

September 30, 2018

**Subject: MINNESOTA ADVANCED MANUFACTURING PROJECT (MNAMP)
FINAL EVALUATION REPORT**

Dear Dr. Parker and Ms. Willaert:

I am pleased to transmit to you PTB's final external evaluation report of MnAMP's TAACCCT grant project.

The report's main findings are that MnAMP is distinguished by the research-based and strategic quality of the model's design, and the fidelity of the model's implementation.

In order to close Minnesota's workforce skills gap, respond to emerging manufacturing industry needs, grow the state's economy, and increase its residents' prosperity and social mobility, MnAMP's innovative lifelong learning model, entitled *Learn Work Earn*, engages employers in the design and continuous development of advanced manufacturing career pathways in mechatronics, machining, and welding. *Learn Work Earn* features a core curriculum and embedded, stackable, and portable industry-recognized and academic credentials. The comprehensive systemic reform model includes stackable and portable curricula, competency-based education, prior learning assessment, career coaching, apprenticeships, and distance learning.

MnAMP's statewide, sector-based, lifelong learning model of career education and training implemented fully these research-based innovations and expanded program, faculty skills and knowledge, and technological capacity.

The following outcomes were observed:

- Shorter time. Among those who completed a credential, it took participants about 1.5 months less time to complete a 1-year credential than comparison students; and further, participants who were Pell eligible took less time to complete a one-year certificate than those who were not Pell eligible.
- Increased full-time employment. Those participants who were unemployed at program enrollment and who received more MnAMP program services (interventions) were more likely to achieve increased attainment of full-time employment post-program.

While PTB's impact evaluation employed a rigorous quasi-experimental design, there was substantial missing data on historical comparison students, which limited our ability to compare other outcomes such as student achievement, post-program career-track job placements, wages, and employment.

MnAMP's accomplishments included total enrollments (3,184), program completers (1,266), participants earning credentials (1,266), and participants employed at enrollment who received a wage increase (1,564). Further, of the 2,381 incumbent workers enrolling in MnAMP, 65.7% (1,564) received a pay increase after enrolling in MnAMP. Further, 98% of the participants agreed or strongly agreed they were satisfied with the level of

knowledge and skill developed through the courses, and 97% would recommend the program to others.

As a result of the MnAMP model demonstration project, Minnesota's community colleges promise to produce more skilled workers as well as enable incumbent workers to learn marketable new skills and earn increased wages throughout their lifetime.

Sincerely,

Paul Bucci
President
PTB & Associates



Minnesota Advanced Manufacturing Project (MnAMP)

Final External Evaluation Report

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*Minnesota Advanced Manufacturing Project (MnAMP)
Final External Evaluation*

Executive Summary

I. TAACCCT Program/Intervention Description and Activities

In order to close Minnesota’s workforce skills gap, respond to emerging manufacturing industry needs, grow the state’s economy, and increase its residents’ prosperity and social mobility, the MnAMP project developed and implemented an innovative lifelong learning model, entitled *Learn Work Earn*. The model engages employers and other stakeholders in the design and continuous development of advanced manufacturing career pathways in mechatronics, machining, and welding that feature a core curriculum and embedded, stackable, and portable industry-recognized and academic credentials.

The MnAMP partnership, a consortium of twelve community and technical colleges and two university centers of excellence that are part of the Minnesota State System, adopted and adapted a Guided Career Pathways model¹ with the following key elements: 1) Sector-based career pathways; 2) Intake process; 3) Integrated Developmental Education and training; 4) Integrated stacked and latticed industry-recognized credentials; 5) Contextualized learning; 6) Multiple entry and exit points; 7) Intrusive advising; 8) “Wraparound” support services and referrals; 9) Articulated non-credit and credit programs as well as two-year and four-year programs; and 10) Faculty development.

Interventions in MnAMP’s comprehensive systemic reform model included stackable and portable curricula, competency-based education, prior learning assessment, career coaching, apprenticeships, and distance learning.

The purpose of the MnAMP project was to produce more skilled and employed workers, shorten the time needed to obtain a credential, and enable incumbent workers to learn marketable new skills and earn increased wages.

The participants of the MnAMP project, totaling 3,184, may be summarized as follows. A typical MnAMP participant could be described as a single, white, non-Hispanic male in his early 30s who is enrolled full-time in a welding or custom training program at Ridgewater College, Saint Paul College, or South Central College. He would be an incumbent worker with a family gross income of less than \$35,000 per year, and would receive a raise sometime after enrolling in MnAMP. He would have a high school diploma or GED degree and some college experience, but would not have earned a postsecondary credential. His goal would be to earn an academic certificate.

II. Evaluation Design Summary

The goal of the evaluation was to conduct both implementation and quasi-experimental design impact evaluations of the MnAMP grant’s model program. External evaluator PTB & Associates (PTB) studied the progress of project implementation, assessed the fidelity of the

¹ The Guided Career Pathways model has been developed and demonstrated by Davis Jenkins and others over the past decade. See, for example, Bailey, T. R., Smith Jaggars, S., and Jenkins, D. (2015). *Redesigning America's community colleges: A clearer path to student success*. Cambridge, Massachusetts: Harvard University Press.

implementation to the original project design, offered recommendations for improvements, and analyzed program impacts and outcomes.

Implementation Study. The primary research question to be answered by the implementation evaluation was: “What are the factors that promote and/or inhibit implementation of the MnAMP project at both the individual college level and within the partnership?”

The implementation evaluation was based on a mixed-methods approach that combined qualitative and quantitative data from multiple sources. The data sources included: participant demographic, transcript, credential, wage, and employment data; site visits to the 12 participating colleges; student surveys; questionnaires of college administrators, project coordinators, data coordinators and academic advisors; interviews and focus groups of employers; wage and employment data; bi-weekly conference calls; and review of project documents.

Capacity building was measured by new policies, programs, practices, protocols, tools, and systems to be continued following the termination of funding, including: industry partnerships; communication, collaboration and knowledge-sharing among faculty and industry leaders; restructured programs, curricula, and credentialing to align with industry-recognized credentials and workforce needs; the online delivery platform (+Connect); articulation agreements; and professional development programs.

Impact Study. The primary impact study research question to be answered was: Do students enrolled in the MnAMP program have better academic and employment outcomes than students trained through the traditional instructional methods associated with mechatronics, machining, and welding?

PTB conducted a rigorous impact evaluation designed to determine whether and to what extent the MnAMP grant had a significant impact on students. Data collected on MnAMP participants and their performance and outcomes were compared to data for similar students enrolled prior to the MnAMP grant. Matched treatment and comparison groups were created through a form of Propensity Score Matching called inverse-probability weighted regression-adjustment (IPWRA) to construct a statistically equivalent comparison group of students enrolled prior to MnAMP at 8 of the consortium colleges.

Missing and unobtainable data problems affected adversely data reliability. For example, missing data on historical comparison students limited PTB’s ability to compare such outcomes as student achievement, post-program career-track job placements, and employment. Consequently, PTB’s confidence in the findings of its multivariate analyses findings is limited, and the extent to which causal inferences can be made is limited.

The key MnAMP impact evaluation outcomes measured included: program/credential completion; degree/credential earned; credits earned; time to completion (total number of terms); grade point average; and participation in grant-related activities (apprenticeships, learning support, and other support services).

III. Implementation Findings

Four key capacity-building strategies were to:

- bring industry partners in at the beginning of the project, build trust levels with them, and engage them as true partners in the development and implementation of the project;
- align project innovations with the colleges' strategic plans;
- use TAACCCT grant funding to leverage other state workforce development grants; and
- empower the consortium's management to drive change.

Key steps taken to create and conduct the MnAMP program included:

- Design systemic reform to close the manufacturing skills gap
- Build and promote the image of advanced manufacturing careers
- Enhance and improve programs, curricula, and credentialing
- Provide supportive services
- Offer professional development
- Leverage resources and relationships

Partnerships were established with over 550 business and industries, many of whom supported the project through scholarships, equipment donations, participant recruiting, offering apprenticeships, making hiring commitments, and assisting with curriculum review and development. Further, MnAMP worked with several national associations to better understand how best to align the three manufacturing pathways with industry-recognized credentials and embed them into the newly-defined core curriculum.

Based on site visit interviews, focus groups, documents analysis, and a series of stakeholder questionnaires, the evaluators concluded that MnAMP largely succeeded in implementing the project with fidelity to the design and plan of the original grant proposal.

MnAMP is distinguished by sound strategic analysis and program design for the 21st-century and by fidelity of design implementation. The strengths of MnAMP's innovative *Learn Work Earn* model of career education and job training are those program aspects in which MnAMP promises to respond well to change. MnAMP's key strengths are: quality, short-term training, customization, convenience, and innovation.

The strengths and weaknesses of the MnAMP program include:

Strengths

- An exemplary systemic reform model.
- Short-term training designed to respond more promptly to changes in the economy and to reduce students' time to credential attainment.
- A more customized, individualized, and flexible approach to education and delivery that recognizes learning experiences and educational goals students have achieved.
- A lifelong learning model that helps adult students balance the competing demands of work and family and acquire new skills at a convenient time, place, and/or pace.
- A restructured curriculum and learning experience.
- A web-based longitudinal data tracking system.

Weaknesses

- Not all colleges in the consortium fully implemented the program.
- The evaluation was limited by not being able to obtain sufficient individual-level postsecondary educational and wage and employment data for the comparison group.

IV. Participant Impacts & Outcomes

MnAMP's positive impacts were:

- Shorter time. Among those who completed a credential, it took participants about 1.5 months less time to complete a 1-year credential than comparison students; and further, participants who were Pell-eligible took less time to complete a one-year certificate than those who were not Pell-eligible.
- Increased full-time employment. Those participants who were unemployed at program enrollment and who received more MnAMP program services (interventions) were more likely to achieve increased attainment of full-time employment post-program.

MnAMP's negative impacts were:

- Lower GPA and fewer credits earned. MnAMP participation was found to be negatively associated with overall student grade point average (GPA) and credits earned, as compared to the comparison group students, based on regression analysis used to calculate an Average Treatment Effect (ATE) outcome.
- Lower credentials attainment. MnAMP participants were less likely than comparable, historical non-participants to attain credentials during their programs of study.
- Fewer earned credits. Participants obtained fewer credits overall by a small margin compared to comparison students.

MnAMP's projected and achieved outcomes on four key U.S. Department of Labor program measures for the TAACCCT program are presented in the table below:

| Outcome Number | Outcome | Projected | Actual | % of Projected |
|-----------------------|--|------------------|---------------|-----------------------|
| 1 | Total unique participants served/enrolled | 3,050 | 3,184 | 104.4% |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (all four years combined) | 1,280 | 2,005 | 156.6% |
| 5 | Total number of participants earning credentials | 2,333 | 1,266 | 62.1% |
| 9 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 1,000 | 1,564 | 156.4% |

In addition, 98% of the participants agreed or strongly agreed they were satisfied with the level of knowledge and skill developed through the courses, and (97%) would recommend the program to others.

V. Conclusions

A. Key Lessons learned

- Take a sector-based, statewide, consortial approach to workforce development reform that is led by a broadly representative partnership governance structure.
- Obtain complete individual-level data sets for participant and comparison groups.
- Establish institutional and student baseline data at the beginning of the project.
- Use a common intake system and a web-based longitudinal data system that integrates standardized individual student-level educational data and state unemployment insurance wage data for reporting, impact evaluation, and continuous improvement.
- Follow individuals' participation in education, training, and social service programs over several years, and store in the database individual student/participant records that can be linked with individual-level state Unemployment Insurance (UI) wage records and other records, such as those of the National Student Clearinghouse database.
- Conduct regular quasi-experimental design evaluations in order to learn whether, to what extent, and how employment outcomes differ among different groups of participants.
- Encourage employers to provide training delivered at the workplace during or outside work hours, using flexible, competency-based approaches.
- Research and apply data technologies for understanding local labor markets, identifying skills gaps, and matching people with available jobs.
- Establish a policy for a consortium data coordinator to report to a consortium director, and charge this key central project staff member with overall management responsibility for data collection from all partner institutions and for complete entry of data, data validation, database currency, and federal, consortial, and institutional performance reporting.

B. Implications for Future Education and Workforce Research

- The U.S. Department of Labor should support state departments of unemployment in providing individual-level employment and wage data to institutions and consortia of higher education, include additional outcome measures for future workforce development grant programs, and allow external evaluators to partner with grant applicants in the design and implementation of grant projects.
- States should assist institutions and consortia of higher education in collecting individual-level postsecondary education data and state Unemployment Insurance employment and wage data in order to enable colleges to evaluate which interventions work to improve education and employment outcomes. States should also provide a policy environment that requires performance outcomes reporting.

- Consortia of higher education should empower the consortium director with administrative authority to execute the project and ensure compliance, including member colleges' compliance with data entry and collection requirements.
- Institutions of higher education should use an intake form that provides an opportunity for all entering students to give their consent to the use of their academic and wage and employment data for evaluation purposes, and routinely collect data on students' entering characteristics, program and support services participation, certificate, credential and degree attainment, and employment outcomes.

1.0 Description of the MnAMP Project

In this time of global trade and rapid advances in technology, entire occupations and industries are expanding and contracting at a rapid pace, and the skills needed to keep up in almost any job are changing continuously. Workers are retiring or being displaced and need to learn new skills to gain reemployment quickly. Changes in technology, demographics, global competition, and the rapidly transforming knowledge economy have contributed to a gap between higher education and labor markets, and consequently, to a skills gap in advanced manufacturing. To close the skills gap, community college job retraining and workforce skills development programs must strategically analyze these trends and adopt comprehensive career education and job training reforms to facilitate individuals learning marketable new skills throughout their lifetime.

MnAMP's key strategy to resolve these issues, to produce more skilled workers to meet employers' labor needs, and thereby close the skills gap in Minnesota, was to rethink its approach to systemic reform and to reconceptualize its traditional academic framework to create career and guided pathways in advanced manufacturing.

The pathways are centered on a consortium-wide standardized core curriculum that leads to stackable, latticed, and portable academic certifications and industry-recognized credentials.^{2,3} These pathways have multiple entry and exit points based on the participant's assessed skill levels, so participants can move into and through programs efficiently and seamlessly. Pathways offer adult learners affordable on-ramps to traditional college programs, or off-ramps to jobs. The pathways offer the opportunity to have an adult learner's prior education and job-relevant skills and competencies assessed. And they offer short-term, credit-bearing certificates that are "stackable," meaning that they can apply them to degree programs without losing credits. Finally, the pathways also are distinguished by employer-driven apprenticeships, and other job-related learning experiences. In these ways, the MnAMP model promises to extend the community college's reach for adult workers, including those who have college credits and on-the-job experience, but lack a degree.

Guided by a Minnesota Advanced Manufacturing Partnership Council comprised of the presidents of the 12 community colleges in the consortium and coordinated by the MnAMP

² "Certificates differ from other kinds of labor market credentials. Certificates are often confused with industry-based certifications, like a Microsoft or Cisco certification, for example. The essential difference between a certificate and an industry-based certification is that the certificates are earned through seat time in a classroom and industry-based certifications are awarded based on performance on a test, irrespective of where the learning occurs. Certificates more closely resemble degrees: They are awarded mainly by public, two-year schools or private, for-profit, non-degree granting business, vocational, technical, and trade schools. Certificates are typically classified by length of program: the amount of time a program is designed to be completed in, typically for students who are enrolled on a full-time basis.

Short-term certificates take less than a year; medium-term certificates take between one and two years to complete; long-term certificates take between two and four years. Short-term certificates are most common, accounting for 54 percent in the most recently available data. Medium-term certificates account for 41 percent of certificates, while the remaining 5 percent are long-term certificates."

³ Carnevale, A., Rose, S., and Hanson, A. (2012). *Certificates: Gateway to Gainful Employment and College Degrees*. Washington, DC: Georgetown University Center on Education and the Workforce. Retrieved from <https://cew.georgetown.edu/wp-content/uploads/2014/11/Certificates.FullReport.061812.pdf>

Grant Director and her staff, MnAMP has succeeded in strategically analyzing technological, economic, and demographic trends as well as in collaboratively conceptualizing a new sector-based,^{4, 5} employer-driven, consortium-wide, advanced manufacturing career education and training system designed to prepare Minnesota's incumbent and future workers. The new system would increase manufacturing program enrollments, certificate and degree completions, and job placements in programs of study where data demonstrate strong and emerging labor-market demand.

The reformed career education and training system model incorporates innovations that enable the community college to respond more promptly to changes in the economy and to provide training in short-term certificates and industry-recognized credentials that take a shorter time to complete than two-year degree programs. In this way, the model enables individuals more readily to learn new marketable skills throughout their lifetime, either simultaneously, or sequentially, by going back and forth between earning and learning.

In order to reduce time to credential attainment and increase credential completion rates, the model integrates non-credit programs, whose courses can be up and running more quickly than credit-based programs, and which take much less time to complete than academic degrees and certificates. It also integrates nationally-recognized stacked and latticed industry credentials (shorter certificates that build on each other) into credit-based career pathways, thus allowing students to feel a sense of accomplishment and to improve their employability in a short time period. It articulates competencies and courses between continuing education and credit programs. And it provides credits for prior learning through competency-based assessment and credit for third-party certifications for continuing education students who matriculate into credit-based programs.

MnAMP's lifelong learning model, entitled *Learn Work Earn*, re-bundles curricula, undergirds curricula with competency-based learning systems and prior learning assessment; expands career coaching, apprenticeships, and work-based learning; and develops distance learning capacity in order to allow students to balance competing demands of work and family and to acquire new skills at a convenient time, place, and/or pace.

These large-scale, capacity-building innovations promise to form and demonstrate an innovative, 21st-century model of career-oriented, sophisticated workforce skills development in advanced manufacturing that will meet Minnesota's industry needs and increase the prosperity of many Minnesotans.

⁴ Sector partnerships, which convene multiple employers with education, training, labor, and community-based organizations to address the local skill needs of a particular industry, are a proven strategy for helping workers prepare for middle-skill jobs and helping employers find skilled workers. See: Maguire, S., Freely, J., Clymer, C., Conway, M., and Schwartz, D. (2010.) *Tuning in to Local Labor Markets: Findings from the Sectoral Employment Impact Study*. Philadelphia: Public/Private Ventures. Retrieved from <http://ppv.issuelab.org/resources/5101/5101.pdf>

⁵ DeRenzis, B. and Wilson, B. (2017). *Skills in the States: Sector Partnership Policy, 50-State Scan*. Washington, DC: National Skills Coalition. Retrieved from <https://www.nationalskillscoalition.org/resources/publications/file/Sector-Partnership-Scan.pdf>

1.1 History and Purpose of MnAMP

In 2009 President Barack Obama articulated a national goal: 60% of 25-to 34-year-olds will complete at least an associate degree by 2020.⁶ To help achieve this goal, the Obama Administration's 2009 American Recovery and Reinvestment Act (ARRA) amended the Trade Act of 1974 to authorize the Trade and Globalization Adjustment Assistance Act (TGAA) Community College and Career Training (TAACCCT) grant program. On March 30, 2010, President Barack Obama signed the Health Care and Education Reconciliation Act, which included \$2 billion over four years to fund the TAACCCT grant program.

The TAACCCT program was designed to develop community colleges' capacity to deliver innovative workforce education and career training programs that could be completed in two years. The three goals of the TAACCCT program are to:

- a. assist TAA-eligible unemployed and employed workers - - especially those affected by foreign trade - - in acquiring the *skills, degrees, certificates, and industry-recognized credentials* needed to move into high-wage, high-skill, career-track jobs in high-growth industry sectors, and thereby meet local and regional employers' demand for a skilled workforce;
- b. introduce and replicate *innovative and effective methods for designing and delivering instruction* that address specific industry needs and lead to improved learning, completion, and other outcomes for TAACCCT participants; and
- c. demonstrate *improved employment outcomes* for TAACCCT participants.⁷

By the time the MnAMP grant was awarded, the target population had expanded to include "other adults, as well as TAA-eligible individuals."⁸

The TAACCCT grant program presented a rare opportunity to drive fundamental reforms in U.S. higher education at a time when colleges and universities were struggling to adjust to the nation's rapid transition from an industrial to a post-industrial economy. This economic shift has been taking place on a scale not seen since the transition of the U.S. labor force out of agriculture in the early 1900s. TAACCCT promised to help community colleges close the skills gap, the gap between the jobs employers need to fill at a given moment and the skills of available workers.⁹

⁶ Fry, R. (2017, January 18). U.S. still has a ways to go in meeting Obama's goal of producing more college grads. *Pew Research Center*. Retrieved from <http://www.pewresearch.org/fact-tank/2017/01/18/u-s-still-has-a-ways-to-go-in-meeting-obamas-goal-of-producing-more-college-grads/>

⁷ Mikelson, K., Eyster, L., Durham, C., and Cohen, E. (2017). *TAACCCT Goals, Design, and Evaluation: TAACCCT Program Brief 1*. Washington, DC: Urban Institute. Retrieved from <https://www.dol.gov/asp/evaluation/completed-studies/20170308-TAACCCT-Brief-1.pdf>

⁸ Employment and Training Administration, U.S. Department Of Labor. (2014). *Notice of Availability of Funds and Solicitation for Grant Applications for Trade Adjustment Assistance Community College and Career Training Grants Program*.

⁹ Selingo, J. (2018, January 8). The False Promises of Worker Retraining. *The Atlantic*. Retrieved from <https://www.theatlantic.com/education/archive/2018/01/the-false-promises-of-worker-retraining/549398/>

To meet this skills-gap challenge, community colleges could, with TAACCCT grant support, undertake reforms to deliver more quality, innovation, customization, convenience, and speed.¹⁰ Reform is needed because while workers are being displaced and need to learn new skills to gain reemployment quickly, community college career education and job training programs largely remain rooted in the industrial era in which they were created. To respond promptly to regional skilled workforce requirements and close local skills gaps, community colleges traditionally take months or even years to design, develop, advertise, and offer new academic programs. Further, the requirements for a degree typically take another two or more years, further delaying graduates' entry into the workforce.

Reform is also needed because automation is making lifelong learning a necessary part of work. Community college job retraining and workforce skills development programs must enable individuals to learn marketable new skills throughout their lifetime. As computers and robots transform the workplace, increasing the productivity of high-skill workers and performing the routine tasks previously undertaken by low-skill workers, such as those working on assembly lines, community colleges must continuously equip workers with the new skills that are needed. The new skills workers of the future will need include social and emotional skills and advanced cognitive capabilities, such as critical thinking and creativity. The workers of the future will spend more time on activities that machines are less capable of, such as managing people, applying expertise, and communicating with others. They will spend less time on predictable physical activities and on collecting and processing data, where machines already exceed human performance.^{11, 12}

Reforms to advance this lifelong learning mission promise higher productivity, rising wages, and increased prosperity. The National Bureau of Economic research notes that technological change has caused a large growth in demand for workers with abstract and cognitive reasoning skills, and skills that cannot easily be automated.¹³ This shift in supply of and demand for higher skills has contributed to higher earnings:

“Around 1980, the growth in demand for college related skills started to outpace supply and has been winning the race ever since. For the past three decades, technological change has led to increased growth in the demand for skilled workers, and because the

¹⁰ Carnevale, A. P., Garcia, T. I., and Gulish, A. (2017). *Career Pathways: Five Ways to Connect College and Careers*. Washington, DC: Georgetown University Center on Education and the Workforce. Retrieved from <https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/LEE-final.pdf>

¹¹ Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., Ryan, K., and Sanghvi, S. (2017). *Jobs lost, Jobs gained: Workforce transitions in a time of automation*. (n.p.): McKinsey Global Institute. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx>

¹² Bughin, J., Hazan, E., Lund, S., Dahlström, P., Weisinger, A., and Subramaniam, A. (2018). *Skill Shift: Automation and the Future of the Workforce*. (n.p.): McKinsey Global Institute. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/Skill%20shift%20Automation%20and%20the%20future%20of%20the%20workforce/MGI-Skill-Shift-Automation-and-future-of-the-workforce-May-2018.ashx>

¹³ Oreopoulos, P. and Petronijevic, U. (2013). *Making College Worth It: A Review of Research on The Returns to Higher Education*. Cambridge, MA: National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w19053.pdf>

supply of college educated workers has not increased at the same rate, employers have bid up the wages of college graduates causing the rise in the college earnings premium.”¹⁴

As automation and foreign trade decreased the need for unskilled workers, and contributed to growing skills gaps across Minnesota, the Minnesota Advanced Manufacturing Partnership’s (MnAMP) *Learn Work Earn* (LWE) 2014 TAACCCT grant initiative was designed to serve one consortium-wide purpose: To help unemployed adults (including TAA-certified workers and veterans) in Minnesota to gain the skills required to fill available jobs in Minnesota’s advanced manufacturing sector. In order to align manufacturing programs to meet the labor needs in the state and thereby close the skills gap, the MnAMP initiative was developed by a consortium of twelve community and technical colleges and two university centers of excellence that are part of the Minnesota State System. The MnAMP consortium was awarded a four-year, \$15 million TAACCCT grant by the U.S. Department of Labor’s (DOL) Employment and Training Administration (ETA) under Round 4 of the TAACCCT grant program.^{15, 16, 17}

1.2 Description of the MnAMP *Learn Work Earn* (LWE) Model

Minnesota manufacturers have had difficulty obtaining workers with appropriate training for advanced manufacturing. According to Enterprise Minnesota, 322,000 Minnesotans have manufacturing jobs, accounting for 13% of all private sector jobs in the state. Manufacturing represents the single largest private sector component of Minnesota’s GDP, and manufacturing employment has risen almost 9 percent since 2010.¹⁸ “Attracting and retaining a qualified workforce” was one of the biggest challenges Minnesota manufacturers named that might negatively impact future growth. Among companies that had difficulty attracting qualified candidates, most said applicants lacked needed skills or education, or there was just a lack of applicants or interest.¹⁹

Challenged to meet the demand for more skilled workers and close a large skills gap,^{20, 21, 22} MnAMP brought industry, state leadership, public education, and manufacturing associations

¹⁴ Ibid.

¹⁵ U.S. Department of Labor. (u.d.). *TAA Statutes*. Retrieved from <https://www.doleta.gov/TradeAct/law/statutes/>

¹⁶ D’Amico, R. and Schochet, P. Z. (2012). *The Evaluation of the Trade Adjustment Assistance Program: A Synthesis of Major Findings*. Oakland, CA: Social Policy Research Associates. Retrieved from <https://www.mathematica-mpr.com/our-publications-and-findings/publications/the-evaluation-of-the-trade-adjustment-assistance-program-a-synthesis-of-major-findings>

¹⁷ Ibid.

¹⁸ Enterprise Minnesota. (u.d.). *Manufacturing in Minnesota*. Retrieved from <http://www.enterpriseminnesota.org/about-us/manufacturing-in-minnesota>

¹⁹ Autry, R. (2018, May). Do booming sales distract manufacturers from the looming workforce crisis? *Enterprise Minnesota, Summer 2018*, 16-21. Retrieved from <https://www.enterpriseminnesota.org/news-and-publications/article/summer-2018-the-state-of-manufacturing-hazard-ahead>

²⁰ Ibid. Today, times are good for Minnesota manufacturers. According to the tenth annual State of Manufacturing®, Minnesota manufacturers have a high level of optimism with expectations of record revenues, record profitability, record-level of investment in their companies, and increased wages. The number of manufacturers who anticipate economic expansion is at 64 percent, exactly twice what it was just two years ago. The risk to economic growth is an anticipated workforce shortage:

together to create educational pathways designed to produce a highly-skilled workforce that would meet the current and future needs of the manufacturing industry.

In the design process, MnAMP community colleges identified and resolved several reform issues: (1) Minnesota State community colleges sometimes have been lacking in the resources required to set up training in advanced manufacturing; (2) their manufacturing curricula might better be aligned with, and optimized to meet, the labor needs of current businesses; (3) Minnesota State community-college students coming into advanced manufacturing may benefit from more individualized treatment and flexible access, ranging from those who need additional assistance to those who through practical experience have already mastered some parts of the curriculum; and (4) academic standards and skills-based curricula might be integrated into an even larger organized system that links education and the workforce systems, where not only academic degrees, diplomas, and certificates will be recognized, but also other types of learning, including work-based industry credentials, apprenticeships, and other contextual experiences.

Because incumbent workers would be able to earn these certifications and credentials in Machining, Welding, and Mechatronics career pathways, either sequentially, or while simultaneously working in industry, MnAMP's lifelong learning model was entitled *Learn Work Earn*.²³ See Appendix A – MnAMP *Learn Work Earn* Logic Model for an overview of the project's logic and theory of change, in which inputs make possible planned grant activities and outputs that, in theory, will produce short- and long-term outcomes. An overview of the Model follows:

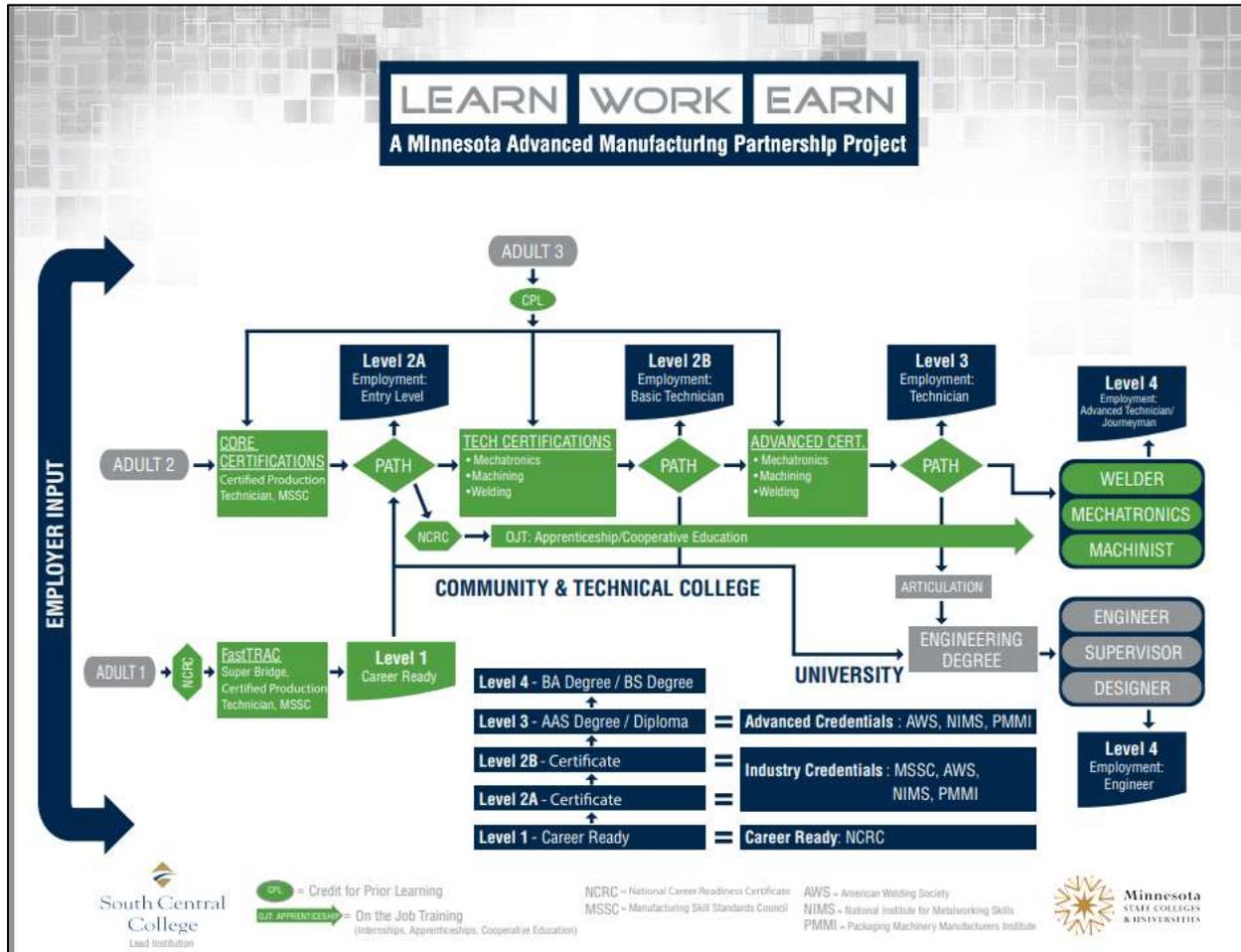
“The workforce shortage—for skilled and unskilled employees—looms large as a likely impediment to future growth to manufacturers across the board... Notably, large and urban companies for the first time are indicating accelerating urgency about workforce issues, possibly signifying employers in Greater Minnesota will face even more intense levels of competition for employees (pg. 19).”

²¹ Enterprise Minnesota. (2018). *The State of Manufacturing*. Retrieved from <https://www.enterpriseminnesota.org/state-of-manufacturing/2018-survey-results>

²² National Skills Coalition. (2017). *Minnesota's Forgotten Middle*. Washington, DC: National Skills Coalition. Retrieved from <https://m.nationalskillscoalition.org/resources/publications/2017-middle-skills-fact-sheets/file/Minnesota-MiddleSkills.pdf>

²³ As the project progressed, the state's economy improved, lowering unemployment rates and enrollments in community colleges, MnAMP focused primarily on upskilling incumbent workers, while also serving TAA-eligible workers, veterans and other adult learners.

MnAMP Career Pathways “Learn Work Earn” Model²⁴



In order to produce completers with higher skill levels and thereby close the skills gap, consortium colleges integrated a shared, consortium-wide, standard core curriculum and restructured career pathways designed with and for industry. The core curriculum leads to career pathways with embedded industry-recognized stackable credentials and employer-driven apprenticeships, and other contextual learning experiences.

To design the restructured curricula, MnAMP created a new consortium-wide manufacturing-industry sector partnership of employers and industry, the public workforce system, and Minnesota State educational institutions. The partnership worked to plan, design, and demonstrate a reformed career education and training model that promises to improve the productivity and responsiveness of the Minnesota workforce education system.

²⁴ A Minnesota Advanced Manufacturing Partnership Project. (2018). *The Minnesota Advanced Manufacturing Partnership (MnAMP): Creating Educational Pathways for Adult Learners in Minnesota*. Retrieved from <http://www.mnamp.net/about/about-mnamp>

Employers were key stakeholders and co-designers of the reformed curriculum. The employers brought their knowledge of their industry’s current and future needs for higher technological and other workforce skills and collaborated with college faculty to “map” manufacturing careers. MnAMP industry partners started with their workplace and career requirements and, collaboratively with faculty, designed programs that teach the skills that prepare students for those workplaces and careers.

The MnAMP partnership adopted and adapted a Guided Career Pathways model²⁵ with the following key elements:

Guided Career Pathways Model

- **Sector-based career pathway:** connecting learners to in-demand advanced manufacturing sector occupations by means of clear, well-organized and advanced manufacturing core curriculum²⁶-based programs of study, designed with and for industry, that map out the courses students should take and in what sequence to build skills toward terminal learning outcomes aligned with industry skills requirements.
- **Intake process:** capturing detailed entering characteristics data on each student, assessing each student’s skills, interests and aspirations as a basis for career and academic planning, and helping students explore college and career options, learn about the labor market and career compensation, choose and enter a career pathway, and receive competency-based credit for prior learning (CPL) through work or military experience or industry-recognized credentials.

²⁵ The Guided Career Pathways model has been developed and demonstrated by Davis Jenkins and others over the past decade. See: Bailey, T. R., Smith Jaggars, S., and Jenkins, D. (2015). *Redesigning America's community colleges: A clearer path to student success*. Cambridge, Massachusetts: Harvard University Press; Jenkins, D., Lahr, H., Fink, J., and Ganga, E. (2018). *What we are learning about guided pathways. Part 1: A reform moves from theory to practice*. New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from <https://files.eric.ed.gov/fulltext/ED582819.pdf>; Fink, J. (2017). *What do students think of guided pathways?* (CCRC Research Brief No. 66). New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from <https://ccrc.tc.columbia.edu/media/k2/attachments/what-do-students-think-guided-pathways.pdf>; Jenkins, D., Lahr, H., and Fink, J. (2017a). *Building blocks: Laying the groundwork for guided pathways reform in Ohio*. New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from http://ohiocommunitycolleges.org/wp-content/uploads/2016/11/CCRC_OH-GP_BuildingBlocks_Laying-the-Foundation_ExecutiveSummary_UPDATED_091217.pdf?x57939; Jenkins, D., Lahr, H., and Fink, J. (2017b). *Implementing guided pathways: Early insights from the AACC Pathways colleges*. New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from <https://files.eric.ed.gov/fulltext/ED574054.pdf>; Jenkins, D., and Cho, S. W. (2012). *Get with the program: Accelerating community college students' entry into and completion of programs of study*. (CCRC Working Paper No. 32). New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from http://www.texascompletes.com/TCDocuments/Getting_with_the_Program.pdf; Prince, D. and Jenkins, D. (2005). *Building Pathways to Success for Low-Skill Adult Students: Lessons for Community College Policy and Practice from a Statewide Longitudinal Tracking Study*. (CCRC Brief No. 25). New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from <https://files.eric.ed.gov/fulltext/ED489093.pdf>; Zeidenberg, M., Cho, S., and Jenkins, D. (2010). *Washington State's Integrated Basic Education and Skills Training Program (I-BEST): New Evidence of Effectiveness*. (CCRC Working Paper No. 20). New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from <http://s3.amazonaws.com/PCRN/docs/i-best-evidence-effectiveness.pdf>.

²⁶ Quality Practices, Safety Awareness, Maintenance Awareness, and Manufacturing Process and Production are the four courses that comprise the advanced manufacturing core curriculum.

- **Integrated Developmental Education and training:**²⁷ building basic skills into technical training courses and providing supplemental learning supports along the pathway.
- **Integrated stacked and latticed industry-recognized credentials:** embedding and aligning short-term academic certificates and industry credentials (*i.e.*, NAM, MSSC, NIMS, PMMI, AWS, and OSHA)²⁸ in seamless career pathways²⁹ so credentials build on one another and enable students to climb a career ladder and continue lifelong learning.
- **Contextualized learning:** incorporating within the pathways hands-on learning, apprenticeships,^{30, 31} programs, and other forms of experiential learning that engage students and help them understand the real-world relevance of what they are learning.
- **Multiple entry and exit points:** enabling students to *Learn Work Earn* and receive credit at different points along the career pathway by means of competency-based and modularized curricula, flexible scheduling and delivery, and technology-enabled distance learning so skills can be acquired at a convenient time, place, and/or pace.
- **Intrusive advising:** In-person professional advising, progress monitoring with e-advising/early warning systems of each student and intervening when helpful with guidance and support services.
- **“Wraparound” support services and referrals:** providing students with referrals for finding and paying for childcare, transportation, applying for financial aid, searching for jobs, and other non-academic support services.
- **Articulated non-credit and credit programs as well as two-year and four-year programs:** bridging the gaps between non-credit continuing education and workforce development programs and credit programs via competency-based courses, as well as

²⁷ Washington State’s Integrated-Basic Education and Skills Training (I-BEST) program is an example of this approach. See Zeidenberg, M., Cho, S., and Jenkins, D. (2010). *Washington State’s Integrated Basic Education and Skills Training Program (I-BEST): New Evidence of Effectiveness*. (CCRC Working Paper No. 20). New York, NY: Columbia University, Teachers College, Community College Research Center. Retrieved from <http://s3.amazonaws.com/PCRN/docs/i-best-evidence-effectiveness.pdf>

²⁸ See the credential agencies’ websites at: NAM - [National Association of Manufacturers](#); NIMS - [The National Institute for Metalworking Skills](#); MSSC - [Manufacturing Skill Standards Council](#); AWS - [American Welding Society](#); PMMI - [The Association for Packaging and Processing Technologies](#); and OSHA - [Occupational Safety and Health Administration](#).

²⁹ For the pathways at each of the 12 MnAMP member colleges, see: <http://www.mnamp.net/programs-pathways/pathways>.

³⁰ MnAMP leveraged two state grant programs to develop and demonstrate apprenticeships and other experiential learning experiences: In 2014, the Minnesota legislature created the Private Investment, Public Education, Labor and Industry Experience (*PIPELINE*) Project to expand registered apprenticeship and other dual programs in advanced manufacturing, agriculture, health care services, and information industries. In 2015, the legislature created the *Dual-Training* grant program for employers that have an agreement with a training institution or program to provide training. Employers could be eligible for up to \$6,000 for each employee participating in a registered apprenticeship or other dual training.

³¹ Wilson B. and Mehta, S. (2017). *Skills in the States: Work-based Learning Policy, 50-State Scan*. Washington, DC: National Skills Coalition. Retrieved from <https://www.nationalskillscoalition.org/resources/publications/file/WBL-Learning-Policy-50-State-Scan.pdf>

articulating two-year credit programs with manufacturing programs at four-year institutions with MnSCU Centers of Excellence³² assistance.

- **Faculty development:** empowering faculty to think broadly about the college, career pathways, students' future employment and higher education goals, and employers' labor needs, and supporting faculty industry credentialing.

The pathways are aligned and embedded with NAM-endorsed learning outcomes and credentials: AWS standards for welding programs; NIMS standards for machining and mechatronics programs; and PMMI standards for mechatronics programs. Industry credentials include the MSSC certified production technician (CPT) certificate, which is an integral part of the core curriculum. The alignment of industry credentials with the colleges' policies and procedures was facilitated by the creation of a MnAMP Credit for Prior Learning Guide.³³

The pathways also include three different “*Learn Work Earn*” opportunities, called apprenticeships:

1. An academic program in which students go to school three days a week and work two days a week, enabling student to work toward an academic credential while receiving work-based learning.
2. A customized apprenticeship program where students can receive industry credentials, which are then direct pathways into academic programs.
3. A hybrid training platform, called +Connect, offered by customized training/continuing education centers at participating Minnesota State colleges, in which credit and non-credit courses are offered that provide a pathway to academic programs and/or industry credentials. Offering a virtual classroom with a live instructor, +Connect is a hybrid model that combines live course instruction through video conferencing technology with an online learning management system for additional coursework outside of class. While designed to train incumbent workers and those in apprenticeship programs, dislocated workers and adults also can participate in short-term training sessions of 8 weeks or less, for one to three hours per week. The +Connect online training system expands accessibility to MnAMP courses by reducing geographical and scheduling barriers.

