



Engaging
industry.

Enhancing
education.

Inspiring
students.



MINNESOTA STATE
IT Center of Excellence

IMPACT REPORT
NOVEMBER
2020

mnstateitcoe.org



**Virginia Arthur, President
Metropolitan State University**

Though it happened before my tenure, the decision to host the Minnesota State IT Center of Excellence at Metropolitan State University is one that has had enormous benefits not just for students, faculty, industry partners, Minnesota State colleges and universities — but the taxpayers and economy of Minnesota.

From helping establish the MN Cyber Institute at Metropolitan State, to fostering cutting-edge curriculum that addresses real-world industry challenges, to inspiring middle and high school students to pursue STEM careers, the IT Center of Excellence is a connective force that builds coalitions and drives innovation.

Most importantly, the IT Center of Excellence shares our commitment to removing barriers, creating opportunities, and expanding the diversity of the IT workforce to meet the needs of a strong and growing technology industry in Minnesota.

How IT helped us navigate the pandemic — and will speed our recovery



**Wilson Garland
Executive Director
Minnesota State
IT Center of Excellence**

Just three weeks after Governor Tim Walz announced a Coronavirus-related state of emergency on March 13, 2020, Minnesota State was expected to resume classes and other student activities with alternative modes of delivery and/or adjusted campus learning spaces. At the Minnesota State IT Center of Excellence, our ability to make this quick pivot for our student learning and faculty events was due in no small part to infrastructure we put in place over the last several years for distance learning and use of technology collaboration tools.

As the economy reopens and industries rebuild following the pandemic, competition for IT talent is expected to intensify dramatically. Our unflagging efforts to increase Minnesota State's IT program capacity will play an essential role in meeting that demand. The aftermath of George Floyd's murder and the Black Lives Matters protests has heightened our continued efforts to increase opportunities for people of color in the technology industry. This urgent work will not only enlarge the pipeline of talent but will also demonstrate that Minnesota is fully committed to turning the tide of social and racial injustice. In all this work, we are not the heroes. Our role is to convene, connect and collaborate with a powerful mix of educators and industry partners to inspire and empower students to prepare for careers that demand creativity, innovation and life-long learning.

We're grateful for the passionate support of our many partners. If you aren't yet involved, please contribute to or join one of our many worthwhile initiatives or ask us to join one of yours.

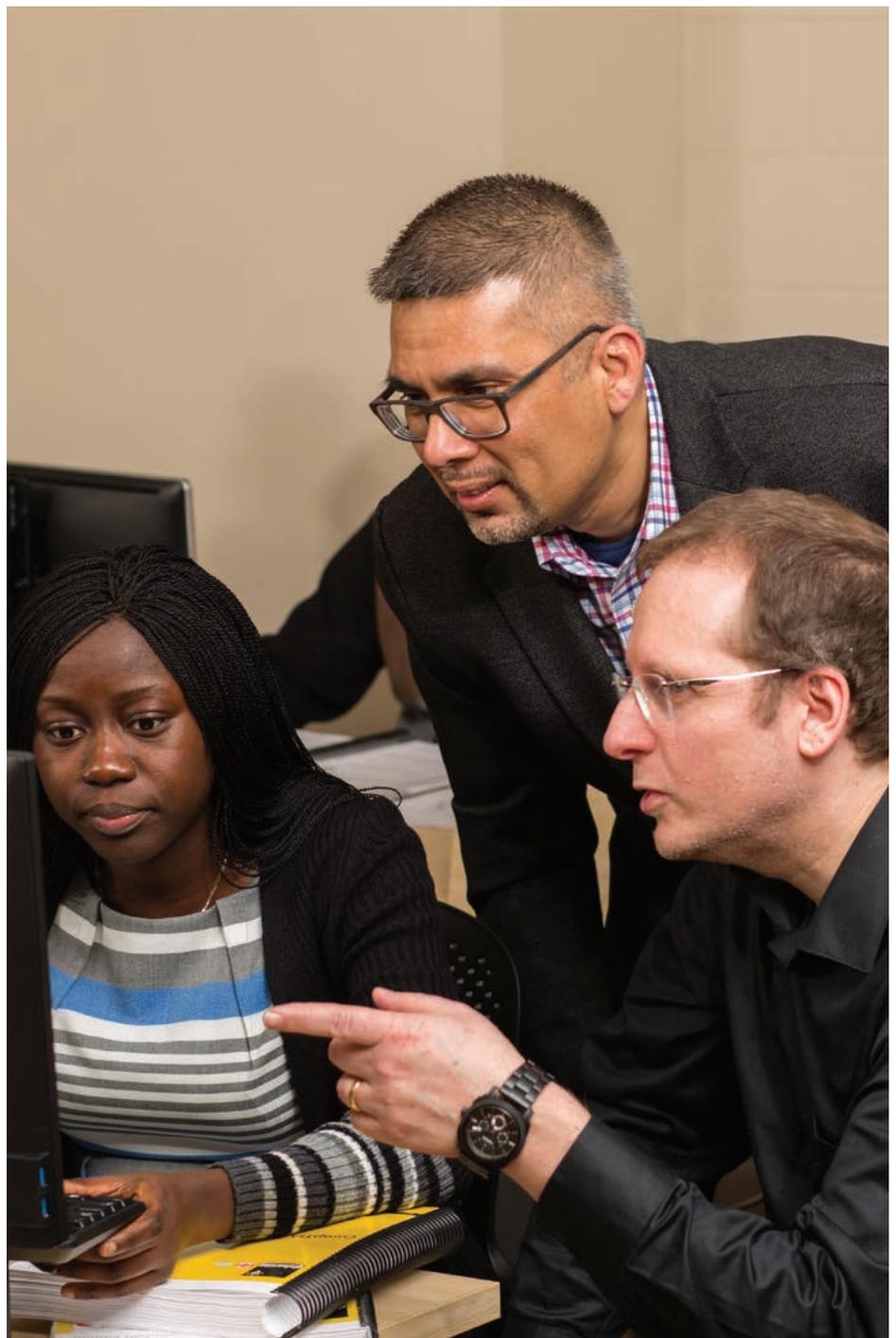
Engaging
industry.

