

Engaging
industry.

Enhancing
education.

Inspiring
students.



MINNESOTA STATE

Centers of Excellence

REPORT TO THE LEGISLATURE

JANUARY 2023

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.

About Minnesota State:

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

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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AGRICULTURE, NORTH



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About the Center

The Minnesota State Northern Agricultural Center of Excellence, also known as AgCentric, promotes innovative agricultural education by connecting education and industry to support lifelong learning, career success, and community leadership. We develop and support Excellence in Agriculture, Food and Natural Resources programs and career pathways in partnership with K-12, government, other academic institutions, and industry. The center is hosted by Central Lakes College in Brainerd, Minnesota.



Highlights

Technical Applications in Agriculture, a curriculum developed in partnership with CASE (Curriculum for Ag Science), trains high school teachers to prepare their students to enter post-secondary college in agricultural mechanical systems and ultimately to serve the industry. Forty-eight teachers from across the United States were trained on this one-year curriculum that aligns with post-secondary curriculum. In addition to the training, three professional development presentations were delivered to many of these teachers. The Association of Equipment Dealers provided funding for training equipment and a new connection between trained schools and local dealers.

Natural Resource Conservation Early Career Employee Training is a technical training and farm immersion experience for new employees of Minnesota NRCS. The goal of the training is to increase the knowledge base of new employees in a variety of production areas. The center trained two cohorts and 35 employees. This training provided a venue to build further collaboration with NRCS and similar organizations.

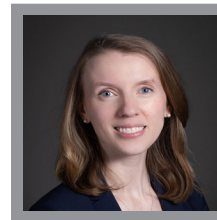
Farm Business Management Program Student Scholarships: In collaboration with many partners, we have created eight funding streams to support our FBM students with over \$1.0 million in scholarships. This will allow organic producers to grow benchmark data, create crop, water quality, and environmental metric data-sets, foster partnership with beginning farmers and the Minnesota Department of Agriculture.

The Center leveraged Federal Community Program funds to meet local workforce needs and support Central Lakes and Ridgewater College to launch **Meat Cutting and Butchery programs**. We have garnered over \$3.5 million in additional funds to build career pathways in meat cutting and butchery. Both colleges launched these new programs in the Fall Semester of 2022.

Looking Ahead

The Regional Conservation Partnership Program is a five-year grant project designed to work directly with agricultural producers using irrigation to implement conservation practices that protect groundwater quality and quantity. The program promotes expanded precision irrigation practices that would also reduce energy consumption, help build the professional capacity of Soil Water Conservation District Technicians, and promote farmer to farmer opportunities. The partnership includes 20 SWCD, Minnesota Department of Agriculture, Mille Lacs Band, the University of Minnesota, and many others.

AGRICULTURE, SOUTH



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About the Center

The Minnesota State Southern Agricultural Center of Excellence promotes agricultural education excellence in collaboration with industry across Minnesota's southern region. We work to establish partnerships with key businesses and organizations to meet workforce demands and deliver the highest quality agricultural education for the region.

The Center looks to inspire students to pursue careers in the Agriculture, Food and Natural Resources (AFNR) industries by making connections to 2-year, 4-year and other programs within Minnesota State colleges and universities. As part of our work, the Center also supports over 1,600 southern Minnesota students enrolled in



(Agriculture, South, Continued)

Farm Business Management (FBM) programs at three southern Minnesota educational institutions: Minnesota West Community & Technical College, South Central College (our host college), and Riverland Community College. FBM is designed to work with existing farmers, farm managers, or people interested in farming and provides instruction in financial and business management.

Highlights

One of our signature events, hosted in collaboration with the Northern Agricultural Center of Excellence and the Minnesota FFA (Future Farmers of America) Foundation, was the **Career Connections** event at the Minnesota FFA State Convention in April, with an estimated 4,000 high school students interacting with nearly 70 colleges and businesses.

STEM Meets Ag, Food, and Natural Resources Academy: The Center partnered with the Minnesota State Engineering Center of Excellence to offer a five-day educational experience targeted for 6th through 9th Graders. The theme was Clean Air, Clean Water, Clean Earth. Over five days, students engaged in a variety of activities and toured multiple sites to help them understand the connection between clean air, clean water, and clean earth.