In theory, this comprehensive systemic-reform approach would produce improved student educational and employment and institutional productivity outcomes.

³² The *360 Manufacturing Center of Excellence* is a consortium of 15 institutions led by Bemidji State University and includes 14 technical and community colleges, including Northwest Technical College. 360 is designing a 21st century education system that prepares individuals to have rewarding careers in manufacturing and meets the dynamic, evolving needs of the region's manufacturing employers through an enhanced pipeline, industry-driven curriculum and authentic assessment. 360 is a member of the Minnesota State colleges and universities system and received a National Science Foundation grant in 2012 to become an Advanced Technological Education Regional Center. See <http://www.360mn.org/>. The *Minnesota State Engineering Center of Excellence* at Minnesota State University promotes connectivity between industry and Minnesota State colleges and universities. The Center facilitates relationships by engaging academic institutions with industry and providing educational outreach by inspiring interest in science, technology, engineering, and math (STEM). See: <http://engineering.mnsu.edu/about/>.

³³ Tomhave, S. (u.d.). *MnAMP Credit for Prior Learning Guide 1.0*. North Mankato: South Central College. Retrieved from <http://www.mnamp.net/images/credit-for-prior-learning/MnAMP-CPL-Guide.pdf>

Consistent with the Guided Pathways model, the MnAMP *Learn Work Earn* model provides for the following activities and services:

| Table 1: Activities and Services within <i>Learn Work Earn</i>³⁴ | | |
|--|---|---------------------------------|
| Service/ Activity | Description | Aligned Project Strategy |
| Remedial Coursework | Individualized assessment will determine an entry point into a program commensurate with current needs and prior learning. In addition, Language Academies will be developed and offered in partnership with Adult Basic Education to meet specific needs of the regional population. Finally, partners will expand the Minnesota Pathways to Prosperity Adult Career Pathway programs which include a bridge program and integrated development or technical courses, <i>e.g.</i> , Tech Math. | 4.2 |
| Career Guidance | MnAMP partner institutions will provide career advising to help individuals prepare education and career plans and link to employers. Education and Placement Advisors and WIB Career Pathway Navigators will work individually with program participants to meet their personal career goals. GPS LifePlan, a web-based career and personal planning tool, will be used with all grant participants. | 4.1 |
| Competency-Based Assessment | MnAMP institutions will expand the use of competency-based instruction to help learners earn certificates and degrees in less time and at a lower cost than traditional semester-length models. This also will decrease barriers to transferability between MnAMP partners and support a consistent system for credit for prior learning. | 1.1, 1.2, 2.1 |
| Modularized Curricula | Courses will be mapped out to give students a sequential and prescriptive schedule that moves them toward their degree or certificate of study. | 1.1, 2.1, 3.1 |
| Stacked/ Latticed Credentials | Programs will be offered across the three manufacturing areas and provide for multiple entry/exit points. Participants will be able to pursue advanced certifications in a given career along an established pathway or move laterally and pursue a certificate in another area of specialization. | 1.1, 2.1, 3.1 |

³⁴ Minnesota Advanced Manufacturing Partnership's (MnAMP). *Learn, Work, Earn grant proposal*, funded under Round IV of the U.S. Department of Labor's Trade Adjustment Assistance Community College and Career Training (TAACCT) program, page 25.

| Table 1: Activities and Services within <i>Learn Work Earn</i>³⁴ | | |
|--|--|--------------------|
| Employer Engagement | MnAMP partners will rely on the input of industry/association partners to design, update, and align the programs of study in the career pathways, as well as provide ongoing assistance with curriculum development. Employers also will be engaged to offer apprenticeship and cooperative education opportunities and recruit participants through outreach efforts and enhancement to the image of manufacturing. | 2.2, 3.1, 3.2, 3.3 |
| Transfer Articulation | Program leaders will revise articulation and 2+2 agreements to allow participants to continue study at four-year institutions in the same or related areas of specialization. MnAMP partners will accept each other's coursework as equivalent to similar courses offered by the receiving partner. | Strategy 1.3 |

1.3 Description of Program Offerings and Credentials

Table 2 lists the available programs offered at MnAMP.³⁵

| Table 2: MnAMP Colleges and Program Offerings | | | | | | | |
|--|-------------|---------|--------|-------------|--------------------------------------|---------------------|---|
| College and Career Area | Certificate | Diploma | Degree | Common Core | Apprenticeship/Cooperative Education | Stacked Credentials | |
| Century College | | | | | | | |
| Mechatronics | X | | X | X | | | |
| Machining | | | | | | | |
| Welding | X | | | | | | |
| Dakota County Technical College | | | | | | | |
| Mechatronics | | X | X | | | | X |
| Welding | | X | | | | | X |
| Lake Superior College | | | | | | | |
| Mechatronics | X | X | X | | X | | X |
| Machining | X | X | X | X | | | X |

³⁵ Graphic representations of the Career Pathways of each consortium college are accessible at <http://www.mnamp.net/programs-pathways/pathways>.

| Table 2: MnAMP Colleges and Program Offerings | | | | | | | |
|---|-------------|---------|--------|-------------|---|---------------------|---|
| College and Career Area | Certificate | Diploma | Degree | Common Core | Apprentice-ship/ Cooperative Education | Stacked Credentials | |
| Welding | X | X | | X | | | X |
| Minneapolis Community and Technical College | | | | | | | |
| Machining | | X | X | | X | | |
| Welding | X | | X | | | | |
| MN State Community and Technical College | | | | | | | |
| Mechatronics | | | | X | | | |
| Machining | | | | X | | | |
| Welding | | | | | | | |
| MN West Community and Technical College | | | | | | | |
| Mechatronics | X | X | X | X | X | | X |
| Machining | X | X | | X | | | X |
| Welding | X | X | | X | X | | X |
| Normandale College | | | | | | | |
| Mechatronics | X | | X | X | | | |
| Northland College | | | | | | | |
| Mechatronics | X | | X | X | | | X |
| Machining | | | | | | | |
| Welding | X | X | | | | | X |
| Ridgewater College | | | | | | | |
| Mechatronics | X | X | X | X | X | | X |
| Machining | X | X | X | X | | | X |
| Welding | X | X | X | X | | | X |
| Riverland Community College | | | | | | | |
| Mechatronics | | X | | | X | | X |
| Machining | X | X | | X | | | X |
| Welding | X | | | X | | | X |

| Table 2: MnAMP Colleges and Program Offerings | | | | | | | |
|--|--------------------|----------------|---------------|--------------------|--|----------------------------|--|
| College and Career Area | Certificate | Diploma | Degree | Common Core | Apprenticeship/ Cooperative Education | Stacked Credentials | |
| Saint Paul College | | | | | | | |
| Mechatronics | X | X | X | X | | X | |
| Machining | X | X | X | X | X | X | |
| Welding | X | X | X | X | | X | |
| South Central College | | | | | | | |
| Mechatronics | X | X | X | X | X | X | |
| Machining | X | X | X | X | X | X | |
| Welding | X | X | | X | | X | |

Table 3 lists the credentials MnAMP participants are eligible to earn through the *Learn Work Earn* program.

| Table 3: LWE Credentials | |
|---------------------------------|---|
| Level | LWE Credentials (Certifications, Diplomas, Degrees, and other industry-recognized credentials) |
| Entry | Certified Production Technician (CPT) through MSSC |
| Intermediate | Mechatronics Certificates: Mechatronics, Robotics, Automation, Industrial Maintenance. Industry Certification: PMMI & NIMS |
| | Machining Certificates: Precision Machining, Industry Certification: NIMS |
| | Welding Certificates: welding, soldering, metalworking; Industry certification: AWS & IPC |
| Advanced | Diploma &/or Associate Degrees in Advanced Manufacturing Technology, Mechatronics and Welding, Applied Engineering |
| Professional | Bachelor’s Degree in Manufacturing Engineering Technology, Industrial Management, Operations Management, |

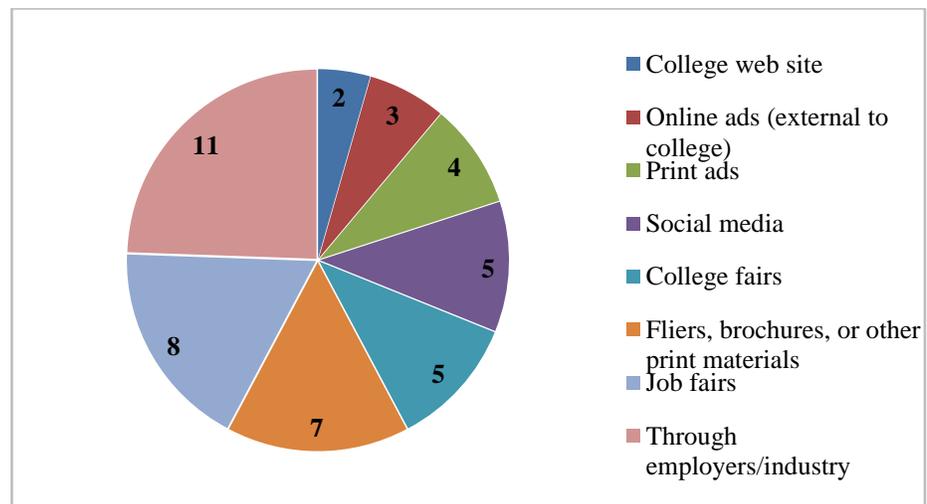
1.4 Description of MnAMP Program Marketing and Student Recruitment

One of the conditions of the U.S. Department of Labor grant is that priority be given first to veterans eligible for training under the TAACCCT program and next to other workers eligible for that program. For the participating two-year colleges, essentially all students are accepted, and thus the colleges did not face a choice as to which students to admit. What the colleges could do was to modify their recruiting/outreach efforts to encourage veterans and dislocated workers to enroll. In this section, we provide data from interviews and focus groups about how students were recruited into MnAMP.

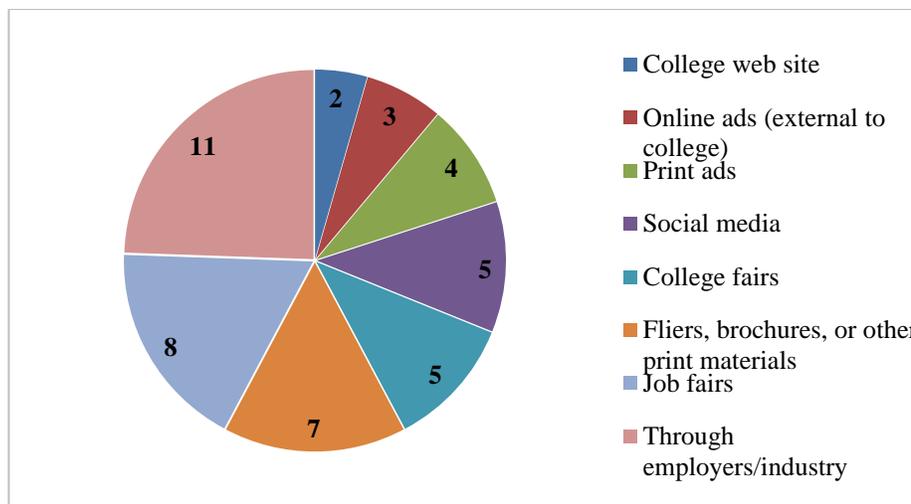
Project Coordinators were asked in surveys which, if any, marketing methods they used to promote MnAMP programs to potential students. The pie charts for Years 2 and 3 (below) note the number of Project Coordinators who indicated that their college has used the marketing method listed.

As illustrated in the pie charts, the most widespread strategy for marketing the MnAMP programs is leveraging Customized Training Representatives' relationships with industry partners. In Year 3, this strategy was combined with fliers, brochures, and other print materials to form the leading MnAMP marketing strategy across consortium colleges. Additionally, the MnAMP web site (www.mnamp.net) is a comprehensive marketing tool, promoting MnAMP through information and resources related to manufacturing careers, programs and pathways, credit for prior learning, apprenticeships, veteran opportunities, partners, and news and events.

Year 2: Marketing the MnAMP Programs: Marketing Strategies Reported by Project Coordinators



Year 3: Marketing the MnAMP Programs: Marketing Strategies Reported by Project Coordinators



At the consortium level, MnAMP Grant Director, Anne Willaert, collaborated with national industry partners to enhance the image of manufacturing and raise awareness of available high-wage jobs. She promoted MnAMP initiatives - - specifically, Career and Guided Pathways and apprenticeships - - by delivering presentations at national conferences or through publications associated with the following organizations:

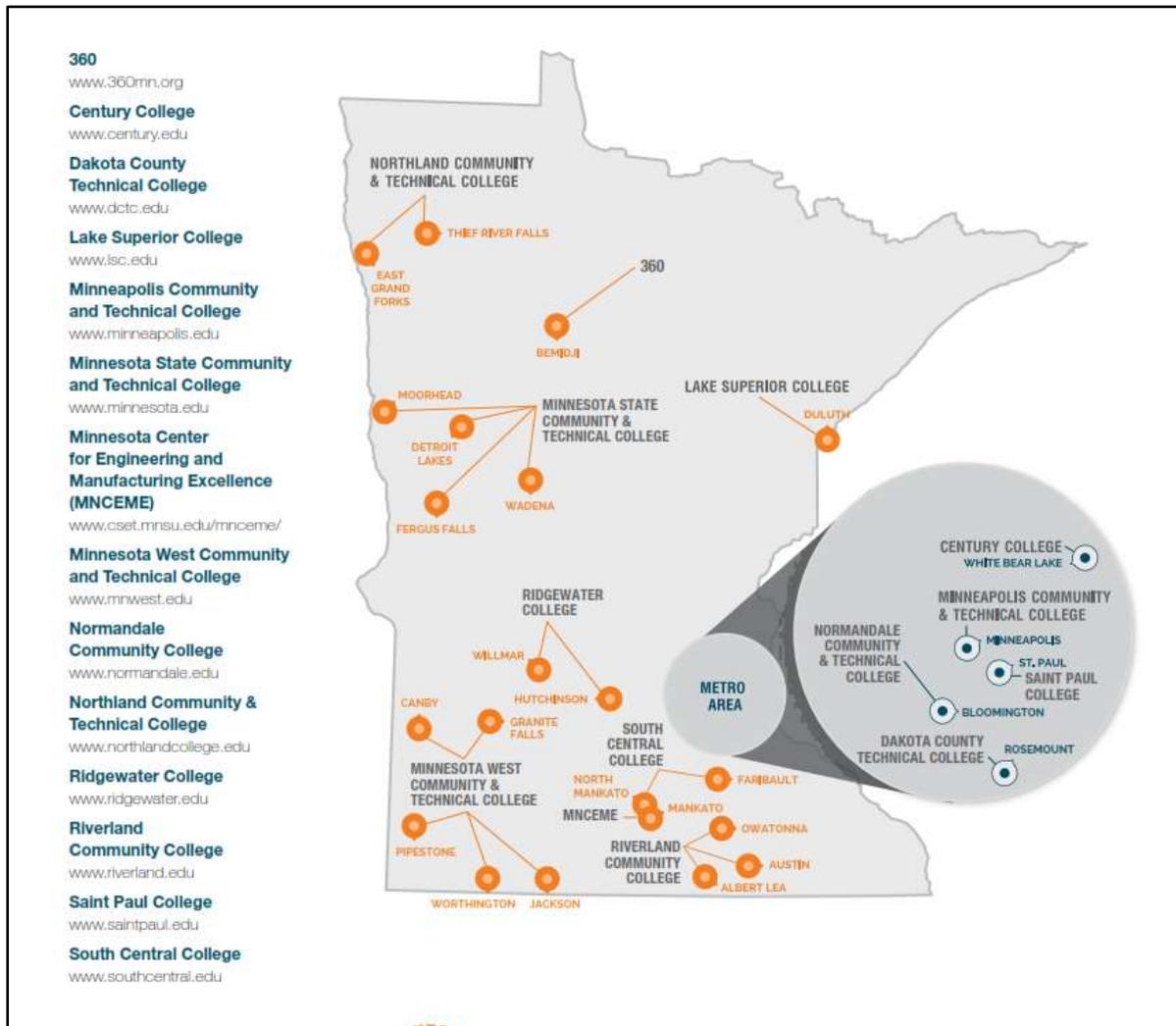
- Minnesota and National Workforce Centers, in support of the Workforce Innovation and Opportunity Act;
- Jobs for the Future (Additionally, Dr. Parker, SCC President, has been invited to present at a number of national Jobs for the Future conferences);
- National Council for Workforce Education (NCWE);
- American Association of Community Colleges (AACC) and the Workforce Development Institute (AACC – WDI); and
- Manufacturing Skills Institute of the National Association of Workforce Boards (NAWB – MSI).

Further, Ms. Willaert promoted the MnAMP project’s Dual Training and apprenticeship initiatives through the Minnesota Regional Training Program and the Minnesota Department of Labor and Industry.

Furthermore, Ms. Willaert promoted MnAMP’s credit for prior learning initiative by collaborating with the Council for Adult and Experiential Learning, as well as MnAMP’s dual-training initiative by collaborating with the Minnesota Workforce Council. Further, she has partnered with the Minnesota Governor’s Workforce Development Council to support the Workforce Innovation and Opportunity Act at the state-level by developing and enhancing higher education and workforce partnerships and, specifically, promoting MnAMP’s dual-training initiative.

1.5 MnAMP Partners

The MnAMP college and university partners are identified in the following graphic:³⁶



The MnAMP business and industry partners totaled over 550 employers, including: Cybex International; Bosch Automotive Service Solutions; 3M Company; EI Microcircuits; Nexen Group; Massman Automation Designs; WASP; Advanced Molding Technologies; Modernistic; Absolute Quality Manufacturing; Ayrshire Electronics MN; Engineered Products Company; BTD; Sweet Harvest Foods; Altec HiLine; Hydrosolutions of Duluth; South St. Paul Steel Supply Company; Kurt Manufacturing; Graco; Chandler Industries; AGCO; Kit Masters; Polar

³⁶ Throughout this evaluation report, the following abbreviations will be used for the colleges: Century College (Century); Dakota County Technical College (DCTC); Lake Superior College (LSC); Minneapolis Community and Technical College (MCTC); Minnesota State Community and Technical College (M-State); Minnesota Center for Engineering and Manufacturing Excellence (MNCME); Minnesota West Community and Technical College (Mn West); Normandale Community College (Normandale); Northland Community and Technical College (Northland); Ridgewater College (Ridgewater); Riverland Community College (Riverland); Saint Paul College (SPC); and South Central College (SSC).

Semiconductor; Gamma Vacuum; Marvin Windows & Doors; Central Boiler; Pride Solutions; Midwest Industrial Tool Grinding; Viracon; Lou-Rich; and VistaTek.

Local Minnesota Workforce Investment Boards (WIBs); other employment agencies and CBO’s; Minnesota Workforce Council Association; and the Minnesota Department of Employment and Economic Development are key members of the partnership.

Other key MnAMP partners include: The National Association of Manufacturers; Enterprise Minnesota; Minnesota Chamber of Commerce; Minnesota Precision Manufacturing Association; Minnesota Valley Action Council; Governors Workforce Development Council; Adult Basic Education; and Minnesota Center for Engineering and Manufacturing Excellence.

1.6 Population Served

Overall, of 3,184 participants, about one-half (49.1%, 1,520) had a high school diploma or GED, and 24.8% had “some college.”

Three-quarters (74.8%) were incumbent workers and this percentage grew from 67% in year 1 to a high of 80.6% in Year 3. The percentage employed full-time at entry increased from 33.4% in year 1 to a peak of 55.2% in Year 3, and falling slightly to 52.4% in Year 4, while the percentage employed part-time decreased from 28.5% in year 1 to 16.5% in year 4.

Along with this increased employment trend, MnAMP’s full-time enrollments decreased from 78.7% in year 1 to 40.7% in year 4, while part-time enrollments increased from 21.3% to 59.3%.

MnAMP participants on average became older (from age 30 in year 1 to age 34 in year 4), with fewer single (from 80.0% in year 1 to 61.2% in year 4), more married (from 17.6% in year 1 to 28.2% in year 4), and more with children (from 25.0% in year 1 to 50.2% in year 4)

MnAMP participants’ educational goals at entry and actual credential attainment show discrepancies between projected and actual attainment:

| Credential | Ed Goal at Entry | Attainment |
|--------------------------------|------------------|--------------|
| Industry-recognized credential | 0.0% | 17.8% (566) |
| 1 yr. certificate | 46.2 % (1,343) | 14.8 % (470) |
| 1-2 yr. certificate | 28.5% (829) | 11.4% (364) |
| 2 yr. degree | 23.5 % (683) | 4.7% (151) |

Following are additional data³⁷ about the characteristics of the students participating in MnAMP.

³⁷ Unless otherwise noted, the LWE database is the source date included for each chart and table included here and in Appendix B. Some data were received directly from the MnAMP Project Director. As noted on the charts and tables, a full data set was not reported for some participants. Some data percentages in the charts and tables

As of March 31, 2018, when grant-supported instruction ended, 3,184 participants (104.4% of the projected enrollees) had engaged in grant-supported programs or services at MnAMP colleges. Of the participants for whom the data are available, the majority were male (89.7%), Non-Hispanic/Latino (92.2%), White (74.8%), and attended full-time (51.9%). Upon entry into MnAMP, 49.1% of the participants were high school graduates or had a GED, 24.8% had some college, and 22.3% had earned a college degree or certificate. The majority of participants (91.3%) entering the LWE program had the goal of obtaining a certificate, diploma, or degree. Over half (62.8%) enrolled in either welding (35.9%) or custom training (26.9%). Two hundred thirteen (213) were enrolled in dual-training apprenticeship programs and 108 in registered apprenticeships.

Other data for participants shows the majority entered the program as incumbent workers (74.8%), and 49.5% were employed full time. About 14 percent (14.2%) were displaced workers, 27.1% were Pell Grant eligible, 6.8% reported a disability, 7.7% were either veterans or eligible spouses of veterans, and 25 (0.8%) were TAA-eligible.

At the time of program entry, 50.7% had a gross family income of less than \$35,000 per year, and 27.1% had a gross family income of less than \$15,000 per year. About 28 percent (28.1%) had a gross family income of \$55,000 or more per year. About 75% (74.8% - - 2,381) of MnAMP participant were incumbent workers. Of these, 1,564 (65.7%) received a wage increase after enrolling in MnAMP.

Of all participants, 17.8% earned an industry-recognized credential; 30.9% earned an academic certificate or degree, with 14.8% earning a certificate of one year or less, 11.4% earning a one to two-year certificate, and 4.7% earning a degree.³⁸

Among those leaving, 44.1% left after completing a certificate of one year or less in length, and 13.0% left after completing a certificate of more than one year in length. MnAMP dropped 19.9% for lack of participation, while 7.9% left to pursue further education and 4.9% entered another grant-funded program.

A typical MnAMP participant could be described as a single, white, non-Hispanic male in his early 30s who is enrolled full-time in a welding or custom training program at Ridgewater College, Saint Paul College, or South Central College. He would be an incumbent worker with a family gross income of less than \$35,000 per year, and would receive a raise sometime after enrolling in MnAMP. He would have a high school diploma or GED degree and some college experience, but would not have earned a postsecondary credential. His goal would be to earn an academic certificate.

may not total to 100% due to rounding and/or computations based on data for fewer than 100% of the participants.

³⁸ For each type of academic credential, a participant is counted once, regardless of how many credentials are earned; a person may be counted in more than one category if more than one type of credential was earned,

The following box summarizes changes in participants' demographics and employment from Year 1 to Year 4.

Changes in Demographics and Employment³⁹

Gender. The percentage of males enrolling in MnAMP dropped by almost 8 percentage points from Year 1 to Year 4. Overall, males comprised almost 90% of total enrollment, outnumbering females by almost nine to one.

Ethnicity. The percentage of Hispanic/Latino participants decreased by 5.5 percentage points (from 10.1% to 4.6%) from Year 1 to Year 4, ending with a total of 7.8% of the enrollment. Non-Hispanic/Latino participants outnumbered Hispanic/Latino participants by almost 12 to one.

Race. The percentage of non-Hispanic/Latino participants who were White remained approximately the same during the grant and totaled 74.8% of all participants. The percentage of Asians and the percentage of Black/African Americans experienced small fluctuations from year to year and totaled 6.6% and 6.5%, respectively. These three groups made up 87.9% of the MnAMP participants.

Attendance. The percentage of participants attending full-time dropped each year, from 78.7% in Year 1 to 40.7% in Year 4. Overall, 51.9% attended full-time.

Entering Educational Level. The highest level of educational attainment for 49.1% of the participants was a high school diploma or a GED and 24.8% had completed some college, but had not earned a credential. About 22 percent (22.3%) had completed a postsecondary certificate or degree. Of those 23.3%, representing 692 participants, 172 (5.5%) had a four-year degree or had attended graduate school.

Entering Educational Goal and Ending Attainment. Of those indicating their goal, 98.2% wished to earn an academic certificate or degree. Earning a certificate of a year or less was the goal of 46.2% of those responding; however, of the nearly 40 percent (39.8% - - 1,266) who completed a program of study, 4.7% earned a two-year degree, 11.4% earned a certificate with a length greater than one year, 14.8% earned a certificate with a length of a year or less, and 17.8% earned an industry-recognized certificate.⁴⁰ The 1,266 participants who completed a program of study earned 1,684 credentials. In some cases, industry-recognized certificates were embedded in the academic certificate or degree programs so a person completing a certificate of degree also earned an industry-recognized certificate.

Entering Employment Status. Those employed upon entry represented 74.8% of all participants, with 49.5% employed full-time. The college with the highest percentage of incumbent workers was Normandale (95.8%), while MCTC had the lowest percentage (58.7%).

³⁹ The tables and graphs below display the data upon which this discussion of changes in demographics and employment is based.

⁴⁰ Participants who earned more than one type of credential are counted for each type of credential earned.

Entering Gross Family Income. The percentage of those with a gross family income less than \$35,000 per year was just over 50% (50.7%). At the same time, 28.1% had a gross family income of \$55,000 or more annually, and 14.8% had a gross family income of \$75,000 or more per year.

MN State's participants had the highest average age upon program entry (38.7) and the highest percentage of participants 25 or older upon program entry (92.8%). DCTC's participants were the youngest (average age of 23.6 upon program entry) and the smallest group of participants 25 and older upon program entry (27%).

Age: The mean age of MnAMP participants increased each year, from 30 in Year 1 to just over 34 in Year 4. The average age upon program entry was just over 32. About 63 percent (63.6%) of all participants were 25 or older upon program entry.

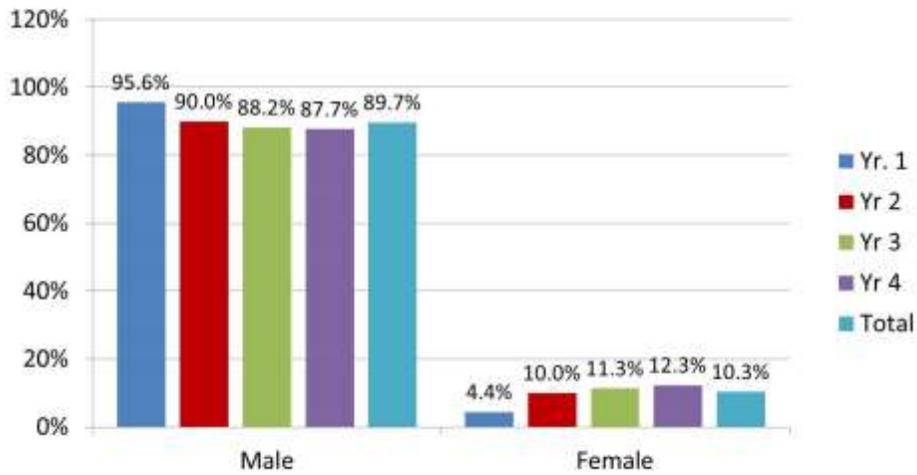
Marital Status: The percentage of single participants decreased from 80.0% in Year 1 to 61.2% in Year 4. Overall, 68.4% were single upon program entry. Further, the percentage of married participants increased from 17.6% in Year 1 to 28.2% in Year 4. Overall, 25.6% were married upon program entry.

Children: The percentage of those with children increased from 25.0% in Year 1 to 50.2% in Year 4. Overall, 38.7% had children at the time of program entry.

Pell Eligibility: The percentage of Pell-eligible participants dropped significantly from 43.3% in Year 1 to 14.2% in Year 4. Overall, 27.1% were Pell-eligible upon program entry.

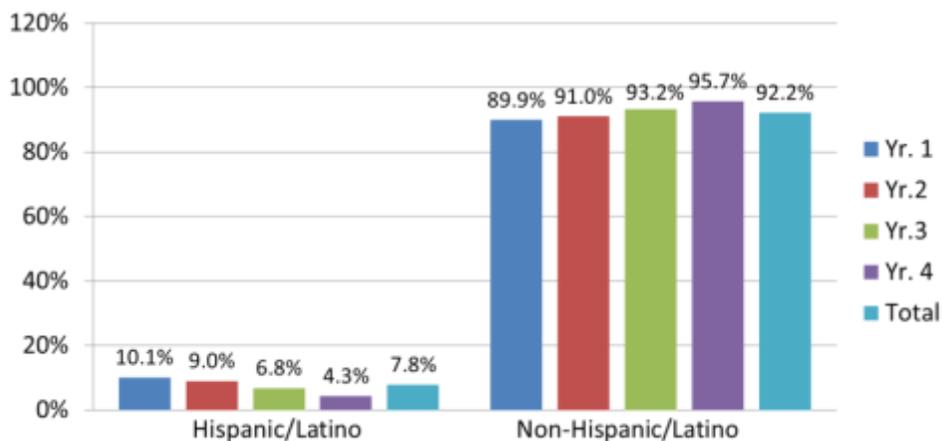
Following are graphs and tables depicting characteristics of MnAMP students.

MnAMP Participants by Gender

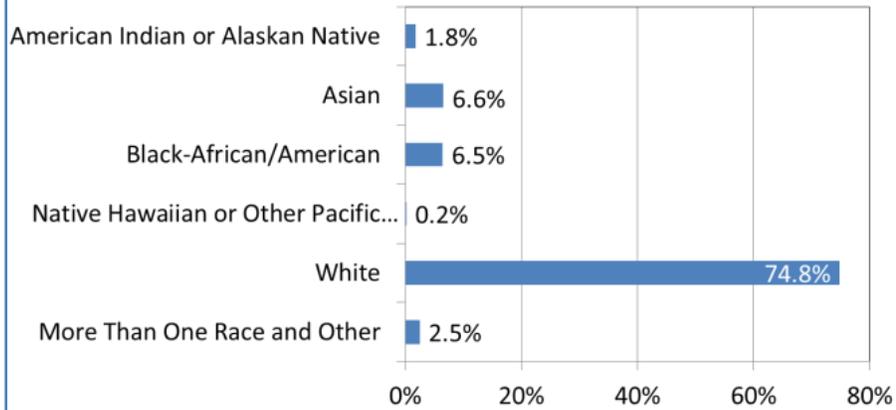


Yr. 1 n=405; Yr. 2 n=1,018; Yr. 3 n=1,549; Yr. 4 n=210; Total n=3184.
 Source: LWE database APR report – September 10, 2018

MnAMP Participants by Ethnicity

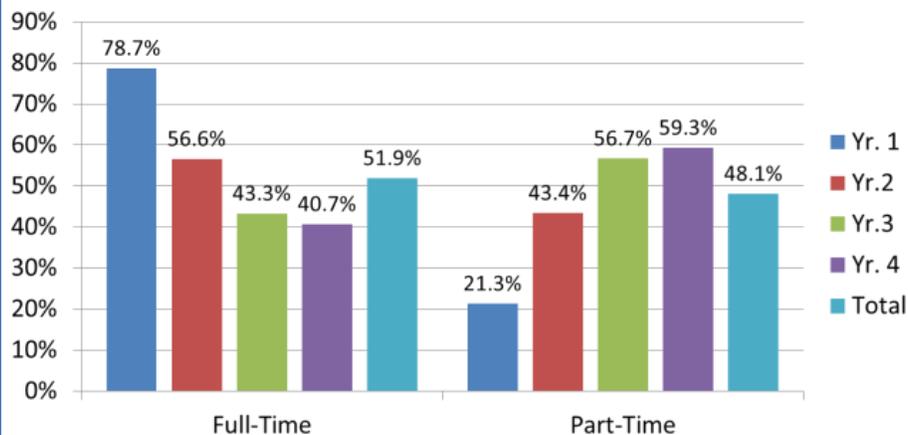


MnAMP Participants by Race



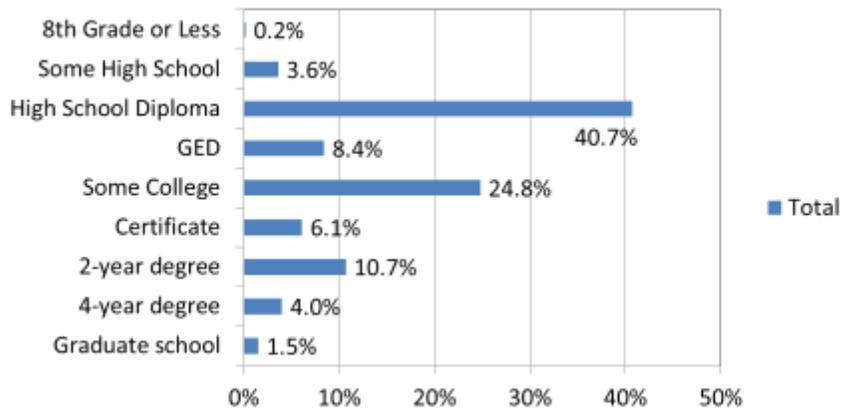
n=3,142. Race not reported for all participants
 Total for all four years
 Source: LWE database – September 14, 2018

MnAMP Full- and Part-time Participants



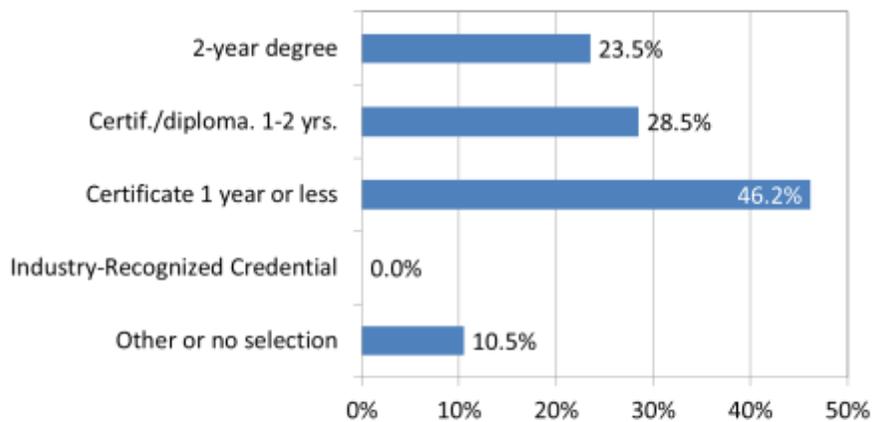
Yr. 1 n=404; Yr. 2 n=1,019; Yr. 3 n=1,548; Yr. 4 n=209; Total n=3,180
 Attendance status not reported for all participants
 Source: LWE database – September 25, 2018

Educational Level at Program Entry



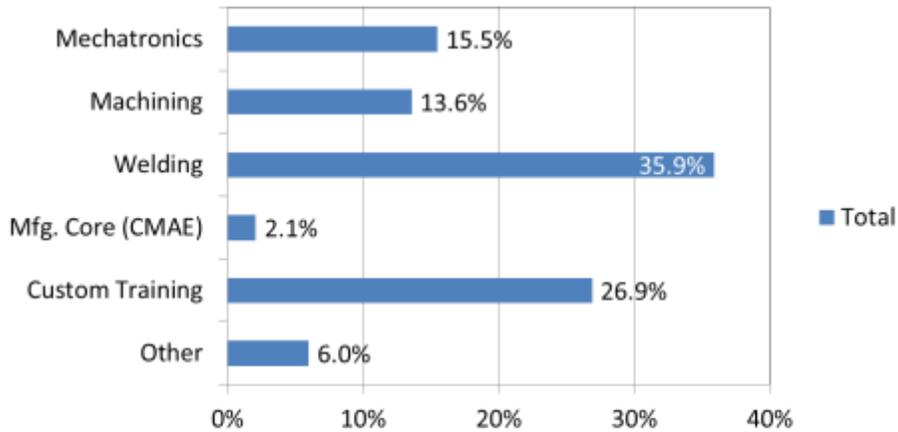
N=3016 (Total for four years)
 Educational level not reported for all participants
 Source: LWE Database - September 24, 2018

Educational Goal at Program Entry



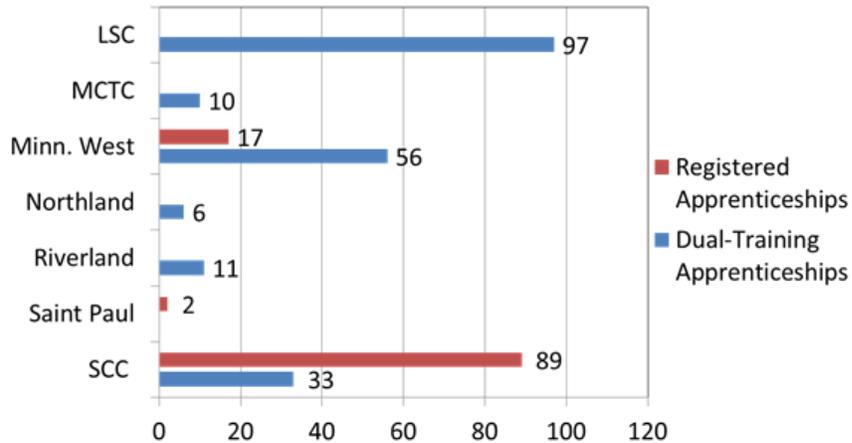
n=3,184 (Total for all four years). Percentages based on those selecting a goal.
 Source: LWE Database as of August 26, 2018

Initial Program of Study



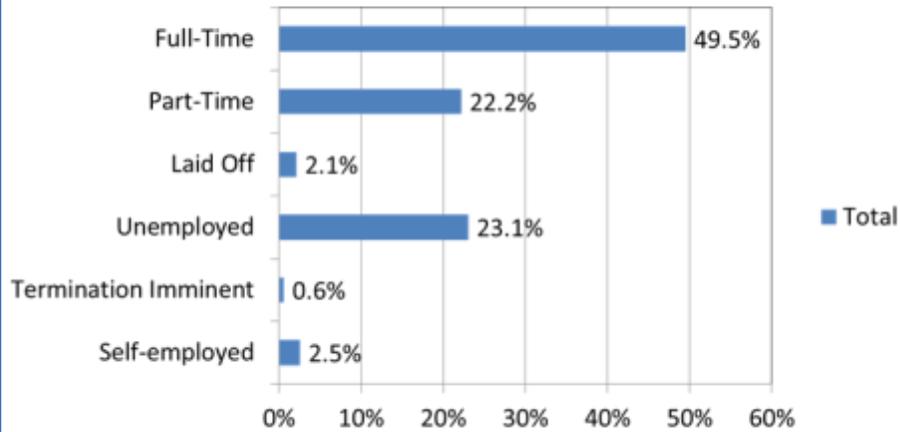
n=3,151 (Total for all four years)
 Employment not reported for all participants
 Source: LWE Database - September 2, 2018

Dual Training and Registered Apprenticeships



Total for all four years
 Data Source: MnAMP Project Director – September 10, 2018

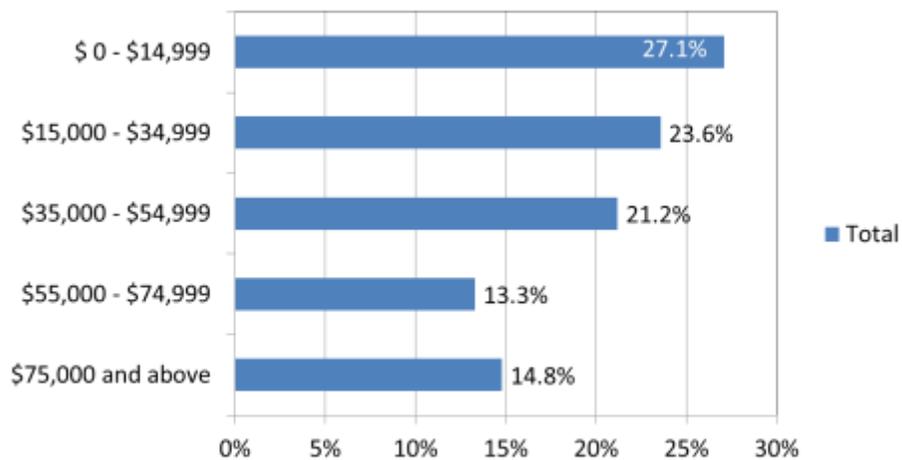
Employment at Program Entry



n=3,184 (Total for all four years)

