly:**

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## Common Strategic Directions 2020

These strategic directions are framed around **Minnesota State Equity 2030: Centers of Excellence cultivate a pipeline entry point for highly qualified talent that fulfills the state's goal to support a diverse workforce and that offers equitable employment outcomes for our students.** Over the next three years, these strategic directions reflect the commitment by our Centers of Excellence to be facilitators of employer voices in enhancing education and inspiring students to meet the education and workforce needs of the future. To be successful, Centers will partner with industry, secondary schools, community, and our colleges and universities to carry out the following strategies:

### Engaging Industry

Seeking the voice and expertise of industry and community partners is integral throughout the work of the Centers. Centers facilitate **rich, interactive networks** to inform and guide our workforce of the future.

#### Strategies:

- 1.1** Sponsor active and engaged industry-led advisory councils that meet regularly each year.
- 1.2** Facilitate industry-led strategic planning that addresses workforce needs and addresses education and employment disparities.
- 1.3** Cultivate non-state financial support for programs and students.
- 1.4** Regularly evaluate workforce needs through a structured process with employers that is shared with colleges and universities, and guides development of innovative education programs.

### Enhancing Education

Centers will be a catalyst and conduit for the latest industry knowledge to benefit our faculty and staff and to provide students with an **innovative, high quality education.**

#### Strategies:

- 2.1** Partner with college and university faculty and staff to develop innovative, adaptive and agile program offerings, such as alternative credentials, prior learning assessment, guided pathways, etc.
- 2.2** Redesign education offerings to meet the needs of today's learners and employers (with the option to facilitate credit and non-credit instruction).
- 2.3** Advise, support and participate in program quality assessment, including program accreditation.
- 2.4** Sponsor or offer faculty and teacher training and professional development.

### Inspiring Students

Centers will provide high school and college students with opportunities to **meaningfully expand their knowledge** of careers and acquire skills and knowledge for their chosen profession.

#### Strategies:

- 3.1** Sponsor or offer career exploration and skill development programs.
- 3.2** Cultivate active learning environments in school and college/university programs, including research, internships, capstone opportunities, and job shadowing.
- 3.3** Facilitate student learning environments using the latest technologies and that are accessible to students in rural or underserved communities.
- 3.4** Develop or support programs that engage students in their communities as citizens and employees.

## 2020 Significant Contributions

### ENGINEERING

#### Providing virtual resources during COVID

When COVID struck, many educators were left feeling confused and isolated. The Engineering Center facilitated online forums for engineering and engineering technology secondary and post-secondary educators to come together regularly to share best practices and supply personal support. Out of this sharing, it was identified that there was a need for a formal organized online resource center that all educators could access.

The Engineering Center, in collaboration with the IT Center of Excellence, where members of the steering committee helped to create an Online Learning Resource Center (OLRC) for CTE. This resource center is a collaboration between Minnesota State Career and Technical Education, the eight Centers of Excellence, and the Minnesota Department of Education. It contains resources for online pedagogy, platform technology tools, and instructional content.

The Engineering Center has also been working to provide virtual tools for industry and academia to collaborate through multiple innovative programs.

- The creation of a STEM Professionals Database is a tool to allow STEM professionals who are interested in sharing with K-12 and college students their professional experiences, which will help students hear first-hand from professionals working in STEM fields.
- Through a collaboration with Engineering Alliance Minnesota, the Engineering Center provides biannual virtual seminars. These seminars bring engineering and engineering technology educators together with STEM workforce professionals to share the needs of a successful future workforce and innovative academic programs.

### HEALTHFORCE

#### Responding to the pandemic

- The healthcare sector was doubly impacted by COVID-19. Minnesota State HealthForce responded to support healthcare education and workforce. By April, HealthForce rolled out a new online nursing assistant curriculum and our robust, online Health Care Core Curriculum was enthusiastically utilized by 86 high schools and 12 colleges.
- Our Clinical Coordination Partnership (TCCP) worked with its clinical partners to optimize clinical site utilization.
- HealthForce staff have led state and national committees related to the impact of the pandemic on underserved students, use of simulation, and supporting nursing education. We shared innovations and practices from Minnesota to colleagues across the country and vice versa.
- Our flagship “Scrubs Camps” was attended by over 1,000 students (15 camps) in 2019. In 2020, we re-worked this offering into a free online camp, attended by more than 350 students – 55% of whom were students of color. This focus on outreach to underserved students continues with the addition of the MN HOSA (Health Occupations Student Association) Director to the HealthForce team.

### 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 continues to cultivate partners to guide student and faculty research and education in these new technologies.

#### Educator Resources and Virtual Career Exploration

- At the beginning of the COVID-19 pandemic, we developed comprehensive Educator Resources and held seminars where faculty and teachers could connect and share best practices for learning and teaching (distance and in-person) and that are free or reduced cost to our Minnesota transportation education programs, secondary and post-secondary.

### TRANSPORTATION (continued)

#### Career Development

- The Transportation Center leads the way with continuing career exploration, recruiting, and outreach to prospective students by designing and operating virtual sessions with the new Teach For The Day program. The virtual day includes industry and college partners that get on a virtual session with a high school CTE classroom. We chat about careers, do virtual tours of college and industry locations, and provide assignments that align to Minnesota's 21st Century College and Career Readiness legislation.

#### Career Pathways

- The Transportation Center partnered with industry on many college programs to redesign and build new programs through enhanced and frequent advisory committee meetings. The transportation industry provides co-leadership that keep programs and faculty motivated to design programs for excellence.