The center collaborated on two grants focused on **business planning and succession planning** with farm producers and main street agricultural businesses. Over 65 farm family members participated in intensive farm succession planning retreats.

Over 500 **Farmfest** attendees interacted with our booth and watched live farm safety demos focused on grain bin entrapment rescue conducted by agribusiness instructors. SACE proudly co-sponsors the Farm Safety and Wellness Pavilion at Farmfest.

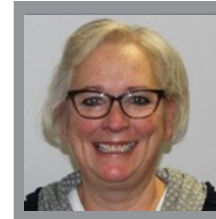
Looking Ahead

In 2023, we are keen to solidify new partnerships with agribusinesses focused on increasing ag apprenticeship programs and dual pipeline training. Historically, agriculture has had strong participation in internships but not many apprenticeships. We are currently building capacity for new ag-focused apprenticeships.

We hope to inspire more students to pick careers in agriculture by increasing participation in summer camps through new collaborations and partnerships. In the past, we have co-hosted standalone summer camps, but we are now partnering with existing YMCA programs to access more students and amplify our educational programming beyond our current audiences.

We are working to establish a regional agricultural crop demonstration site and resource plots. We plan to pilot the program in summer 2023 working with multiple educational institutions and a non-profit.

ENERGY



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About the Center

Minnesota State Energy Center of Excellence continues to focus on program development to prepare technicians for the energy production and transmission industries. Degree programs cover the broad spectrum of energy production technologies including biodiesel, ethanol, fossil fuels, natural gas, power transmission, solar, and wind. The Energy Center of Excellence works to engage industry, enhance education, and inspire students through a variety of activities and partnerships including:

- Workforce Development: The right education and training to support the energy industry
- Pipeline: Increased awareness of energy related career opportunities
- Research: Education and Industry partnerships that advance research in energy related fields
- Collaboration at the national level with the Center for Energy Workforce Development
- Regional collaboration with the Great Lakes States Energy Partnership
- Education partner for the Minnesota Energy Consortium



Highlights

The center provided fiscal support for faculty and program development assistance. A customized solar photovoltaic installation program was built targeting first and second-year electricians from various colleges. Students complete three credits of online learning and seven laboratory credits. Hands-on lab credits were completed just after graduation and equipped the students with a solar installation certificate in just three short weeks.

Through a partnership with Xcel Energy, Minnesota State Community and Technical College, and Legacy 13, we developed a **Line Worker Education Program**. The training program is made accessible to residents of St. Paul and Minneapolis, provides wrap-around services and support for students, and is housed at Xcel Energy's Riverside Training Facility. Thirteen students started the program with eleven representing communities of color.

Energy, (Continued)

Looking Ahead

A promising project includes working with the MPCA and Serve Minnesota to develop an AmeriCorps energy-related pathway or pre-apprenticeship program with one or more Minnesota State colleges and universities. Both the Green Core and the Climate Impact Core provide an opportunity for us to partner with industry and higher education to offer students and potential students the opportunity to be exposed to the varying energy careers.

Another project that is in infancy includes a partnership with staff from the system office, University of Minnesota researchers, the Minnesota State Centers of Excellence in Engineering, Manufacturing, and Energy, and Inver Hills Community College. The U of M engineers have developed curriculum for an Electrical Power Specialist certificate and is willing to share the curriculum with our state colleges and universities. Inver Hills is the initial college to begin to introduce this work into their engineering programs and/or Climate Change certificate program.

ENGINEERING



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About the Center

The Minnesota State Center of Excellence promotes connectivity between industry and Minnesota State colleges and universities. We facilitate these unique relationships by engaging academic institutions with industry to ensure Minnesota students are prepared to join the workforce



current and upcoming technologies. Our educational outreach initiatives inspire interest in science, technology, engineering, and math (STEM). Our efforts will shape the next generation of engineers who will face and be equipped to solve real-world problems. We promote accessibility to the latest technologies, workforce programs, and post-secondary education.