Data Source: LWE database - September 24, 2018

Gross Family Income at Program Entry

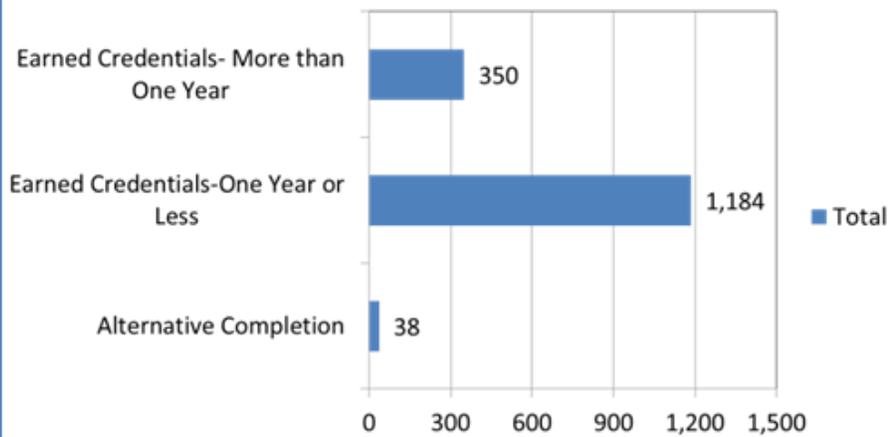


n=2,636 (Total for all four years)

Income not reported for all participants

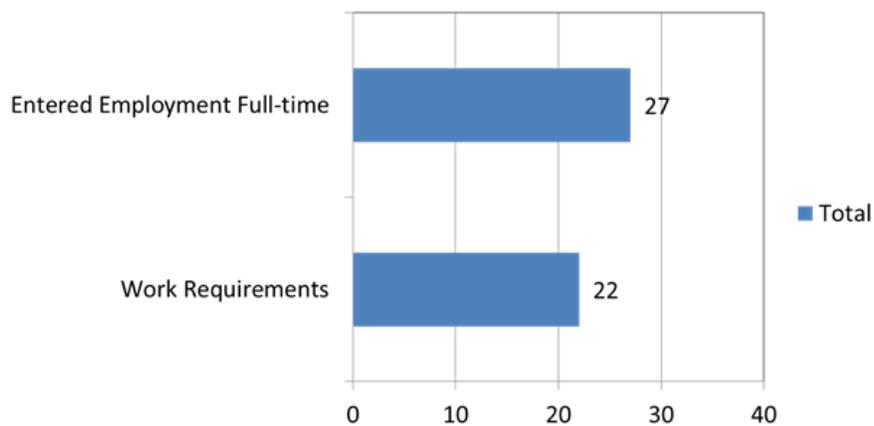
Data Source: LWE database - August 26, 2018

Reasons for Leaving - Completion



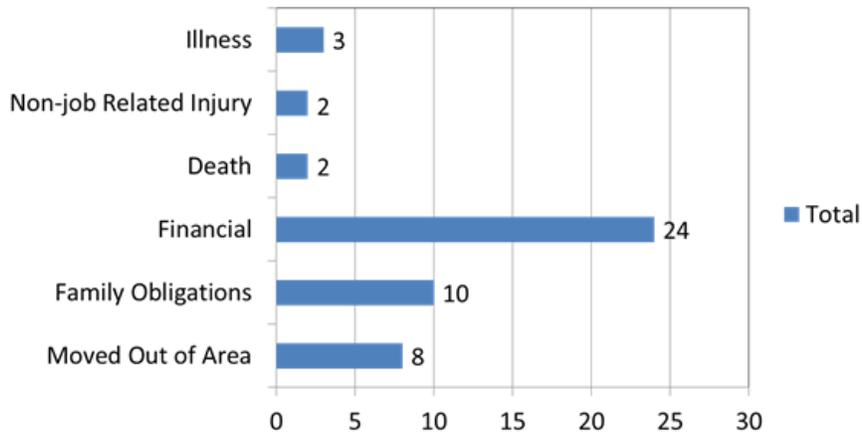
n=2,684. Total for all four years
Data not reported for all participants
Source: LWE Database as of September 12, 2018

Reasons for Leaving - Employment



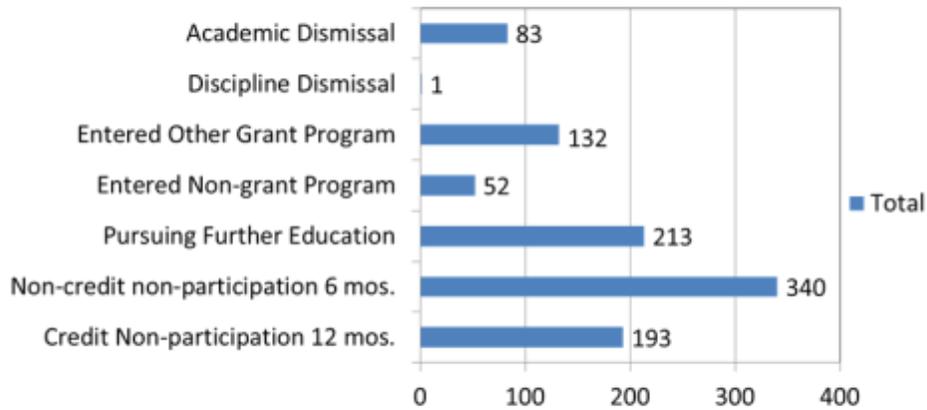
n=2,684. Total for all four years
Data not reported for all participants
Source: LWE Database as of September 12, 2018

Reasons for Leaving – Personal



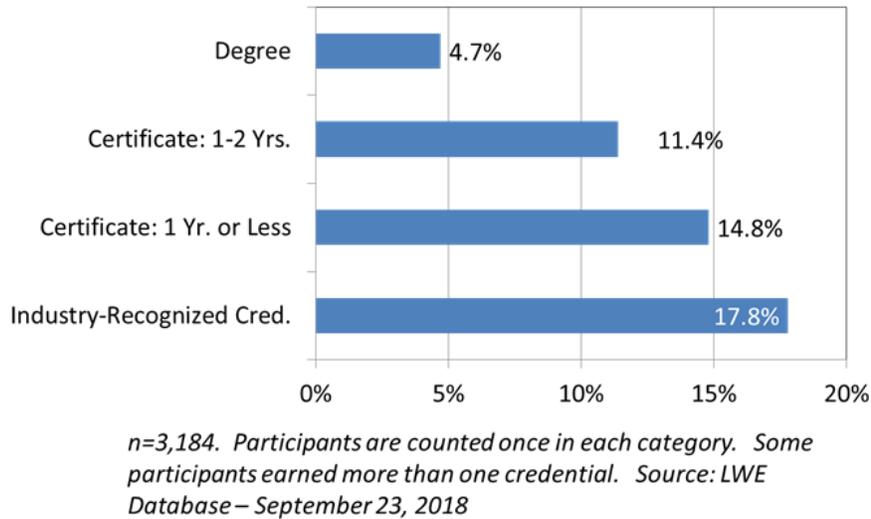
n=2,684. Total for all four years
Data not reported for all participants
Source: LWE Database as of September 12, 2018

Reasons for Leaving – Academic



n=2,684. Total for all four years
Data not reported for all participants
Source: LWE Database as of September 12, 2018

Certificate, Degree, and Industry-Recognized Credential Completion



See Appendix B, Information on MnAMP Participants, for the following tables providing detailed information about the participants served by the MnAMP programs.

Table 17: MnAMP Participants by Gender

Table 18: Enrollment in MnAMP by Ethnicity/Race

Table 19: Enrollment in MnAMP by Participant Characteristics

Table 20: MnAMP Participant Personal Information

Table 21: Annual Family Gross Income at Time of Enrollment

Table 22: Enrollment in MnAMP by Attendance

Table 23: Employment Status upon Entry into MnAMP

Table 24: Education Level upon Entry into MnAMP

Table 25: MnAMP Dual Training and Apprenticeships

Table 26: Initial Program of Study upon Enrollment

Table 27: Barriers to Education

Table 28: Education or Training Goal

Table 29: Reason for Leaving

Table 30: DOL Outcome 3 and 5 Detail

Table 31: Participants – By Member College as Percentage of All Participants as of the End of Year 4

Table 32: Participants – Ethnicity as of the End of Year 4

Table 33: Participants – Race as of the End of Year 4 by College

Table 34: Completion of Credentials as of the End of Year 4

Table 35: Participant Characteristics upon Program Entry Four Year Data by College

Tables 36a, b, c, and d: APR Outcomes – Cumulative Numbers by College
as of End of Year 4

Table 37: Supporting Services Used by Students as of the End of Year 4

Table 38: Year 4 Projected and Actual Outcomes and Combined Years 1 - 4 Projected
and Actual Outcomes

1.7 Evaluation Design

This evaluation is based on a mixed-methods approach that combines qualitative and quantitative data from multiple sources. The data sources included site visits at the 12 participating colleges, surveys of students as they first entered MnAMP and after they completed a program of study and exited the college, institutional data about the students and institutions, questionnaires of college project coordinators, data coordinators and academic advisors, interviews and focus groups of employers, employment data provided by the Minnesota Department of Employment and Economic Development (DEED), institutional data for a group of comparable students who enrolled prior to the implementation of MnAMP, bi-weekly conference calls with project staff, and review of project documents, including reports sent to U.S. Department of Labor.

1.7 A. Purpose of the Evaluation

MnAMP hired PTB & Associates (PTB) as the external evaluator to provide implementation and impact evaluations of the MnAMP grant program.

Beginning in fall 2014, PTB began an implementation evaluation of MnAMP and presented findings in annual (Years 1, 2, and 3) implementation evaluation reports to the consortium. These reports described the progress of project implementation, assessed the fidelity of the implementation to the original project design, and offered recommendations for improvements.

This final (Year 4) evaluation report summarizes implementation findings and analyzes the impacts and outcomes from the program.

1.7 B. Implementation Evaluation Design

PTB's MnAMP Year 3 Evaluation Report, section 1.5, *Overview of Research Methodology* (pp 11-15), and the Separate Index, *MnAMP Consortium Colleges Comprehensive Site Visits Report: Year 2 (2015-16) and Year 3 (2016-17)* (pp 1-155), offers additional information on the design of the implementation evaluation. Section 4.2, *PTB Assessment of Progress*, (pp 59-65), offers additional research questions asked. See Appendix C, Additional Research Questions, for additional questions that guided assessment of the project's implementation.

1. Research Questions the Implementation Evaluation Addressed

The primary research question to be answered by the implementation evaluation was:

- 1) What are the factors that promote and/or inhibit implementation of the MnAMP project at both the individual college-level and within the overall partnership?*

Additional research questions considered by the implementation evaluation were:

- *How was the particular curriculum or activity selected, used, or created?*
- *How were programs/program designs improved or expanded? What delivery methods were offered? What was the program administrative structure? What support services were offered? Were new programs of study implemented with fidelity?*
- *Were in-depth assessment of participant abilities, skills, and interests conducted? What assessment tools and process were used? Who conducted the assessments? How were the results used? Were the results useful in determining the appropriate program and course sequence for participants? How was career guidance provided?*
- *What contributions did partners/stakeholders make toward: 1) program design, 2) curriculum development, 3) recruitment, 4) training, 5) placement, 6) program management, 7) leveraging of resources, and 8) commitment to program sustainability? What factors affected partner involvement or lack of? Which partner contributions were most and least critical?*
- *What interventions appeared to have the greatest success (e.g., competency-based instruction, credit for prior and work-based learning, Comprehensive Assessment, FastTRAC, Language Academies, and Academic Advising)? How did the grant increase institutional capacity in serving students? What efforts are the institutions taking to sustain the increased institutional capacity following the end of funding?*

2. How the Conceptual Framework Guided the Implementation Evaluation

Appendix A – *Learn Work Earn* Logic Model, presents the conceptual framework and theory of change that guided the implementation evaluation.

This program logic model was a key tool for the evaluation of program development and implementation. The logic model shows the linkages among project inputs, activities, outputs, and outcomes. Project staff and evaluators used the logic model to assess whether and to what extent the program was implemented with fidelity to the original project design.

In addition, PTB helped ensure fidelity of project implementation by analyzing the project work plan's deliverables, performance measures, and timelines, and then constructing the site visit interview and focus group protocols and questionnaires of project stakeholders accordingly.

Further, the LWE project database and related systematic data collection, validation, and reporting protocols also were customized to help ensure implementation fidelity.

See section 2.4, *Implementation of the LWE model with Fidelity to the Original Design*, below, for additional information on how the project's conceptual framework guided the implementation evaluation.

3. Implementation Evaluation Methods and Data

Implementation evaluation methods included site visits to colleges to observe programs, to interview staff and employers, and conduct focus groups with students. Data presented in this report also come from surveys of students, the MnAMP LWE database, and the MnAMP office.

Intake and program completer exit surveys of students were conducted beginning in fall 2014. At entry, all students completed an individual Participant Intake Form⁴¹ when they started participating in MnAMP. The Participant Intake Form collected basic information about the student's demographics, educational and employment background, and goals. Data collected included entering placement test scores and dates, educational barriers, previous technical training and Credit for Prior learning information, and enrolled program and courses. The form also provided an opportunity for the student to give or withhold consent for obtaining future employment and wage data through the Minnesota Department of Employment and Economic Development (DEED).

At exit, when students completed the MnAMP program, they were asked to complete a completer survey, which asks questions about their MnAMP experience, future plans, and employment status. A long form of the completer survey, and a short form of the completer survey that focused on post-program employment and wages were administered.

For detailed information on the two student surveys, see Appendix E – Completer Surveys.

An instrumental method of collecting implementation data as well as outcome data was MnAMP's longitudinal database, called LWE (*Learn Work Earn*) which PTB developed for MnAMP data collection, validation, and reporting purposes. Individual student-level Participant Intake and academic transcript data, program/service participation data, and employment data were collected and integrated in the LWE database. The LWE database is a customized version of PTB's proprietary longitudinal database, called COMPETE (College Outcomes Management and Performance Environment for Tracking and Evaluation). See Table 4, below, and Appendix F – Description of the COMPETE Database. For a list of the data elements captured in the COMPETE database, see Appendix G – Student level Data Elements for Use in a Longitudinal Data Tracking System.

⁴¹ See: Appendix D – Participant Intake Form.

| Table 4: Data Collected in the COMPETE Database | |
|--|--|
| Data | Description |
| Demographic Data | Name, DOB, gender, ethnicity, race, disability status, educational barriers, employment status, current wage, most recent occupation, prior experience in the field, prior experience overall |
| Tracking Data | A unique student identifier, social security number, e-mail address, alternate contact, alternate contact phone number and e-mail address, cohort assignment |
| Program Data | Entry date, Student Education Plan status, previous education and training, full- or part-time status, Pell Grant eligibility, basic skills deficiency, year and term certificate/degree awarded, exit year, program completion information including employment, wages, further education, internship |
| Course information | Course number, prefix, term, and name, college name, program of study assignment, certificate assignment, course level, number of credits, grades, GPA, whether course is Dual Credit, whether course is remedial or college level |
| Participation information | Name and brief description of the activity, the year the activity took place, the start and end date, the number of sessions if more than one, the number of hours per session |
| Other | Because the database is relational, the data can be indexed using any value the user chooses. For example, performance of students with prior learning assessments can be compared with performance of students without prior learning assessments |

PTB designed the LWE database so MnAMP consortium’s 12 member community colleges - geographically distributed across the state - easily could:

- (1) collect and have available 24x7 via the Internet, annual and summary MnAMP data and reports on U.S. Department of Labor and MnAMP outcome targets;
- (2) track participants’ education and employment outcomes;
- (3) make data-informed decisions to improve student outcomes; and
- (4) facilitate impact evaluations of which interventions work to increase student achievement and attainment and close achievement and attainment gaps among student subgroups.

For data cited in this report, PTB relied in part on data that colleges entered into the LWE database. The statistics in this report may sometimes differ from those in the Annual Performance Reports (APRs), either because they are based on updated or additional data entered after data were pulled for this report, or because of differences in definitions between those used by the DOL for APR reporting and those used by PTB for impact evaluation.

4. How Capacity Building was Measured and Indicators Used

Appendix H – Progress on Objectives, Strategies and Deliverables, has two sub-sections (Objectives and Strategies, and Deliverables) that offer details on how the project’s capacity building was measured and the indicators that were used.

In project years 1, 2, and 3, for each of MnAMP’s four main project objectives, PTB set forth the strategies for achieving each objective in the Objectives and Strategies sub-section of Appendix H. For each strategy, PTB identified and entered in the table information on and documentation of the outputs or output indicators for measuring that strategy’s progress. The information and documentation were gathered from site-visit interviews, observations, focus groups, MnAMP project staff input, and documents analysis. PTB also completed the Deliverables sub-section of Appendix H to record the progress of the deliverables planned each year for each Objective and Strategy.

Further, prior to the site visits, questionnaires aligned with the site-visit interview protocols were completed by Consortium College Project Coordinators, Consortium College Data Coordinators, and Consortium College Academic Advisors. These questionnaires provided additional quantitative and qualitative information on capacity-building progress.

1.7 C. Impact Evaluation Design

In addition to summarizing implementation evaluation findings, this final evaluation report presents the results of a rigorous impact evaluation designed to determine whether and to what extent the MnAMP grant has had a significant impact on students. PTB collected information on MnAMP participants and compared their performance and outcomes to a comparison group of similar students enrolled prior to the MnAMP grant, from 2010 – 2014. PTB produced matched groups of treatment and comparison groups through Propensity Score Matching, a process that matches treatment group members with comparison group members using propensity scores based on their characteristics. Specifically, PTB used a form of Propensity Score Matching (PSM) analysis called inverse-probability weighted regression-adjustment (IPWRA) to construct a statistically equivalent comparison group of students enrolled from 2010-2014 at 8 of the 12 consortium colleges.

1. Research Questions the Impact Evaluation Addressed

The primary research questions to be answered by the impact study were:

- 1) What is the impact of the MnAMP project on project participants with particular regard to completion of programs of study and employment rates?*
- 2) Do students enrolled in the MnAMP program have better academic and employment outcomes than students trained through the traditional instructional methods associated with mechatronics, machining, and welding?*

2. Methodology Used and Whether or Not Causal Inferences can be Made

While PTB employed a rigorous quasi-experimental impact evaluation design, missing data problems affected adversely data reliability. Consequently, PTB's confidence in the findings of its multivariate analyses findings is limited. PTB therefore cautions that the extent to which causal inferences can be made is limited.

PTB conducted an impact evaluation of MnAMP throughout the grant period, from 2014 to 2018. The evaluation design is based on comparisons of newly enrolled MnAMP students beginning in Fall of 2014 to students enrolled in the previous programs during the four years prior to the grant at 8 consortium colleges, from 2010-2014. These institutions were the following:

- Lake Superior
- Normandale
- Ridgewater
- St. Paul
- MN West
- Northland
- Riverland
- South Central

The 8 institutions listed above had available data on student demographics, employment, educational experience, and performance that are directly relevant to creating propensity scores for use in matching. PTB used Propensity Score Matching (PSM) analysis based on a number of socio-demographic variables including age, gender, income, race, previous employment, and previous education level and achievement as co-variates in a multivariable logistic regression procedure to compare the historical sample of 2010-2014 students to the newly enrolled MnAMP institution students (Guo & Fraser, 2010).⁴² This procedure was used to select a comparable group of comparison students from the historical sample. As recommended by Shadish and colleagues (2002)⁴³ and by Pearl (2000),⁴⁴ PTB used a form of PSM (described below) to determine the subset of the historical sample that was statistically independent (un-confounded) based on comparison of co-variates between MnAMP participants and an historical sample. The resulting sub-set from 2010-14 represented our comparison sample for subsequent comparisons to MnAMP student outcomes.

Primary outcomes of interest were 1) academic achievement, 2) credentials earned, 3) program/credential completion, and 4) attainment of appropriate employment suited to MnAMP training. PTB compared MnAMP participants at the 8 institutions to students in the comparable credential programs (*i.e.*, one-year certificate programs in Mechatronics, Machining, and Welding) at MnAMP institutions prior to receipt of the TAACCCT grant during the period from 2010-2014. The programs by college are:

⁴² Guo, S., & Fraser, M.W. (2010) *Propensity Score Analysis: Statistical Methods and Applications*. Los Angeles: Sage Publications.

⁴³ Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin.

⁴⁴ Pearl, J. (2000). *Causality: Models, Reasoning, and Inference*, Cambridge University Press.

- Lake Superior Mechatronics, Machining, Welding
- MN West Mechatronics, Machining, Welding
- Normandale Mechatronics
- Northland Mechatronics, Welding
- Ridgewater Mechatronics, Machining, Welding
- Riverland Machining, Welding
- St. Paul Mechatronics, Machining, Welding
- South Central Mechatronics, Machining, Welding

While there were 12 colleges in the consortium, PTB used data from only 8 colleges. Three colleges (Century, DCTC, and MCTC) were not included due to lack of historical comparison group data for comparable programs from those institutions, and Minnesota State Community and Technical College did not have existing academic programs in manufacturing at that time.

PTB began the impact evaluation study in 2014. PTB first identified key variables for analysis from datasets that described student socio-demographic information, courses taken, grades given, credentials received, and MnAMP programs attended. The evaluation team received student data from MnAMP institutions' institutional research (IR) offices and merged these data (based on college and an ID number for each student generated by the colleges, used to manage the data) and reshaped it so that each student would have one observation with variables defining relevant outcome data.

PTB then identified students as being in the treatment or comparison group, determined by whether they were enrolled in any grant program year (from fall 2014 onwards). This split, described in methodological detail below, resulted in 2,180 students assigned to the control and 2,403 to the treatment group, where the treatment group was defined as students who started in the MnAMP intervention after the grant was deemed to be fully operational after fall 2014. This resulted in a full sample of 4,583 for the impact study. PTB conducted descriptive analysis on the socio-demographic, educational attainment, and skill variables considered for a propensity score model.

From that point, PTB constructed a propensity score, using enrolled age, race, gender, three educational attainment variables, full vs. part time student status, Pell Grant eligibility, and having a basic skills deficiency as potential predictors of treatment assignment. PTB examined covariate balance and performance of regression models with three potential outcomes (employment after graduation, credits earned, GPA) by examining standardized differences and variance ratios in the raw and matched analysis. PTB also evaluated several PS methods, including Propensity Score Matching (PSM) and PS Inverse Probability Weighting (IPW). The

PS IPW was most effective in balancing covariates and contending with noted differences in group size (Guo & Fraser, 2010).⁴⁵

The following provides a detailed technical description of the impact evaluation analytic methods.

Overall, the analysis was designed to compare students participating in the MnAMP program at the 8 MnAMP institutions noted earlier during the TAACCCT grant period from 2014-2018 to a group of students who attended those same institutions during the four years immediately prior to the intervention (comparison group). Descriptive analyses were completed in order to assess the overall sample. Next, multivariate analyses employed Inverse Probability Weighting (IPW) to control for the differences between the MnAMP model intervention and comparison groups. A propensity score matching was also used to cross-validate the findings. Both approaches rely on the propensity score described below.

Outcome variables: Analyses compared the comparison and intervention groups in terms of three outcome variables:

- 1) Number of credentials in the field received by a student;
- 2) Cumulative GPA; and
- 3) Credits earned.

The total number of credits was derived by summing up the number of course credits completed with a passing grade received by each student across data fields indicating credits for each of the academic terms a student was enrolled.

Cumulative GPA was calculated by first multiplying the reported GPA for each academic term by the number of credits for that term. The products for each term were then summed across all the terms a student was enrolled. Finally, the sum of products was divided by the total number of credits earned by each student.

Credentials were calculated by summing up the total number of credentials completed by each student across data fields by credential type. Students had the ability to complete multiple credentials and the resulting variable was treated as continuous ranging from 0 and up.

Propensity score: Propensity score was derived through a regression logistic model predicting membership in MnAMP intervention group. Table 5, Variables used in the Propensity Score Analysis, below, identifies the variables used in the analysis.

⁴⁵ Guo, S., & Fraser, M.W. (2010) *Propensity Score Analysis: Statistical Methods and Applications*. Los Angeles: Sage Publications.

| Table 4: Data Collected in the COMPETE Database | |
|--|---|
| High school education | Received high school diploma at the beginning of the program |
| More than high school education | Had attended any educational institution beyond high school at the beginning of the program and may or may not have earned a credential |
| White vs. other | Caucasian non-Hispanic versus all other |
| Pell Grant eligibility | Eligible for Pell Grant at the beginning of the program |
| Incumbent worker | Works in manufacturing field as indicated by either eligibility for the program or employment field |
| COMPASS Reading Taken | Taken COMPASS reading and had a score |
| Compass Math Taken | Taken COMPASS math and had a score |
| Fulltime student | Full time student at the beginning of the program. |

The variables selected as predictors met the following criteria:

- 1) Have valid values for at least 90% of participants in each group;
- 2) Theoretically related to the academic outcomes of the intervention; and
- 3) Differ between intervention and comparison group participants.

Inverse probability weights: An inverse probability weight (IPW) for each participant was calculated using standardized formulas. For the intervention group IPW is the propensity score over 1 ($IPC=1/ps$). For the comparison group, the IPW is defined as the difference of 1 minus the propensity score over 1 ($1/(1-ps)$). IPW were included in the models analyzing outcome variables that did not rely on a matching approach.

Propensity Score Matching: SPSS version 25 was used to run the logistic regression, to match the intervention group with the comparison group based on the propensity score. The procedure excludes participants with incomplete data. A propensity score is generated by the logistic regression procedure for each participant included in the analysis. It is best interpreted as the probability of being classified into the intervention group.

In this analysis, SPSS applies ‘nearest neighbor matching’, meaning that the algorithm tries to create a matched pair based on closest values of the propensity score. The tolerance or caliper value (degree of precision) was set at .05. This value is defined in units of standard deviations of the logit of the estimated propensity score, and represents the largest difference between the matched propensity scores that may qualify for a match.

IPW regressions: Two-step linear regressions were used to analyze the effect of treatment group on the number of credentials and cumulative GPA. Control variables were entered in the first step and treatment group indicator was entered in the second step. An identical approach was used to specify a logistic regression model to analyze the effects of treatment group on retention. The data were weighted by the Inverse Probability (IPW) Score as defined above.

Matched group comparisons: As a validity check on the results of IPW analyses, number of credentials and GPA scores for matched pairs were analyzed with dependent group t-test. The Wilcoxon Signed Ranks Test was used to compare retention between matched groups.

3. Data and Data Reliability⁴⁶

The PTB Data Team responsible for ensuring complete and valid data was Douglas A. Fox, Data Manager, Dr. Kathy Bishop, Database Administrator, and Naveen Balraj, Database Technical Manager. The PTB Data Team met periodically to manage the input, validation, and cleaning of data. Steps taken in this responsibility included:

- Determining, in collaboration with MnAMP leadership, the data elements to be collected;
- Designing, constructing and testing the database structure;
- Assigning role-based passwords and training data entry personnel;
- Loading data, via direct-screen entry or file upload, by college data entry personnel;
- Checking for incorrect and missing data and potential data inconsistencies;
- Providing each college with reports of missing, incorrect, and potentially inconsistent data and requesting review and updating of data for that college;
- Creating dynamic and one-time data reports, queries, and flat files as requested by MnAMP and for APR reporting and external evaluation;
- Periodically running data validations checks to ensure internal consistency;
- Providing Helpdesk services throughout the grant period;
- As needed modifying database structure and adding data elements; and
- Trouble-shooting and resolving database and data issues as identified.

Notwithstanding strong data collection and validation efforts by the PTB Data Team and their counterpart MnAMP consortium team, however, the evaluators found serious missing data problems. For example, the colleges could not obtain individual-level employment and earnings data for the historical comparison group students. This missing data problem limited PTB's quasi-experimental design impact study. For example, PTB could not demonstrate that the

⁴⁶ There was a high percentage of missing (unavailable) data for workforce participation and job incumbency in the comparison sample, and for this reason PTB was not able to conduct an impact analysis of the effects of MnAMP participation on employment status post-program.

industry-recognized credentials and academic certifications that MnAMP students earned improved their labor market outcomes compared to pre-MnAMP groups. While in theory the practice of embedding certifications and credentials into programs of study would improve program quality and responsiveness, and thereby lead to better student employment outcomes, this hypothesis could not be confirmed or refuted.

The missing data problem limited PTB to examining within-treatment group effects of participation and receipt of MnAMP services on employment outcomes.

4. Outcomes and Impacts Measured

The key MnAMP impact evaluation outcomes measured are presented in the table below:

| Table 6: Key MnAMP Impact Evaluation Outcomes |
|---|
| <ul style="list-style-type: none"> • Program/credential completion • Degree/credential earned • Credits earned • Time to completion (total number of terms) • Grade point average • Participation in grant-related activities (apprenticeships, learning support, etc.) |

2.0 Implementation Findings

2.1 How the Grant was used to Build Institutional Capacity

PTB’s MnAMP Year 3 Evaluation Report, section 6.3, *Level of Buy-in* (pp 74-75), and section 6.5, *Elements of MnAMP that will be Sustained* (pp 78-79), offers additional details on how the grant was used to build institutional capacity.

Capacity-building Strategies

A summary of four key capacity-building strategies follows.

One of MnAMP’s key strategies to building and sustaining institutional capacity was to ***bring industry partners in at the beginning of the project, build trust levels with them, and engage them as true partners*** in the development and implementation of the project.

By engaging employers, faculty, and other stakeholders as partners in the design and delivery of content, coursework, and learning experiences to meet credentialing needs in mechatronics, machining, and welding, MnAMP was poised to deliver programs aimed at the higher skills and expertise levels needed by local and regional business and industry, and thereby close the skills gap.

This partnering method helped foster member colleges' design, adoption and scaling up, and sustaining of research-based program and service innovations and capacities that promised to improve institutional quality, productivity, and responsiveness, and thereby improve student success.

In executing this strategy, MnAMP was challenged to engage industry partners and faculty in creating a shared vision and co-designing the innovative MnAMP model of career education and training. Responding to this challenge was important because, as leaders rightly assumed, without building stakeholders' conceptual buy-in, gained by collaborating as true partners in designing and building the new model, sustaining and scaling the innovative model likely would be limited.

Abiding MnAMP-seeded innovations and capacities included new policies, practices, protocols, and tools, employed within and among consortium colleges. MnAMP promises to sustain the following key model elements:

- Industry partnerships
 - an increased number of industry partners (over 550);
 - the increased practice of faculty and industry knowledge-sharing, communication, and collaboration in program design, development, implementation, and evaluation; and
 - the value of industry credentialing and curriculum design instilled in employers and other stakeholders.
- Programs, Curriculum, and Credentialing
 - restructured mechatronics, machining, and welding curricula centered on a core curriculum and aligned with industry-recognized credentials and workforce needs;
 - increased capacity and program offerings for training in mechatronics, machining, and welding;
 - reduced gap between competencies and skills taught and those needed by employers;
 - pooling and sharing of programs and best-practice innovations among member colleges;
 - procured equipment (\$2.178 million);
 - integrated stacked and latticed credentials;
 - created credit for prior learning process for industry credentials;
 - expanded the military crosswalk for entering courses into the Veteran's Education Transfer System (VETS) by adding manufacturing programs;
 - expanded apprenticeship and Dual Training programs in manufacturing; and
 - created MSSC testing centers in 9 MnAMP colleges.
- Created an online delivery platform (+Connect);
- Established 22 newly developed articulation agreements with four-year institutions;

- Eighty-five (85 faculty trained in new technology and instructional credentials;
- Enhanced image of manufacturing and raised awareness of available high-wage jobs; and
- Customized a web-based longitudinal database to support data-driven decision making and knowledge development.

If continued, MnAMP’s demonstrated practice of sector-based partnering of the Minnesota State Technical colleges with employers and industry associations, the public workforce system, nonprofit and community-based organizations, and four-year educational institutions, could improve alignment among these entities and position Minnesota to pursue and receive additional capacity-building U.S. Department of Labor workforce development grant funding.

A second strategy for building and sustaining institutional capacity was to ***align project innovations with the colleges’ strategic plans***. A major factor contributing to a high level of buy-in to the MnAMP project and institutionalization of grant-seeded capacities was the realization by member college leaders that the MnAMP project aligned with and advanced the colleges’ strategic plans for strengthened manufacturing program capacity. Presidents and chief academic officers valued the contribution of the MnAMP project in advancing their strategic goals for offering industry-relevant programs to enhance students’ career opportunities and develop a highly skilled workforce for industry partners.

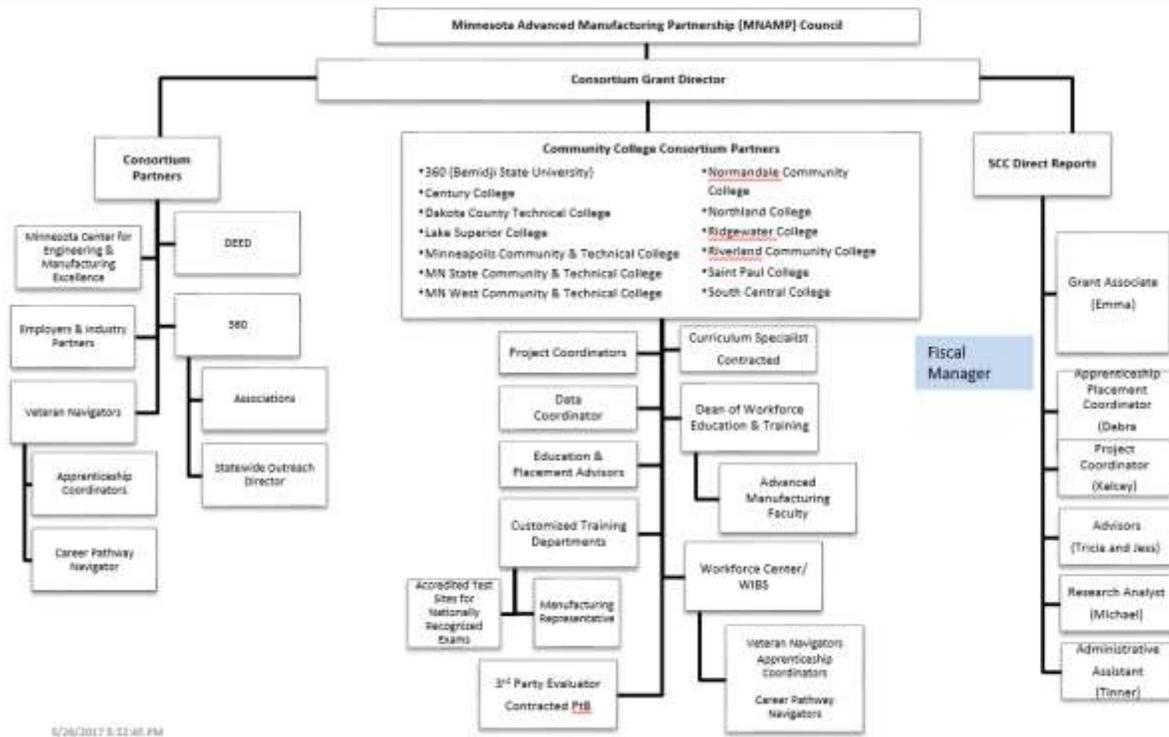
A third strategy for building and sustaining institutional capacity was to build on TAACCCT grant funding to ***leverage other state workforce development grants***, including the Minnesota Apprenticeship Initiative grant program and the Minnesota PIPELINE Dual Training grant program. A chief academic officer said: “We were able to take non-State money—documented MnAMP money and other grant money—and then receive a State match of those monies. The equipment investment exponentially helped with student preparation, along with student enrollment and retention. [Through the matching funds], it doubles the investment.”

Finally, the fourth strategy is the foundational strategy for implementing the three strategies identified above. The ***MnAMP consortium’s management structure*** played a critical role in accomplishing these three capacity-building strategies.

Elaboration on the important role of MnAMP’s management structure in driving change and building institutional capacity follows.

Consortium Organization

The MnAMP Consortium Organizational Chart, below, presents the governance and management structure for implementing the grant project. Entities include the governing MnAMP Council (made up of the presidents of each member college), the community college partners, and other consortium partners. South Central College, as the lead college for the consortium, provides consortium management through its president, grant director, and staff.



Consortium Communication, Collaboration and Value-added Services

Facilitating cross-consortium collaboration and providing project management services, the MnAMP consortium:

- fostered greater engagement and collaboration of the MnSCU community colleges with industry associations and employers, the public workforce system, nonprofit and community-based organizations, and four-year educational institutions;
- nurtured communication, knowledge-sharing, and coordination among the consortium partners, including formation of cross-consortium learning communities of staff performing similar roles (for example, WebEx sessions of Project Coordinators, Advisors and, Data Coordinators);
- promoted cross-consortium consistency and standardization in training programs by aligning programs to industry-certified standards, using third-party industry certifications as a basis for awarding academic credit, and bridging the divide between noncredit and credit programs;
- provided support in the procurement of equipment for manufacturing programs;
- leveraged the MnAMP grant to obtain additional resources to improve programs;

- increased awareness of advanced manufacturing programs among prospective students, parents, and employers; and
- developed and demonstrated methods and tools for collecting demographic, program, and outcomes data for evaluating the implementation and impact of the MnAMP model.

Building Buy-in

As mentioned, a major factor contributing to a high level of buy-in to the MnAMP project was the realization by member college leaders that the MnAMP project aligned with and advanced the colleges' strategic plans for strengthened manufacturing program capacity. Presidents and Chief Academic Officers value the role of the MnAMP project in advancing their strategic goals for offering industry-relevant programs to enhance students' career opportunities and develop a highly skilled workforce for industry partners. A sampling of comments follows.

A President said: "In [our strategic plan], we talk about access to education to our constituency and responsiveness to the community. The purpose of this grant is to serve the needs of manufacturing. You've seen our labs and facilities. You've seen how much investment we've made, staying ahead of the employer needs. We have a strong commitment from committee members and technical advisory members. Having this grant, having the 'ladders pathways' is very timely to meet student needs, as students are getting placed in jobs or [benefiting from] continuing ed. For us, it fits within our strategic plan."

A Chief Academic Officer, explaining the value of the MnAMP project, said: "It's perfect. It fits mission of the College. The grant is exactly aligned to our strategic plan. [The grant helped us] shift [the focus] to a high-tech industry, rather than the old stereotypical image of manufacturing. Now, we communicate that."

A President said: "[The MnAMP Project] definitely dovetails with our plan. It aligns with our ability to provide students with relevant course material in a field that is part of the emerging trends. It provides a research-based background. We specialize in scholarship of learning, and we can learn from multiple campuses and college partnerships."

A President said: "[The project] dovetails in important ways [with our strategic plan]. The grant enables us to meet college goals and system goals, curricular alignment, and stronger partnerships with industry. Obviously, we want to create clean pathways for students, to provide work experience and education to fulfill significant gaps in manufacturing and related industries."

In addition to the MnAMP project's strategic alignment benefits described above, themes of comments by the Presidents and Chief Academic Officers that contributed to colleges' buy-in include: industry partnership expansion, increased enrollment, faculty development and industry credentialing, equipment acquisition and integration into the curricula, the introduction and the expansion of apprenticeships. A sampling of comments follows.

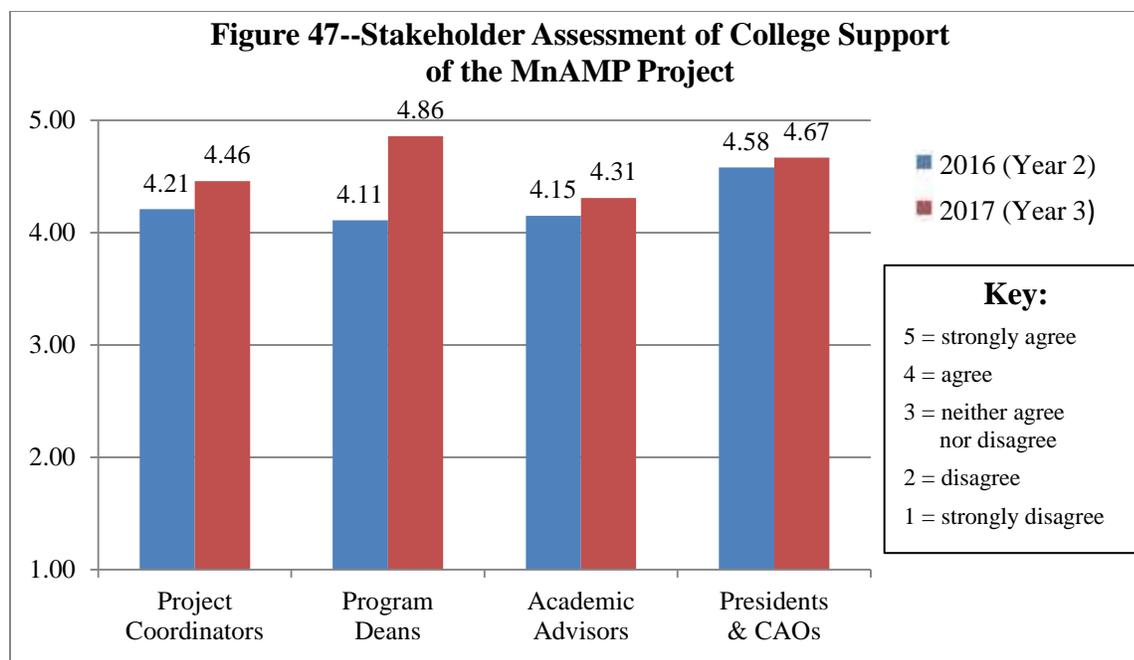
A President said: “We constantly hear from district businesses and industries that they need workforce. The greatest need is career and technical areas. The strategic plan identifies the need to advance a technical and transportation center. The expense for replicating labs is expensive. [Our] strategic plan raises stature...to attract students to career and technical programs. MnAMP complements that strategic goal, [lending]...distinctiveness and brand identity for this campus and [for the College] as a whole.

A President noted the value of “aligning curriculum with industry recognized credentials and research around guided pathways,” and said: “We’re scaling [guided pathways] beyond MnAMP programs. We’re also in the process of integrating apprenticeships into the college as a whole. I’m looking at the expansion and sustainability of that work.”