#### Financial Resources for Minnesota State Students

- The Center partnered with colleges, and industry partners to support the Workforce Development Scholarship program for better ways to communicate a student's financial needs and to recruit diverse students to receive a scholarship.

### AGRICULTURE, SOUTH

To address the challenges caused by COVID-19, the Agricultural Centers worked to facilitate:

- Beginning Farmer education via enrollment in farm business management, \$485,000 funding from MN Department of Agriculture distributed as scholarships to new and emerging farmers
- USDA-National Institute of Food & Agriculture grant to expand Advancing Ag Technologies - \$499,657 awarded
- Synchronous virtual connections to industry representatives to learn about current and projected agriculture, food, and natural resources (AFNR) careers
- An “on-demand” library of AFNR career videos to foster virtual career exploration

## ADVANCED MANUFACTURING

### Advancing advanced manufacturing

Despite significant challenges during the global pandemic, The Advanced Manufacturing Center performed extensive research on the Minnesota manufacturing industry and educational programs, and published the 2020 Environmental Scan: Minnesota Manufacturing Needs and Resources. The scan analyzes labor and educational needs (current and projected), trends, challenges manufacturers are faced with, and the impact of COVID-19.

The Center completed a 5-year strategic plan including a new Executive Board to focus on addressing needs of different manufacturing sectors in areas such as: welding, machine tool, mechatronics, etc. The Center's plan will also focus on:

- competency-based education
- provide in-demand faculty professional development
- develop and host the Minnesota Manufactured Technical Education (2MTech) conference for secondary and post-secondary educators
- expand digital badging into foundational manufacturing
- establish a robust internship program, and
- leverage technology to enhance career awareness and skills development for rural and underserved students.

### A Strong Brand

The Center undertook a significant marketing program that also created Minnesota Manufactured™, a pro-manufacturing campaign, where all products the Center produces will be branded with Minnesota Manufactured™.

The Center responded to the pandemic in March 2020, by leading and hosting CTE Educator Forums to offer resources for teaching and learning in a digital environment. The Center maintains a repository of information on [www.mnmfg.org](http://www.mnmfg.org) and in the Online Learning Resource Center.

The Center also coordinated professional development workshops to ensure quality teaching strategies. New approaches to education were explored, including Competency-Based Education (CBE) and flexible labs for students, with an open entrance/closed exit design for manufacturing education.

## INFORMATION TECHNOLOGY

### Curriculum Modules in Cybersecurity, Data Science, and Agile Development

The IT Center of Excellence is leading a collaborative development initiative, including 38 faculty from 27 Minnesota State institutions, to develop more than 160 online curriculum modules which are used by faculty to develop or update their courses and programs in these high demand disciplines.

### IT Exploration High School Curriculum

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

### Hands-On Student Learning

Despite the pandemic challenge of moving everything to an online format, more than 200 students across the Minnesota State system participated in virtual cybersecurity and data science competitions or bootcamps during 2020, many earning recognition and industry recognized certifications in the process.

### Career Readiness Skills Badging Program

The IT Center of Excellence has piloted and launched a new badging program to build and document student's non-technical skills needed to succeed in the IT workplace. Over 300 students across 13 Minnesota State institutions have completed at least one of the eight 21st Century Skills modules, and more than 200 have received badges.

## AGRICULTURE, NORTH

- Increased Workforce Development Scholarships in agriculture awards from 24 to 82 in fall 2020
- Collaborated with the Minnesota Department of Agriculture (MDA) to provide \$250,000 in distressed farmer scholarships through the CARES Act Funds
- Addressing workforce demands in precision agriculture, AgCentric partnered with Equipment Dealers Association and Curriculum for Ag Science Education to land a \$590,000 NSF grant to build a broader career pathway
- Expanded the Rural Mental Health program allowing two professionals to work with farmers on building and maintaining healthy mental habits

## ENERGY

### Advancing research and education

Continuing fiscal management and reporting of the Higher Education Renewable Energy Fund grant. Eleven research projects were funded and completed in 2020; final reports and presentations will be delivered to Xcel Energy in 2021.

Active participant in Energy Utility Diversity Stakeholder Group. Report submitted to the legislature in January 2020. A group convened by the MN Public Utilities Commission to examine the challenges and opportunities for Minnesota's energy utilities to attract a diverse workforce with the skills needed to advance a 21st century industry and to increase supplier diversity of energy utilities.

Completed MN Department of Commerce Division of Energy Resources grant. The purpose was to purchase and distribute teaching aids to teachers who participating in our "Energy in the Classroom" mobile education presentation. Sixty teachers and their students participated in these active learning sessions.

Participation and coordination of two-day, virtual Southwestern Minnesota Electric Transmission Summit along with the Rural Minnesota Energy Board, Southwest Regional Development Partnership, Great Plains Institute and the MN Public Utilities Commission. This summit was to educate stakeholders on MISO's transmission planning process and any identified transmission needed to enable continued renewable energy development in Southwestern Minnesota.

### FOR MORE INFORMATION, CONTACT A CENTER DIRECTOR OR:

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# 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 partnerships among Minnesota State colleges and universities with relevant programs and dedicated faculty.



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Minnesota State Centers of Excellence is an initiative of Minnesota State Colleges and Universities

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[www.minnstate.edu/coe](http://www.minnstate.edu/coe)

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