Minnesota State consists of 30 colleges and seven universities with 54 campuses throughout the state. It's a dynamic system with enormous potential for employers interested in developing a diverse pipeline of IT professionals.

Industry and non-profit partners are central to our shared mission of building and supporting a robust IT workforce.

Without an organization like the IT Center of Excellence advocating for industry investment, best practices, and modern trends, there's a risk faculty would only be able to teach older, more outmoded methods and technologies.

— Charles Betz,
Principal Analyst at
Forester Research &
2020 New Directions
Keynote Speaker



Engaging
industry.



Financial Sponsorship

We rely on financial contributions from industry and government sponsors for program costs beyond our basic operating expenses. In 2019, we received over \$200,000 which was used to support the ***Aspirations in Computing*** program, ***Cyber and Data Curriculum Module*** development, our annual ***New Directions in IT Education Conference***, collegiate competitions, and ***IT Connect***, our social platform to engage Minnesota's IT community.

Going forward, our goal is to raise an additional \$80,000 to \$120,000 per year through foundation grants and private contributions to maintain and expand our growing array of successful initiatives.

In addition to earning our sincere gratitude, sponsorship of IT Center initiatives provides employers with strategic opportunities to engage with emerging high school and college technology talent.



The Collegiate Cyber Defense Competition is a great little crucible that tests a student's ability to perform in the real world. The students that do well are people I would hire in a heartbeat."

— John Hoffoss

director of security at CliftonLarsonAllen

Industry Expertise

The industry experts who serve on our advisory committees not only engage with educators about the latest advances in IT, but also volunteer as mentors and judges for national competitions like the ***Data Derby and Collegiate Cyber Defense Competition***.

IT professionals from some of Minnesota's largest healthcare, retail and software development companies provided critical input to the development of ***Career Readiness Badges***. Designed to teach the high-demand "soft skills" required for long-term success in technical careers, the curriculum provides experiential learning opportunities for IT students to improve their mastery of communication, collaboration and leadership skills outside of the classroom.

Credit to our partners, Education Design Lab, for authorizing the use of their 21st Century Skills badges.



CRITICAL THINKING



EMPATHY



INTERCULTURAL FLUENCY



COLLABORATION



RESILIENCE



INITIATIVE



The Next Generation of Tech Talent

Experiential Learning If an employer is serious about increasing gender and racial diversity, there’s no better way to demonstrate that commitment than by offering job shadowing, mentorship experiences and paid summer internships to young women of high school age who have excelled in our **Aspirations in Computing** partnership. Since 2013, more than 144 job shadowing opportunities and 58 paid summer internships have been contributed by industry partners including: General Mills, HelpSystems, Land O’Lakes, Minnesota Twins, Optum, SPS Commerce, Thomson Reuters, Trimble, and Veritas Technologies, among others.

College Technology Interns Many Minnesota State programs require or encourage students to have internships in their field of study. Through the IT Center of Excellence, organizations can tap into this emerging IT and computer science talent.