A Chief Academic Officer said: “For academics, for-credit, we have goals set for more direct pathways to industry and more credentials and certifications that make sense for [MnAMP] programs. We’re putting a greater emphasis on industry credentials, like American Welding Society (AWS), and a third-party technical skills assessment (TSA). We’re trying to get 100% of our programs to have a TSA or an industry credential as part of the program. We’ve seen a strong correlation between the quality of the Advisory Board and the quality of programs. The Advisory Boards guide us in best practices. These are all best practices for technical colleges. The grant supported this.”

This senior leadership buy-in of member colleges was reflected in a high level of member colleges’ support of the MnAMP project.

In the interviews, stakeholders were asked to rate the extent to which they agree with the statement, “I have the support—of administrators, faculty, and staff at my college—that I need to effectively implement the MnAMP project at my college.” Their responses are graphed in the figure below.



The key challenge for the MnAMP project was to *engage industry partners and faculty in creating a shared vision* and co-designing the innovative MnAMP model of career education and training. Responding to this challenge was important because, as leaders rightly assumed, without *building stakeholders' conceptual buy-in*, gained by collaborating as true partners in designing and building the new model, sustaining and scaling the innovative model likely would be limited.

Change Management Tools

Aligning manufacturing programs to meet the state's labor needs, particularly by upskilling incumbent workers, required *strategically rethinking and reforming career education and training as a system*. In a new consortium-coordinated partnership in which formal authority was limited and decision making done largely by consensus, faculty, employers, and other stakeholders undertook collaborative learning and program design. The partnership created a core manufacturing curriculum, aligned industry credentials with all academic programs in the consortium's 12 colleges, and developed apprenticeships or work-based learning programs, among other innovations.

MnAMP succeeding in responding to this stakeholders' engagement challenge, and in driving collective change that addresses employers' and students' needs, by means of seven tools:

1. Career and guided pathways, with entry and exit points to facilitate the *Learn Work Earn* model;
2. A credit for prior learning process related to industry credentials and other experiential learning and test centers to enable participants to test out on industry credentials, which gave them credits into academic programs;

3. Industry credentials, including the MSSC CPT, Certified Production Technician, which is an integral part of the core curriculum, the NIMS in machining and mechatronics, PMMI in mechatronics, and AWS in welding. MnAMP created a guidebook that helped align industry credentials with colleges' policies and procedures;
4. An online credit for prior learning platform that leveraged the [Minnesota's Veterans Education Transfer System](#) (VETS) by training faculty to map courses to the VETS system, enabling veterans and service members to be granted academic credit for prior training and military experience when enrolled in academic programs;
5. An apprenticeship and work-based learning program;
6. An online learning platform, called +Connect, in which incumbent workers and other adults can take credit and non-credit courses that relate to industry credentials or academic programs; and
7. An employer and faculty professional development program.

Leadership

Finally, the most important factor evinced in the four strategies' success was leadership. In particular, capacity-building was advanced by three leadership characteristics:

1. A **vision** of a larger common good and commitment to do the right thing to make a positive difference for Minnesotans, Minnesota State institutions, and the students served;
2. A **long-term development perspective** to build abiding capacities; and
3. A **culture of shared leadership and collaborative decision making**.

Far-sighted and collaborative leadership, at the consortium and college levels, helped foster member colleges' design, adoption, institutionalization, and scaling up of program and service innovations in order to improve institutional quality, productivity, and responsiveness, and thereby improve student success.

2.2 Summary of Key Steps Taken to Create and Run the Program

Appendix I – Assessment of Progress, recounts in detail the steps taken to create and conduct the MnAMP program.

A summary of key steps taken follows.

In order to create and conduct the program, MnAMP faculty, employers and other stakeholders engaged in:

- Systemic reform
 - analyzed, strategically, current and emerging technological, economic, and demographic trends, and collaboratively designed a sector-based comprehensive

- systemic reform model of career education and training to close the state's manufacturing skills gap;
- envisioned a post-grant future in which the grant would help build abiding capacities; and
 - fostered a culture of shared leadership, collaborative decision making, and innovation.
- Leveraging resources and relationships
 - leveraged customized training representatives' relationships with industry partners;
 - leveraged two state grant programs to develop and demonstrate apprenticeships and other experiential learning experiences;
 - involved over 550 employers through the +Connect online training program, advisory board meetings, equipment purchases, apprenticeships, curriculum design, hiring, internships, job fairs, and Tour of Manufacturing events; and
 - Coordinated eleven employer workshops that educated area employers and strengthened relationships.
 - Offering professional development
 - developed a college-to-college, professional peer learning community to address grant challenges such as curriculum development, equipment procurement, and participant tracking;
 - empowered faculty to think broadly about their college, career pathways, students' future employment and higher education goals, and area employers' labor needs; and
 - conducted faculty workshops to discuss the embedding of the MSSC curriculum into the three manufacturing pathways.
 - Enhancing and Improving Programs, Curriculum, and Credentialing
 - created "visual career pathways" for each career area offered by a college;
 - created contracts with NIMS, PMMI, MSSC and AWS to provide discounted rates for faculty and participants in training and credentialing and to establish colleges and testing centers;
 - developed a MnAMP Credit for Prior Learning (CPL) Guide to facilitate alignment of industry credentials with colleges' policies and procedures;
 - Expanded and aligned the manufacturing courses under the VETS online program by holding workshops for faculty;
 - developed for MnAMP's web site and resources for students, colleges and universities, and businesses;

- leveraged resources with South Central College to create MinnesotaCPL.com, a web-based self-serve wizard for Credit for Prior (CPL) applications which utilizes a centralized portal;
- engaged curriculum design specialists to review existing curricula, map learning outcomes, and recommend curricular changes to align the programs to NAM-endorsed standards;
- engaged a CPL specialist to develop a consistent process for awarding CPL for industry-recognized credentials and embedding them into manufacturing pathways;
- developed a CPT Boot Camp to provide short-term preparation experience for instructors, incumbent workers, and veterans to help them earn a CPT credential and then receive credit for prior learning as a pathway into the manufacturing programs;
- launched +Connect, an online learning platform that allows incumbent workers to receive training on-site at their place of work; and
- Assisted nine colleges in becoming MSSC test centers.
- Providing Supportive Services
 - aligned their advising programs with the GPS LifePlan intrusive advising plan to assist participants with goal setting, graduation preparation, and career and life planning;
 - increased use of MNWorks.net for MnAMP job and apprenticeship postings;
 - leveraged state Pathways 2 Prosperity funds to help support the development of training programs for diverse, low language skilled and first-generation participants; and
 - developed a comprehensive enrollment plan featuring individualized career and personal plans for participants, intrusive advising and job placement services, an early alert tracking system, and enhanced career services.
- Marketing and Image-building
 - created the MnAMP web site (www.mnamp.net) to serve as a marketing tool providing information and resources related to manufacturing careers, MnAMP programs and pathways, credit for prior learning, apprenticeships, veteran opportunities, partners, and news and events;
 - created social media, hard copy, and videos on the manufacturing programs; and
 - collaborated with Women in Manufacturing (WiM) national association to assist in starting two WiM Chapters in MN.

2.3 Partnerships

See above, section 1.5, MnAMP Partners (pp. 17-18) for a listing of MnAMP partners.

A summary of MnAMP partnerships follows.

MnAMP developed a consortium governance and management structure defining roles, rights, and responsibilities, methods for making decisions, and protocols for operation, including procurement, funds management, and accountability. The governance structure was the Minnesota Advanced Manufacturing Partnership Council consisting of the presidents of the member colleges. Operationally, MnAMP was led by a Grant Director, housed at the lead consortium college, South Central College (SCC). The twelve MnAMP educational partners in the consortium are community colleges in the Minnesota State System. Business and industry, governmental, and association partners are coordinated through the MnAMP project staff at each college.

A key strategy for marketing and developing the MnAMP project was to leverage relationships with industry partners. By establishing partnerships with business and industry, MnAMP developed Apprenticeships, and +Connect for offering online on the job education, among other capacities.

Employers participated in advisory committees, offered scholarships and equipment donations, recruited participants, offered internships and apprenticeships, made hiring commitments, developed On-The-Job training opportunities, and collaborated on curriculum design and development. Additionally, employers provided training space, participated in Job Fairs, the annual Tour of Manufacturing, and also partnered with colleges to provide industry-recognized credential training to employees in the workplace.

MnAMP worked with several national associations^[1] to better understand how best to align the three manufacturing pathways with industry-recognized credentials and embed the newly-defined core curriculum and other industry credentials, including MSSC, NIMS, PMMI and AWS credentials.

At the consortium level, MnAMP Grant Director Anne Willaert collaborated with national industry partners to enhance the image of manufacturing and raise awareness of available high-wage jobs. She promoted MnAMP initiatives - - including Career and Guided Pathways and apprenticeships - - by delivering presentations at national conferences or through publications associated with the following organizations:

- Minnesota and National Workforce Centers, in support of the Workforce Innovation and Opportunity Act;

^[1] See the credential agencies' websites at: NAM - [National Association of Manufacturers](#); NIMS - [The National Institute for Metalworking Skills](#); MSSC - [Manufacturing Skill Standards Council](#); AWS - [American Welding Society](#); PMMI - [The Association for Packaging and Processing Technologies](#); and OSHA - [Occupational Safety and Health Administration](#).

- Jobs for the Future (Additionally, Dr. Parker, SCC President, presented at a number of national Jobs for the Future conferences);
- National Council for Workforce Education (NCWE);
- American Association of Community Colleges (AACC) and the Workforce Development Institute (AACC – WDI); and
- Manufacturing Skills Institute of the National Association of Workforce Boards (NAWB – MSI).

Further, Grant Director Willaert:

- promoted MnAMP’s credit for prior learning initiative by collaborating with the Council for Adult and Experiential Learning, and
- collaborated with the Minnesota Governor’s Workforce Development Council to support the Workforce Innovation and Opportunity Act at the state-level.

Furthermore, Grant Director Willaert collaborated with the Minnesota Department of Labor and Industry, the Minnesota Workforce Council, and the Minnesota Regional Training Program to learn how to align employer-driven apprenticeships and Dual Training education programs into the three manufacturing pathways. SCC also joined the Registered Apprenticeship College Consortium (RACC) and worked with Minnesota Precision Manufacturing Association, the Central Minnesota Manufacturing Association, and National Association of Manufacturing to create a statewide partnership called the Minnesota Manufacturing Workforce Partnership (MMWP). She worked with the Minnesota Center for Engineering & Manufacturing Excellence (MNCEME) to determine how to sustain this partnership.

Additionally, in order to enhance the image of manufacturing and raise awareness of available high-wage jobs and thereby increase MnAMP participant numbers, Grant Director Willaert fostered collaborations with the Minnesota Yellow Ribbon veterans program, the newly-developed charter of Women in Manufacturing (WiM), and the 360° Manufacturing and Applied Engineering Center of Excellence on the “Dream It. Do It.” campaign for high school and adult populations.

Finally, many of the consortium colleges also participated in partnerships with their local Workforce centers and the Adult Basic Education programs through the Partners to Prosperity (P2P) grants. These are grants to better serve displaced, dislocated, and underserved populations. Other colleges built New American Programs funded by United Way and local non-profits to better serve diverse populations by offering them career skills, CPT, and welding courses.

2.4 Implementation of the LWE Model with Fidelity to the Original Design

PTB’s MnAMP Year 3 Evaluation Report, section 3.0, *Progress on Objectives, Strategies and Deliverables* (pp 29-48), section 4.0, *Assessment of Progress* (pp 48-65), assesses in detail the fidelity of the MnAMP model’s implementation to the original proposed design.

Fidelity of implementation is the degree to which an intervention is delivered as intended.⁴⁷ To attribute an outcome to a plan, it was necessary to know that a predetermined plan was consistently implemented as designed. When plans, procedures, methods, and programs are implemented as planned, reliable and valid outcomes and data are established.⁴⁸

A summary assessment of the implementation of the MnAMP model with fidelity to the original design follows. See Appendix H – Progress on Objectives, Strategies and Deliverables, for a detailed assessment of MnAMP’s implementation.

Based on site visit interviews, focus groups, documents analysis, and a series of stakeholder questionnaires, *PTB concluded that MnAMP largely succeeded in implementing the project with fidelity to the design and plan of the original grant proposal.*

To illustrate the fidelity of the project, a summary of the project’s objectives, the strategies for achieving each project objective, and the outcomes intended are presented below:

| Table 7: MnAMP Objectives and Strategies and Outcomes | |
|---|--|
| Objective and Strategy | Outcome |
| Objective 1.0: Create seamless career pathways in advanced manufacturing that offer stackable and latticed industry-recognized credentials in mechatronics, machining, and welding (the three manufacturing pathways). | |
| Strategy 1.1: Implement a core curriculum that directly aligns with the Certified Production Technician certificate awarded by the Manufacturing Skills Standards Council (MSSC) (Core Elements 1, 2, and 3) | <ul style="list-style-type: none"> • A core curriculum directly aligned with the Certified Production Technician (CPT) certificate was developed and implemented in eight MnAMP colleges on either a credit or non-credit basis. • Each college created a “Visual Pathway” for each career area it offered, accessible at http://www.mnamp.net/images/programs-pathways/pathways/scc_pathway.pdf. |
| Strategy 1.2: Implement a consistent, competency-based approach to awarding credit for prior learning (CPL) that aligns with national industry standards | <ul style="list-style-type: none"> • MnAMP created a CPL process flow adapted from the methodology used by the Council for Adult and Experiential Learning (CAEL). |

⁴⁷ Breitenstein, S., Gross, D., Garvey, C., Hill, C., Fogg, L., and Resnick, B. *Implementation Fidelity in Community-Based Interventions*. (2010). Res Nurs Health. Author manuscript. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3409469/>

Table 7: MnAMP Objectives and Strategies and Outcomes

| Objective and Strategy | Outcome |
|--|--|
| and includes formal and informal assessments of military, work, and other life experience (Core Elements 1 and 2) | <ul style="list-style-type: none"> • MnAMP’s web site provides a CPL overview and a MnAMP Credit for Prior Learning Guide. • MnAMP aligned and entered all the Manufacturing Foundation Courses onto the Military crosswalk Veteran’s Education Transfer System (VETS). • A total of 234 CPL credits were granted. |
| Strategy 1.3: Collaborate with MnSCU Centers of Excellence and other four-year institutions to expand/refine articulation agreements | <ul style="list-style-type: none"> • MnAMP created +Connect, a hybrid learning platform that combines live course instruction through video conferencing technology with an online learning management system for additional coursework outside of class. • Nine of the 12 MnAMP colleges became 360 Manufacturing Center of Excellence, ATE Regional Center members. • Among nine colleges, twenty-two new articulation agreements were established under the MnAMP grant. |
| Objective 2.0: Create/Update academic programs in advanced manufacturing to match employer needs and industry-recognized credentials | |
| Strategy 2.1: Align curriculum in mechatronics, machining, and welding with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS) (Core Elements 1, 2, 3, and 5) | <ul style="list-style-type: none"> • MnAMP crosswalked curriculum with the MSSC, NIMS, PMMI and AWS credentials. • Forty-seven (47) faculty were credentialed in MSSC; 10 faculty were credentialed in NIMS; 17 faculty were credentialed in a number of AWS; 2 faculty were credentialed in PMMI, 2 in Mastercam, and 7 in either IPC or Fanac. • Nine colleges became MSSC test centers; 6 are granting NIMS credentials; 1 grants the PMMI credentials; and 2 are test centers for IPC; 2 colleges became AWS Accredited Testing Facility Centers. |
| Strategy 2.2: Engage employers, faculty, and other stakeholders in the development of content, coursework, and learning experiences to meet credentialing | <ul style="list-style-type: none"> • MnAMP partnered with the MN PIPELINE Project to define competency standards for occupations in advanced manufacturing, agriculture, health care services, and IT. |

Table 7: MnAMP Objectives and Strategies and Outcomes

| Objective and Strategy | Outcome |
|--|--|
| needs in mechatronics, machining, and welding (Core Element 6) | <ul style="list-style-type: none"> • MnAMP engaged over 550 employers who participated in advisory committees, offered scholarships, and made equipment donations, recruited participants, offered internships, made hiring commitments, developed OJT opportunities and internships, assisted with curriculum review, provided training space, participated in Job Fairs and a Tour of Manufacturing, and partnered with colleges to provide industry-recognized credential training to employees in the workplace via +Connect. • Apprenticeship and Dual Training programs were developed with 53 employers. • State funded Pathways to Prosperity funds helped support the development of bridge programs for diverse, low language skills, or 1st generation participants. |
| <p>Objective 3.0: Develop long-term, collaborative partnerships with advanced manufacturing employers</p> | |
| <p>Strategy 3.1: Establish employer-driven apprenticeship and Dual Training education programs in mechatronics, machining, and welding (Core Elements 1 and 6)</p> | <ul style="list-style-type: none"> • Three colleges joined the registered apprenticeship college consortium (RACC). • In partnership with 53 companies, six colleges provided Dual Training opportunities to 213 participants, and three colleges provided Registered Apprenticeships for 108 participants. |
| <p>Strategy 3.2: Provide professional development opportunities for employers and other stakeholders designed to communicate and instill the value of industry credentialing and curriculum design (Core Element 6)</p> | <ul style="list-style-type: none"> • MnAMP worked with state and national associations to create the Minnesota Manufacturing Workforce Partnership (MMWP), a statewide partnership meant to serve as a networking association for Statewide Manufacturing Associations, Chambers of Commerce, Government Agencies, Veteran Associations, two- and four-year institutions, Manufacturing Centers of Excellence, industry, and others. • MnAMP increased college-level participation in the MN Yellow Ribbon veterans program. |

Table 7: MnAMP Objectives and Strategies and Outcomes

| Objective and Strategy | Outcome |
|--|---|
| | <ul style="list-style-type: none"> • MnAMP members joined and participated in the newly developed charter of Women in Manufacturing (WiM). • Eight colleges partnered with their local Workforce centers and the Adult Basic Education programs through the Partners to Prosperity (P2P) grants. • Two colleges in partnership with community and industry members created New American Programs. |
| <p>Strategy 3.3: Collaborate with national industry partners to enhance the image of manufacturing and raise awareness of available high-wage jobs (Core Elements 4 and 6).</p> | <ul style="list-style-type: none"> • MnAMP created agreements with NIMS, PMMI, MSSC and AWS to provide discounted rates for faculty and participants in training and credentialing and to establish colleges and testing centers. • SCC became one of the first 100 colleges in Minnesota and the nation to become a RACC college. • MnAMP supported the implementation of two charters of Women in Manufacturing National Association in Minnesota. • MnAMP partnered with the Department of Corrections and was chosen as one of 161 educational institutions nationally to take part in the Second Chance Pell Experiment. • MnAMP partnered with 360 NSF-ATE Center of Manufacturing on the “Dream It. Do It.” campaign and the annual Tour of Manufacturing. • MnAMP collaborated with a number of veterans programs and with the Minnesota Department of Employment and Economic Development. • MnAMP Grant Director, Anne Willaert, collaborated with national partners to advance the MnAMP project and delivered numerous presentations at national conferences or through publications.⁴⁹ |

⁴⁹ See page 38 of the Year 3 evaluation report for a list of presentations and publications.

| Table 7: MnAMP Objectives and Strategies and Outcomes | |
|--|---|
| Objective and Strategy | Outcome |
| Objective 4.0: Improve time-to-completion and job placement in advanced manufacturing through improved learner supports and wraparound services | |
| <p>Strategy 4.1: Create and implement a comprehensive enrollment management plan that emphasizes intrusive advising and job placement services (<i>Core Elements 3, 4, and 5</i>)</p> | <ul style="list-style-type: none"> • MnAMP established a participant case management plan and process to track participants enrolled in MnAMP. • Two colleges have aligned their advising programs with the GPS LifePlan intrusive advising plan to assist participants with goal setting, graduation preparation, and career and life planning. • Nine (9) colleges provided orientation; 11 provided tutoring; 8 provided mentoring; 8 provided academic success workshops; 6 provided supplemental instruction; 2 have learning communities; 11 use intrusive advising; 11 have career pathways and career counseling; 7 support paid internships; 6 have apprenticeships or cooperative education; 7 have on-the-job training; and 10 support job fairs. • One college developed an online advising platform. |
| <p>Strategy 4.2: Improve basic academic skills of participants through integrated education and language services for underrepresented groups (<i>Core Elements 2 and 4</i>)</p> | <ul style="list-style-type: none"> • Eight (8) colleges partnered with their WFC and ABE to receive P2P grants to assist participants who required extra assistance and wrap around services due to language, first generation or other barriers. • One college implemented a New American Readiness Certificate program, including an Occupational Workforce Readiness component, in partnership with the Lakes and Prairies Action Council and their local United Way. • One college piloted a new approach to revising their developmental math courses. |

Through implementation of the project, MnAMP projected it would produce a number of deliverables. The projected and actual deliverables are included in the table below.

Table 8: MnAMP Objectives and Strategies and Deliverables

| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
|---|---|---|
| <p>Objective 1.0: Create seamless career pathways in advanced manufacturing that offer stackable and latticed industry-recognized credentials in mechatronics, machining, and welding.</p> | | |
| <p><i>Strategy 1.1: Implement a core curriculum that directly aligns with the Certified Production Technician certificate awarded by the Manufacturing Skills Standards Council (MSSC).</i></p> | <ul style="list-style-type: none"> • An eight-credit standardized core curriculum in manufacturing that aligns with the MSSC Certified Production Technician certifications established and implemented in all 11 MNAMP institutions | <ul style="list-style-type: none"> • An 8 credit Standardized core curriculum in manufacturing called the Manufacturing Foundations Certificate, developed and adopted in 8 of the MnAMP colleges on a credit or non-credit basis. |
| | <ul style="list-style-type: none"> • 72 MNAMP faculty certified in MSSC standards | <ul style="list-style-type: none"> • Forty-seven (47) faculty were credentialed in MSSC; 10 faculty were credentialed in NIMS; 17 faculty were credentialed in a number of AWS; 2 faculty were credentialed in PMMI, 2 in Mastercam, and 7 in either IPC or Fanuc. |
| | <ul style="list-style-type: none"> • 12 MSSC testing centers located all MNAMP colleges | <ul style="list-style-type: none"> • Nine colleges became MSSC test centers; 6 are granting NIMS credentials; 1 grants the PMMI credentials; and 2 are test centers for IPC; 2 colleges became AWS Accredited Testing Facility centers. |
| | <ul style="list-style-type: none"> • 1,900 participants receive a Certified Production Technician certification | <ul style="list-style-type: none"> • As of the end of year 4, participants from eight colleges had earned a CPT credential - CPT (168 credentials), NIMS (138), PMMI (7), AWS (209) and Fluid Power Society (5). |
| <p><i>Strategy 1.2: Implement a consistent, competency-based approach to awarding credit for prior learning that aligns with national industry</i></p> | <ul style="list-style-type: none"> • A written protocol for competency-based credit for prior learning and related assessments | <ul style="list-style-type: none"> • MnAMP created a CPL process flow, adapted from the methodology used by the Council for Adult and Experiential Learning. |

Table 8: MnAMP Objectives and Strategies and Deliverables

| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
|--|---|--|
| <p><i>standards and includes formal and informal assessments of military, work, and other life experiences.</i></p> | | <ul style="list-style-type: none"> • MnAMP’s web site has a CPL overview and MnAMP CPL Guide. |
| | <ul style="list-style-type: none"> • A written crosswalk between Military Occupational Standards and MNAMP mechatronics, machining, and welding programs | <ul style="list-style-type: none"> • Manufacturing Foundations courses were aligned and entered into the existing Veteran’s Education Transfer System (VETS). |
| <p><i>Strategy 1.3: Collaborate with MnSCU Centers of Excellence and other four-year institutions to expand/refine articulation agreements</i></p> | <ul style="list-style-type: none"> • Six new/revised articulation agreements from MNAMP colleges to four-year manufacturing programs | <ul style="list-style-type: none"> • Twenty-two (22) new articulation agreements established under the MnAMP grant. |
| <p>Objective 2.0: Create/Update academic programs in advanced manufacturing to match employer needs and industry-recognized credentials.</p> | | |
| <p><i>Strategy 2.1: Align curriculum in mechatronics, machining, and welding with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS).</i></p> | <ul style="list-style-type: none"> • Competency-based curriculum in mechatronics, machining, and welding programs at all MNAMP institutions | <ul style="list-style-type: none"> • Crosswalked curriculum with the MSSC, NIMS, PMMI and AWS credentials. |
| | <ul style="list-style-type: none"> • 72 MNAMP faculty certified or re-certified in program specific, NAM-endorsed credentials | <ul style="list-style-type: none"> • 85 MNAMP faculty certified or re-certified in program specific, NAM-endorsed credentials. |
| <p><i>Strategy 2.2: Engage employers, faculty, and other stakeholders in the development of content, coursework, and learning experiences to meet credentialing needs in mechatronics, machining, and welding.</i></p> | <ul style="list-style-type: none"> • Program Advisory Committees meet once a semester (minimum). | <ul style="list-style-type: none"> • Over 550 employers who participated in advisory committees, offered scholarships, and made equipment donations, recruited participants, offered internships, made hiring commitments, developed OJT opportunities and internships, assisted with curriculum review provided training space, participated in Job Fairs and a Tour of Manufacturing, and |

Table 8: MnAMP Objectives and Strategies and Deliverables

| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
|---|---|---|
| | | partnered with colleges to provide industry-recognized credential training to employees in the workplace via +Connect. |
| | <ul style="list-style-type: none"> • Apprenticeship/ Cooperative Education Coalitions in seven regions. | <ul style="list-style-type: none"> • In partnership with 53 companies, 6 colleges provided Dual Training opportunities to 213 participants, and 3 colleges provided Registered Apprenticeships for 108 participants. |
| | <ul style="list-style-type: none"> • Presentations on the benefits of embedded industry credentials at manufacturing summits and engagement activities | <ul style="list-style-type: none"> • Employer workshops were hosted by 11 colleges. |
| Objective 3.0: Develop long-term, collaborative partnerships with advanced manufacturing employers | | |
| <i>Strategy 3.1: Establish employer-driven apprenticeship and cooperative education programs in mechatronics, machining, and welding.</i> | <ul style="list-style-type: none"> • MN Statewide Apprenticeship standards and models for fields of mechatronics, machining, and welding | <ul style="list-style-type: none"> • Three models of related instructions for Registered Apprenticeships and Dual Training were established with 53 companies. |
| | <ul style="list-style-type: none"> • Competency-based cooperative education standards and models for field of mechatronics, machining, and welding | <ul style="list-style-type: none"> • Standards developed in all three manufacturing programs (welding, machining, and mechatronics). |
| | <ul style="list-style-type: none"> • Curriculum for training employer apprenticeship mentors | <ul style="list-style-type: none"> • Worked with NIMS to develop an outline training for apprenticeship employer-based mentors. |
| | <ul style="list-style-type: none"> • Recruitment materials | <ul style="list-style-type: none"> • Learn Work Earn Campaign was developed and implemented. |

Table 8: MnAMP Objectives and Strategies and Deliverables

| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
|--|--|--|
| | <ul style="list-style-type: none"> • MNAMP Apprenticeship Coalitions in seven regions across MN. | <ul style="list-style-type: none"> • Project Director attended and spoke at 5 regional events in MN about the MnAMP <i>Learn Work Earn</i> campaign and spoke at a number of national conferences on the MN <i>Learn Work Earn</i> model. |
| <p><i>Strategy 3.2 Provide professional development opportunities for employers and other stakeholders designed to communicate and instill the value of industry credentialing and curriculum design.</i></p> | <ul style="list-style-type: none"> • Train 315 apprentices during the grant period. | <ul style="list-style-type: none"> • Three colleges provided Registered Apprenticeships for 108 participants. |
| <ul style="list-style-type: none"> • MnAMP worked with state and national associations to create the Minnesota Manufacturing Workforce Partnership (MMWP), a statewide partnership meant to serve as a networking association for past TAA grants, Associations, Chambers, TAA departments, Veteran Associations, Governor Workforce Development Councils, manufacturing colleges and others. • Increased participation in the MN Yellow Ribbon veterans program. • Joined and participated in the newly developed charter of Women in Manufacturing (WiM). | <ul style="list-style-type: none"> • Workshop presentations & materials | <ul style="list-style-type: none"> • Project Director spoke at national and state conferences, developed a MnAMP website and outreach materials for +Connect, MSSC-CPT and our <i>Learn Work Earn</i> model. |
| | <ul style="list-style-type: none"> • Met with 120 employers over a three-year time period | <ul style="list-style-type: none"> • Met with and have involved over 550 employers |
| | <ul style="list-style-type: none"> • Recruitment strategies and materials highlighting the benefits of stackable industry credentials and apprenticeships | <ul style="list-style-type: none"> • Demonstrated pathways from non-credit to credit, showed value of entry and exit points for students through stackable credentials, and built apprenticeships on the credit and non-credit side of the colleges. • Created outreach materials to support and showcase guided pathways and Learn Work Earn model. |

Table 8: MnAMP Objectives and Strategies and Deliverables

| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
|--|---|--|
| <ul style="list-style-type: none"> Many colleges partnered with their local Workforce centers and the Adult Basic Education programs through the Partners to Prosperity (P2P) grants. <p>Some colleges built New American Programs.</p> | | |
| <p><i>Strategy 3.3: Collaborate with national industry partners to enhance the image of manufacturing and raise awareness of available high-wage jobs.</i></p> | <ul style="list-style-type: none"> An adapted “Dream It. Do It.” campaign for adult populations | <ul style="list-style-type: none"> Partnered with 360 NSF-ATE Center on the “Dream It. Do It.” campaign. Partnered with the DOC to provide training to inmates through a Pell experiment. Provide training in a mechatronic certificate serving 27 inmates to date. |
| | <ul style="list-style-type: none"> Consistent outreach strategies and materials for MNAMP colleges | <ul style="list-style-type: none"> An MnAMP (http://mnamp.net) Website successfully launched. Worked with 360 NSF-ATE Center of Excellence on the MN Tour of Manufacturing campaign each year. Created standard outreach MnAMP recruitment materials for all programs and +Connect |
| <p>Objective 4.0: Improve time-to-completion and job placement in advanced manufacturing through improved learner supports and wraparound services</p> | | |
| <p><i>Strategy 4.1: Create and implement a comprehensive enrollment management plan that emphasizes intrusive advising and job placement services.</i></p> | <ul style="list-style-type: none"> Increased use of MNWorks.net for MNAMP job and apprenticeship postings Real-time demand data for students and Employee Results Scorecard | <ul style="list-style-type: none"> Web site postings are paired on the MnAMP Website. The scorecard is updated quarterly and sent to the colleges. <i>Note: Under a post-award option offered by the</i> |

Table 8: MnAMP Objectives and Strategies and Deliverables

| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
|---|---|--|
| | <ul style="list-style-type: none"> • Individualized career and personal plans for participants | <p><i>Department of Labor, MnAMP selected employing the Employment Results Continuous Improvement Plan instead of the Employment Results Scorecard. The Continuous Plan was sent to all the colleges.</i></p> <ul style="list-style-type: none"> • Established a participant case management plan and process to track participants enrolled in MnAMP. • Two colleges have aligned their advising programs with the GPS LifePlan. • Eleven (11) colleges have career pathways and career counseling; 7 support paid internships; 4 have apprenticeships or cooperative education; 7 have on-the-job training; and 10 support job fairs. |
| <p><i>Strategy 4.2: Improve basic academic skills of participants through integrated education and language services for underrepresented groups.</i></p> | <ul style="list-style-type: none"> • Language Academy curriculum for four populations (Spanish, Somali, Sudanese, Hmong) • Language Academies delivered at 12 sites • MN FastTRAC offered at <ul style="list-style-type: none"> • 12 sites | <ul style="list-style-type: none"> • Two colleges designed and implemented New American Programs. • Four colleges have Pathway 2 Prosperity grants that include workforce English, integrated instruction and mentoring. • Implemented through 6 colleges with a number of industry partners. • Offered through 4 colleges that partnered with their local Workforce Center and ABE programs. |

| Table 8: MnAMP Objectives and Strategies and Deliverables | | |
|---|--|--|
| Objectives and Strategies | Projected Deliverables | Actual Deliverables |
| | <ul style="list-style-type: none"> • NCRC assessment pathway to apprenticeships | <ul style="list-style-type: none"> • Because NCRC is not an approved credential by DOL, MnAMP did not track |

2.5 Strengths and Weaknesses of the Program

Identification of the strengths and weaknesses of the innovative MnAMP model program is based upon how well the reform program has been designed, developed, and implemented to respond to change. How well has the program addressed changes in the economy and industry, changes in technology, and changes to the student body? How well has the program applied changes in the science of learning in order to equip students with the knowledge and skills that will enable them to adapt to the continuously transforming nature of work and achieve career advancement over a lifetime? Program reform is needed because automation is making lifelong learning a necessary part of work. Community college job retraining and workforce skills development programs must enable individuals to learn marketable new skills throughout their lifetime.

2.5.1 Strengths

MnAMP is distinguished by sound strategic analysis and program design for the 21st-century and by fidelity of design implementation. The strengths of MnAMP’s innovative *Learn Work Earn* model of career education and job training are those program aspects in which MnAMP promises to respond well to change. MnAMP’s strengths are: quality, short-term training, customization, convenience, and innovation. These are aspects in which U.S. higher education needs to modernize.⁵⁰

Quality

In a time when many college graduates have a heavy student loan debt burden to carry and alternative higher education providers such as edX or Coursera offer free online courses, innovative community colleges are transforming traditional college structures and conventions to provide access to higher education in shorter periods of time, either online or in face-to-face classes, to enable students to learn a skill to get a job or a promotion at work. They are aligning degree programs, courses, and curricula to the changing skills requirements and industry standards of the job market. They are embedding industry-recognized certifications to help students communicate their mastery of specific, in-demand knowledge and skills to prospective employers and earn industry and academic credentials at the same time. They are offering short-term training and redesigned course schedules, online learning, apprenticeships, and expanded

⁵⁰ Carnevale, A. P., Garcia, T. I., and Gulish, A. (2017). *Career Pathways: Five Ways to Connect College and Careers*. Washington, DC: Georgetown University Center on Education and the Workforce. Retrieved from <https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/LEE-final.pdf>

technology-enhanced advising and career services. They are reorganizing and streamlining general education, major programs, and education pathways based on targeted learning outcomes. And they are improving the articulation of programs between secondary schools and community colleges and between community colleges and four-year institutions.

These transformation initiatives are based on the theory that comprehensive systemic reform is necessary to improve significantly a college's productivity and responsiveness - - to achieve a higher completion rate, a lower time to degree, and a lower cost of completing a degree.

MnAMP's exemplary systemic reform model of career education and training integrates these innovations and focuses attention on improving quality throughout the education pathway. MnAMP thus promises to be more responsive, faster, and cheaper for the student, and also better long term for the student, industry, and the state.

Short-term training

At the rate new knowledge is being created and new skills are being demanded by employers, most workers cannot take two or four years from their working lives to achieve yet another degree as their only pathway to additional credentials.

MnAMP-seeded innovations designed to enable the community college to respond more promptly to changes in the economy and to reduce students' time to credential attainment include: competency-based, third-party certification; credit for prior learning for continuing education students who matriculate into credit-based programs; revamped non-credit programs; apprenticeship programs; and online and hybrid instruction.

Non-credit programs can be developed and offered more quickly than credit-based programs, and usually take less time to complete than academic degrees and credit certificates. By articulating competencies and courses from non-credit (*i.e.*, continuing education) to credit programs, by building pathways to credit programs from non-credit, offering shorter-term training opportunities, and by integrating nationally-recognized stacked and latticed industry credentials (shorter certificates that build on each other) into credit-based career pathways, students begin to feel a sense of accomplishment and improvement in their employability in a short time period. Using non-credit programming as a pathway to credit has been a key strategy for MnAMP.

Customization

Adult incumbent learners often are not interested in, or have the time or money for, pursuing traditional degrees. Instead of the traditional, front-loaded educational experience with a defined start and finish, increasingly these adult learners welcome a more customized, individualized, and flexible approach to education and delivery, one that recognizes learning experiences and educational goals they have achieved. Instead of the industrial model of education, with a prescribed timeline and curricula delivered largely in formal classroom settings, these students seek an education that can help them take the next step in their careers. Education for these workers is often experienced episodically. They seek practical learning experiences because of

life events. Many learners arrive to complete a specific learning task or experience and leave once that task is completed.

MnAMP affords learners the ability to customize their educational experiences by unbundling a set of credit hour-based courses that normally are thought of as a single product and breaking that product into modular-based trainings. Students can choose new types of learning credentials and adopt flexible timelines, calendars, and pathways with easy on-/off-ramps that allow them to take individual courses or modules.

Learners can move through college at different speeds, mix learning opportunities that include courses and industry-recognized credentials that can be stacked over time, and undertake experiential, contextual, and work-based apprenticeships. Increasingly, learning is assessed through demonstration of mastered competencies - - through demonstrating what the learner actually knows and can do - - instead of time spent in a classroom.

By shifting from the traditional college-centered lecture model to a student-centered educational model, learners are enabled to customize their educational experiences to achieve credentials relevant to particular points in time of their career and life.

Convenience

MnAMP's *Learn Work Earn* lifelong learning model helps adult students balance the competing demands of work and family and acquire new skills at a convenient time, place, and/or pace. The model does so by offering career pathways with multiple entry and exit points, prior learning assessment to gain credits into academic programs, modularized curricula embedded with national industry-recognized credentials and competency-based assessment methods, apprenticeships and project-based learning experiences, and distance delivery of instruction in the workplace.

Innovation

Curriculum and Instruction. One of MnAMP's most important innovations was to *restructure the curriculum and learning experiences* in order intentionally to produce skilled individuals who can think and solve problems and adapt to change throughout a lifetime, particularly adult learners, including incumbent workers.

The skills needed for success in the twenty-first century workplace include cognitive skills (such as problem solving, critical thinking, and creativity), interpersonal skills (such as communications, teamwork, and leadership), intrapersonal skills (such as discipline, drive, determination, ethical behavior, and judgment), and metacognitive skills (such as curiosity, optimism, and social intelligence).

Work-based and project-based learning provide immersive and applied experiences that can develop the independent thinking and problem-solving skills that the twenty-first century workplace requires.

Fundamental curricular reform required *re-thinking traditional higher education roles*: faculty teach, students learn, and companies hire. This segmentation of roles was replaced by new stakeholders, new collaborative practices, and greater engagement of the Minnesota State community colleges with industry associations and employers, the public workforce system, nonprofit and community-based organizations, and four-year educational institutions. The role of students in the reform initiative, however, was not evident.

The expanded partnership reflected critically upon the assumptions, values, attitudes, behaviors, organizational structures, and administrative processes of the existing academic culture, and facilitated undertaking comprehensive systemic reform.

Key reform products and outcomes include:

- MnAMP created an eight-credit, 4-course, standardized “Manufacturing Foundation” core curriculum in advanced manufacturing that was aligned with the MSSC Certified Production Technician credential and was implemented at 8 of the 12 MNAMP institutions as either credit or non-credit;
- Students earned 527 NAM-endorsed credentials;
- MnAMP supported 85 MNAMP faculty in becoming certified or re-certified in program specific, NAM-endorsed credentials;
- 9 MSSC testing centers are located at MNAMP colleges;
- MnAMP developed a written protocol for competency-based credit for prior learning and related assessment (234 credits were offered);
- MnAMP Colleges established 22 new articulation agreements with 4-year institutions;
- MnAMP established Statewide Apprenticeship and competency-based Dual Training models for mechatronics, machining, and welding;
- MnAMP provided faculty the ability to crosswalk their manufacturing programs with the Military Occupational Standards and place them on the Veterans Education Transfer System program managed through the Minnesota State System;
- MnAMP established 108 Registered Apprenticeships and 213 competency-based Dual Training opportunities at 53 companies;
- Employed an online learning platform called +Connect to serve incumbent workers by offering courses that align with apprenticeships or industry credentials, serving 575 incumbent participants and 64 employers; and
- MnAMP program completers reported highly positive attitudes about the MnAMP program in their responses to the attitudinal and evaluative questions in the Survey Monkey completer survey.

Database. Another MnAMP innovative program strength is the *consortium's customized database*, called *LWE* (pronounced “Louie”).⁵¹ LWE is a web-based longitudinal data tracking system designed to follow MnAMP participants as they progress through their college education and careers and to make possible rigorous impact evaluations that determine which interventions work to improve student success in college, career, and life.

The Lumina Foundation has called for development of such a data system:

Unfortunately, current data systems do not allow us to follow certificate and certification holders as they progress in both education and careers. It is essential that data systems be developed and implemented to provide reliable national information on these credentials.⁵²

2.5.1 Weaknesses

The design of the MnAMP model program is sound, although primarily face-to-face intrusive advising perhaps could have been improved with technology-enhanced advising. By integrating student data into a common database and adopting predictive analytics, advisors can advise students on guided pathways, identify those most at risk, provide timely advising, and create an educational process to ensure classes are offered when students need them.

The implementation of the model program, however, could have been improved in two ways.

First, two of the colleges in the consortium did not fully implement the program. The consortium management's *de jure* authority to require timely, specific performance of a member college was limited. Moreover, the governance authority of the Minnesota Advanced Manufacturing Partnership Council, which is composed of the member colleges' presidents, was unable to ensure grant compliance for every member college. Through competent leadership, however, consortium management earned *de facto* authority and willing cooperation from almost all member colleges.

A strong connection between the leaders at multiple levels of the member colleges and the consortium leadership, and a broad mutual commitment to the grant's purposes, are necessary for building institutional support of the grant project, and for adopting and sustaining grant-demonstrated innovations at the college.

Second, to undertake a quasi-experimental design impact analysis, the evaluation was limited by two constraints:

- (1) obtaining individual-level comparison group data, and
- (2) obtaining individual-level unemployment insurance (UI) wage-record data that are collected by the State of Minnesota to administer unemployment benefits.