Our augmented services and activities effectively engage a diverse student population to better reflect Minnesota's changing demographics. Our host campus is Minnesota State University, Mankato.

Highlights

The Engineering Machine Design Contest (EMDC), is an opportunity for teams of 5th - 12th grade students to design and build a complex machine. Students explore science, technology, engineering, and mathematics (STEM) principles while having fun in a collaborative environment. 342 students in 75 teams competed across the state.

Engineering and Engineering Technology STEM Educator is a professional development opportunity for secondary and post-secondary educators to learn about pedagogically supported foundations for teaching engineering and technology related techniques. These skills apply to all STEM educators and help with student retention and success. In addition, students learn key skills that will make a positive impact on the workforce in STEM careers.

Minnesota State Engineering & Engineering Technology Consortium

The Minnesota State Engineering & Engineering Technology Consortium (MEET) is a collaboration among Minnesota State engineering and engineering technology faculty. It was created to build a shared vision for strengthening Minnesota State Engineering and Engineering Technology programs through innovation, partnership, and mutuality. In the spring of 2022, Minnesota State engineering and engineering technology faculty came together for a one-day conference inspiring faculty to then collectively brainstorm ideas to find mutual collaboration opportunities to act on.

Looking Ahead

Leveraging NSF grants to grow STEM education and workforce opportunities: The Minnesota State Engineering & Engineering Technology Consortium looks to leverage the NSF - Broadening Participation in Engineering (BPE) grant to strengthen the future U.S. Engineering workforce and catalyze research innovation by enabling the participation of all citizens in STEM, reflecting the diversity and true intellectual capacity of the nation's population.

The NSF – Experiential Learning for Emerging and Novel Technologies (ExLENT) – program aims to connect companies, governments, agencies, schools, professional organizations, and/or non-profits in order to provide individuals experiential STEM learning opportunities needed to accelerate the nation's innovation capacity.

HEALTHFORCE



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About the Center

The Minnesota State HealthForce Center of Excellence looks to closely collaborate and innovate with key stakeholders including healthcare industry providers, educators, and government, to develop Minnesota's current and future healthcare workforce. With Minnesota State being the largest educator of nurses and allied medical professionals in the state, HealthForce works with our colleges and universities to ensure students successfully attain the skills needed for a career in healthcare. The Minnesota State HealthForce Center of Excellence is hosted at Winona State University.



Highlights

Nursing Assistant: HealthForce continues to make significant investments in nursing assistant training resources such as online curriculum, virtual skills lab, hybrid classes with skills labs distributed across multiple campuses, and student support, as well as convening nursing assistant programs to ensure the pipeline remained open. The need for this expertise and leadership was clear when, in December of 2021, Governor Walz called for 1,000 nursing assistants to be trained and employed within months. Working with state agency leadership, HealthForce led the implementation of this effort, known as the Next Generation Nursing Assistant initiative. Minnesota State colleges and universities customized training departments offered over 60 “no barrier, free up-front” classes which resulted in more than 1500 nursing assistants being trained with almost 900 passing the certification exam. A second round is underway which will train an additional 800 students.

MN HOSA - Future Health Professionals: MN HOSA was recognized internationally for membership growth in the 2021-2022 school year as we brought educational opportunities to over 1300 students across Minnesota. The Fall Leadership Conference in November 2022 was the largest conference held for MN HOSA, hosting over 500 students, advisors, and business and industry professionals from a variety of healthcare organizations. Following the conference, over 90% of students surveyed plan to attend a college or university.

Nursing: Internally, HealthForce staff has mentored nursing program directors, identified challenges, and shared solutions, analyzed data on enrollment, retention, and faculty shortages, and worked with nursing leaders to share best practices in an ever-changing landscape. Externally, the Coalition of Nursing Equity and Excellence exemplifies HealthForce's collaborative approach and focus on meeting workforce needs of MN's healthcare employers. The Coalition brings Minnesota State and the University of Minnesota's School of Nursing together to collectively lead innovation in nursing education that will educate nurses for the workplace of the future.