Public Private Partnerships

The IT CENTER OF EXCELLENCE also joins industry, government, and other organizations in key public-private partnerships:

IT Discovery Network A consortium of “tech experience providers” who help K-12 students discover, explore and engage in the world of information technology.

MN Cyber MN Cyber’s mission is to position Minnesota as a national leader in cybersecurity education. Launched in 2018, with over \$300,000 in grant funding from NSA and NSF, the MN Cyber Academy at Metropolitan State University has trained veterans and underrepresented individuals for high-paying, high-demand cybersecurity jobs.

Upper Midwest Security Alliance (UMSA) The IT CENTER OF EXCELLENCE is an affiliate member and works closely with this non-profit to promote educational and experiential learning events, including a Secure 360 conference for security professionals and a complementary Student 360 event.



While there are more women-centered technology groups than when I first started, the industry is still a boy’s club. I don’t want that for the next generation.”

— Shelley Andrew
Manager, Business Systems at
Minnesota Twins



MN CYBER



Enhancing
education.

The IT Center of Excellence plays an important role as convener, coordinator, and innovation catalyst to ensure Minnesota State programs are informed by the latest industry developments, particularly in high-demand topics like cybersecurity, data science, agile software development, and career readiness.

The IT Center of Excellence acts as a catalyst to leverage resources and coordinates activity across the system so that we don't have programs being developed in isolation with unnecessary repetition of services.

— Kyle Swanson, Dean,
College of Sciences at Metropolitan
State University



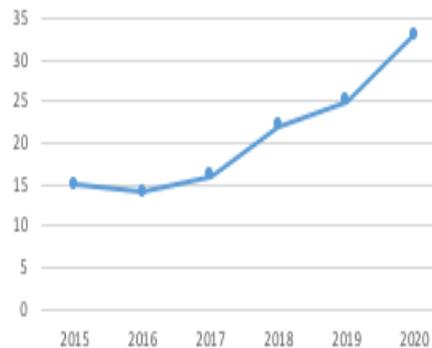


Programs for Faculty

New Directions in IT Education Conference

Employers, IT professionals and Minnesota State faculty members convene annually to discuss emerging employer needs, map out actions that can be implemented immediately, and identify opportunities for collaborative development.

FACULTY FROM UNIQUE CAMPUSES



Collaborative Curriculum & Program

The IT Center of Excellence serves as a catalyst and coordinator for collaborative curriculum development projects, bringing together industry experts and faculty from across the Minnesota State system. The result is a rapidly increasing repository of curriculum resources that align with standards and incorporate innovative learning technologies and best practices. Recent developments include:

- Cybersecurity Pathway Curriculum Modules
- Data Science Curriculum Modules
- Teaching Agile Software Development
- Career Readiness Modules and Digital Badging System

Faculty Development

Through innovative industry partnerships, the IT Center of Excellence has worked to provide key training and development opportunities for faculty who want to stay ahead of key industry tools and trends.



The new Data Science Curriculum Modules allow students from non-STEM fields to gain the basic competencies needed to solve complex problems in their own disciplines.”

—Dr. Rajeev Bukralia,
Associate Professor & Program Director,
MS Data Science, Minnesota State
University Mankato



I don't know where our program would be without the IT Center of Excellence. They build bridges between 2-year and 4-year faculty to develop relevant curriculum, create connections for students and future employers, and provide access to training on systems like SAS that I can then incorporate in my classes.”

— Linda Paquette,
Faculty, Information Technology at
Hennepin Technical College



Experiential Learning for Students

The IT Center of Excellence has spearheaded the development of programs that enhance student learning at the college level.

National and Regional Competitions

We host or provide sponsorship and support for the following events:

The Collegiate Cyber Defense Competition The CCDC pits college student teams against a “Red Team” of professionals who try to hack and infiltrate student networks.

Midwest Undergraduate Data Analytics Competition (MUDAC) This prestigious contest challenges student teams to solve a real-world issue using a sponsor-provided data set. More than 250 students from over 30 universities and colleges in the Midwest took part in the 2019 competition.

Data Derby An annual multi-disciplinary competition, open to all Minnesota State institutions, the Data Derby allows student teams to compete and present data-driven answers to defined problems and societal issues.



The real world experience opened my eyes wider. It was an opportunity to talk to people in the field. IT is changing every day. With cloud technologies, security is changing every twenty minutes.”

— *Sergiy Kalmuk,*

student at Century College, majoring in Advanced Networking and Security

Applied Learning Bootcamps

Students seek opportunities to put their skills into practice in ways that can give them an edge. By attending these camps, they get the training they need to attain valuable industry certifications.