⁵¹ See Appendix F for a description of the database

⁵² Lumina Foundation. Lumina Foundation Strategic Plan, p. 5. Retrieved from <https://www.luminafoundation.org/files/resources/strategic-plan-2017-to-2020-apr17.pdf>

If obtaining comparison group data could have been a centralized process and downloaded from the Minnesota State data system, the evaluation would have been greatly facilitated. The evaluator was obliged to work with each of the 12 colleges to obtain, validate, and aggregate comparison group data - an exceedingly labor- and time-intensive process.

Obtaining UI wage and employment data of comparison group students was prohibited due to lack of student permissions to access that data.

Consortium leadership could not obtain student-level employment and earnings data on historical comparison-group students. This and other missing data problems limited the evaluator's quasi-experimental design impact study. For example, the evaluator could not demonstrate that the certifications that MnAMP students earned improved their labor market outcomes as compared to pre-MnAMP groups. While in theory the practice of embedding certifications into programs of study would improve program quality and responsiveness, and thereby lead to better student employment outcomes, this hypothesis could not be confirmed or refuted.

3.0 Participant Impacts and Outcome

For initiatives on student success, research has demonstrated that collecting and analyzing data on students by differences in demographics, majors, course-taking patterns, pathways, and outcomes, and using these analyses to develop interventions has helped increase student success.⁵³

PTB's MnAMP impact evaluation sought to determine which interventions worked to improve student success in college and the workplace.

3.1 Impacts Achieved

The positive impacts found were:

1. Shorter time. Among those who completed a credential, it took participants about 1.5 months less time to complete a 1-year credential than comparison students; and further, participants who were Pell eligible took less time to complete a one-year certificate than those who were not Pell eligible.
2. More earned credits. Within the participant group only, students enrolled at the end of the grant (*i.e.*, post-test) period earned more credits than students enrolled early in the grant (*i.e.*, pre-test) period. In this pre-post analysis, students enrolled later earned more credits than those who enrolled earlier.

⁵³ National Academies of Sciences, Engineering, and Medicine. 2016. *Barriers and Opportunities for 2-Year and 4-Year STEM Degrees: Systemic Change to Support Students' Diverse Pathways*. Washington, DC: The National Academies Press.

3. Increased full-time employment. Those participants who were unemployed at program enrollment and who received more MnAMP program services (interventions) were more likely to achieve increased attainment of full-time employment post-program.

The negative impacts found were:

1. Lower GPA and fewer credits earned. MnAMP participation was found to be negatively associated with overall student grade point average (GPA) and credits earned, as compared to the comparison group students, based on regression analysis used to calculate an Average Treatment Effect (ATE) outcome.
2. Lower credentials attainment. MnAMP participants were less likely than comparable, historical non-participants to attain credentials during their programs of study.
3. Fewer earned credits. Participants obtained fewer credits overall by a small margin compared to comparison students.

Overall, compared to the historical group, MnAMP participation either produced no effects or negative effects on educational outcomes. Specifically, PTB observed no change in GPA, a reduction in credentials earned, and a reduction in total credits earned.

However, within the treatment group, there is some evidence of positive effects of participation over time. Student counseling is associated with positive effects on increased credits earned and on achieving full-time employment among those who were unemployed at enrollment.

Appendix J – Full Impact Analysis Reort,⁵⁴ provides a technical summary of the propensity scores (IPWRA) for each of the variables used to create the treatment and comparison groups.

Table 9 summarizes results of the treatment-comparison group outcome analyses. In final outcome analyses, PTB ran two versions of these outcome models: 1) the IPW model comparing the two groups and accounting for the demographic variables noted above in Table 5; 2) an IPW model comparing the pre-post effects within the treatment group only (right hand side of the table).

| Table 9: Summary of MnAMP Treatment Effects on Selected Outcomes | | | | | | |
|---|--|------------------------|----------|--|------------------------|---------|
| Summary of Treatment Effects | Multivariate Analyses with IPW (compared to historical group) | | | Multivariate Analyses with IPW (treatment group only) | | |
| | Treatment Effect (coefficient) | Mean Level/ Proportion | P value | Treatment Effect (coefficient) | Mean Level/ Proportion | P value |
| Received any | -30% | 50% | 0.001*** | -29% | 50% | NA |

⁵⁴ Appendix J – Full Impact Analysis Report is included with this report as a separate Excel Workbook.

| Table 9: Summary of MnAMP Treatment Effects on Selected Outcomes | | | | | | |
|---|--|------------------------|----------|--|------------------------|----------|
| Summary of Treatment Effects | Multivariate Analyses with IPW (compared to historical group) | | | Multivariate Analyses with IPW (treatment group only) | | |
| | Treatment Effect (coefficient) | Mean Level/ Proportion | P value | Treatment Effect (coefficient) | Mean Level/ Proportion | P value |
| credential | | | | | | |
| Length of time to receive 1-year certificate | -1.5 months | 6.3 months | 0.001*** | -1.4 Months | 6.3 months | 0.001*** |
| GPA | NS | 2.3 | NS | NS | 2.3 | NS |
| Credits earned | -2.0 | 26.1 | 0.001*** | 0.5 | 27.5 | 0.001*** |
| Credits earned by students receiving counseling | NA | NA | NA | 8.4 | 36.3 | 0.001*** |

*** $p < .001$; NS = not significant

PTB found no statistically significant change in GPA any of these models, meaning there was no difference between treatment and comparison group, and no difference pre-post within the treatment group in student GPA outcomes.

There was a negative effect for credential attainment. MnAMP participants had lower total credentials on average in the multivariate model, and completed fewer credentials adjusting for co-variables (-30% ATE, $p < .001$), and had -29% fewer credentials completed in the pre-post treatment group only model ($p < .001$).

Time to complete a 1-year certificate (the variable for which PTB had data suitable for analysis) was shorter in the MnAMP treatment group in each model. In treatment-comparison multivariate model, ATE was negative (indicating shorter time to completion), and it took 1.5 months fewer for MnAMP participants to complete a 1-year certificate ($p < .001$). In the pre-post only model, the difference was 1.4 months fewer to complete a 1-year certificate at post-test ($p < .001$).

In the treatment-comparison analysis, PTB found treatment students achieved 2.0 fewer credits than comparison students ($p < .001$). However, PTB observed a positive program effect within the pre-post only comparison for total credits earned by treatment students who received counseling, or 8.4 more credits earned at post-test ($p < .001$).

Because PTB did not have employment data for historical comparison students, PTB was limited to examining within-treatment group effects of participation and receipt of MnAMP services on

employment outcomes. With this limitation, PTB examined any change in employment status as a function of amount of program intervention services (*e.g.*, counseling) received. Table 10 summarizes pre-post analysis of the effects of quantity of counseling received on achievement of full-time (FT) employment at post-test. Students were classified as being either unemployed, employed part-time (PT) or FT at pre-test and post-test. PTB found a positive effect of counseling on achievement of FT at program completion among students unemployed at entry (8.6% greater at post-test, $p < .039$). No other employment categories at baseline showed a post-test effect.

Table 10: Summary of MnAMP Participation on Achievement of Full-time Employment

| Summary of Treatment Effects | Multivariate Analyses | | |
|--|--------------------------------|-----------------------|---------------|
| | Treatment Effect (coefficient) | Mean Level/Proportion | P value |
| Received counseling | 4.0% | 58% | NS |
| Unemployed at start by counseling/employed FT at completion | 8.6% | 28.9% | 0.039* |
| PT at start by counseling/employed FT at completion | 6.3% | 27.4% | NS |

* $p < .05$; NS = not significant

3.3 Impact Evaluation Limitations

Due to the lack of availability of comparison data at some MnAMP colleges, the impact evaluation and outcomes were evaluated only at the following eight institutions: Lake Superior, MN West, Normandale, Northland, Ridgewater, Riverland, St. Paul, and South Central. The lack of comparison data at the other three colleges may have affected the multivariate modeling results in unknown ways, introducing selection bias due to missing institutions.

Given a high percentage of missing (unavailable) data for workforce participation and job incumbency in the comparison sample, PTB was unable to conduct a meaningful comparative impact analysis of the effects of MnAMP participation on employment status post-program.

Despite not having employment data for historical comparison students, PTB was able to examine within-treatment group effects of participation and receipt of MnAMP services on employment outcomes.

However, it is worth noting that the total amount of program services (interventions) reported was much lower in the participant data compared to the comparison students. This was unexpected and raises the question of whether services delivered were under reported by colleges during the grant period. The lack of program services reported in the participant group made it

impossible to conduct comparative analysis of the effects of program services with the comparison group.

Finally, it is important to note that there were substantial changes in the economy during the 2014-2018 period, and prior,⁵⁵ which may have affected educational and workforce participation and opportunities for students. While this evaluation was not designed to answer the question of what effects those changes (*e.g.*, the steady increase in employment during the period and reduction in jobless claims), it raises the question of whether other events in the local area, job market, or catchment group for program enrollment at the MnAMP colleges may explain observed outcomes. For example, the availability of jobs for program completers could lead some students to leave school earlier, and thus be less likely to obtain credentials when they had opportunities to obtain immediate employment. Those are important questions that are beyond the scope of this evaluation.

3.2 Outcomes Achieved

MnAMP achieved the following targets on the nine core U.S. Department of Labor program measures for the TAACCCT program, as noted in the tables below:

| Table 11: DOL Outcomes – Projections and Actuals as of End of Year 4 | | | | |
|---|--|------------------|---------------|---------------------------------|
| Outcome Number | Outcome | Projected | Actual | Actual as % of Projected |
| 1 | Total unique participants served/enrolled | 3,050 | 3,184 | 104.4% |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 1,914 | 1,266 | 66.1% |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (all four years combined) | 1,280 | 2,005 | 156.6% |
| 4 | Total number of participants completing credit hours | 2,123 | 1,576* | 74.2% |
| 5 | Total number of participants earning credentials | 2,333 | 1,266** | 62.1% |
| 6 | Total number of participants enrolled in further education after grant-funded program of study completion | 215 | 119 | 55.3% |

⁵⁵ The unemployment rate in Minnesota dropped from 7.8% in 2009 to 2.9% in 2018. See <https://www.statista.com/statistics/189441/unemployment-rate-in-minnesota-since-1992/> and https://ycharts.com/indicators/minnesota_unemployment_rate

| Table 11: DOL Outcomes – Projections and Actuals as of End of Year 4 | | | | |
|--|---|------------------|---------------|---------------------------------|
| Outcome Number | Outcome | Projected | Actual | Actual as % of Projected |
| 7 | Total number of participants employed after grant-funded program of study completion | 751 | 194 | 25.8% |
| 8 | Total number of participants retained in employment after program of study completions | 638 | 184 | 28.8% |
| 9 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 1,000 | 1,564 | 156.4% |
| * Unduplicated headcount. Duplicated headcount (sum of all four years) is 3,337 | | | | |
| ** Unduplicated headcount. Duplicated headcount (sum of all four years) is 1,448 | | | | |

Source: MnAMP Projections and LWE Database – September 19, 2018

| Table 12: Enrollment in MnAMP (Outcome B1) | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------------|---------------------|
| College | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Total Proj. | Total Actual |
| Century College | 6 | 20 | 77 | 0 | | 103 |
| Dakota County Tech College | 2 | 62 | 140 | 0 | | 204 |
| Lake Superior College | 4 | 88 | 104 | 10 | | 206 |
| Minneapolis Comm. & Tech. College | 38 | 30 | 30 | 6 | | 104 |
| MN State Comm. & Tech. College | 2 | 33 | 76 | 41 | | 152 |
| MN West Comm. & Tech. College | 20 | 105 | 100 | 4 | | 229 |
| Normandale College | 0 | 5 | 56 | 10 | | 71 |
| Northland Comm. & Tech. College | 0 | 65 | 52 | 0 | | 117 |
| Ridgewater College | 88 | 148 | 103 | 42 | | 381 |
| Riverland Comm. College | 48 | 18 | 47 | 0 | | 113 |
| Saint Paul College | 48 | 159 | 255 | 29 | | 491 |
| South Central College | 149 | 285 | 509 | 70 | | 1,013 |
| Consortium Total | 405 | 1,018 | 1,549 | 212 | 3,050 | 3,184 |

Source: LWE database – September 19, 2018

| Table 13: MnAMP Participants Completing a Program of Study (Outcome B2) | | | | | | |
|--|--------------|--------------|--------------|--------------|--------------------|---------------------|
| College | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Total Proj. | Total Actual |
| Century College | 6 | 8 | 30 | 0 | 1,914 | 44 |
| Dakota County Tech College | 0 | 0 | 59 | 10 | | 69 |
| Lake Superior College | 1 | 7 | 19 | 2 | | 29 |
| Minneapolis Comm. & Tech. College | 0 | 16 | 16 | 0 | | 32 |
| MN State Comm. & Tech. College | 0 | 31 | 67 | 27 | | 125 |
| MN West Comm. & Tech. College | 11 | 51 | 74 | 10 | | 146 |
| Normandale College | 0 | 3 | 8 | 5 | | 16 |
| Northland Comm. & Tech. College | 0 | 5 | 33 | 7 | | 45 |
| Ridgewater College | 1 | 60 | 68 | 21 | | 150 |
| Riverland Comm. College | 0 | 22 | 35 | 5 | | 62 |
| Saint Paul College | 0 | 88 | 62 | 27 | | 177 |
| South Central College | 20 | 125 | 129 | 97 | | 371 |
| Consortium Total | 39 | 416 | 600 | 211 | | 1,914 |

Source: LWE database – September 19, 2018

| Table 14: MnAMP Participants Enrolled in Further Education After Program of Study Completion and Exit (Outcome B7) | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------------|---------------------|
| Total Actual | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Total Proj. | Total Actual |
| Century College | 0 | 0 | 2 | 0 | 1,914 | 2 |
| Dakota County Tech College | 0 | 0 | 0 | 0 | | 0 |
| Lake Superior College | 0 | 0 | 0 | 0 | | 0 |
| Minneapolis Comm. & Tech. College | 0 | 1 | 4 | 0 | | 5 |
| MN State Comm. & Tech. College | 0 | 0 | 1 | 0 | | 1 |
| MN West Comm. & Tech. College | 1 | 6 | 3 | 1 | | 11 |
| Normandale College | 0 | 0 | 0 | 0 | | 0 |
| Northland Comm. & Tech. College | 0 | 1 | 1 | 2 | | 4 |

| Table 14: MnAMP Participants Enrolled in Further Education After Program of Study Completion and Exit (Outcome B7) | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------------|---------------------|
| Total Actual | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Total Proj. | Total Actual |
| Ridgewater College | 0 | 7 | 5 | 6 | | 18 |
| Riverland Comm. College | 0 | 1 | 9 | 0 | | 10 |
| Saint Paul College | 0 | 1 | 7 | 0 | | 8 |
| South Central College | 1 | 24 | 20 | 15 | | 60 |
| Consortium Total | 2 | 41 | 52 | 24 | | 215 |

Source: LWE database – September 19, 2018

| Table 15: MnAMP Participants Employed After Program of Study Completion and Exit (Outcome B8) | | | | | | | |
|--|--------------|--------------|--------------|--------------|--------------------|---------------------|-----|
| Total Actual | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Total Proj. | Total Actual | |
| Century College | 1 | 2 | 9 | 0 | | 12 | |
| Dakota County Tech College | 0 | 0 | 2 | 0 | | 2 | |
| Lake Superior College | 0 | 2 | 6 | 0 | | 8 | |
| Minneapolis Comm. & Tech. College | 0 | 5 | 6 | 0 | | 11 | |
| MN State Comm. & Tech. College | 0 | 7 | 5 | 4 | | 16 | |
| MN West Comm. & Tech. College | 0 | 11 | 17 | 0 | | 28 | |
| Normandale College | 0 | 1 | 0 | 0 | | 1 | |
| Northland Comm. & Tech. College | 0 | 0 | 4 | 0 | | 4 | |
| Ridgewater College | 0 | 14 | 11 | 2 | | 27 | |
| Riverland Comm. College | 0 | 5 | 5 | 0 | | 10 | |
| Saint Paul College | 0 | 13 | 17 | 1 | | 31 | |
| South Central College | 2 | 14 | 22 | 6 | | 44 | |
| Consortium Total | 3 | 74 | 104 | 13 | | 751 | 194 |

| Table 16: MnAMP Participants Receiving a Raise After Program Entry (Outcome B10) | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------------|---------------------|
| Total Actual | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Total Proj. | Total Actual |
| Century College | 0 | 3 | 40 | 3 | 1,000 | 46 |
| Dakota County Tech College | 0 | 0 | 70 | 50 | | 120 |
| Lake Superior College | 0 | 17 | 72 | 19 | | 108 |
| Minneapolis Comm. & Tech. College | 0 | 19 | 13 | 10 | | 42 |
| MN State Comm. & Tech. College | 0 | 5 | 16 | 6 | | 27 |
| MN West Comm. & Tech. College | 2 | 23 | 56 | 37 | | 118 |
| Normandale College | 0 | 1 | 17 | 1 | | 19 |
| Northland Comm. & Tech College | 0 | 3 | 24 | 25 | | 52 |
| Ridgewater College | 0 | 46 | 67 | 61 | | 174 |
| Riverland Comm. College | 0 | 22 | 25 | 21 | | 68 |
| Saint Paul College | 0 | 18 | 73 | 71 | | 162 |
| South Central College | 1 | 99 | 327 | 201 | | 628 |
| Consortium Total | 3 | 256 | 800 | 505 | | 1,000 |

Source: LWE database APR report – October 8, 2018

It is worth noting that of the 3,184 participants, 2,381 (74.8%) were incumbent workers. This percentage exceeded initial expectations, but is not surprising considering the decreasing unemployment in Minnesota during the grant period. In light of this high percentage, MnAMP revised upward its projection of the number of incumbent participants who would receive a pay increase after enrolling in MnAMP. Although MnAMP increased its projection by almost 15% (from 853 to 1,000), the number of incumbent workers who received an increase after enrollment exceeded the projection by 56.4%. Of the 2,381 incumbent workers enrolling in MnAMP, 1,564 (65.8%) received a pay increase after enrolling in MnAMP.

See Appendix K – DOL APR Outcomes by College as of the End of Year 4, for additional information on outcomes achieved by each consortium college.

3.3 Participants' Survey Results

Participants reported a high level of satisfaction with MnAMP, with 98% agreeing or strongly agreeing they were satisfied with the level of knowledge and skill developed through the courses. Ninety-seven percent (97%) would recommend the program to others. Overall, participants' attitudes and satisfaction with the program, support services, faculty, and the role of MnAMP in obtaining a job were high. Most had positive expectations for doing well in college, enjoyed learning, and expected to succeed.

PTB's MnAMP Year 3 Evaluation Report, Appendix C – Short (South Central College) Completer Survey, and Appendix D – Long (Survey Monkey)⁵⁶ Completer Survey, provides detailed information from the surveys administered to participants.

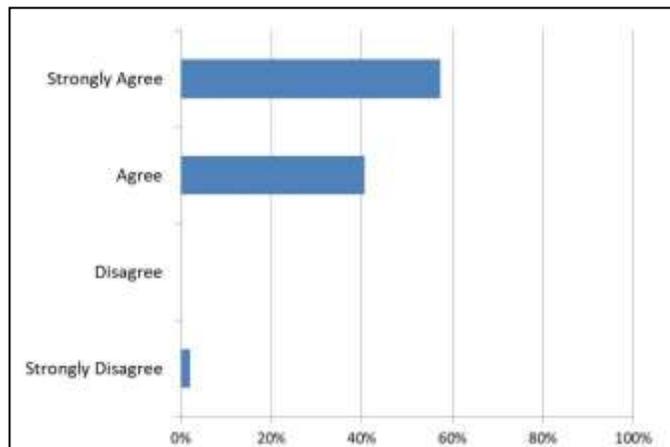
A summary of participants' survey results follows.

Satisfaction with MnAMP

18 – Satisfaction with the Level of Knowledge and Skill Developed in the Courses

(96 responded – 44 skipped)

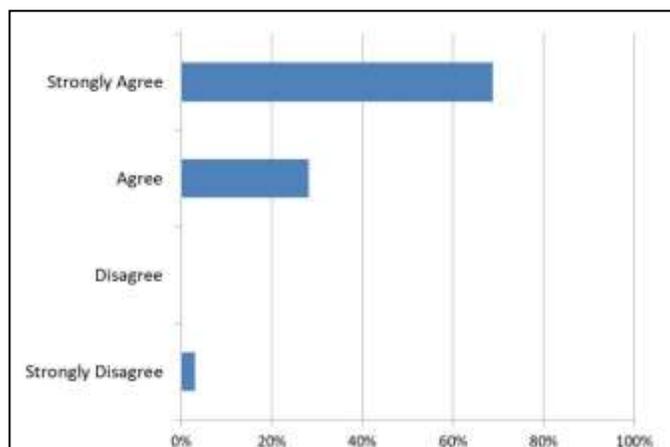
Of the 96 participants (68.57%) responding to this item, 94 (97.92%) agreed or strongly agreed they were satisfied with the level of knowledge and skill developed through the courses.



19 – Willingness to Recommend the Manufacturing Program Courses to Others

(96 responded – 44 skipped)

Of the 96 participants (68.57%) responding to this item, 93 (96.88%) agreed or strongly agreed they would recommend the courses/program to others.



⁵⁶ Both Surveys are included in Appendix E of this Year 4 report.

The percentages on these items for those taking the longer, MnAMP Completer Survey Long Form and the MnAMP Completer Survey Short Form were 95% and 97%, respectively.⁵⁷

Overall, participants' attitudes and satisfaction with the program, support services, faculty, and the role of MnAMP in obtaining a job are high. Most had positive expectations for doing well in college, enjoyed learning, and expected to succeed.

Almost all had earned a credential upon leaving MnAMP. Only about one in four participants planned to earn an additional credential or certificate.

About 4 out of 10 participants had no plans to earn additional diplomas or degrees, and about one in four participants planned to earn an additional diploma or degree.

For the nearly 9 out of 10 participants who received support services, almost all who received educational advising, placement assistance, or tutoring found these services helpful.

Over 9 out of 10 participants believe their MnAMP program and courses played a role in getting a job and will play a role in keeping a job.⁵⁸

Nearly 3 out of 4 participants responding to the survey had a job or job offer, and 3 out of 4 of those jobs or job offers are in the area of training completed. Most participants will be working 40 hours or more per week.

Almost half of those employed were employed prior to completing the MnAMP program and one third got a new job after completing the program. One in six participants employed prior to completing received a wage increase, and of those participants who did not have a job upon entry more than 8 out of 10 participants obtained a job after program completion.

Nearly one half reported an hourly pay rate between \$15.00 and \$19.99 per hour and about 1 in 5 participants reported an income of \$20.00 or above per hour.⁵⁹

The occupational titles of the jobs were welding, machining, mechatronics, manufacturing, Certified Production Technician, and Maintenance.

⁵⁷ Two Completer Surveys were administered. The MnAMP Completer Survey Short Form was administered primarily to gather employment and wage data, while the MnAMP Completer Survey Long Form collected wage and employment data, but focused more closely on student attitudes and satisfaction. Some participants may have completed both surveys.

⁵⁸ However, only about 6 out of 10 participants in the Survey Monkey survey believed that their MnAMP program and courses played a role in getting a job and will play a role in keeping a job.

⁵⁹ However, about 2 in 5 participants reported in the Survey Monkey survey an income of \$20.00 or above per hour.

4.0 Summary and Conclusions

4.1 Summary

The originating problem, the solution designed, and the outcomes intended by the MnAMP project are summarized in the box below.

Problem, Solution, and Outcomes

PROBLEM

Minnesota has a Workforce Skills Gap. To grow the state's economy and increase its residents' prosperity and social mobility, more skilled manufacturing workers are needed, yet the state's community colleges are not producing enough skilled workers to meet industry needs.

SOLUTION

Transform the state's workforce development system to respond to current and emerging manufacturing industry needs, and expand the system's program, faculty, and technological capacity to produce more skilled workers.

In order to solve this skilled-workers deficit, close the workforce skills gap, and meet the state's future workforce demands, Minnesota must increase:

1. Community College Enrollment. The number and percentage of high school graduates and adult learners (including those in groups that have been historically underrepresented in higher education) enrolling in Minnesota community colleges to obtain credentials that will qualify them for employment in skilled, career-track manufacturing jobs must increase;
2. Degree and Certification Completion. The number and percentage of community-college associate-degree and industry-certification completers must increase; and
3. Job Placement. The number of Minnesota community college completers who find and keep employment in skilled career-track jobs must increase.
4. Workforce Upskilling. The incumbent workforce must be given increased opportunities to increase and expand their skills to adapt to new skill requirements and technological advances.

These improvements of institutional effectiveness and student success would boost the state's production of skilled manufacturing workers.

To this end, the Minnesota Advanced Manufacturing Partnership (MnAMP), a consortium of 12 geographically-dispersed community colleges and two centers of excellence from the Minnesota State System, acting in close collaboration with industry leaders and other

stakeholders, has developed an innovative workforce development model to provide students with redesigned and enhanced mechatronics, machining, and welding career pathways to advanced manufacturing employment. This strengthened partnership between industry and education, resolved to meet the ever-changing automation needs of employers, has developed a system and a process for continuously updating and improving a competency-based curriculum.

OUTCOMES

Development and demonstration of MnAMP as an effective model for advanced manufacturing workforce development could produce beneficial outcomes for the people, higher education, industry, and state of Minnesota. The long-term benefits to Minnesotans of MnAMP-led improvements in institutional productivity and in completers' educational and employment success promise to include: a more highly skilled workforce, an increased manufacturing industry capacity, higher incomes, a stronger state economy, and reduced state government expenditures for unemployment and related services.

4.2 Conclusions

MnAMP has succeeded in:

1. Analyzing current and emerging technological, economic, and demographic trends strategically in order to rethink and revamp an advanced manufacturing career education and training system that will prepare Minnesota's future workers. Automation and artificial intelligence, global trade, and retirement of the baby boomer generation from the workforce will bring accelerating change in industries and occupations that will require rapid responses from community colleges, because the skills needed to keep up in manufacturing will be changing continuously;
2. Adopting a sector-based approach⁶⁰ to workforce development reform led by the Minnesota Advanced Manufacturing Partnership Council and coordinated by the MnAMP Grant Director and her staff;
3. Recognizing that to close the skills gap, Minnesota must upskill its existing adult workforce and concentrate on Minnesota's incumbent workers who return to college to learn new skills and gain credentials to improve their economic prospects;
4. Analyzing Minnesota's current and future manufacturing skills needs and the skills gap to be closed;
5. Developing a comprehensive systemic reform plan to close the manufacturing skills gap;
6. Identifying common skills standards and promoting industry-recognized credentials;
7. Building a core curriculum and career pathways to skilled manufacturing jobs;

⁶⁰ This approach is wholly consistent with the legislation proposed by former Senator Franken ([S.1245 - Advancing Career Pathways Innovation Act, 115th Congress \[2017-2018\]](#)) to expand career pathways.

8. Breaking down the non-credit workforce development and continuing education divisions and credit divisions silos, reorganizing and integrating them along a career pathway, and building, in partnership with employers, new protocols and mechanisms to keep programs current with and responsive to the labor market;
9. Introducing and pilot testing innovations of curriculum, instructional delivery, support, and scheduling that promise to enable the community college to respond more promptly to changes in the economy and provide continuous, regular training to enable individuals to convert learning to earning quickly, to learn new marketable skills throughout their lifetime, and in short periods when needed rather than in the long blocks of time often required to complete two-year degrees;
10. Expanding noncredit programs, whose courses can be developed and up and running more quickly than credit-based programs, and which take much less time to complete than academic degrees and certificates;
11. Providing for award of credits through prior learning and competency-based assessment and third-party certification for continuing education students who matriculate in credit-based programs;
12. Integrating nationally-recognized stacked and latticed industry credentials (shorter certificates that build on each other) into career pathways to allow students to feel a sense of accomplishment and to improve their employability in a short period of time;
13. Articulating competencies and courses between continuing education and credit programs through third-party certification, competency-based programming, and prior learning assessment;
14. Building on-ramps to credit programs of study from non-credit, shorter-term training opportunities and thereby accelerating time to credential attainment and increasing credential completion rates;
15. Designing MnAMP's lifelong learning model, entitled *Learn Work Earn*, that aligns short-term academic certificates and industry-recognized credentials on career pathways so that the credentials build upon one another and enable students to climb a career ladder and continue lifelong learning while working through work-based training model, including apprenticeship programs;
16. Modularizing curricula, expanding apprenticeships and work-based learning experiences, and developing competency-based education, prior learning assessment, distance delivery capacity and other innovations that promise to help students balance the competing demands of work and family and acquire new skills at convenient times, places, and/or paces;
17. Bringing greater awareness of advanced manufacturing programs to college administrators, employers, and prospective students;
18. Building a bridge or on-ramp to the career pathways for students with low basic skills with community partners such as the Workforce Centers and Adult Basic Education programs;
19. Expanding roles for employers, including apprenticeships and use of plant facilities;

20. Establishing new articulation agreements with four-year institutions; and
21. Utilizing the +Connect Mediated Telepresence live video conferencing distance learning platform.

These large-scale, capacity-building innovations promise to form and demonstrate an innovative and comprehensive 21st-century model of career-oriented workforce skills development in advanced manufacturing that will meet industry needs and increase the prosperity of many Minnesotans.

5.0 Recommendations and Implications for Future Workforce and Education Research

5.1 Recommendations

I. Sustain the MnAMP Consortium in order to continue working relationships and build upon the gains achieved through the TAACCCT grant

1. Sustain the new governance structure formed and developed under MnAMP - - the Minnesota Advanced Manufacturing Partnership Council - - to allow the MnAMP partners to continue to work together as a consortium for the benefit of MnSCU colleges and students, manufacturers, and the state.
2. Maintain the MnAMP Grant Director, whose periodic visits to each campus have been critically important in creating a common understanding of MnAMP, in building partnerships, and in encouraging the colleges to implement MnAMP program features.
3. Develop a post-grant consortium continuation plan to develop and demonstrate, scale up, and institutionalize the comprehensive systemic reform model of a career education and job training system that MnAMP will have demonstrated. The plan should provide for:
 - a. Institutionalizing positions and funding to support the curricular, CPL, learning support, and other innovations and interventions the Year 4 Impact Study may demonstrate to be beneficial in helping participants launch a career in advanced manufacturing;
 - b. Maintaining and building upon the extensive business, industry, employer, association, governmental, and other college partnerships established during the project;
 - c. Reviewing and updating curricula regularly to reflect changing needs and requirements of business and industry;
 - d. Embedding high-quality and in-demand industry certifications into degree programs;⁶¹

⁶¹ McCarthy, M. and Prebil, M. (2018). *Building Better Degrees Using Industry Certifications, Lessons from the Field. New America Report*. Retrieved from <https://www.newamerica.org/education-policy/reports/building-better-degrees-using-industry-certifications>

- e. Aligning continuing education learning outcomes and competencies continuously with those taught in credit-based programs in order to facilitate the acceptance and approval of credit for continuing education within credit pathways;
- f. Ensuring the non-credit/credit alignment by engaging full-time credit faculty in creating the curriculum and competencies for continuing education programs.⁶²
- g. Encouraging employers to provide training delivered at the workplace during or outside work hours, using flexible, competency-based approaches;⁶³
- h. Measuring and reporting the value of attained credentials in terms of employment, earnings, and further education;
- i. Evaluating the institutional return on investment gained from innovations developed and demonstrated by MnAMP in order to inform college leaders whether and how the innovations might be built into a college's annual operating base budget;
- j. Acquiring new federal grants from the U.S. Department of Labor,⁶⁴ the U.S. Department of Education, and the National Science Foundation, as well as state and foundation grants, in order to continue the development, demonstration, and scaling of MnAMP-seeded innovations;
- k. Maintaining and promoting the value of MnAMP's common intake system and real-time, web-based longitudinal data system, LWE, that integrates standardized individual student-level educational data and state unemployment insurance wage data for reporting, impact evaluation, and continuous improvement purposes. A longitudinal data system can follow individuals' participation in education, training, and social service programs over several years, and individual student/participant records stored in the data system can be linked with individual-level state Unemployment Insurance (UI) wage records and other records, such as those of the National Student Clearinghouse database, and thereby enable accountability on how training programs are helping participants get skilled jobs and further education;
- l. Using the LWE data system, at the consortia and institutional levels, to document, track, analyze, and report attainment not only of students' training completion outcomes, but also of *post-completion outcomes* (e.g., employment, retention in employment, earnings, further education, and cumulative student debt).⁶⁵ These post-

⁶² Price, D. and Sediak, W. (2018). *Creating Opportunity for All: Building Pathways from Continuing Education to Credit Programs*. Silver Spring, MD: Achieving the Dream. Retrieved from <http://www.achievethe dream.org/resource/17254/creating-opportunity-for-all-building-pathways-from-continuing-education-to-credit-programs>

⁶³ Tyszko, J., Carrick, G., and Sheets, R. (2018). *Quality Pathways: Employer Leadership in Earn & Learn Opportunities*. Washington, DC: U.S. Chamber of Commerce Foundation Center for Education and Workforce. Retrieved from https://www.uschamber.com/sites/default/files/quality_pathways_march_2018.pdf

⁶⁴ For example, the U.S. Department of Labor, Employment and Training Administration's recently announced \$150 million Scaling Apprenticeship Through Sector-Based Strategies grant program. See: <https://www.grants.gov/web/grants/view-opportunity.html?oppId=307212>.

⁶⁵ See Appendix G – Student Level Data Elements for Use in a Longitudinal Data Tracking System for the elements of an institutional or consortial data system that would support impact evaluations.

completion outcomes should be criteria for determining a student's success and a community college's success; and

- m. Developing, through collaboration between the college and local or state workforce board, a shared student/participant intake form that will be used in providing shared services between the two institutions.

II. Undertake continuous evidence-based program evaluation to identify those programs and program components and supports most beneficial in promoting student success

4. Undertake studies designed to determine which innovative interventions in the MnAMP model work, for whom, and under what circumstances to improve education and employment outcomes and can be scaled and replicated to reach significantly more people.
5. Conduct regular quasi-experimental design evaluations in order to learn:⁶⁶
 - a. whether and to what extent MnAMP is helping Minnesotans obtain credit and noncredit credentials representing the knowledge and skills they need to succeed in the workplace and in life, and that the state needs for economic development;
 - b. the root causes of inadequate attainment, and which MnAMP model elements - or combinations of elements - - work to improve student success in college, career, and life;
 - c. how incumbent workers on the *Learn Work Earn* career pathway (*i.e.*, taking advantage of new continuing education to credit linkages and matriculating into credit programs) enter and exit learning and work over time;
 - d. how and to what extent the educational outcomes of incumbent workers differ from those of non-incumbent students; and
 - e. how and to what extent the employment outcomes differ among three groups of participants: (1) holders of non-degree credit certificates (awarded by community colleges), (2) holders of non-degree, non-credit certifications (recognized by industry), and (3) holders of academic degrees.

III. Disseminate MnAMP's results and successes to broader audiences

6. Report the MnAMP model's impact on meeting Minnesota's growing demand for talent and skills and on closing Minnesota's skills gap in accordance with the Lumina Foundation's three target populations:
 - a. Traditional aged students (16-24);
 - b. Returning adults (25-64) who attended college, but "stopped out" and did not attain a degree; and
 - c. Adults (25-64) with no recognized postsecondary education.

⁶⁶ Where feasible, quasi-experimental design evaluations using treatment and matched comparison groups should be conducted.

IV. Seek funding to continue to develop and enhance MnAMP’s model of systemic reform

7. Submit a proposal to the Lumina Foundation⁶⁷ to continue to develop and demonstrate MnAMP’s longitudinal data tracking system, LWE, by following noncredit certification and credit certificate and degree holders as they progress through their education and careers.

The Lumina Foundation has called for development of such a data system.⁶⁸ This tracking system would extend tracking beyond community college into the workplace and enable employment (career-track employment, wage, career advancement) and social outcomes (student debt, housing, *etc.*) to be measures of community college effectiveness. *Post-program attainment* and performance measures would also include postsecondary enrollment and persistence by matching graduates with enrolled four-year college students in the [National Student Clearinghouse](#) database.

8. Consider submitting this concept or a related concept in an unsolicited “innovative ideas” proposal to the [U.S. Department of Education’s Division of Contracts & Acquisitions Management](#).

V. Continue to develop and expand upon the collection, analysis, and reporting of program data as the basis for data-based decision making.

9. Measure the success of MnAMP’s workforce preparation and employment program by means of three data collection methods: (1) matching individual-student college administrative records to unemployment insurance (UI) data that are collected by the State of Minnesota to administer unemployment benefits, and (2) follow-up surveys which can supplement the UI data by reaching former students who are out-of-state or self-employed, and (3) collecting more detailed information on employment outcomes.⁶⁹ Both postsecondary and UI data should be entered into Statewide Longitudinal Education Data System (SLEDS).

“Colleges can use these data to tailor existing programs to improve outcomes for students and to consider restructuring or eliminating programs with low success rates... Prospective and enrolled community college students and their families can use these data to make decisions about which programs of study would best meet students’ career goals and whether they should plan to transfer to a four year-institution to earn a bachelor’s degree... Surveys can also determine which community college graduates

⁶⁷ See <https://www.luminafoundation.org/lumina-impact-ventures>.

⁶⁸ See: Lumina Foundation. (2017). *Lumina Foundation Strategic Plan for 2017 to 2020*. Indianapolis, IN: Lumina Foundation. Retrieved from <https://www.luminafoundation.org/files/resources/strategic-plan-2017-to-2020-apr17.pdf>. “Unfortunately, current data systems do not allow us to follow certificate and certification holders as they progress in both education and careers. It is essential that data systems be developed and implemented to provide reliable national information on these credentials (pg. 5).”

⁶⁹ More detailed information might include: full-time or part-time employment; number of jobs held; industry type; job title and occupational classification; availability of employer-sponsored health, retirement, or other benefits; occupational licensing status; and subjective factors such as job satisfaction, perceived job security, and perceived opportunities for advancement.

continued their education to earn additional credentials, including bachelor's and graduate degrees.”⁷⁰

10. Propose that data on MnAMP's non-credit certificates, registered apprenticeship and non-registered apprenticeship credentials, and industry-recognized certifications be entered into the [Minnesota Statewide Longitudinal Education Data System \(SLEDS\)](#) and maximize the use of this system and its data tools.⁷¹
11. Continue tracking annual cohorts for such outcome measures as: entered employment rate; employment retention rate; average earnings; attainment of credits toward degrees; attainment of industry-recognized certificates of less than one year; attainment of industry-recognized certificates of more than one year, and graduation rate for degree programs.⁷²
12. Continue to track individual students into the workplace, capturing data not only on completion and transfer rates, but also on employment rates and average earnings by institution, program, and major; and then summarize and give this information on participants' post-program attainment to entering students so they may make informed decisions on which career pathway to enter and which skills employers need and value.

VI. Continue to develop and refine MnAMP's programs by adding new services and interventions that will further help to ensure student success.

13. Continue to collaborate and realize synergies with Minnesota workforce development initiatives, including Minnesota's Pathways 2 Prosperity career pathways initiative that integrates basic skills education and career-specific training for occupations in high-demand industry sectors, the Minnesota State Centers of Excellence that promote connectivity between industry sectors and colleges and universities, and the Governor's Workforce Development Council's [Skills@Work Campaign](#).⁷³
14. Develop additional apprenticeship programs by (1) using labor market data to identify locally in-demand occupations appropriate for apprenticeships, (2) maintaining active engagement with employers, unions, and state and local government workforce offices, and (3) recruiting employers.

VII. Continue to assess the skills gap in advanced manufacturing and use the data obtained through that assessment to continuously modify and improve MnAMP programs.

⁷⁰ Radwin, D. and Horn, L. (2014). *Measuring Workforce Preparation and Employment Outcomes*. Research Triangle Park, NC: RTI Press. Retrieved from <https://www.rti.org/sites/default/files/resources/rti-publication-file-f2f07472-de49-4c0f-abd0-a5b02286da44.pdf>

⁷¹ See the Minnesota Employment and Economic Development website: <https://mn.gov/deed/data/data-tools/>.

⁷² Haskins, R. and Margolis, G. (2014). *Show Me the Evidence: Obama's Fight for Rigor and Results in Social Policy*. Washington, D. C.: Brookings Institution Press.

⁷³ DeRenzis, B. and Wilson, B. (2015). *Skills in the States: Sector Partnership Policy, 50-State Scan*. Washington, DC: National Skills Coalition. Retrieved from <https://www.nationalskillscoalition.org/resources/publications/file/Final-Revised-50-State-Scan-Sector-Partnerships-1.pdf>

15. Assess the skills gap. Count the number of newly-trained workers completing training and compare the annual supply of completers with the number of annual net job openings projected and the skills required for those jobs, in order to determine the aggregate gap between supply and demand, and the extent to which MnAMP's career education and workforce program is meeting labor market demand.

Skills gaps assessments can help answer such questions as: "Do MnAMP career pathway completers have the right skills for available high-skill, high-wage jobs?" and, "How many more skilled workers are needed, and what skills will they need?"

VIII. Research and test technology applications to identify and implement those most likely to support institutional effectiveness and student success.

16. Explore the expanded use of mobile videos by smartphone users as a means of delivering training anywhere, anytime. Cisco predicts mobile video use will increase 9-fold between 2016 and 2021, accounting for 78% of total mobile data traffic.⁷⁴
17. Research and apply the data technologies for understanding local labor markets, identifying skills gaps, and matching people with available jobs developed and offered by [Burning Glass Technologies](#) and [Emsi](#).

5.2 Implications for Future Workforce and Education Research

For the U.S. Department of Labor Grant Programs

1. *Support state departments of unemployment in providing individual-level employment and wage data to institutions and consortia of higher education.*
2. *Include additional outcome and performance measures for future programs.* The performance measures currently used in the APR do not fully measure all appropriate outcomes that might come out of the program. If participants get jobs as a result of being in the program, then those jobs might be considered positive outcomes even if the participants do not complete a college certificate or degree. Similarly, the earning of an outside credential such as the Manufacturing Skill Standards Council (MSSC) credential can be a positive outcome that can supplement a degree or even take the place of an academic certificate.