K-12 Outreach: Scrubs Camps are re-building back to pre-pandemic numbers. This signature offering of HealthForce allows middle and high school students to explore healthcare careers, learn about themselves, and envision themselves going to college. In 2022, a total 580 students attended one of 12 Scrubs Camps held across the state.

Looking Ahead

The Coalition for Nursing Equity and Excellence will be exciting to watch. With the support of over 200 nursing education programs, employers, and organizations, the Coalition will begin its work by convening an Advisory Board and creating Lead Teams for the four pillars of: reimagining nursing education, simulation & experiential learning, equity in the nursing workforce, and nursing student success.



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About the Center

The Minnesota State IT Center of Excellence aims to inspire Minnesota youth and adults to pursue computer science and technology by offering to the public low or no-cost resources that develop high-demand and immediately applicable technology workforce skills. Through various programs and initiatives, the Center brings awareness of STEM fields currently lacking enough professionals and help to build knowledge around career pathways where that gap is expected to grow. The center is hosted by Metropolitan State University.



Highlights (IT Continued)

The Tech Training Program is a collaborative workforce development initiative, including four workforce partners, three technical colleges, and two technology training programs funded by the State of Minnesota Department of Employment and Economic Development. Over 60 Black, Indigenous, and students of color received one or more IT certifications and opportunities to be placed through the MN Tech organization partners. Certifications were mapped to college courses allowing students to gain credit through the Credit for Prior Learning process.

Hands-On Student Learning: The Center hosted six college student events in 2022 including CADSCOM (Data Analytics Research Consortium), Data Derby, Cyber Defense Challenge, Cyber Bootcamps, and Secure 360. Over 450 students competed or attended these events, and 22 Minnesota State colleges and universities took part, along with the U of M (Twin Cities and Duluth) and seven private or for-profit colleges. These engaging experiences led to students to earning experience and industry-recognized certifications.

2022 marked the 10th year of the **Minnesota Aspirations in Computing Program**. This program offers year-round events and activities to inspire and empower students in high school to become our next, best Minnesota-grown technology talent. The IT Center and MNAiC partners with the National Center for Women and Information Technology and a remarkable array of Minnesota companies and organizations to support high school students who identify as women, gender queer, or non-binary to realize their computing-related education and career aspirations. One hundred ten high school women were honored for their IT initiatives in 2022.

Looking Ahead

IT Career Highways: A career pathways program that will allow students to document learning, experiences, and career skills from 9th grade through retirement.

IT Badging and Credentials: To reach workforce partners, the IT center has created 6 to 12 non-credit cybersecurity and data analytics training options. These curriculum bundles can be taken and, if complete, can earn digital badges and possible industry certification credentials.

Cyber for Physical Systems: With the increase in cyber-attacks, ransomware, and industry hacking, there is a high need to equip Minnesota businesses with the knowledge and tools they need to protect themselves. This program will allow businesses to participate in the Department of Defense Cyber Security content modules and an industry-specific application course that will enable them to secure their systems, networks, work product, and more.

ADVANCED MANUFACTURING



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About the Center

The Minnesota State Advanced Manufacturing Center of Excellence, located at Bemidji State University, has been in existence since 2006. One of the original four centers of excellence, the Center has served manufacturing and manufacturing education institutions through multiple programs and initiatives. The Center (2012



– 2021) served as a National Science Foundation – Advanced Technological Education (NSF-ATE) Regional Center.

Highlights

360 eTECH Program: The Center continued to manage the 360 eTECH Online and Hands-on Manufacturing Education program, a consortia program comprised of 10 Minnesota State college partners.

Professional Development: The Center launched the Minnesota Manufactured Technical Education Conference (2MTEC), a state-wide three-day conference for secondary and post-secondary educators, increasing knowledge and preparedness for CTE educators by providing leading-edge industry knowledge and educational best practices for teaching in-demand CTE skills.