CSi Bootcamp Taught by industry professionals, students from across Minnesota learn the latest in cyber techniques and tools at our CSi Boot Camp held annually in June.

Data Bootcamp A data analytics prep course that provides hands-on experience in machine learning and Artificial Intelligence (AI) technologies and software.



Student Research

Student research is emerging as a high-impact practice that enhances student engagement and success. The IT Center of Excellence has partnered with faculty to launch and support two Colloquia in high-growth disciplines: Cybersecurity (CIACAM) and Data Science (CADSCOM).

Inspiring
students.

To build the IT Workforce of the future, it is critical to inspire secondary-level students to explore technology as a potential career path and help them build technical confidence and competence.

Here is an overview of the K-12 pipeline programs central to our efforts to increase not just the sheer number of students interested in pursuing tech careers — but also the gender and racial diversity of the workforce.

Last year, **52%**
of Minnesota's IT
graduates earned
degrees from
Minnesota State



Inspiring students.



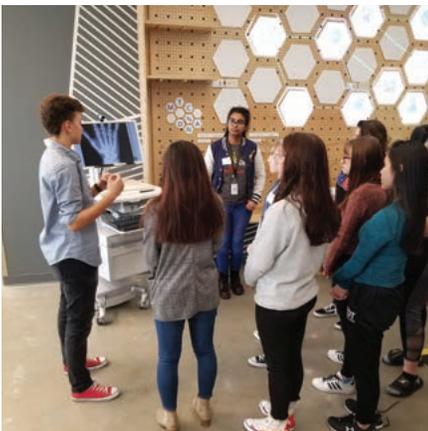
High-Quality Curriculum

IT Exploration

An easy-to-use online or in-person curriculum, complete with teacher training and support, is provided at no-cost to Minnesota educators. Students (grades 8-12) receive essential technology skills training and are provided with an introduction to the technology career options available to them.

Tech IT Out! MN

Demystifying IT is often the first step in opening a student's mind to technology education and career opportunities. Designed to inspire, Tech IT Out! MN is a 45- to 60-minute presentation delivered by IT professionals from General Mills and Veritas Technologies. Since 2014, over 375 classrooms and 5,000 students have been impacted.



Engaging Experiences

IT Discovery Network Established in 2014, the IT Discovery Network is a consortium of technology learning providers who are working to ensure that students, parents and educators across the state can access opportunities available in their area by visiting their shared web page at <https://mnstateitcoe.org/it-discovery-network/>. Our goal is to maximize consumer awareness, student participation, and volunteer commitment to the mission of these organizations.

Outreach to Students of Color

PowerUP IT First piloted in 2018-2019, PowerUP IT is designed to engage students of color from inner-city schools in year-round IT learning, skill development, networking experiences, and awards programs. Participants are introduced to technology professionals of color who share inspirational stories and provide mentorship. The program is currently investing in the development of tools for students, schools, and providers to track students' progress along a technology learning and career pathway.



The IT Center of Excellence provides a cohesive link that allows disparate providers to exchange information, share resources and work together so that the value of what we do grows exponentially."

*— Dr. Michael G. Wulf,
Executive Director, Minnesota STEM
Partnership*



Attracting Young Women to Tech

Generating SPARCS

Since 2015, the SPARCS Program has been Sustaining Passion, Ambition and Resolve for Career Success by offering female students in grades 6-12 access to a variety of technology exploration hands-on experiences. All events involve a MentorMash with female IT professionals, and sisterhood support.

For quick links to all the complementary K-12 pathway programs offered by the Minnesota State IT Center of Excellence, visit <https://mnstateitcoe.org/for-high-school-middle-school-educators/>

Minnesota Aspirations in Computing (MN AiC)

A program that leverages school, business, and community resources to inspire, engage and empower young women in grades 9-12 to pursue a technology education and career path.



I'm excited about being able to recognize young women at different tiers who are more likely to attend schools in the state and pursue careers closer to home."

*— Devan Sayles,
Manager, Data Engineering at
General Mills*

MN AiC - By the Numbers	2016-17	2017-18	2018-19	2019-20
Award Applicants	109	105	125	163
Participating High Schools	48	46	48	65
National Honorees	8	11	11	10
State-Top Tier Honorees	30	31	32	41
Other State Honorees	14	44	65	90
% of Women of Color Top Level Honorees	59	60	62	80
Greater MN and Inner-City School Honorees	9	17	28	52
Job Shadow Experiences	14	34	47	19
Paid Internships	14	10	9	7
SPARCS Hands-on Experiences	7	5	6	4
Financial Sponsors	25	25	28	24