Many of the LWE participants received jobs right before graduation because they are high-demand jobs. These participants were not counted in the APR as job placements, due to the timing of placement before completion, even though that participant would not have received the job without the training.

⁷⁴ Gibbs, C. (2017, February 7). Mobile video to grow almost 900% by 2021, Cisco predicts. *FierceWireless*. Retrieved from <https://www.fiercewireless.com/wireless/mobile-video-to-grow-almost-900-by-2021-cisco-predicts>

3. ***Allow external evaluators to partner with grant applicants in the design as well as the implementation of the grant project.*** Unlike DOL’s TAACCCT grant program, the National Science Foundation’s Advanced Technological Education grant program recommends engaging an external evaluator in the proposal development process “as a means to improve the quality of data collected and feasibility of conducting the evaluation,” and also recommends that “the evaluator be named in the proposal.” Further, the NSF notes that “if the submitting organization requires evaluation consultants to be selected through a competitive bid process after an award is made, the proposer should note the policy that prohibits noncompetitive selection and describe the procedures that will be used to select an evaluator after the award is made.”⁷⁵

For the States

1. ***Allow institutions and consortia of higher education to gather employment data.*** One weakness of this study was the inability to conduct a rigorous impact analysis of the program on ***employment and wages*** of participants vs. non-MnAMP comparison students. It would be valuable for states to make available individual-level employment and wage data, as this data makes possible the ‘gold standard’ evaluation design for determining the effectiveness of federal and state career education and training grant programs.
2. ***Allow institutions and consortia of higher education to gather education data.*** Another weakness of this study was the inability to conduct a rigorous impact analysis of the program on ***educational outcomes*** of participants vs. non-MnAMP comparison students. It would be valuable for state systems of higher education to allow individual-level student data to be downloaded from the state system’s database and provided to institutions and consortia to support quasi-experimental design and random assignment impact evaluations.
3. ***Support institutions and partnerships with a state policy environment that requires performance outcomes data reporting.*** It would be valuable for state systems of higher education to provide an incentive system to encourage institutions of higher education routinely to collect and report key performance metrics to stakeholders. Ideally, states should provide for an expanded individual-level dataset that would make possible quasi-experimental design and random assignment evaluations.

For Consortia like MnAMP

1. ***Provide in a consortium Memorandum of Understanding for formal centralized grant project authority of the consortium director, including sanctions for member college noncompliance.***
2. ***Empower the consortium director with administrative-level authorization, vs. middle-management level authorization,*** so the director can work with CEOs and CAOs at the

⁷⁵ NSF ATE grant program solicitation: <https://www.nsf.gov/pubs/2018/nsf18571/nsf18571.htm>

member colleges and more readily ensure accountability and compliance, including proper, complete and timely data entry on grant services rendered.

3. ***Budget for data entry staff at each member college as part of the consortium's management budget, and provide for the data entry staff to report directly to the consortium director,*** so that the consortium director can exercise greater control over the grant project's data entry and validation responsibilities.
4. **Establish a policy for a consortium data coordinator to report to a consortium director,** and charge this key central project staff member with overall management responsibility of data collection from all partner institutions and for complete entry of data, data validation, database currency, and federal, consortia, and institutional performance reporting

For Individual Colleges

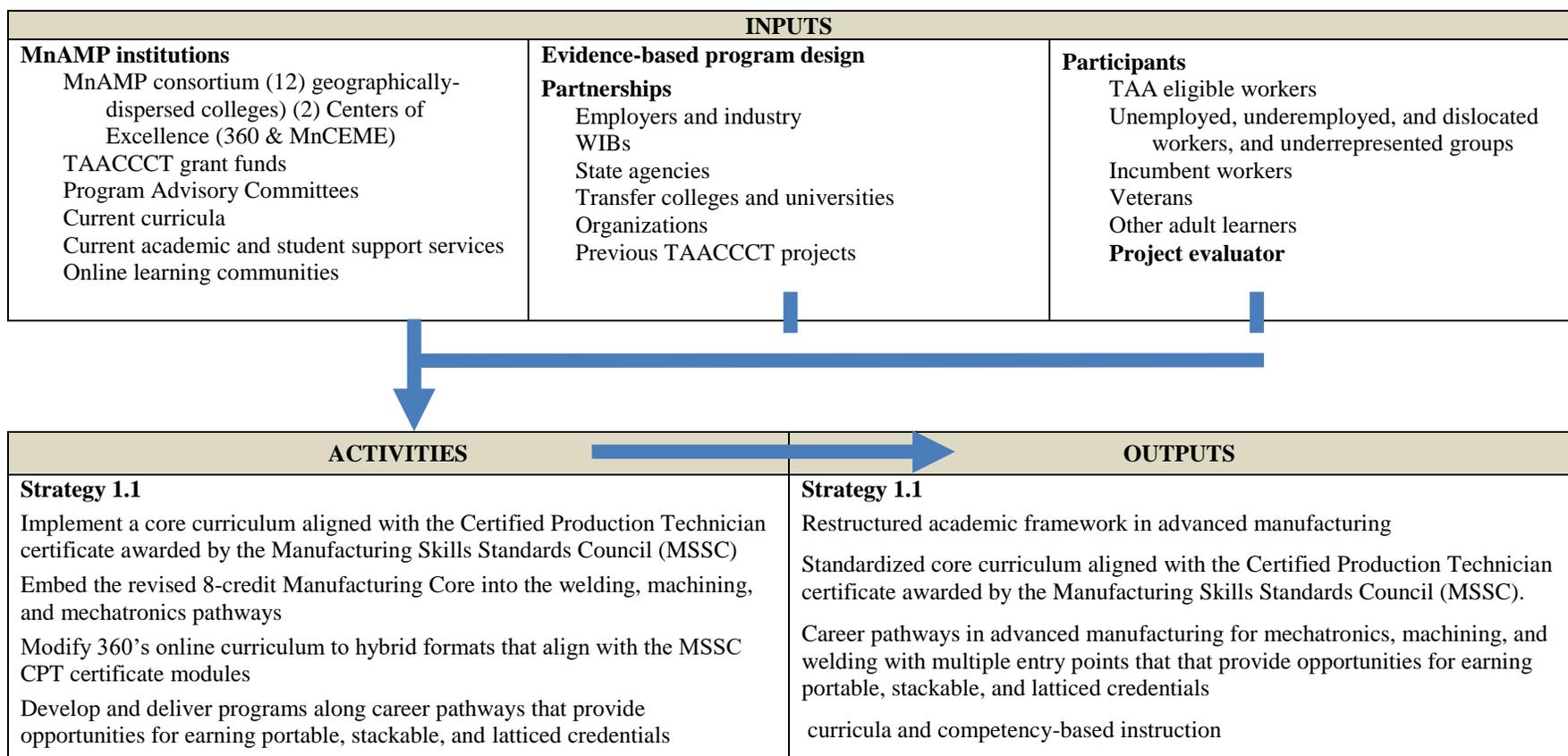
1. ***Use an intake form that provides an opportunity for all entering students to give their consent to the use of their academic and wage and employment data for evaluation purposes.*** This consent would permit use of both participant and comparison group data for quasi-experimental evaluation and impact studies. (See Appendix D for a sample intake form that could be adapted
2. ***Use the college's ERP to collect intake form data and data on program participation, certificate, credential and degree attainment, and support services participation and employment outcomes.*** These data can then be reported out for quasi-experimental design evaluation, data-informed decision-making, and for use in developing predictive analytics.

APPENDICES

Appendix A - Learn Work Earn Logic Model

MnAMP TAACCCTGP PROJECT Learn, Work, Earn Logic Model

Goal Statement: To implement a restructured academic framework in advanced manufacturing that emphasizes a standardized core and employer-driven apprenticeships/Dual Training opportunities, which lead to industry-recognized credentials for Trade Adjustment Assistance (TAA)-eligible and other adult learners seeking employment in high-growth, high-wage occupations.



| ACTIVITIES | OUTPUTS |
|---|---|
| <p>Establish MNAMP colleges as authorized for MSSC certification testing sites</p> <p>Conduct Annual MnAMP Council meetings</p> | <p>Online curriculum in hybrid formats that align with the MSSC CPT certificate modules</p> <p>8-credit Manufacturing Core embedded into the welding, machining, and mechatronics pathways</p> <p>MNAMP colleges authorized as MSSC certification testing sites</p> |
| <p>Strategy 1.2</p> <p>Implement a consistent, competency-based approach to awarding credit for prior learning (CPL) that aligns with national industry standards and includes formal and informal assessments of military, work, and other life experiences</p> <p>Develop a comprehensive personal, academic, and career assessment program</p> <p>Map current MnAMP colleges' CPL systems and policies</p> <p>Develop MnAMP CPL policies and procedures</p> | <p>Strategy 1.2</p> <p>Comprehensive personal, academic, and career assessment</p> <p>System for awarding credit for prior learning</p> <p>Military Occupational Standards/MnAMP programs crosswalk</p> |
| <p>Strategy 1.3</p> <p>Collaborate with MnSCU Centers of Excellence and other four-year institutions to expand/refine articulation agreements and 2+2 degree programs</p> <p>Create seamless transfer options and career pathways to advanced degrees by bridging the gaps between non-credit and credit programming</p> | <p>Strategy 1.3</p> <p>Seamless transfer options and career pathways that bridge gaps between non-credit and credit programming</p> |
| <p>Strategy 2.1</p> <p>Align curriculum in mechatronics, machining, and welding with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS).</p> <p>Map and then align curriculum to industry credentials</p> <p>Provide faculty training for respective NAM credentials</p> | <p>Strategy 2.1</p> <p>Curricula in mechatronics, machining, and welding aligned with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS).</p> <p>Competency-based mechatronics, machining, and welding curricula</p> <p>Faculty trained for respective NAM credentials</p> |
| <p>Strategy 2.2</p> <p>Engage employers, faculty, and other stakeholders in the development of content, coursework, and learning experiences to meet credentialing needs in mechatronics, machining, and welding.</p> <p>Invite employers and industry members to serve on Program Advisory Committees</p> | <p>Strategy 2.2</p> <p>Content, coursework, and learning experiences that meet credentialing needs in mechatronics, machining, and welding</p> <p>Program Advisory Committees with employer and industry representation</p> |
| <p>Strategy 3.1</p> <p>Establish employer-driven apprenticeship and Dual Training programs in mechatronics, machining, and welding</p> | <p>Strategy 3.1</p> <p>Employer-driven apprenticeships and Dual Training opportunities and Coalitions in seven regions</p> |

| ACTIVITIES | OUTPUTS |
|---|---|
| <p>Create a MnAMP Apprenticeship Coalition of employers (sponsors) specifically related to creating apprenticeship programs</p> <p>Create apprenticeship standards in partnership with MNDOLI, the workforce system, and employers</p> <p>Implement apprenticeship and cooperative education cohort programs</p> | <p>MN Statewide Apprenticeship standards and models for fields of mechatronics, machining, and welding</p> <p>Competency-based education standards and models for field of mechatronics, machining, and welding</p> <p>Apprenticeship and cooperative education cohort programs</p> |
| <p>Strategy 3.2</p> <p>Provide professional development opportunities for employers and other stakeholders designed to communicate and instill the value of industry credentialing and curriculum design.</p> <p>Develop and host employer workshops</p> | <p>Strategy 3.2</p> <p>Professional development opportunities for employers and other stakeholders</p> <p>Crosswalk that illustrates the alignment of MnAMP advanced manufacturing programs to the appropriate industry credentials</p> |
| <p>Strategy 3.3</p> <p>Collaborate with national industry partners to enhance the image of manufacturing and raise awareness of available high-wage jobs</p> <p>Create and roll-out outreach campaign to revitalize the manufacturing image statewide</p> | <p>Strategy 3.3</p> <p>An adapted “Dream It. Do It.” campaign for adult populations</p> <p>Consistent outreach strategies and materials for MnAMP colleges – Webpage, social media, hard copy, videos.</p> |
| <p>Strategy 4.1</p> <p>Create and implement a comprehensive enrollment management plan emphasizing intrusive advising and job placement services</p> <p>Use GPS LifePlan with grant participants for career and life planning</p> <p>Provide real time workforce data to students (EMSI)</p> | <p>Strategy 4.1</p> <p>Comprehensive enrollment plan featuring intrusive advising and job placement services</p> <p>Early alert tracking system</p> <p>Enhanced career services and GPS LifePlan</p> <p>Individualized career and personal plans for participants</p> <p>Increased use of MNWorks.net for MnAMP job and apprenticeship postings</p> <p>Real-time demand data for students and Employee Results Scorecard</p> <p>Employment Scorecard</p> |
| <p>Strategy 4.2</p> <p>Integrate education and language services for underrepresented groups to improve basic academic skills</p> <p>Expand Minnesota Pathways to Prosperity (p2p) Adult Career Pathway Program in advanced manufacturing</p> <p>Assess and offer National Career Readiness Certificate (NCRC) assessments &</p> | <p>Strategy 4.2</p> <p>Integrated education and language services for underrepresented groups</p> <p>Expanded p2p “super bridge” program</p> <p>Language Academy curriculum for four populations (Spanish, Somali, Sudanese, Hmong)</p> |

| ACTIVITIES | OUTPUTS |
|---|--|
| training | MN p2p curriculum NCRC assessment pathway to apprenticeships or advanced manufacturing academic pathways |
| Database and Related Services Develop a web-based longitudinal database Develop and provide training on data collection and management | Database and related services Web-based longitudinal database that allows for convenient data collection, storage, tracking, and reporting |
| Technology-enabled Learning Develop technology-enable occupational skill training, including innovative course delivery | Technology-enabled Learning Flipped classrooms Hybrid and online instruction |
| Evaluation Evaluate project implementation and impact | Evaluation Project formative and summative evaluations Project implementation and impact evaluations |



| OUTCOMES | |
|---|---|
| <p>Project Outcome <i>A restructured academic framework in advanced manufacturing emphasizing a standardized core and employer-driven apprenticeships and Dual Training opportunities, leading to industry-recognized credentials for Trade Adjustment Assistance (TAA)-eligible and other adult learners seeking employment in high-growth, high-wage occupations</i></p> <p>DOL Outcomes 3,059 unique participants served/enrolled 1,914 participants complete a TAACCCT-funded program 2,123 participants complete credit hours 2,333 participants earn credentials 485 participants enroll in further education after completion 1,722 participants employed after completion</p> | <p>Continuing Outcomes High quality educational opportunities aligned with industry-recognized credentials in mechatronics, machining, and welding Curricula better aligned with MN workforce needs Consistent core curricula across consortium institutions Increased capacity for training in mechatronics, machining, and welding</p> <p>Reduced gap between competencies and skills taught and those needed by employers Improved apprenticeship and cooperative education programs Expanded opportunities for underrepresented groups Improved Credit for Prior Learning policies and procedures Systemic changes in student services and academic programs</p> |

| OUTCOMES | |
|---|---|
| <p>853 incumbent participants receive post-enrollment wage increase</p> <p>End of Grant Outcomes</p> <p>Increased number of skilled workers in mechatronics, machining, and welding</p> <p>Decreased difficulty in attracting qualified candidates to fill vacancies</p> <p>Increase in the pipeline of learners entering manufacturing careers</p> <p>Increased adult credential attainment</p> <p>Upgraded equipment resources</p> <p>72 MnAMP faculty certified in MSSC standards</p> <p>12 MSSC testing centers located all MnAMP colleges</p> <p>1,900 participants receive a Certified Production Technician certification</p> <p>Six new/revised articulation agreements from MnAMP colleges to four-year manufacturing programs</p> <p>72 MnAMP faculty certified or re-certified in program specific, NAM-endorsed credentials</p> <p>315 apprentices trained during the grant period</p> <p>Language Academy delivered at 12 sites</p> <p>MN p2p offered at 12 sites</p> | <p>Smoother transitions to further learning or employment</p> <p>Participants receive comprehensive assessment, intrusive advising, opportunities for credit for prior learning, instruction in selected career field, career counseling, and job search assistance.</p> <p>Value of industry credentialing and curriculum design instilled in employers and other stakeholders</p> <p>Enhanced image of manufacturing and raised awareness of available high-wage jobs</p> <p>Availability of a web-based longitudinal database to support data-driven decision-making</p> <p>Established partnerships among MnAMP colleges and other grant partners</p> <p>Increased knowledge sharing and communication among consortium members</p> <p>Continuous improvement strategies to effectively serve adult learners</p> |

BASELINE CONDITIONS AND RELATED OUTCOMES

| BASELINE CONDITIONS | RELATED OUTCOMES |
|---|---|
| High quality educational opportunities not aligned with industry-recognized credentials in mechatronics, machining, and welding | High quality educational opportunities aligned with industry-recognized credentials in mechatronics, machining, and welding |
| Curricula not well aligned with MN workforce needs | Curricula better aligned with MN workforce needs |
| Core curricula not consistent across consortium institutions | Consistent standardized core curricula across consortium institutions |

| BASELINE CONDITIONS | RELATED OUTCOMES |
|---|---|
| Limited Increased capacity for training in mechatronics, machining, and welding | Increased capacity for training in mechatronics, machining, and welding |
| Large gap between competencies and skills taught and those needed by employers | Reduced gap between competencies and skills taught and those needed by employers |
| Limited apprenticeship and dual training programs | Improved apprenticeship and dual training programs |
| Limited opportunities for underrepresented groups | Expanded opportunities for underrepresented groups |
| Limited Credit for Prior Learning policies and procedures | Improved Credit for Prior Learning policies and procedures |
| No systemic changes in student services and academic programs | Systemic changes in student services and academic programs |
| Limited Smooth transitions to further learning or employment | Smoother transitions to further learning or employment |
| Participants receive limited comprehensive assessment, intrusive advising, opportunities for credit for prior learning, instruction in selected career field, career counseling, and job search assistance. | Participants receive comprehensive assessment, intrusive advising, opportunities for credit for prior learning, instruction in selected career field, career counseling, and job search assistance. |
| Value of industry credentialing and curriculum design limited in mind of employers and other stakeholders | Value of industry credentialing and curriculum design instilled in employers and other stakeholders |
| Tarnished image of manufacturing and low awareness of available high-wage jobs | Enhanced image of manufacturing and raised awareness of available high-wage jobs |
| No web-based longitudinal database to support data-driven decision-making | Availability of a web-based longitudinal database to support data-driven decision-making |
| Informal partnerships among MnAMP colleges and other grant partners | Established partnerships among MnAMP colleges and other grant partners |
| Minimal knowledge sharing and communication among consortium members | Increased knowledge sharing and communication among consortium members |
| Sporadic continuous improvement strategies to effectively serve adult learners | Continuous improvement strategies to effectively serve adult learners |

Appendix B – Information on MnAMP Participants

| Table 17: MnAMP Participants by Gender | | | | | | | | | | |
|---|---------------|----------|---------------|----------|---------------|----------|---------------|----------|--------------|----------|
| Gender | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Male | 387 | 95.6% | 916 | 90.0% | 1,367 | 88.2% | 186 | 87.7% | 2,856 | 89.7% |
| Female | 18 | 4.4% | 102 | 10.0% | 182 | 11.3% | 26 | 12.3% | 328 | 10.3% |
| Consortium Total | 405 | 100% | 1,018 | 100% | 1,549 | 100% | 212 | 100% | 3,184 | 100% |

Source: LWE database APR report – September 10, 2018.

| Table 18: Enrollment in MnAMP by Ethnicity/Race | | | | | | | | | | |
|--|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|--------------|--------------|
| Ethnicity/Race | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Hispanic/Latino | 40 | 10.1% | 91 | 9.0% | 104 | 6.8% | 9 | 4.3% | 244 | 7.8% |
| American Indian or Alaskan Native | 7 | 1.8% | 15 | 1.5% | 20 | 1.3% | 13 | 6.3% | 55 | 1.8% |
| Asian | 34 | 8.5% | 53 | 5.2% | 102 | 6.7% | 17 | 8.2% | 206 | 6.6% |
| Black or African American | 25 | 6.3% | 65 | 6.4% | 102 | 6.7% | 12 | 5.8% | 204 | 6.5% |
| Native Hawaiian or Other Pacific Islander | 0 | 0.0% | 2 | 0.2% | 2 | 0.1% | 1 | 0.5% | 5 | 0.2% |
| White | 281 | 70.6% | 768 | 75.8% | 1,147 | 75.3% | 153 | 73.6% | 2,349 | 74.8% |
| More Than One Race and Other | 11 | 2.8% | 19 | 1.9% | 46 | 3.0% | 3 | 1.4% | 79 | 2.5% |
| Consortium Total | 398 | 98.3% | 1,013 | 99.5% | 1,523 | 98.3% | 208 | 98.1% | 3,142 | 98.7% |

Source: LWE database – September 14, 2018. Not all participants reported race or ethnicity. Percentages for each category for each year are based on those who did report race and/or ethnicity. Consortium Total shows number reporting for each year and the percentage that number is of the total participants for that year. Year 1, n=398; Year 2, n=1,013; Year 3, n=1,523; Year 4, n=208. Years 1-4, n= 3,142

| Table 19: Enrollment in MnAMP by Participant Characteristics | | | | | | | | | | |
|---|---------------|----------|---------------|----------|---------------|----------|---------------|----------|--------------|----------|
| Characteristic | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Displaced Worker | 111 | 27.4% | 155 | 15.2% | 154 | 9.9% | 33 | 15.6% | 453 | 14.2% |
| Incumbent Worker | 273 | 67.4% | 710 | 69.7% | 1,249 | 80.6% | 149 | 70.3% | 2,381 | 74.8% |
| Locally Eligible | 91 | 22.5% | 148 | 14.5% | 114 | 7.4% | 11 | 5.2% | 364 | 11.4% |
| Non-TAA Eligible | 11 | 2.7% | 46 | 4.5% | 20 | 1.3% | 0 | 0.0% | 77 | 2.4% |
| Other Eligible | 199 | 49.1% | 280 | 27.5% | 325 | 21.0% | 58 | 27.4% | 862 | 27.1% |
| Eligible Veteran's Spouse | 1 | 0.2% | 3 | 0.3% | 24 | 1.5% | 1 | 0.5% | 29 | 0.9% |
| TAA Eligible | 5 | 1.2% | 6 | 0.6% | 12 | 0.8% | 3 | 1.4% | 26 | 0.8% |
| Veteran | 27 | 6.7% | 67 | 6.6% | 106 | 6.8% | 15 | 7.1% | 215 | 6.8% |
| WIA | 5 | 1.2% | 10 | 1.0% | 9 | 0.6% | 2 | 0.9% | 26 | 0.8% |
| Pell Grant Eligible | 175 | 43.2% | 323 | 31.7% | 336 | 21.7% | 30 | 14.2% | 864 | 27.1% |
| Person with a Disability | 35 | 8.6% | 64 | 6.3% | 97 | 6.3% | 20 | 9.4% | 216 | 6.8% |

Source: LWE database – September 19, 2018. Participants may have reported more than one characteristic. Percentages for each category for each year are based on those who did report data for that category. Year 1 – n=404; Year 2 – n=1,019; Year 3 – n=1,549; Year 4 – n=212; All four years combined – n=3,184.

| Table 20: MnAMP Participant Personal Information | | | | | | | | | | |
|---|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|--------------|-------------|
| Characteristic | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Single | 323 | 80.0% | 697 | 69.2% | 1,003 | 65.7% | 128 | 61.2% | 2,151 | 68.4% |
| Married | 71 | 17.6% | 259 | 25.7% | 417 | 27.3% | 59 | 28.2% | 806 | 25.6% |
| Separated | 7 | 1.7% | 9 | 0.9% | 19 | 1.2% | 3 | 1.4% | 38 | 1.2% |
| Divorced | 3 | 0.7% | 38 | 3.8% | 81 | 5.3% | 17 | 8.1% | 139 | 4.4% |
| Widowed | 0 | 0.0% | 4 | 0.4% | 7 | 0.5% | 2 | 1.0% | 13 | 0.4% |
| Has children | 101 | 25.0% | 403 | 40.0% | 608 | 39.8% | 105 | 50.2% | 1,217 | 38.7% |
| No response | 1 | 0.2% | 11 | 1.1% | 22 | 1.4% | 3 | 1.4% | 37 | 1.2% |
| Consortium Totals | 405 | 100% | 1,018 | 100% | 1,549 | 100% | 212 | 100% | 3,184 | 100% |

Source: LWE database – September 19, 2018. Not all participants reported personal information. Percentages are based on the number for each characteristic for the consortium for each year. Year 1 – n=405; Year 2 – n=1,018; Year 3 – n=1,549; Year 4 – n=212; All four years combined – n=3,184.

| Table 21: Annual Gross Income at Time of Enrollment | | | | | | | | | |
|--|----------|----------------------------|----------|----------------------------|----------|----------------------------|----------|---------------------------|----------|
| \$0 - \$14,999 | | \$15,000 - \$34,999 | | \$35,000 - \$54,999 | | \$55,000 - \$74,999 | | \$75,000 and above | |
| No. | % | No. | % | No. | % | No. | % | No. | % |
| 714 | 27.1% | 622 | 23.6% | 560 | 21.2% | 351 | 13.3% | 389 | 14.8% |

Source: LWE database – August 26, 2018. Percentages are based on 2,636 participants reporting income.

| Table 22: Enrollment in MnAMP by Attendance | | | | | | | | | | |
|--|---------------|----------|---------------|----------|---------------|----------|---------------|----------|--------------|----------|
| Attendance | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Full-Time | 318 | 78.7% | 577 | 56.6% | 671 | 43.3% | 85 | 40.7% | 1,651 | 51.9% |
| Part-Time | 86 | 21.3% | 442 | 43.4% | 877 | 56.7% | 124 | 59.3% | 1,529 | 48.1% |
| Unknown or not reported | 0 | 0.0% | 0 | 0.0% | 1 | 0.1% | 3 | 1.4% | 4 | 0.1% |
| Consortium Total Reported | 404 | 100% | 1019 | 100% | 1,548 | 100% | 209 | 100% | 3,180 | 100% |

Source: LWE database – September 19, 2018. Percentages based on number reporting Attendance.

| Table 23: Employment Status upon Entry into MnAMP | | | | | | | | | | |
|--|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|--------------|-------------|
| Employment | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Employed Full-Time (30 hrs./wk. or more) | 135 | 33.4% | 475 | 46.6% | 855 | 55.2% | 111 | 52.4% | 1,576 | 49.5% |
| Employed Part-Time Less than 30 hrs./wk. | 115 | 28.5% | 215 | 21.1% | 343 | 22.1% | 35 | 16.5% | 708 | 22.2% |
| Laid-off or Furloughed | 11 | 2.7% | 27 | 2.6% | 23 | 1.5% | 7 | 3.3% | 68 | 2.1% |
| Unemployed | 121 | 30.0% | 281 | 27.6% | 277 | 17.9% | 56 | 26.4% | 735 | 23.1% |
| Employed and Received Termination Notice | 0 | 0.0% | 5 | 0.5% | 12 | 0.8% | 1 | 0.5% | 18 | 0.6% |
| Self-Employed | 22 | 5.4% | 16 | 1.6% | 39 | 2.5% | 2 | 0.9% | 79 | 2.5% |
| Consortium Total | 404 | 100% | 1,019 | 100% | 1,549 | 100% | 212 | 100% | 3,184 | 100% |

Source: LWE Database - September 24, 2018.

| Table 24: Education Level upon Entry into MnAMP | | | | | | | | | | |
|--|---------------|----------|---------------|----------|---------------|----------|---------------|----------|--------------|----------|
| Education Level | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Eighth Grade or Less | 0 | 0.0% | 2 | 0.2% | 3 | 0.2% | 1 | 0.5% | 6 | 0.2% |
| Some High School | 14 | 3.6% | 34 | 3.5% | 55 | 3.7% | 8 | 4.0% | 111 | 3.6% |
| High School Diploma | 193 | 49.4% | 403 | 41.0% | 570 | 38.2% | 64 | 32.3% | 1,261 | 40.7% |
| GED | 38 | 9.7% | 97 | 9.9% | 105 | 7.0% | 19 | 9.6% | 259 | 8.4% |
| Some College | 97 | 24.8% | 235 | 23.9% | 373 | 25.0% | 61 | 30.8% | 766 | 24.8% |
| Certificate(s) | 12 | 3.1% | 67 | 6.8% | 100 | 6.7% | 10 | 5.1% | 189 | 6.1% |
| Two-Year Degree | 25 | 6.4% | 98 | 10.0% | 190 | 12.7% | 18 | 9.1% | 331 | 10.7% |
| Four-Year Degree | 10 | 2.6% | 29 | 3.0% | 74 | 5.0% | 12 | 6.1% | 125 | 4.0% |
| Graduate School | 2 | 0.5% | 17 | 1.7% | 23 | 1.5% | 5 | 2.5% | 47 | 1.5% |
| Consortium Total | 391 | 100% | 982 | 100% | 1,493 | 100% | 198 | 100% | 3,095 | 100% |

Source: LWE Database – September 24, 2018. Data not reported for all participants. Percentages based on number reporting entering educational level.

| Table 25: MnAMP Dual Training and Apprenticeships | | | | |
|--|---------------------------|--|------------------------|------------------|
| College | Dual Training (DT) | Registered Apprenticeships (RA) | Total DT and RA | Companies |
| Lake Superior College | 97 | 0 | 97 | 5 |
| Minneapolis Comm. & Tech. College | 10 | 0 | 10 | 10 |
| MN West Comm. & Tech. College | 56 | 17 | 73 | 8 |
| Northland Comm. & Tech. College | 6 | 0 | 6 | 5 |
| Riverland College- | 11 | 0 | 11 | 2 |
| Saint Paul College | 0 | 2 | 2 | 2 |
| South Central College | 33 | 89 | 122 | 21 |
| Consortium Total | 213 | 108 | 321 | 53 |

Source: MnAMP Project Director – September 10, 2018

Table 26: Initial Program of Study upon Enrollment

| College | Mechatronics | | Machining | | Welding | | Mfg. Core (CMAE) | | Custom Training | | Other | |
|-----------------------------------|--------------|-------|-----------|-------|---------|--------|------------------|------|-----------------|-------|-------|-------|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Century College | 25 | 24.0% | 0 | 0.0% | 46 | 44.2% | 4 | 3.8% | 28 | 26.9% | 1 | 1.0% |
| Dakota County Tech College | 78 | 38.2% | 0 | 0.0% | 126 | 61.8% | | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Lake Superior College | 0 | 0.0% | 35 | 17.1% | 71 | 34.6% | 2 | 1.0% | 96 | 46.8% | 1 | 0.5% |
| Minneapolis Comm. & Tech. College | 0 | 0.0% | 27 | 26.0% | 56 | 53.8% | 4 | 3.8% | 6 | 5.8% | 11 | 10.6% |
| MN State Comm. & Tech. College | 0 | 0.0% | 0 | 0.0% | 151 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| MN West Comm. & Tech. College | 82 | 35.7% | 18 | 7.8% | 122 | 53.0% | 3 | 1.3% | 2 | 0.9% | 3 | 1.3% |
| Normandale College | 1 | 1.4% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 50 | 69.4% | 21 | 29.2% |
| Ridgewater College | 24 | 28.2% | 0 | 0.0% | 30 | 35.3% | | 0.0% | 31 | 36.5% | 0 | 0.0% |
| Northland Comm. & Tech. College | 55 | 14.4% | 59 | 15.5% | 163 | 42.8% | 21 | 5.5% | 83 | 21.8% | 0 | 0.0% |
| Riverland Comm. College | 23 | 20.4% | 26 | 23.0% | 39 | 34.5% | 7 | 6.2% | 16 | 14.2% | 2 | 1.8% |
| Saint Paul College | 10 | 2.0% | 168 | 34.2% | 154 | 31.4% | 7 | 1.4% | 7 | 1.4% | 145 | 29.5% |

| Table 26: Initial Program of Study upon Enrollment | | | | | | | | | | | | |
|--|--------------|-------|-----------|-------|---------|-------|------------------|------|-----------------|-------|-------|------|
| College | Mechatronics | | Machining | | Welding | | Mfg. Core (CMAE) | | Custom Training | | Other | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| South Central College | 189 | 18.7% | 97 | 9.6% | 172 | 17.0% | 19 | 1.9% | 530 | 52.4% | 4 | 0.4% |
| Consortium Total | 487 | 15.5% | 430 | 13.6% | 1,130 | 35.9% | 67 | 2.1% | 849 | 26.9% | 188 | 6.0% |

Source: LWE Database - September 2, 2018. Data not reported for all participants. Percentages based on number reporting initial program of study for each program. n=3,151.

| Table 27: Barriers to Education | |
|--|------------|
| Barrier | No. |
| Disability | 163 |
| Limited English | 48 |
| Transportation | 168 |
| Family Responsibilities | 238 |
| Employment Schedule | 329 |
| Financial | 401 |
| Out of School (15 years or more) | 245 |
| Other | 89 |

Source: LWE Database as of August 26, 2018

| Table 28: Education or Training Goal | | |
|---|------------|----------|
| Goal | No. | % |
| Certificate/Credential (One Year or Less) | 1,343 | 46.2% |
| Certificate/Credential (One to Two Years) | 829 | 28.5% |
| Two-Year Degree | 683 | 23.5% |
| Industry-Recognized Credential | | 0.00% |
| Other | 52 | 1.8% |
| No response | 277 | 8.7% |

Source: LWE Database - August 26, 2018

| Table 29: Reason for Leaving | | |
|--|------------|----------|
| Reason | No. | % |
| Alternative Completion | 38 | 1.4% |
| Earned Credentials-One Year or Less | 1,184 | 44.1% |
| Earned Credentials- More than One Year | 350 | 13.0% |
| Illness | 3 | 0.1% |
| Non-job Related Injury | 2 | 0.1% |
| Job-related Injury | 0 | 0.0% |
| Death | 2 | 0.1% |
| Financial | 24 | 0.9% |
| Work Requirements | 22 | 0.8% |
| Family Obligations | 10 | 0.4% |
| Moved Out of Area | 8 | 0.3% |
| Academic Dismissal | 83 | 3.1% |
| Discipline Dismissal | 1 | 0.0% |
| Entered Other Grant Funded Program | 132 | 4.9% |
| Entered Non-grant Funded Program | 52 | 1.9% |
| Entered Employment Full-time | 27 | 1.0% |
| Entered Employment Part-time | 0 | 0.0% |
| Pursuing Further Education | 213 | 7.9% |
| Non-credit Lack of participation 6 Months | 340 | 12.7% |
| For Credit Lack of Participation 12 Months | 193 | 7.2% |

Source: LWE Database as of September 12, 2018. Data not reported for all participants. Percentages based on number reporting each reason for leaving. n=2,684.

| Table 30: DOL Outcomes 3 and 5 Detail | | | | | |
|---|---------------|---------------|---------------|---------------|--------------|
| Outcome* | Year 1 | Year 2 | Year 3 | Year 4 | Total |
| Outcome 5 - Certificate (1 year or less) | 13 | 161 | 242 | 77 | 493 |
| Outcome 5 - Certificate (1-2 years) | 1 | 87 | 226 | 55 | 369 |
| Outcome 5 - Degree | 0 | 34 | 94 | 23 | 151 |
| Outcome 5 - Industry Recognized Credential | 39 | 259 | 247 | 126 | 671 |
| Outcome 3 – Retained in Program of Study | 355 | 697 | 950 | 3 | 2,005 |
| * For Outcome 5, this table counts the number of credentials earned in each category. | | | | | |

Source: LWE Database as of September 19, 2018

| Table 31: Participants – By Member College as Percentage of All Participants as of the End of Year 4 | | | | | | |
|---|---------------------|---------------|---------------|---------------|--------------|-------------------------------|
| College | Participants | | | | | Percent of MnAMP Total |
| | Year 1 | Year 2 | Year 3 | Year 4 | Total | |
| Century | 6 | 20 | 77 | 0 | 103 | 3.23% |
| DCTC | 2 | 62 | 140 | 0 | 204 | 6.41% |
| LSC | 4 | 88 | 104 | 10 | 206 | 6.47% |
| MCTC | 38 | 30 | 30 | 6 | 104 | 3.27% |
| MN State | 20 | 105 | 100 | 4 | 229 | 7.19% |
| MN West | 2 | 33 | 76 | 41 | 152 | 4.77% |
| Normandale | 0 | 5 | 56 | 10 | 71 | 2.23% |
| Northland | 0 | 65 | 52 | 0 | 117 | 3.67% |
| Ridgewater | 88 | 148 | 103 | 42 | 381 | 11.97% |
| Riverland | 48 | 18 | 47 | 0 | 113 | 3.55% |
| SPC | 48 | 159 | 255 | 29 | 491 | 15.42% |
| SCC | 149 | 285 | 509 | 70 | 1,013 | 31.82% |
| Consortium Total | 405 | 1,018 | 1,549 | 212 | 3,184 | 100% |

Source: LWE Database – September 19, 2018

| Table 32: Participants – Ethnicity as of the End of Year 4 | | | | |
|---|-------------------------------|-------------------|---------------------------|-------------------|
| College | Not Hispanic or Latino | | Hispanic or Latino | |
| | Number | % of Total | Number | % of Total |
| Century | 94 | 93.1% | 7 | 6.9% |
| DCTC | 198 | 97.5% | 5 | 2.5% |
| LSC | 189 | 98.4% | 3 | 1.6% |
| MCTC | 93 | 90.3% | 10 | 9.7% |
| MN West | 160 | 70.2% | 68 | 29.8% |
| MN State | 146 | 96.7% | 5 | 3.3% |
| Normandale | 64 | 90.1% | 7 | 9.9% |
| Northland | 108 | 94.7% | 6 | 5.3% |
| Ridgewater | 342 | 91.4% | 32 | 8.6% |
| Riverland | 102 | 92.7% | 8 | 7.3% |
| SPC | 470 | 97.1% | 14 | 2.9% |
| SCC | 932 | 92.2% | 79 | 7.8% |
| Consortium Total | 2,898 | 92.2% | 244 | 7.8% |

Source: LWE Database – September 19, 2018. Percentages based on the number reporting ethnicity at each college.

| Table 33: Participants – Race as of the End of Year 4 by College | | | | | | | | |
|---|---------------|-------------------|-------------------------------|-------------------|---------------|-------------------|---------------|-------------------|
| College | White | | Black/African American | | Asian | | Other | |
| | Number | % of Total | Number | % of Total | Number | % of Total | Number | % of Total |
| Century | 65 | 64.4% | 11 | 10.9% | 13 | 12.9% | 5 | 5.0% |
| DCTC | 185 | 91.1% | 0 | 0.0% | 3 | 1.5% | 10 | 4.9% |
| LSC | 175 | 91.1% | 2 | 1.0% | 4 | 2.1% | 8 | 4.2% |
| MCTC | 64 | 62.1% | 19 | 18.4% | 3 | 2.9% | 7 | 6.8% |
| MN West | 135 | 59.2% | 14 | 6.1% | 5 | 2.2% | 6 | 2.6% |
| MN State | 93 | 61.6% | 21 | 13.9% | 2 | 1.3% | 30 | 19.9% |
| Normandale | 27 | 38.0% | 20 | 28.2% | 13 | 18.3% | 4 | 5.6% |
| Northland | 94 | 82.5% | 4 | 3.5% | 5 | 4.4% | 5 | 4.4% |
| Ridgewater | 323 | 86.4% | 12 | 3.2% | 0 | 0.0% | 7 | 1.9% |
| Riverland | 96 | 87.3% | 4 | 3.6% | 1 | 0.9% | 1 | 0.9% |
| SPC | 251 | 51.9% | 54 | 11.2% | 132 | 27.3% | 33 | 6.8% |
| SCC | 841 | 83.2% | 43 | 4.3% | 25 | 2.5% | 23 | 2.3% |
| Consortium Total | 2,349 | 74.8% | 204 | 6.5% | 206 | 6.6% | 139 | 4.4% |

Source: LWE Database – September 19, 2018. Data not reported for all participants. Percent based on total reporting race and ethnicity for each college.