Community/Stakeholder Connections: The Center partnered with the Minnesota State Engineering Center of Excellence to host the Engineering and Manufacturing Workforce Partnership Seminars. These events created opportunities to bring together education, industry, and stakeholder groups to share best practices, learn about innovative models and initiatives, and for networking/relationship building. Over 1,000 students, educators, and parents attended and engaged with the center.

The Center continued to lead the **Statewide Tour of Manufacturing**. A total of 330 in-person tours were hosted, impacting almost 6,000 students. Total attendance at the 2022 Statewide Tour was 15,694 people.

Looking Ahead (Manufacturing, Continued)

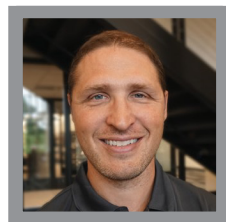
The Center proposes to establish multiple **Minnesota State Advanced Manufacturing Training Centers** in the state of Minnesota, aligned with college partners, following the NCTC-Marvin Advanced Resource Center model.

We are developing a **redesign of curriculum and programs** to become competency-based, with an emphasis on course modulization and outfitting, showcasing advanced manufacturing labs at college partners in the state, while providing relevant curriculum that is fast and flexible.

The Center is working directly with Lake Superior College on the **NE Minnesota Manufacturing Pathways** project. The CNC Machining program is currently being developed, which clearly defines a pathway from NE Minnesota high schools, through Lake Superior College (AAS), and finally to Bemidji State University (BAS).

We are helping to establish the **Northern Minnesota Career Pathway** project. This project includes multiple area high schools, manufacturers, the Minnesota Innovation Institute, Greater Bemidji, the Bemidji Chamber of Commerce, Northwest Technical College, and Bemidji State University. The purpose of the project is to ensure that regional educators are meeting the needs of manufacturers in northern Minnesota, and a qualified supply of talent is made available to manufacturers in the region.

TRANSPORTATION



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About the Center

Founded in 2013, the Minnesota State Transportation Center of Excellence is focused on developing a highly skilled workforce to meet the current and future needs for high-demand, high-paying, high-growth, high-tech careers in Minnesota's transportation industries.

We drive workforce innovation through education and industry collaboration – and provide thought leadership on workforce development in the transportation industry. The center is hosted by Dakota County Technical College.



Highlights

The Center partnered with Dakota County Technical College, Saint Paul College, The Unjamma Place of Minneapolis, Goodwill Easter Seals, Dakota and Ramsey County workforce centers, the YWCA of St. Paul, the Minnesota Trucking Association, multiple employers, and the Minnesota Job Skills Partnership department of DEED to build the **Minnesota State Commercial Driver Academy**.

We worked with legislative and congressional partners to secure \$1.2 million in federal funding to rebuild the **Driver Decision track** at DCTC.

The Center met with **US President Joe Biden** and US Secretary of Education Miguel Cardona to discuss transportation workforce challenges in Minnesota.

We partnered with the National Center for Autonomous Technologies and were awarded funds to develop the **Innovative Semi-Autonomous Truck and Off-Highway Powered Equipment** project, bringing new technology and curriculum to 18 Minnesota State colleges and 490 students annually.

The Transportation Center partnered with the Northern Agriculture Center of Excellence on four **Train the Trainer** programs that impacted, enhanced, and connected 65 college and high school teachers.

Looking Ahead

We are developing the CDL Workforce Solutions Training Consortium, a 14-college consortium designed to be able to respond to CDL training needs statewide.

The Center will continue to foster relationships between local Minnesota State campuses and community based organizations to support and develop learners that are underrepresented in transportation.

We will work to continue expanding dual enrollment options for and opportunities for Minnesota State colleges to partner with secondary and adult learner transportation programs through the Transportation CORE project.

The Transportation Center will be partnering with labor unions and the Minnesota Virtual Academy (a public K-12 school) to expand and support their innovative and non-traditional programs.

We are currently communicating with MN-DOT and US-DOT on the Bipartisan Infrastructure Bill (Infrastructure Investment and Jobs Act) and will be partnering with Minnesota State campuses to develop training programs that align with the funded pieces of the legislation.



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.

www.minnstate.edu/coe

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MINNESOTA STATE Centers of Excellence