Table 34: Completion of Credentials as of the End of Year 4

| College | Completed an Academic Credential. Participants counted once for each type, regardless of number of credentials of that type earned | | | | | Completed an Industry-Recognized Credential. Participants counted once regardless of number of credentials earned | | Total Participants |
|------------------|--|------------------------|--------|------------------|--------------|---|--------|--------------------|
| | Certificate: 1 year or less | Certificate: 1-2 years | Degree | Total Completing | % Completing | No. | % | |
| Century | 5 | 0 | 0 | 5 | 4.9% | 41 | 39.81% | 103 |
| DCTC | 0 | 53 | 16 | 69 | 33.8% | | 0.00% | 204 |
| LSC | 5 | 12 | 11 | 28 | 13.6% | 4 | 1.94% | 206 |
| MCTC | 14 | 13 | 10 | 37 | 35.6% | 0 | 0.00% | 104 |
| MN West | 106 | 29 | 11 | 146 | 96.1% | 47 | 30.92% | 152 |
| MN State | 96 | 0 | 0 | 96 | 41.9% | 91 | 39.74% | 229 |
| Normandale | 4 | 1 | 5 | 10 | 14.1% | 8 | 11.27% | 71 |
| Northland | 16 | 18 | 10 | 44 | 37.6% | 6 | 5.13% | 117 |
| Ridgewater | 9 | 81 | 20 | 110 | 28.9% | 49 | 12.86% | 381 |
| Riverland | 26 | 22 | 0 | 48 | 42.5% | 32 | 28.32% | 113 |
| SPC | 12 | 116 | 14 | 142 | 28.9% | 91 | 18.53% | 491 |
| SCC | 177 | 19 | 54 | 250 | 24.7% | 197 | 19.45% | 1,013 |
| Consortium Total | 470 | 364 | 151 | 985 | 30.9% | 566 | 17.78% | 3,184 |

Source: LWE Database as of September 23, 2018

| Table 35: Participant Characteristics upon Program Entry – Four Year Data by College | | | | | | | |
|---|--------------------|----------------------|-----------------|------------------|---------------------------|-----------------------------|------------------------|
| College | Average Age | % 25 or older | % Female | % Veteran | % Incumbent Worker | % Enrolled Full-Time | % Pell-eligible |
| Century | 33 | 68.9% | 10.7% | 3.9% | 62.1% | 22.3% | 19.4% |
| DCTC | 23.6 | 27.0% | 7.8% | 7.4% | 83.8% | 99.5% | 27.9% |
| LSC | 36.6 | 68.9% | 6.8% | 8.3% | 76.7% | 46.6% | 29.1% |
| MCTC | 32 | 67.3% | 4.8% | 4.8% | 58.7% | 69.2% | 51.9% |
| MN West | 31.9 | 66.4% | 8.7% | 6.1% | 65.1% | 52.4% | 6.6% |
| MN State | 38.7 | 92.8% | 17.1% | 7.2% | 63.2% | 0.0% | 0.0% |
| Normandale | 34.6 | 80.3% | 18.3% | 7.0% | 95.8% | 5.6% | 4.2% |
| Northland | 30.4 | 57.3% | 22.2% | 6.8% | 83.8% | 52.1% | 72.7% |
| Ridgewater | 27.4 | 44.9% | 5.8% | 6.8% | 70.9% | 67.7% | 30.2% |
| Riverland | 31.2 | 52.2% | 9.7% | 5.3% | 79.7% | 85.8% | 36.3% |
| SPC | 30.2 | 62.5% | 9.8% | 5.3% | 60.3% | 80.5% | 44.2% |
| SCC | 34.7 | 72.5% | 11.5% | 7.7% | 84.9% | 31.8% | 19.5% |
| Consortium Total | 32.01 | 63.6% | 10.3% | 6.8% | 74.8% | 51.9% | 27.1% |

Source: LWE Database – September 2, 2018

Table 36a: APR Outcomes – Cumulative Numbers by College as of End of Year 4

| Outcome Number | Outcome | Century | DCTC | LSC |
|-----------------------|--|----------------|-------------|------------|
| 1 | Total unique participants served/enrolled | 1,03 | 204 | 206 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 44 | 69 | 29 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 29 | 58 | 16 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 18 | 199 | 131 |
| 4 | Total number of participants retained in other programs | 0 | 0 | 0 |
| 5 | Total number of grant-funded credit hours completed | 330 | 5,877 | 2,917 |
| 5a | Total number of participants completing credit hours | 92 | 254 | 128 |
| 6 | Total number of earned certificates/degrees | 58 | 69 | 32 |
| 6a | Total number of participants earning certificates (1 year or less) | 44 | 0 | 9 |
| 6b | Total number of participants earning certificates (more than 1 year) | 1 | 53 | 12 |
| 6c | Total number of participants earning degrees | 0 | 16 | 11 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 5 | 0 | 1 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 12 | 2 | 8 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 12 | 2 | 8 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 42 | 139 | 118 |

Source: LWE APR – September 13, 2018.

Table 36b: APR Outcomes – Cumulative Numbers as of End of Year 4

| Outcome Number | Outcome | MCTC | MN West | MN State |
|-----------------------|--|-------------|----------------|-----------------|
| 1 | Total unique participants served/enrolled | 104 | 229 | 152 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 32 | 146 | 125 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 18 | 88 | 83 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 93 | 134 | 3 |
| 4 | Total number of participants retained in other programs | 5 | 1 | 0 |
| 5 | Total number of grant-funded credit hours completed | 2,025 | 4,734 | 0 |
| 5a | Total number of participants completing credit hours | 135 | 294 | 115 |
| 6 | Total number of earned certificates/degrees | 37 | 194 | 187 |
| 6a | Total number of participants earning certificates (1 year or less) | 14 | 112 | 125 |
| 6b | Total number of participants earning certificates (more than 1 year) | 13 | 31 | 0 |
| 6c | Total number of participants earning degrees | 10 | 11 | 0 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 5 | 11 | 1 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 11 | 28 | 16 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 11 | 28 | 12 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 61 | 138 | 44 |

Source: LWE APR – September 13, 2018.

Table 36c: APR Outcomes – Cumulative Numbers as of End of Year 4

| Outcome Number | Outcome | Norman- dale | North- land | Ridge- water |
|-----------------------|--|-------------------------|------------------------|-------------------------|
| 1 | Total unique participants served/enrolled | 71 | 117 | 381 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 16 | 45 | 150 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 14 | 34 | 95 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 14 | 101 | 300 |
| 4 | Total number of participants retained in other programs | 0 | 0 | 0 |
| 5 | Total number of grant-funded credit hours completed | 138 | 1,664 | 8,590 |
| 5a | Total number of participants completing credit hours | 16 | 124 | 473 |
| 6 | Total number of earned certificates/degrees | 18 | 58 | 163 |
| 6a | Total number of participants earning certificates (1 year or less) | 12 | 22 | 58 |
| 6b | Total number of participants earning certificates (more than 1 year) | 1 | 18 | 85 |
| 6c | Total number of participants earning degrees | 5 | 10 | 20 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 0 | 4 | 18 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 1 | 4 | 27 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 1 | 4 | 26 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 35 | 66 | 218 |

Source: LWE APR – September 13, 2018.

Table 36d: APR Outcomes – Cumulative Numbers as of End of Year 4

| Outcome Number | Outcome | River-land | SPC | SCC |
|-----------------------|--|-------------------|------------|------------|
| 1 | Total unique participants served/enrolled | 113 | 491 | 1,013 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 62 | 177 | 371 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 45 | 105 | 285 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 106 | 354 | 552 |
| 4 | Total number of participants completing credit hours | 2 | 0 | 3 |
| 5 | Total number of grant-funded credit hours completed | 3,057 | 10,289 | 9,789 |
| 5a | Total number of participants completing credit hours | 139 | 490 | 1,077 |
| 6 | Total number of earned certificates/degrees | 94 | 278 | 496 |
| 6a | Total number of participants earning certificates (1 year or less) | 59 | 121 | 348 |
| 6b | Total number of participants earning certificates (more than 1 year) | 23 | 116 | 20 |
| 6c | Total number of participants earning degrees | 0 | 14 | 54 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 10 | 8 | 60 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 10 | 31 | 44 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 10 | 29 | 41 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 113 | 202 | 831 |

Source: LWE APR – September 13, 2018.

Table 37: Supporting Services Used by Students as of the End of Year 4

| College | Academic Student Support Services (all types) | Wrap-around services (all types) | Financial Aid | Job Placement | Resume | Interview | Career Counseling | GPS Lifeline | Other |
|------------------|--|---|----------------------|----------------------|---------------|------------------|--------------------------|---------------------|--------------|
| Century | 15 | | | | | | 1 | | 54 |
| DCTC | 29 | | 10 | | 30 | 27 | | | |
| LSC | 170 | 56 | 22 | 3 | | | 2 | 1 | 34 |
| MCTC | 1,103 | 117 | 128 | 53 | 11 | 17 | 644 | | 3 |
| MN West | 163 | 89 | 3 | 8 | 1 | | 8 | | 181 |
| MN State | 20 | 2 | | | | | | | 41 |
| Normandale | 10 | 2 | | | | | | | |
| Northland | 139 | | | | | | | | |
| Ridgewater | 36 | 37 | | 8 | 4 | 1 | 41 | 2 | 249 |
| Riverland | | | | | | | | | |
| SPC | 309 | 2 | 1 | 10 | 4 | | 19 | | 159 |
| SCC | 4,036 | 54 | 42 | | | 3 | 173 | | 346 |
| Consortium Total | 6,030 | 359 | 206 | 82 | 50 | 48 | 888 | 3 | 1,067 |

Source: LWE Database – August 26, 2018

| Table 38 Year 4 Projected and Actual Outcomes and Combined Years 1 - 4 Projected and Actual Outcomes⁷⁶ | | | | | | |
|--|--|---------------|---------------|-----------------------------|---------------|-------------------|
| Outcome Measures | | Year 4 | | Years 1 - 4 Combined | | |
| | | Proj. | Actual | Proj. | Actual | % of Proj. |
| 1 | Unique Participants Served/Enrollees | 0 | 212 | 3,050 | 3,184 | 104.4% |
| 2 | Total Number Who Have Completed a Grant-Funded Program of Study | 0 | 211 | 1914 | 1,266 | 66.1% |
| 2a | Total Number of Grant-Funded Program of Study Completers Who Are Incumbent | N/A | 150 | N/A | 870 | N/A |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program | 0 | 3 | 1,280 | 2,005* | 156.6% |
| 4 | Total Number Retained in Other Education Program(s) | N/A | 1 | N/A | 11 | N/A |
| 5 | Total Number of Credit Hours Completed (aggregate across all enrollees) | N/A | 11,398 | N/A | 49,410 | N/A |
| 5a | Total Number of Participants Completing Credit Hours | 0 | 980 | 2,123 | 3,337** | 157.2% |
| 6 | Total Number of Earned Credentials (aggregate across all enrollees) | N/A | 281 | N/A | 1,684 | NA |
| 6a | Total Number of Participants Earning Certificates - Less Than One Year | 0 | 160 | 2,333 | 924 | 62.1% |

⁷⁶ The SGA for the TAACCCT program asked for projections for 9 Outcomes; however the APR required data beyond that requested in the SGA. In the Projected column, N/A indicates that a projection was not requested in the SGA. Actuals are from the LWE database. Projections are those provided by MnAMP.

| Table 38 Year 4 Projected and Actual Outcomes and Combined Years 1 - 4 Projected and Actual Outcomes⁷⁶ | | | | | | |
|--|---|---------------|---------------|-----------------------------|---------------|-------------------|
| Outcome Measures | | Year 4 | | Years 1 - 4 Combined | | |
| | | Proj. | Actual | Proj. | Actual | % of Proj. |
| | (aggregate across all enrollees) | | | | | |
| 6b | Total Number of Participants Earning Certificates - More Than One Year (aggregate across all enrollees) | | 57 | | 373 | |
| 6c | Total Number of Participants Earning Degrees (aggregate across all enrollees) | | 23 | | 151 | |
| 7 | Total Number Pursuing Further Education After Program of Study Completion | 0 | 0 | 215 | 119 | 55.3% |
| 8 | Total number of participants employed after grant-funded program of study completion | 765 | 13 | 751 | 194 | 25.8% |
| 9 | Total number of participants retained in employment after program of study completions | 544 | 6 | 638 | 184 | 28.8% |
| 10 | Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment | 170 | 332 | 1,000 | 1,564 | 156.4% |
| * Sum of all four years; ** Sum of all four years. Unduplicated headcount is 1,576 | | | | | | |

Source: MnAMP Projections and LWE Database – September 19, 2018

Appendix C - Additional Research Questions

At the inception of the MnAMP project, a number of research questions were formulated, based on the MnAMP proposal and purpose of the TAACCCT program. Progress by MnAMP with respect to these research questions is related below.

- Has MnAMP aligned programs closely to the local and regional economy?
- How were the particular curricula selected, used, or created?
- How different are the curricula from those used in the past?
- Were the curricula aligned to regional industry needs?
 - Curricula were created in response to identified business and industry needs and programs in welding, machining, and mechatronics were designed or modified to fill the needs of the local and regional economy. Some curricula were new, and others revised to meet regional industry needs. Curricula in mechatronics, machining, and welding were aligned with National Association of Manufacturers (NAM) endorsed credentials (MSSC, NIMS, PMMI, and AWS)⁷⁷.

A required core curriculum for advanced manufacturing programs was implemented for the welding, machining, and/or mechatronics programs. As part of the required core curriculum, at least one of each college's advanced manufacturing programs integrated the Manufacturing Skill Standards Council (MSSC) modules and four MSSC courses comprising the Certified Production Technician (CPT)⁷⁸ stackable credential and is offering all four courses through academic, credit-bearing delivery. Currently, 55% (6/11) of the colleges deliver the MSSC courses on a non-credit basis. Two of the six colleges offer the MSSC courses through non-profit employment agencies to develop and prepare unskilled workers for jobs in advanced manufacturing. All consortium colleges that deliver the MSSC courses through academic programs have aligned the course learning outcomes to the MSSC industry standards. This approach allows students who completed the MSSC courses on a non-credit basis to earn academic credit by demonstrating achievement of the course learning outcomes by passing the MSSC module test that corresponds to the MSSC course. Through this approach, students are able to bypass academic courses, saving them both time and money.

- Has the consortium developed a series of agreed-upon learning outcomes and a collaborative core curriculum among member colleges?

⁷⁷ NAM - [National Association of Manufacturers](#); NIMS - [The national Institute for Metalworking Skills](#); MSSC - [Manufacturing Skill Standards Council](#); AWS - [American Welding Society](#); PMMI - [The Association for Packaging and Processing Technologies](#); and OSHA - [Occupational Safety and Health Administration](#)

⁷⁸ <https://www.msscusa.org/certification/production-certification-cpt/>

- A collaboratively-developed Manufacturing Foundations core curriculum has been created for adoption by all the colleges.
- How were existing programs and program design revised, improved, or expanded using grant funds?
 - New curricula were added, existing curricula were revised, stackable and portable credentials were embedded, and a Military Occupational Standards/MnAMP programs crosswalk was created and courses were added to VETS.
- Were the modified curriculum and coursework adopted across the consortium? What delivery methods were offered (e.g., online and technology-enabled learning)?
 - The Manufacturing Foundations core curriculum has been adopted across the consortium. Building-based, online, and telepresence delivery methods are being employed.
- Was there a reduction in the gap between skills needed by employers and skills available in workforce?
 - By engaging employers, faculty, and other stakeholders as partners in the design and delivery of content, coursework, and learning experiences to meet credentialing needs in mechatronics, machining, and welding, MnAMP promises to deliver programs aimed at the higher skills and expertise needed by local and regional business and industry, and thereby close the skills gap.
- Has MnAMP redesigned courses to help students finish more quickly?
 - Courses provide stackable and portable credentials along with opportunities for CPL in support of the “*Learn Work Earn*” model. By ensuring that MSSC non-credit offerings met all the same requirements of the credit-bearing versions, workers taking non-credit MSSC offerings may later enroll in MnAMP programs and may be awarded college credit for their non-credit training. Special attention has been paid to programs for veterans.
- Has MnAMP offered hybrid courses (face-to-face and online) or purely online courses at the same time they are taking traditional face-to-face courses?
 - MnAMP has offered online courses and telepresence courses offered at the workplace.
- Were new instructional technologies developed to expand or create distance learning or online programs as components of the education and training “re-employment system”?
- What changes were made through the acquisition or use of appropriate equipment/technology?
 - MnAMP launched +Connect to deliver training directly to the workplace via telepresence.

Just over 14.5% of the MnAMP budget was devoted to welding, machining, and mechatronics equipment to either upgrade or replace current equipment or support new programming.

- What PLA processes are being used at each of the colleges?
 - MnAMP has developed a CPL guidebook related to granting credit for industry related credentials. Two colleges (SCC and MN West) granted 66 credits through CPL. A Military Occupational Standards/MnAMP programs crosswalk was created. The site visits revealed that most CPL is awarded through faculty assessment on a case-by-case basis.
- Has MnAMP provided for portability of credits?
 - MnAMP colleges have negotiated articulation agreements with MnSCU Centers of Excellence and other four-year colleges to facilitate transfer. MnAMP colleges also have agreed to transfer any MSSC course from one MnAMP college to another.
- What support services and other services were offered?
 - Faculty consultation, financial aid, orientation, mentoring, educational advising, tutoring, academic success workshops, supplemental instruction, intrusive advising, early alerts, and job placement assistance are being provided to assist students, either directly by colleges or in partnership with Workforce Boards or non-profits in their communities. Not all services are provided by all colleges.
- Has MnAMP provided individualized support and coaching on academic progress, personal and career goals, and transfer?
 - A case management plan was adopted in Year 1. Two colleges have aligned their advising programs with the GPS LifePlan intrusive advising plan. Academic advisors have been hired for the MnAMP programs to provide intrusive advising and career advising to participants.
- Did MnAMP provide for coordination with public assistance programs that offer support services such as child care, transportation, and other services not available through the grant?
 - During the site visits, several Advisors stated that they provide a full range of support services and referrals in addition to academic advising. Colleges have begun partnering with Adult Basic Education (ABE), and two colleges have developed partnerships with social service employment agencies.

Minnesota's FastTRAC (through Pathways to Prosperity Grants) has supported development of training programs for diverse, low language skills, or first-generation participants and "super bridge" courses that can integrate with ABE instruction.
- Was financial aid advice provided to participants, through scholarships, stipends, and assistance in accessing Pell grants and WIA training funds?
 - Participants received financial aid and scholarships. Completers noted that financial aid was particularly helpful.
 - SCC partnered with the Department of Corrections and was one of 161 community colleges throughout the United States to be selected as a Pell Eligible institution to work with the Pell Second Chance Program.

- Were job search and placement services (including career counseling, early academic alerts, interviewing and resume workshops, referrals to job openings, and related services) provided to participants?
 - Participants received placement services through their college career readiness programs, or many colleges partner with their local one-stop.
- Was career guidance provided, and if so, through what methods?
 - As revealed during the site visits, at most colleges, Advisors provide career counseling and liaise with employers. At some colleges, Advisors also refer students to Career Services.
- How many registered apprenticeships were secured?
 - In mechatronics, machining, and welding programs, 53 participants had worked as Registered Apprentices with 12 employers, and 127 participants had worked in dual training Apprenticeships with 15 employers.
- Did MnAMP develop true partnership with employers, industry associations, chambers of commerce, workforce investment boards, community-based organizations, and other education and training providers?
- How and to what extent did MnAMP involve partners in the planning, development, implementation, and evaluation of the grant?
- Did MnAMP establish strong connections with employers to help them meet their workforce needs?
- Will MnAMP be able to continue to leverage these resources after the grant period has ended?
 - MnAMP's partnerships with employers and others have been extensive. MnAMP worked with several national associations^[5] to better understand how to best align the three manufacturing pathways with industry-recognized credentials. MnAMP and employer partners are reviewing and revising the three manufacturing pathways to embed the newly defined core curriculum and other industry credentials. The curriculum is being cross-walked with the MSSC, NIMS, PMMI and AWS credentials. Nine colleges have become test centers for various industry credentials.

Employers participated in advisory committees, offered scholarships made equipment donations, recruited participants and offered internships and apprenticeships, made hiring commitments, developed OJT opportunities and internships, assisted with curriculum review and development, including curriculum development for a new program at Northland and established dual training programs at Riverland, SCC and LSC. Employers also provided training space, participated in Job Fairs, a Tour of Manufacturing, and partnered with

^[5] [NAM - National Association of Manufacturers](#); [NIMS - The national Institute for Metalworking Skills](#); [MSSC - Manufacturing Skill Standards Council](#); [AWS - American Welding Society](#); [PMMI - The Association for Packaging and Processing Technologies](#); and [OSHA - Occupational Safety and Health Administration](#)

colleges to provide industry-recognized credential training to employees in the workplace via +Connect,.

Over 70 employers attended four employer workshops that educated employers and built new relationships. The Minnesota Manufacturing Workforce Partnership (MMWP), developed under the MnAMP grant, and their partners, continue to meet quarterly. MnAMP is working in partnership with the Minnesota Center for Engineering & Manufacturing Excellence (MNCEME) and a number of the manufacturing associations in Minnesota. During the site visits, several colleges reported specific interactions with employers and employer/industry associations.

MnAMP plans to continue the strong partnerships that have led to the consortium obtaining leveraged resources and establishing close bonds with business and industry and related associations.

- Has MnAMP provided frequently updated individual student data to determine progress toward college and career standards?
 - Data are updated each semester and loaded into the LWE database^[6]. Data also can be loaded at other times as determined by the colleges. Data from the LWE Completer Survey, hosted by Survey Monkey, also are available to the MnAMP colleges. MnAMP also decided to adopt the Employment Results Continuous Improvement Plan instead of implementing the Employment Results Scorecard, as the Employment Results Continuous Improvement Plan provides more opportunity for longitudinal collection and analysis of data.
- What was the program administrative structure?
- Has MnAMP developed a consortium governance and management structure defining roles, rights, and responsibilities, methods for making decisions, and protocols for operation, including procurement, funds management, and accountability?
 - MnAMP is guided by a Minnesota Advanced Manufacturing Partnership Council that meets on a regular basis. Operationally, MnAMP is led by a Grant Director, housed at the lead consortium college, SCC. There are twelve MnAMP educational partners, each of which has, at a minimum, a Project Coordinator, an advisor and a Data Coordinator. Other grant and institutionally-funded personnel are involved in the project, depending upon the structure of the project at the individual colleges. Business and Industry, governmental, and association partners are coordinated through the MnAMP project staff at SCC.
- Has MnAMP developed a strategy for communication and engagement with internal and external stakeholders?
 - During the site visits, most Presidents or Chief Academic Officers (CAO) said they were updated formally or informally by their Project Coordinators on a monthly basis, and quarterly, on a formal basis, by the MnAMP Grant Director. As reported in responses to other questions, MnAMP has had excellent engagement with external stakeholders. Presidents and CAOs also stated the value

^[6] See: Appendix F – Description of the LWE Database

of MnAMP in terms of (a) the colleges' acquisition of current equipment used by the advanced manufacturing industry; and (b) the project's alignment to the colleges' strategic plans.

- Was there increased knowledge sharing and communication across consortium institutions?
- Did MnAMP foster a college-to-college, professional peer learning community to address grant challenges such as curriculum development, equipment procurement, participant tracking, *etc.*?
 - Through monthly Web-Ex conferences MnAMP has created a learning community among advisors and data managers, project coordinators and Deans. Results from the site visits show there was increased interaction among staff at the MnAMP colleges.
- Did the use of consortia increase institutional capacities?
 - Institutional capacity was increased through new and revised curricula, equipment, staffing, and partnership development.
- Did MnAMP create train-the-trainer programs to update faculty skills or other faculty professional development initiatives to expand the pool of available faculty?
 - Sixty-nine MNAMP faculty have been certified or re-certified in program specific, NAM-endorsed credentials

Appendix D – Participant Intake Form

Minnesota Advanced Manufacturing Partnership (MnAMP) TAACCCT GRANT Participant Intake Form



| PART A. PARTICIPANT DATA | | SSN: |
|--|--|--|
| Enrollment Date: | Student Tech ID: | College Name: |
| First Name | Middle Name | Last Name |
| Former Name(s) | Date of Birth (MM/DD/YYYY) | Gender <input type="checkbox"/> Female <input type="checkbox"/> Male |
| Marital Status <input type="checkbox"/> Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/> Separated | Children <input type="checkbox"/> Yes <input type="checkbox"/> No | Registered with Selective Service? (Males only) <input type="checkbox"/> No <input type="checkbox"/> Yes. Selective Service #: _____ |
| Street Address | City | State |
| | Zip | County |
| Mailing Address (if different from above) | | |
| Home Ownership (Select ALL that apply) <input type="checkbox"/> Own Home <input type="checkbox"/> Rent Home <input type="checkbox"/> Living with Other(s) <input type="checkbox"/> Live with Parents | Distance from Home to School <input type="checkbox"/> 0-5 miles <input type="checkbox"/> 6-10 miles <input type="checkbox"/> more than 10 miles | What is the best way to contact you? <input type="checkbox"/> Home Phone <input type="checkbox"/> Cell Phone <input type="checkbox"/> E-mail <input type="checkbox"/> Other _____ |
| Preferred E-mail: | Home Phone: | Cell Phone: |
| Alternate E-mail: | Alternate Contact Person: Alternate Phone: | Do you agree to be contacted via text message? <input type="checkbox"/> No <input type="checkbox"/> Yes |
| Advisor's Name: | Previous Technical Training Received: | |
| Citizenship Information/Right to Work | Legal | Primary Language |
| Are you a U.S. citizen? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, are you eligible to work in the U.S.? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, which applies to you? | Have you ever been convicted of a felony? <input type="checkbox"/> No <input type="checkbox"/> Yes | Select ALL that apply: <input type="checkbox"/> English <input type="checkbox"/> Other(s): _____ |
| | Disability Status | |

| | | | |
|--|--|--|--|
| <input type="checkbox"/> Student Visa <input type="checkbox"/> Legal Registered Alien Expiration Date: _____ If Legal Alien Registration: <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent | | Do you have disabilities as defined by Americans with Disabilities Act (ADA)? <input type="checkbox"/> No <input type="checkbox"/> Yes | Race/Ethnicity Ethnicity <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Non-Hispanic/Latino |
| Eligibility <input type="checkbox"/> Displaced Worker <input type="checkbox"/> Incumbent Worker <input type="checkbox"/> Locally Eligible <input type="checkbox"/> Non-TAA Eligible <input type="checkbox"/> Other Eligible <input type="checkbox"/> Eligible Spouse <input type="checkbox"/> TAA Eligible <input type="checkbox"/> Veteran <input type="checkbox"/> WIA | Referred to program by: Select ALL that apply: <input type="checkbox"/> Advisor <input type="checkbox"/> Employer <input type="checkbox"/> Veteran's Center <input type="checkbox"/> Self-Referred <input type="checkbox"/> Basic Education <input type="checkbox"/> Workforce Center <input type="checkbox"/> Other (please specify) _____ | Military Status Please identify your military status: <input type="checkbox"/> Current Military (Active, Guard, Reserve, etc.) <input type="checkbox"/> Veteran <input type="checkbox"/> Eligible Spouse of Military/Veteran <input type="checkbox"/> Not Applicable | Race (Select ALL that apply) <input type="checkbox"/> White <input type="checkbox"/> Black/African American <input type="checkbox"/> Asian <input type="checkbox"/> American Indian / Alaskan Native (AIAN) <input type="checkbox"/> Native Hawaiian or Other Pacific Islander (NHOPI) <input type="checkbox"/> Two or more races <input type="checkbox"/> Unknown |

Break

| PART B. PARTICIPANT EDUCATIONAL AND EMPLOYMENT DATA | | | | |
|--|---|---|---|--|
| Current Enrollment Status: | Pell Grant Eligibility | Technical program | Bridge program | Education/Training Plan |
| Program Start Date (MM/DD/YYYY): _____ <input type="checkbox"/> Full-Time (Enrolled in 12 credits or more in Fall/Spring. 6 credits or more in Summer) <input type="checkbox"/> Part-time (Enrolled in less than 12 credits in Fall/Spring. Less than 6 credits in Summer) | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Name of Program Enrolled <input type="checkbox"/> Mechatronics <input type="checkbox"/> Machining <input type="checkbox"/> Welding <input type="checkbox"/> Manufacturing Core CMAE <input type="checkbox"/> Other _____ | Length of Credential <input type="checkbox"/> Certificate / Credential: One year or less <input type="checkbox"/> Certificate/Credential/ Diploma: 1-2 years <input type="checkbox"/> Two-Year Degree | Education/Training Goal <input type="checkbox"/> Certificate / Credential: One year or less <input type="checkbox"/> Certificate/Credential/ Diploma: 1-2 years <input type="checkbox"/> Two year degree <input type="checkbox"/> Other training or activity | |
| Entering Academic Year <input type="checkbox"/> 2015-2016 <input type="checkbox"/> 2016-2017 <input type="checkbox"/> 2017-2018 | Currently admitted to college? <input type="checkbox"/> Yes <input type="checkbox"/> No Credit for Prior Learning (CPL): <input type="checkbox"/> No <input type="checkbox"/> Yes. If yes, Total CPL Credits Earned: _____ | Name of Credential(s) Currently Enrolled In (Check Inventory List) (MM/DD/YYYY) List name & length of credential(s) & start date. 1) _____ Date: _____ Length: _____ 2) _____ Date: _____ Length: _____ 3) _____ Date: _____ Length: _____ 4) _____ Date: _____ Length: _____ | | |
| Educational Barriers | Entering Educational Level | Parent/Guardian #1& #2 Education Level | | |

| | | | |
|---|---|--|---|
| <input type="checkbox"/> Disability <input type="checkbox"/> Limited English <input type="checkbox"/> Transportation <input type="checkbox"/> Family responsibilities <input type="checkbox"/> Employment (e.g., rotating shift work) <input type="checkbox"/> Financial <input type="checkbox"/> Out of school for 15 or more years <input type="checkbox"/> Other _____ | Select ONE response only: <input type="checkbox"/> Eighth Grade or Less <input type="checkbox"/> Some High School <input type="checkbox"/> High School Diploma <input type="checkbox"/> GED <input type="checkbox"/> Some College Credits <input type="checkbox"/> Certificate(s) <input type="checkbox"/> Two-year Degree <input type="checkbox"/> Four-year Degree <input type="checkbox"/> Graduate School or Higher | Parent/Guardian #1 Education Level <input type="checkbox"/> Eight Grade or Less <input type="checkbox"/> Some High School <input type="checkbox"/> High School diploma <input type="checkbox"/> GED <input type="checkbox"/> Some College Credits <input type="checkbox"/> Certificate(s) <input type="checkbox"/> Two-year Degree <input type="checkbox"/> Four-year Degree <input type="checkbox"/> Graduate School or Higher | Parent/Guardian #2 Education Level <input type="checkbox"/> Eight Grade or Less <input type="checkbox"/> Some High School <input type="checkbox"/> High school diploma <input type="checkbox"/> GED <input type="checkbox"/> Some College Credits <input type="checkbox"/> Certificate(s) <input type="checkbox"/> Two-year Degree <input type="checkbox"/> Four-year Degree <input type="checkbox"/> Graduate School or Higher |
| Employment Status at Time of Enrollment <input type="checkbox"/> Employed full-time (30 hrs. or more) <input type="checkbox"/> Employed part-time (less than 30 hrs.) <input type="checkbox"/> Laid-off or furloughed <input type="checkbox"/> Unemployed <input type="checkbox"/> Employed and have received notice of termination <input type="checkbox"/> Self-Employed | | Previous Employment Previous Employer: _____ Previous Field: _____ Previous Job Title: _____ Status: <input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time. Start & End Date: _____ to _____ Wage: \$_____ per <input type="checkbox"/> Hour <input type="checkbox"/> Week <input type="checkbox"/> Month <input type="checkbox"/> Year <i>Previous Experience In Field of Study?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No | Prior Work Experience Years Overall Enter the Number of Years for Overall Prior Work Experience (any field) <input type="checkbox"/> _____ years Number of Overall Years of Experience in Related Major/Study Field only <input type="checkbox"/> _____ years |
| Current Employment (Incumbent Worker) | | | Annual Household Gross Income <input type="checkbox"/> \$0-\$ 14,999 <input type="checkbox"/> \$15,000-\$34,999 <input type="checkbox"/> \$35,000-\$54,999 <input type="checkbox"/> \$55,000-\$74,999 <input type="checkbox"/> \$75,000-\$94,999 <input type="checkbox"/> \$95,000 and over |
| Current Employer: _____ Job Title: _____ Start Date (MM/DD/YYYY) _____ Wage: \$_____ per <input type="checkbox"/> Hour <input type="checkbox"/> Week <input type="checkbox"/> Month <input type="checkbox"/> Year Work Hours: _____ per week <i>Is the Current Employment In Field of Study?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |
| For Database entry only. To be entered by Advisor or Data Coordinator. | | | |
| Current Job DOL Category Code: _____ (Obtain the code from Sheet 2. PTB will provide the list) | | Previous Job DOL Categories Code: _____ (Obtain the code from Sheet 2. PTB will provide the list) | |

Break

| PART C. COMPLETE THIS SECTION WITH THE HELP OF ADVISOR | | | | | | | | |
|--|---------|---------|---------|------|-------|------|---------------|------------------------------|
| Test & Scores | English | Reading | Writing | Math | Other | Date | Skills Gained | Basic Skills Placement Level |

| | | | | | | | | |
|--|---|---|--|---|---|--|--|---|
| Accuplacer - Score | | | | | | | Skills gained in any areas through remedial courses? Reading <input type="checkbox"/> Yes <input type="checkbox"/> No Writing <input type="checkbox"/> Yes <input type="checkbox"/> No Arithmetic <input type="checkbox"/> Yes <input type="checkbox"/> No Computer <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Development, Credit <input type="checkbox"/> Development, Non-Credit (Ex. Bridge, FastTRAC) <input type="checkbox"/> College Level |
| Accuplacer approved for College Level? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |
| ACT - Score | | | | | | | | |
| ACT: Approved for College Level? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |
| NCRC Date: | | | Other Placement Test Scores. Date: | | | | | |
| Scores for all three exams. <input type="checkbox"/> Level 3 _____ <input type="checkbox"/> Level 4 _____ <input type="checkbox"/> Level 5 _____ <input type="checkbox"/> Level 6 or greater _____ | | | <input type="checkbox"/> Advanced Placement (AP) _____ <input type="checkbox"/> COMPASS _____ <input type="checkbox"/> PERT _____ | | <input type="checkbox"/> ASSET _____ <input type="checkbox"/> SAT _____ <input type="checkbox"/> Others _____ | | | |
| | | | Are any of the above test Approved for College Level Courses? <input type="checkbox"/> Yes <input type="checkbox"/> No. If Yes, please describe _____ | | | | | |

Break

| PLEASE ACKNOWLEDGE THAT YOU HAVE READ & SIGNED THE FOLLOWING FORMS | |
|--|--|
| Consent to Share Wage and Employment Info | Release Student Data & Information Release Form |
| Did you read and sign the Consent to Share Wage, Employment and Student Data & Information Form? <input type="checkbox"/> Yes <input type="checkbox"/> No | Did you read and sign the Equal Employment Opportunity Commission (EEOC) Statement Form? <input type="checkbox"/> Yes <input type="checkbox"/> No |

I attest that the information I have provided is true and correct to the best of my knowledge.

I acknowledge that I have received a copy of the Equal Employment Opportunity Commission (EEOC) Statement describing my rights under the law and the procedure to file a grievance, and that I have read and signed the Student Data/Information Release and Consent to Share Wage, Employment and Student Data & Information Form.

Student Name (Print Clearly): _____

Student's Signature: _____

Date: _____

| To be completed by College Representative Staff completing this form | |
|---|--|
| <input type="checkbox"/> Verified the Student (Photo ID) <input type="checkbox"/> Completed Part C above <input type="checkbox"/> Documents Verified (Veteran Card, etc.) | College Representative/Staff Name : _____ Position/Title: _____ Rep. Signature: _____ Date: _____ |



**CONSENT TO SHARE WAGE,
EMPLOYMENT AND STUDENT
DATA & INFORMATION**

Please read. If you need help or do not understand this form, please contact staff person.

In accordance with the Minnesota State Statute on Data Privacy, M.S. § 268.19, Subd.(1b), I agree that the Minnesota Department of Employment and Economic Development (DEED) may release information on my wages and employment contained on the state’s Wage Detail files to the Following Colleges for their records related to the Minnesota Advanced Manufacturing TAACCCT grant.

South Central College and/or _____ College
(College Name)

I understand this is private information and my decision to refuse to provide consent to share this information will not have an effect on my participation in the program.

I understand that the information will use this information ONLY for the following purposes:

1. Preparing required reports;
2. Auditing MnAMP TAACCCT Grant by Department of Labor;
3. For evaluation purposes through the MnAMP Third Party Evaluator;
4. Reviewing my eligibility for employment and training program; and/or
5. Determine and report wage difference.

I understand that Minnesota law does not allow the MnAMP grant to use this information for any other purpose.

This information may not be shared without my consent.

This consent goes into effect today. This approval expires three (3) years from the time I leave MnAMP TAACCCT Grant.

I may cancel this consent in writing at any time.

- Yes, I agree to the sharing of wage and employment information.
- No, I do not agree to the sharing of wage and employment information.

Participant’s Name (Print or Type)

Date

**Participant's Signature
Number**

Participant's Social Security

Parent/Guardian Signature (If Applicable)

Date

FOR OFFICE USE ONLY

NOTE: THE PARTICIPANT MAY CANCEL THIS AUTHORIZATION OF CONSENT AT ANYTIME WITH A WRITTEN REQUEST.

(Rev. 05/26/15)

Use of Data/WIA Title I-B Equal Opportunity Information

A partnership sponsored by the Minnesota Department of Employment and Economic Development and your local One Stop Service Area

Please read the data privacy notice below and the equal opportunity information on the reverse side. When you finish reading, please sign and date at the bottom.

The data we are asking you to provide about yourself is considered private data by [Minnesota Statute 13.47 subdivision 2](#). In order to collect and use this data we must tell you why we need the data, how we intend to use it and any consequences you may experience if you supply the information or not.

Why we need the data

- Your Social Security Number is requested to identify you as a unique individual and to find wage data on you that helps us determine how well our services helped you.
- Personal characteristics; age, gender, ethnicity, race, disability and economic status is collected to evaluate our performance and in some cases to determine if you're eligible for special assistance
- Veteran status is asked to determine if you are eligible for special services and to evaluate our service delivery.
- Work and education history is used to help you plan your employment and training goals.

How we intend to use the data

Work and education history may be shared with prospective employers. In addition to analyzing this data to improve our services, we may share information about you with other employment and training service providers in order to determine what services you may be eligible for and to coordinate services provided to you. Data may be shared with federal and state entities that provide funding for WorkForce Center services. Additionally other government entities with a legal right to this data may see your information

Consequences to you

You can refuse to supply any or all of this information; you are not legally required to provide any of this information to use WorkForce Center services. Not supplying sufficient information may limit our ability to provide you the services you want.

For more information

DEED Data Practices www.deed.state.mn.us/privacy.htm

Minnesota Data Practices Act <https://www.revisor.mn.gov/statutes/?id=13>

Minnesota Department of Administration Information Policy Analysis Division www.ipad.state.mn.us/index.html

EQUAL OPPORTUNITY IS THE LAW: *(Please see next page for additional information)*

We consider applicants without regard to race, color, creed, religion, national origin, age, sex, political affiliation or belief, marital status, disability, sexual orientation, or status with regard to public assistance. It is our policy to abide by all federal, state, and local laws concerning discrimination.

COMPLAINT AND APPEAL POLICY:

If you feel that anyone in our office has treated you unfairly, you have the right to file a complaint. If you have been denied services, you have the right to an appeal. If you wish to file a formal complaint or an appeal, please see a staff member for assistance.

I have been made aware of and understand this Data Privacy Notice. (If you do not understand this statement, please ask that a staff member explain it to you.) I agree that the information on this form may be shared among Minnesota WorkForce Center agencies for the purpose of helping me find employment or training.

I have read the equal opportunity information found on the reverse side "NOTICE TO THE PUBLIC", Equal Opportunity Is The Law. I understand that I have the right to file a complaint of discrimination.

_____ **Date**

_____ **Signature (If Under 18, Signature of Parent or Guardian)**

This material is available in alternative formats, such as large print, Braille, or audio tape.

Equal Opportunity Is The Law

It is against the law for this recipient of Federal financial assistance to discriminate on the following bases: Against any individual in the United States, on the basis of race, color, religion, sex, national origin, age, disability, political affiliation or belief; and

Against any beneficiary of programs financially assisted under Title I of the Workforce Investment Act of 1998 (WIA), on the basis of the beneficiary=s citizenship/status as a lawfully admitted immigrant authorized to work in the United States, or his or her participation in any WIA Title I-financially assisted program or activity.

The recipient must not discriminate in any of the following areas:

Deciding who will be admitted, or have access, to any WIA Title I-financially assisted program or

activity; Providing opportunities in, or treating any person with regard to, such a program or activity; or

Making employment decisions in the administration of, or in connection with, such a program or activity.

What to Do If You Believe You Have Experienced Discrimination

If you think that you have been subjected to discrimination under a WIA Title I-financially assisted program or activity, you may file a complaint within 180 days from the date of the alleged violation with either:

The Director
Civil Rights Center, (CRC)
U.S. Department of Labor
200 Constitution Avenue NW
Room N-4123
Washington, DC 20210

If you file your complaint with the recipient, you must wait either until the recipient issues a written Notice of Final Action, or until 90 days have passed (whichever is sooner), before filing with the Civil Rights Center (see address above).

If the recipient does not give you a written Notice of Final Action within 90 days of the day on which you filed your complaint, you do not have to wait for the recipient to issue that Notice before filing a complaint with CRC. However, you must file your CRC complaint within 30 days of the 90-day deadline (in other words, within 120 days after the day on which you filed your complaint with the recipient).

If the recipient does give you a written Notice of Final Action on your complaint, but you are dissatisfied with the decision or resolution, you may file a complaint with CRC. You must file your CRC complaint within 30 days of the date on which you received the Notice of Final Action.

The above "NOTICE TO THE PUBLIC" applies to the federal programs covered under the Workforce Investment Act. Complaints concerning services provided by non-WIA programs may be processed differently.

The recipient* must provide the notice to all appropriate parties including: registrants and applicants for services; participants; applicants for employment; employees; unions or professional organizations that hold collective bargaining or professional agreements with the recipient; sub-recipients that receive Workforce Investment Act (WIA) Title 1 funds from the recipient; members of the public, including those with impaired vision or hearing.

*Term to Know-Recipient: Any entity to which financial assistance under WIA Title 1 is extended, either directly from the U.S. Department of Labor or through the Governor or another recipient; excluding the ultimate beneficiaries of the WIA Title 1 funded programs or activities.

Appendix E – Completer Surveys

MnAMP Completer Survey – Short Form

Summary

As of February 12, 2018, 140 MnAMP participants who had completed a program of study had completed a MnAMP Completer Survey - Short Form (MCSS) that focused on post-program employment and wages. The responses of those 140 are included in the charts and tables following this summary

In some instances, the questions posed in this survey parallel, or closely parallel, those posed in the MnAMP Completer Survey - Long Form (MCSL), and some individuals may have completed both surveys, in which case their responses will be included in the analysis of the data from both sources. As all participants did not respond to all of the survey items, percentages are, in most cases, based on the number of participants who responded to the particular item. Participants who indicated they did not have a job were directed to those survey items related to program satisfaction, and these participants did not respond to items related to job title, pay rate and other items appropriate only for those having a job.

Generally, participants were highly positive about their MnAMP experience. They believe the MnAMP program helped them get a job, or will help them get a job in the future, were satisfied with the level of knowledge and skill they developed in the program, and would recommend MnAMP to others. In this respect, the responses to both the MCSS and MCSL are similar. In this report, responses are grouped by topic and percentages are rounded to the nearest whole number in this summary and out to two decimal places for the tables and graphs.

A. The participants, their programs of study, college expectations, and future educational plans

Of the 140 participants responding to the survey, 137 (98%) identified the college where they enrolled and 114 (81%) came from Lake Superior College, MN West Community and Technical College, Ridgewater College, and South Central College.

Fifty-three percent (53%) had enrolled in welding. Just over half (53%) had earned a certificate and 22% had earned a degree at the time they completed the survey.

B. Views on the Programs of Study

Almost all (98%) believed the course content was well organized, 98% believed they learned a lot in the courses, and 89% believe the courses covered everything they needed to get a job in their field of study. These percentages compare with MCSL responses of 97%, 98%, and 92%, respectively, on the same or similar items.

Almost all agreed or strongly agreed that faculty members and advisors were available to meet and talk with them (99% and 97% respectively).

C. Programs of Study and Employment

Of those responding, 85% (as compared to 83% in the MCSL) believed the courses helped get the job they now have, and 89% (as compared to 79% in the MCSL) believe the MnAMP program helped them get a job in their field of study. Further, 92% (as compared to 90% in the MCSL) believed the courses will help them get and keep future jobs.

One area in which the MCSS and MCSL produced a marked difference was in responding to whether or not the program would help them in getting better job prospects upon completion. While 95% of those taking the MCSS agreed or strongly agreed this to be the case, only 58% of those taking the MCSL agreed or strongly agreed the program would help in this manner.

D. Participant Employment

Only those who reported having a job were asked to respond to the employment questions. Almost half (43%) of those employed were employed prior to completing the MnAMP program and 33% got a new job after completing (although 19% of those no longer have that new job). Sixty-three percent (63%) of those employed prior to completing received a wage increase. 18 participants (14%) did not have a job as of the date they completed the survey. Of those who did not have a job upon entry into MnAMP⁷⁹, 86% obtained a job after completion, and 73% still had that job at the time of survey completion.

The most frequently listed job title was welder (28%) followed by technician (27%). At least 75% of all jobs held appear to have a direct connection to manufacturing. Sixty-nine percent (69%) of the participants said their job was in their field of study, and 40% indicated an hourly pay rate between \$15.00 and \$19.99 per hour (compared to 50% of those responding to the MCSL. Less than half (42%) of those responding reported an income of \$20.00 or above per hour.

Twenty-three percent began their employment prior to October 2014, while 39% became employed during the last 6 months of the third year.

E. Satisfaction with MnAMP

Participants reported a high level of satisfaction with MnAMP, with 98% agreeing or strongly agreeing they were satisfied with the level of knowledge and skill developed through the courses. Ninety-seven percent (97%) would recommend the program to others. The percentages for those taking the MCSL were 95% and 97%, respectively.

Tables and Graphs

⁷⁹ 14 “Other” responses are not included in this calculation.

As of February 12, 2018, 140 MnAMP participants who had completed a program of study completed a MnAMP Completer Survey – Short Form (MCSS) that focused on post-program employment and wages. The responses of those 140 are included in the charts and tables below.

In some instances, the questions posed in this survey parallel, or closely parallel, those posed in the MnAMP Completer Survey – Long Form (MCSL), which included a focus on attitudes and opinions, as well as post-program employment and wages. Some individuals may have completed both surveys, in which case their responses will be included in the analysis of the data from both sources.

Participants who indicated they did not have a job were directed to those survey items related to program satisfaction, and these participants did not respond to items related to job title, pay rate and other items appropriate only for those having a job.

The results of the survey are reported below in the form of graphs and charts associated with each survey item. These have been further grouped by topic. As all participants did not respond to all of the survey items, the number responding and the number skipping the item are shown. Other than the percentage responding, percentages are based on the number of participants who responded to the particular item. In some tables, percentages may not add up to 100% due to rounding.

A. The participants, their programs of study, college expectations, and future educational plans

1 - Respondents by College

(137 responded – 3 skipped)

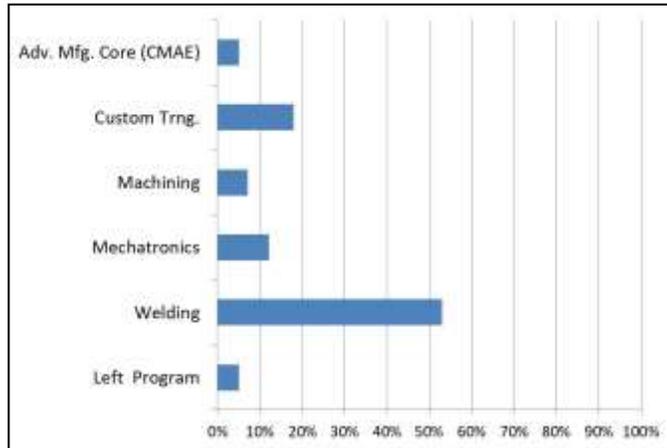
Of the 140 participants responding to the survey, 137 (97.86%) identified the college where they enrolled. 114 (81.43%) of the 140 came from four colleges (Lake Superior College, MN West Community and Technical College, Ridgewater College, and South Central College).

| College | Participants | |
|---|--------------|---------|
| | Number | Percent |
| Century College | 6 | 4.29% |
| Dakota County Technical College | 1 | 0.71% |
| Lake Superior College | 19 | 13.57% |
| Minneapolis Community and Technical College | 3 | 2.14% |
| MN State Community and Technical College | 1 | 0.71% |
| MN West Community and Technical College | 13 | 9.29% |
| Normandale Community College | 4 | 2.86% |
| Northland Community and Technical College | 6 | 4.29% |
| Ridgewater College | 35 | 25.0% |
| Riverland Community College | 0 | 0.0% |
| St. Paul College | 2 | 1.43% |
| South Central College | 47 | 33.57% |
| No Response | 3 | 2.14% |

2 - Programs of Study

(140 responded – 0 skipped)

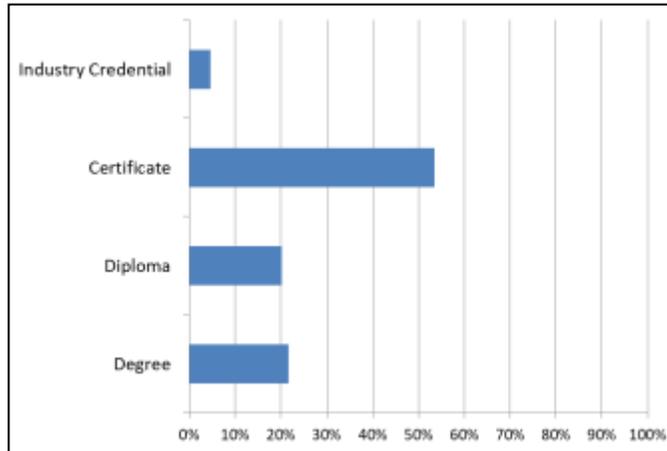
Of the 140 (100%) participants responding to this item, 74 (52.86%) were enrolled in welding programs.



3 – Credential Earned

(129 responded – 11 skipped)

Of the 129 (92.14%) participants responding to this item. Just over half (53.49%) had earned a certificate and 21.71% had earned a degree.

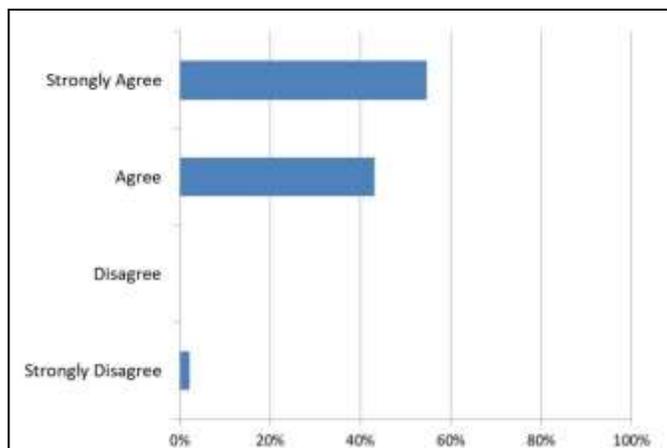


B. Views on the Programs of Study

4 – Content of the Courses Was Well Organized

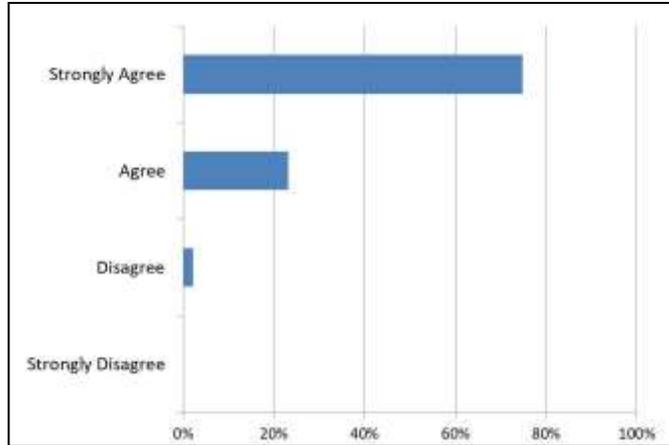
(95 responded – 45 skipped)

Of the 95 participants (67.86%) responding to this item, 93 (97.89%) agreed or strongly agreed that the course content was well organized. In the MCSL, 97.33% of respondents agreed or strongly agreed that the course content was well organized.



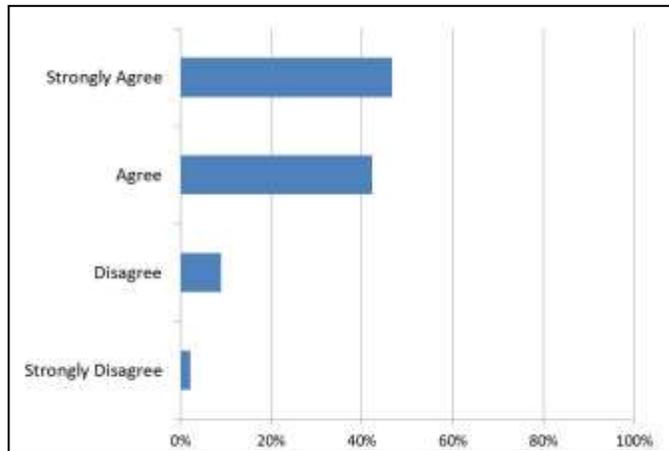
5 – Learned a Lot in the Courses
(95 responded – 45 skipped)

Of the 95 participants (67.86%) responding to this item, 93 (97.89%) agreed or strongly agreed that they learned a lot in the courses. In the MCSL, 97.78% of respondents agreed or strongly agreed that that they learned a lot in the courses.



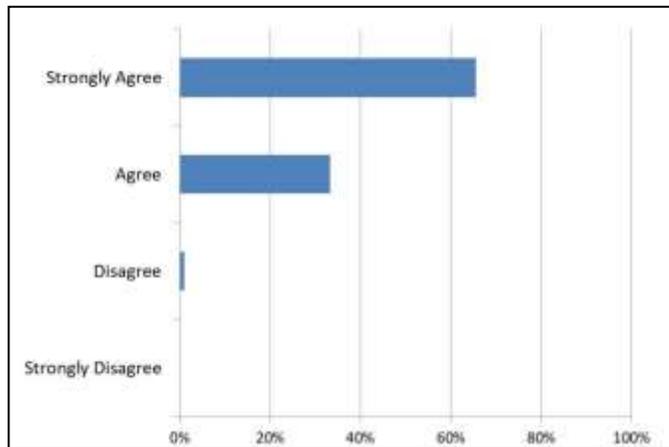
6 – Courses Covered Everything Needed to Get a Job in This Field of Study
(90 responded – 50 skipped)

Of the 90 participants (64.29%) responding to this item, 80 (88.89%) agreed or strongly agreed the courses covered everything needed for a job in their field of study. In the MCSL, 92.31% of respondents agreed or strongly agreed that that the courses covered everything needed for a job in their field of study.



7 – Faculty Availability
(96 responded – 44 skipped)

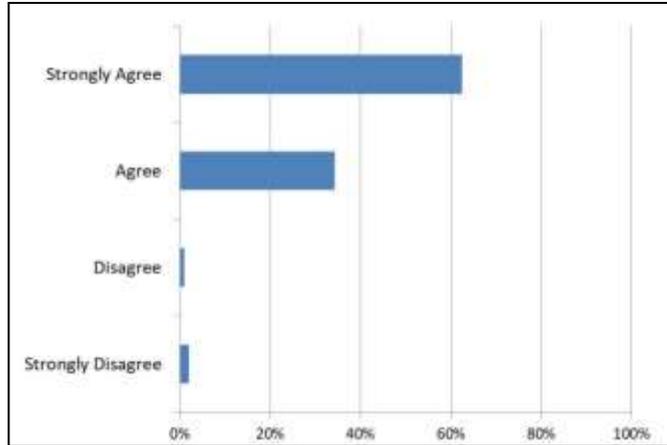
Of the 96 participants (68.57%) responding to this item, 95 (98.96%) agreed or strongly agreed that faculty were available if participants wanted to talk to them. In the MCSL, 96.85% of respondents agreed or strongly agreed that faculty were available if participants wanted to talk to them.



8 – Advisor Availability

(96 responded – 44 skipped)

Of the 96 participants (68.57%) responding to this item, 93 (96.88%) agreed or strongly agreed an advisor was available if they wanted to talk.

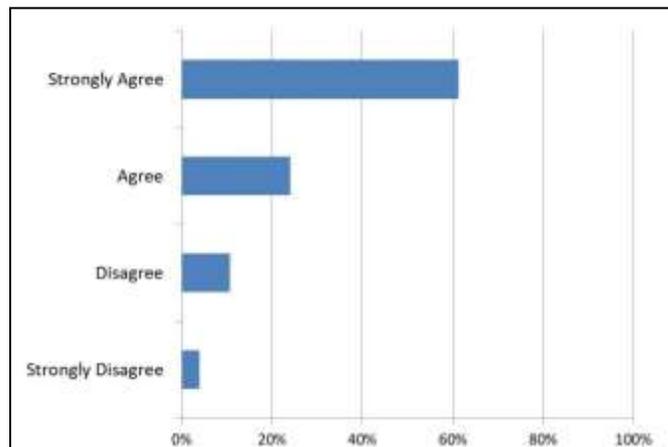


C. Programs of Study and Employment

9 – Courses Helped Get the Job They Have Now

(75 responded – 65 skipped)

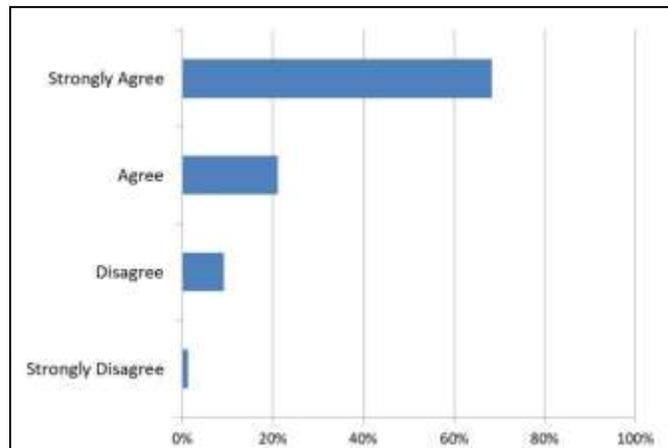
Of the 75 participants (53.57%) responding to this item, 64 (85.33%) agreed or strongly agreed that the courses helped get the job they now have. In the MCSL, 82.93% of respondents agreed or strongly agreed that the courses helped get the job they now have.



10 – Program Helped in Obtaining a Job in Field of Study

(76 responded – 64 skipped)

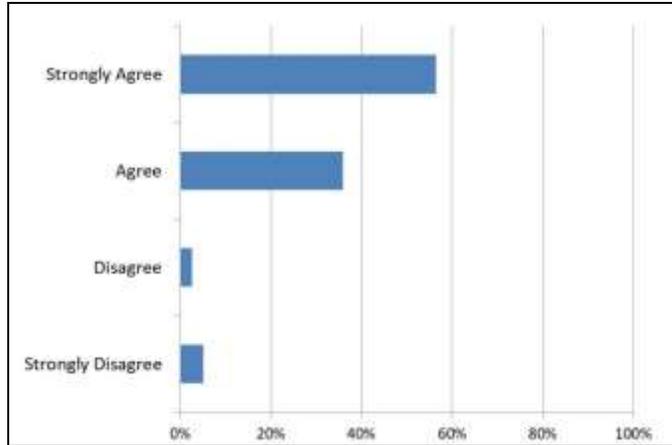
Of the 76 participants (54.29%) responding to this item, 68 (89.47%) agreed or strongly agreed that the program helped them obtain a job in their field of study upon completion. In the MCSL, 78.67% of respondents agreed or strongly agreed the program helped them obtain a job in their field of study.



11 – Participation Will Help Get and Keep Future Jobs

(39 responded – 101 skipped)

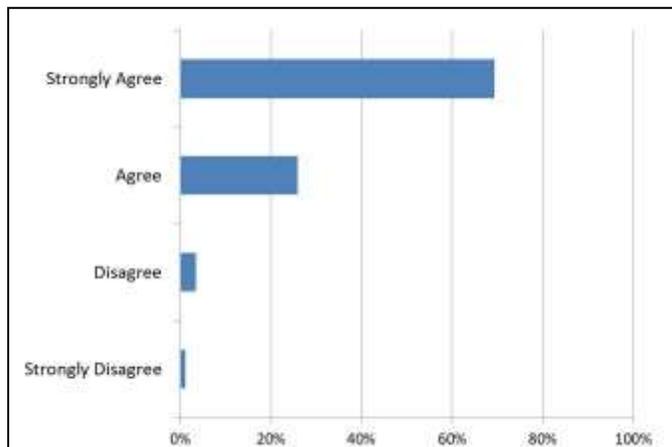
Of the 39 participants (27.86%) responding to this item, 36 (92.31%) agreed or strongly agreed that the courses will help them get and keep future jobs. In the MCSL, 90.44% of respondents agreed or strongly agreed that the courses will help them get and keep future jobs.



12 – Program Helped in Getting Better Job Prospects

(85 responded – 55 skipped)

Of the 85 participants (60.71%) responding to this item, 81 (95.29%) agreed or strongly agreed that the program helped them in getting better job prospects upon completion. This is markedly different from the MCSL, in which 58.14% of respondents agreed or strongly agreed the program helped them in getting better job prospects upon completion.



D. Participant Employment

13 - Employment

(133 responded – 7 no response)

Of the 133 (95.00%) participants responding to the item, 57 (42.86%) were incumbent workers prior to completing. Just over thirty percent (33.08%) obtained a new job upon completion of their program of study. Of those who did not have a job upon entry into MnAMP⁸⁰, 86% obtained a job after completion, and 73% still had that job at the time of survey completion.

| Employment Status | Participants | |
|---|--------------|---------|
| | Number | Percent |
| I was employed prior to completing and I still have it | 35 | 26.32% |
| After completing I got a new job and still have it | 37 | 27.82% |
| I was employed prior to completing and I received a wage increase | 22 | 16.54% |
| I do not currently have a job | 18 | 13.53% |

⁸⁰ 14 “Other” responses are not included in this calculation.

| Employment Status | Participants | |
|---|--------------|---------|
| | Number | Percent |
| After completing I got a new job but no longer work there | 7 | 5.26% |
| Other | 14 | 10.53% |

14 – Job Title

(106 responded – 34 skipped)

Of the 106 (75.71%) participants responding to the item, the most frequently listed job title was welder (28.30%) followed by technician (27.36%). Of all the job titles listed, a minimum of 75.47% appear to have a direct connection to manufacturing.

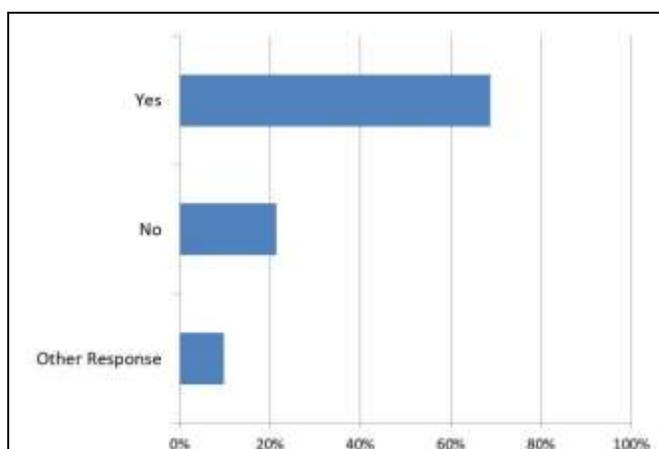
| Job Title | Participants | |
|---------------------|--------------|---------|
| | Number | Percent |
| Analyst | 1 | 0.94% |
| *Assembler | 9 | 8.49% |
| Cook | 2 | 1.89% |
| Customer service | 6 | 5.66% |
| Driver | 2 | 1.89% |
| *Machinist/Operator | 10 | 9.43% |
| Management | 5 | 4.72% |
| Mechanic | 8 | 7.55% |
| *Millwright | 1 | 0.94% |
| Security officer | 1 | 0.94% |
| Teacher/Trainer | 2 | 1.89% |
| *Technician | 29 | 27.36% |
| *Welder | 30 | 28.30% |

* Apparent direct connection to manufacturing

15 – Job in Field of Study

(112 responded – 28 skipped)

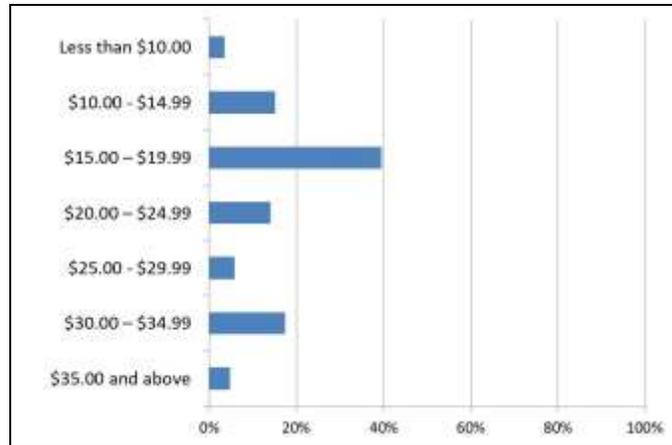
Of the 112 (80.00%) participants responding to this item, 77 (68.75%) indicated their job was in their field of study.



16 – Pay Rates

(86 responded – 54 skipped)

Of the 86 (61.43%) participants responding to this item, almost 40% (39.54%) indicated an hourly pay rate between \$15.00 and \$19.99 per hour. This contrasts with responses to the same item in the MCSL, where just over 50% of those responding indicated an hourly pay in that range. Based on a 40-hour work week, weekly earnings would be \$600.00 - \$799.60 per week, or \$31,200.00 - \$41,579.20 per year.



According to the MN Department of Employment and Economic Development (DEED) the 2017 estimate of the annual cost of living for basic needs in Minnesota counties for a family of four with one adult working full-time varied between \$41,245 annual/\$19.83/hr. (Stevens County) and \$64,575 annual/\$31.05/hr. (Chisago County).

The estimated cost for a family of four with one adult working full-time in each MnAMP county is shown in the table below.⁸¹

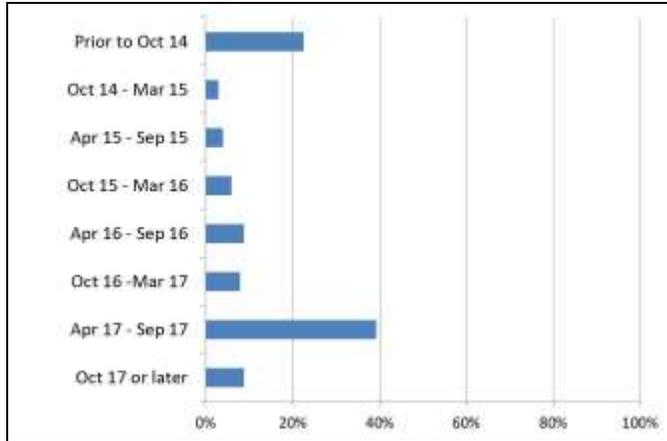
| MnAMP College | County | 2017 Estimated Cost of Living | |
|-----------------------|------------|-------------------------------|---------------------------|
| | | Annual Compensation | Hourly Rate (2,080 hours) |
| Century | Ramsey | \$62,069 | \$29.84 |
| St. Paul | Ramsey | \$62,069 | \$29.84 |
| MCTC | Hennepin | \$61,768 | \$29.70 |
| Normandale | Hennepin | \$61,768 | \$29.70 |
| DCTC | Dakota | \$61,256 | \$29.50 |
| Northland | Polk | \$50,181 | \$24.13 |
| South Central College | Nicollet | \$49,251 | \$23.68 |
| MnState | Otter Tail | \$47,980 | \$23.07 |
| Lake Superior College | St. Louis | \$47,456 | \$22.82 |
| Riverland | Mower | \$46,922 | \$22.56 |
| MnWest | Nobles | \$46,268 | \$22.24 |
| Ridgewater | Kandiyohi | \$46,091 | \$22.16 |

Less than half (41.86%) of those responding reported an income of \$20.00 or above per hour.

⁸¹ [Minnesota Employment and Economic Development. \(n.d.\). Cost of Living in Minnesota. Retrieved from https://mn.gov/deed/data/data-tools/col/](https://mn.gov/deed/data/data-tools/col/)

17 – Employment Start Date
(102 responded – 38 skipped)

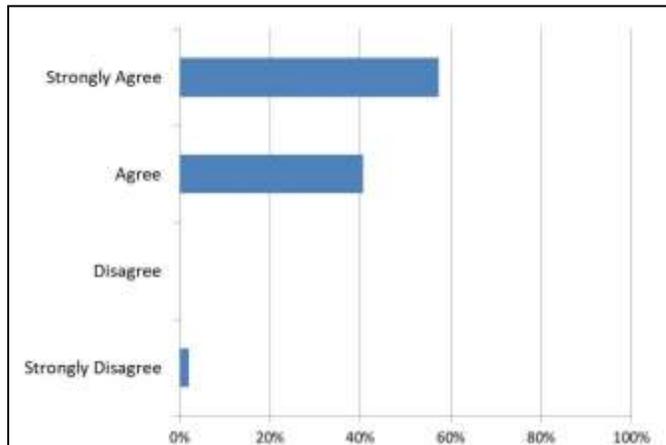
Of the 102 (72.86%) participants responding to this item, 22.55% entered the program as incumbent workers, having started employment before the project began in October 2014. Just under 40% (39.22%) began their employment during the last 6 months of the third year.



E. Satisfaction with MnAMP

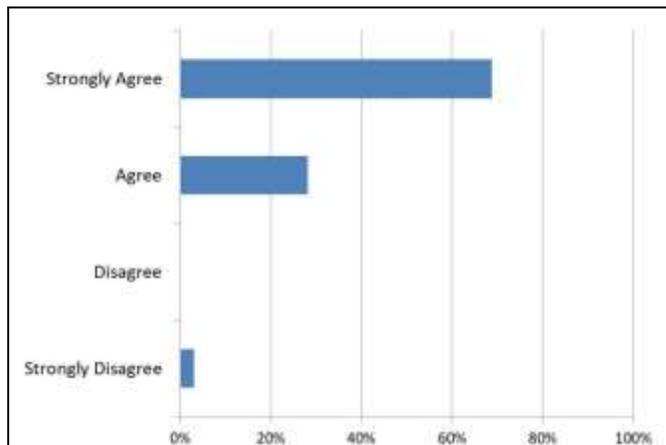
18 – Satisfaction with the Level of Knowledge and Skill Developed in the Courses
(96 responded – 44 skipped)

Of the 96 participants (68.57%) responding to this item, 94 (97.92%) agreed or strongly agreed they were satisfied with the level of knowledge and skill developed through the courses. In the MCSL, 95.07% of respondents agreed or strongly agreed they were satisfied with the level of knowledge and skill developed through the courses.



19 – Willingness to Recommend the Manufacturing Program Courses to Others
(96 responded – 44 skipped)

Of the 96 participants (68.57%) responding to this item, 93 (96.88%) agreed or strongly agreed they would recommend the courses/program to others. In the MCSL, 96.83% of respondents agreed or strongly agreed they would recommend the courses/program to others.



MnAMP Completer Survey – Long Form

Summary

Upon completing a program of study, MnAMP participants may be asked to complete a survey which asks questions about their MnAMP experience.

As of November 14, 2017, 862 MnAMP participants had completed a program of study. Of those 862, 243 (28.2%) fully or partially completed the MnAMP Completer Survey – Long Form (MCSL) that focused on the participants' overall experience in MnAMP. Data from the survey were downloaded on December 27, 2017, and include survey responses made through September 9, 2017 by those completing a Program of Study in Years 1, 2, and 3.

Detailed survey results are reported in the data tables and graphs following this summary and summarized below by topic grouping. Percentages have been rounded to the nearest percentage for this summary and are rounded out to two decimal places in the data tables and graphs.

Overall, there was little change in the responses from the Year 2 report, which covered completers in Years 1 and 2. Overall, participants' attitudes, satisfaction with the program, program content, support services, faculty, and the role of MnAMP in obtaining a job remained high and unchanged, or only slightly changed.

A. The participants, their programs of study, college expectations, and future educational plans

Just over 58% of the participants were enrolled in welding (down from almost 75% in years 1 and 2). 97% had earned a credential upon leaving MnAMP. Most (90%) had positive expectations for doing well in college, enjoyed learning (97%), and expected to succeed (98%), but most did not intend to pursue further education after completing their current program of study.

The majority of those taking the survey who identified their college (92%) came from four colleges (MN West Community and Technical College [17%], MN State Community and Technical College [9%], Ridgewater College [37%], and South Central College [29%]), were enrolled in a welding program (58%), and had earned a credential of some type (97%).

Just over a third (34%) enrolled because they saw no reasonable alternative, and almost two-thirds (62%) said they were leaving because they had graduated, were starting a new job, or had achieved their goal. Twenty-one percent (21%) of the completers were not leaving, but were returning or continuing their education.

Attitudinally, participants were generally positive about their college experience: Seventy-seven percent (76%) felt they did not need some help to be ready for college, and 74% did not feel nervous about resuming their education. Ninety percent (90%) agreed or strongly agreed they tended to do well in college; 97% agreed or strongly agreed they enjoyed learning in school/college; 98% agreed or strongly agreed they expected to succeed in whatever work they did; 97% felt that education is important in finding a job; and 97% agreed or strongly agreed that success mainly depends on being willing to work hard.

Despite the positive attitude, only 16% planned to earn an additional credential or certificate beyond the one in which they were enrolled, and only fifteen percent (15%) planned to earn an additional degree or diploma (up from 13% in Years 1 and 2).

B. Views on the Programs of Study

Participants continued to be most positive about the MnAMP programs and the support they received within those programs.

Almost all (97%) agreed or strongly agreed that the course content was well organized, and 98% agreed or strongly agreed that they learned a lot in the courses. About two-thirds (66%) agreed or strongly agreed the courses were difficult, down from 73 percent for Years 1 and 2. Ninety-two percent (92%) agreed or strongly agreed the courses covered everything they would need to do in a job in their field of study. Almost all (97%) agreed or strongly agreed that faculty were available to talk to them.

Ninety-nine percent (99%) of those who received financial aid found it very or somewhat helpful. For the approximately 87% who received support services, 95% who received educational advising, 93% who received job placement assistance, and 98% who received tutoring found these services very helpful or somewhat helpful.

Eight participants worked in a business in a registered apprenticeship or cooperative arrangement with the college, and 30 worked in a business in an internship or externship cooperative arrangement with the college.

C. Programs of Study and Employment

The participants had an overall favorable impression of the MnAMP program and courses and the role the programs of study played in getting a job.

Eighty-three percent (83%) agreed or strongly agreed that the courses helped them get the job they now have; 90% agreed or strongly agreed the program will help them get and keep future jobs; 74% agreed or strongly agreed the program helped them obtain a job in the field of study upon completion; and 58% agreed or strongly agreed they had better job prospects after completing the program. Close to 74% of the participants disagreed or strongly disagreed that finding a good job is a matter of luck, and 97% agreed or strongly agreed that education is important in finding a job.

Almost all (98%) agreed or strongly agreed they preferred an education with a practical application, and 78% (down from 81% for Years 1 and 2) disagreed or strongly disagreed with the statement that their skills are not awarded in education. If given a choice, 72% (down from 75% in Years 1 and 2) would continue to work, and 78% (up from 76% in Years 1 and 2) believed working gives their life meaning.

D. Participant Employment

Seventy-two percent (77%) of those responding to the survey have a job or a job offer, and 77% of those jobs or job offers (up from 74% in Years 1 and 2) are in the area of training they just completed. Eighty-four percent (84.81%) of the jobs are permanent (up from 81% in Years 1 and 2). The highest percentage of jobs or job offers (36.31%) was in welding or metalworking (down from 43% in Years 1 and 2). Eighty-two percent (82%) of the jobs or job offers were in “Manufacturing” or a specific area of training offered by MnAMP, and 84% said they would be working 40 hours or more per week.

The hourly wage in the job or the job for which participants had an offer ranged from under \$10.00 per hour up to over \$30.00 per hour. Half of the respondents (50%) indicated an hourly wage of \$15.00 - \$19.99 per hour. Based on a 40 hour work week, weekly earnings would be \$600.00 - \$799.60 per week, or \$31,200.00 - \$41,579.20 per year. According to the MN Department of Employment and Economic Development (DEED) the 2017 estimate of the annual cost of living for basic needs in Minnesota counties served by MnAMP colleges for a family of four with one adult working full-time varied between \$46,091 and \$62,069 (\$22.16 and \$29.84 per hour). Approximately 29% of those who had a job or job offer had a job or job offer with an hourly wage of \$20.00 or more.

Just over three-fourths (77%) thought it somewhat likely or very likely they would be working for the same company 5 years from now, and 85% thought it somewhat likely or very likely they would have received a promotion 5 years from now.

E. Satisfaction with MnAMP

There was a high degree of satisfaction (94%) with the MnAMP program among participants. Ninety-five percent (95%) agreed or strongly agreed they were satisfied with the level of knowledge and skill gained. Ninety-eight percent (97%) agreed or strongly agreed they would recommend the manufacturing program to others and 94% agreed or strongly agreed they were satisfied with the program.

Tables and Graphs

The results of the MnAMP Completer Survey – Long Form are reported below in the form of graphs and charts associated with each survey item. These have been further grouped by topic. As all participants did not respond to all of the survey items, the number responding and the number skipping the item are shown. Other than the percentage responding, percentages are based on the number of participants who responded to the particular item. In some table, percentages may not add up to 100% due to rounding.

A. The participants, their programs of study, college expectations, and future educational plans

1 - Respondents by College

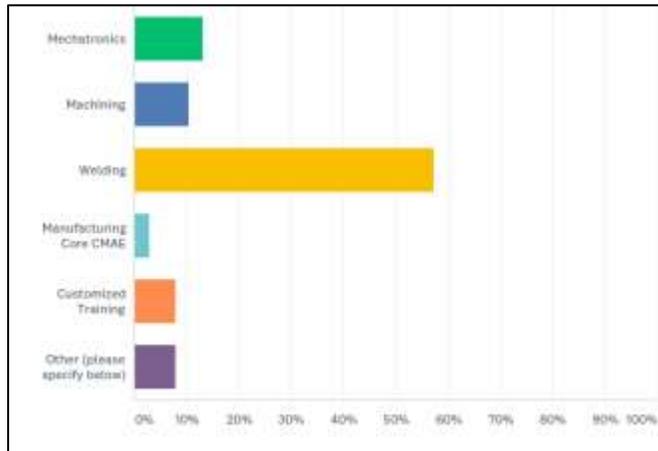
Of the 243 participants responding to the survey, 238 (97.94%) identified the college where they enrolled. 218 (91.60%) of those came from four colleges.

| College | Participants | |
|---|--------------|---------|
| | Number | Percent |
| Century College | 4 | 1.68% |
| Dakota County Technical College | 0 | 0.00% |
| Lake Superior College | 1 | 0.42% |
| Minneapolis Community and Technical College | 5 | 2.10% |
| MN West Community and Technical College | 40 | 16.81% |
| MN State Community and Technical College | 21 | 8.82% |
| Normandale Community College | 2 | 0.84% |
| Northland Community and Technical College | 1 | 0.42% |
| Ridgewater College | 89 | 37.39% |
| Riverland Community College | 0 | 0.00% |
| St. Paul College | 7 | 2.94% |
| South Central College | 68 | 28.57% |

2 - Programs of Study

(234 responded – 9 skipped)

Of the 234 (96.30%) participants responding to this item, 136 (58.12%) were enrolled in welding programs.



3 - Status at Time of Program Completion or College Exit

(222 responded – 21 skipped)

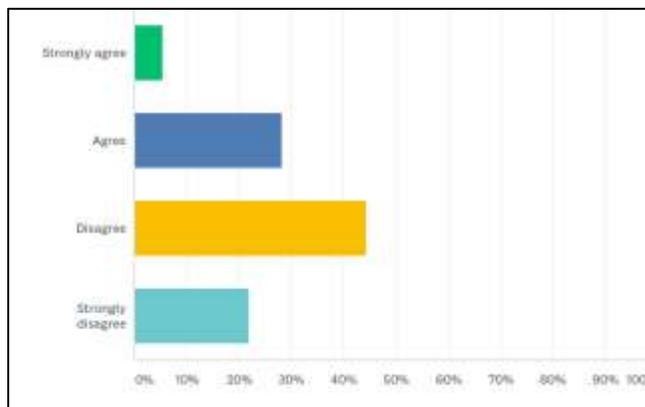
Of the 222 participants (91.36%) responding to this item, 217 (97.75%) had earned a certificate, degree, diploma, or industry credential. 117 (79.73%) had earned a credit-bearing credential.

| Status | Participants | |
|---|--------------|---------|
| | Number | Percent |
| Completed and earned a certificate | 65 | 38.21% |
| Completed and earned a degree | 27 | 13.01% |
| Completed and earned a diploma | 85 | 30.08% |
| Completed and earned an industry credential | 40 | 15.45% |
| Leaving or delaying his/her education | 5 | 3.25% |

4 - Reason for Enrolling

(219 responded – 24 skipped)

Of the 219 (90.12%) participants responding to this item, 74 (33.79%) agreed or strongly agreed they enrolled because they saw no reasonable alternative; however, 145 (66.21%) disagreed or strongly disagreed with this statement.



5 - Reason for Exiting

(71 responded – 172 skipped)

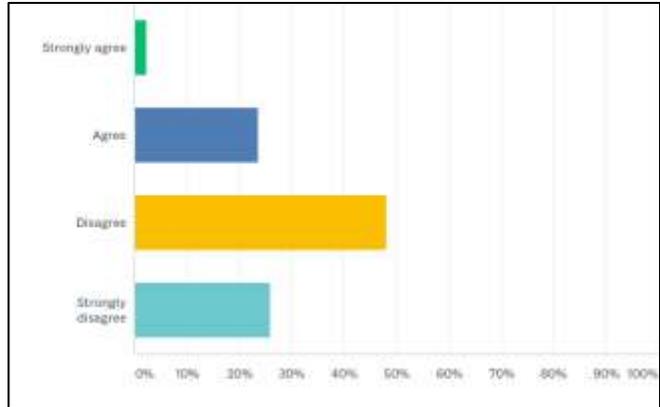
Of the 71 (29.22%) participants responding to this item, 40 (56.34%) indicated they were leaving because they graduated or were starting a new job. 15 (21.13%) were not leaving, but continuing their current or a different program.

| Which of the following best describes why you are leaving or delaying your education? | Participants | |
|---|--------------|---------|
| | Number | Percent |
| Illness | 1 | 1.41% |
| Job-related injury | 2 | 2.62% |
| Starting a new job | 11 | 15.49% |
| Family obligations | 5 | 7.04% |
| Disciplinary dismissal | 1 | 1.41% |
| Graduated | 29 | 40.85% |
| Not leaving - Returning or Continuing Education | 15 | 21.13% |
| Achieved goal | 4 | 5.63% |
| Other | 3 | 4.23% |

6 - Nervousness about Resuming Education

(220 responded – 23 skipped)

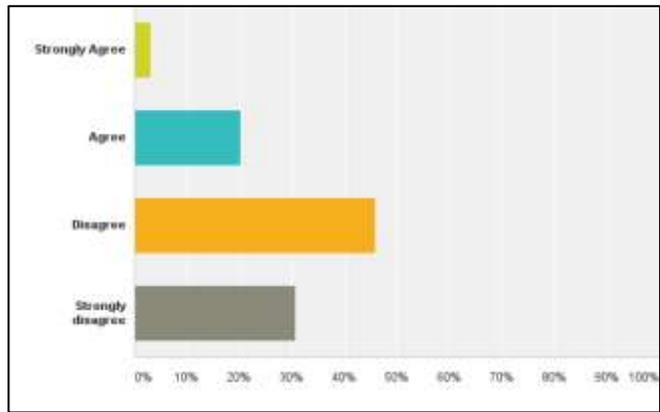
Of the 220 participants (90.53%) responding to this item, 57 (25.91%) agreed or strongly agreed they were nervous about resuming their education; however, 163 (74.09%) disagreed or strongly disagreed with this statement.



7 - Help Getting Ready for College

(218 responded – 25 skipped)

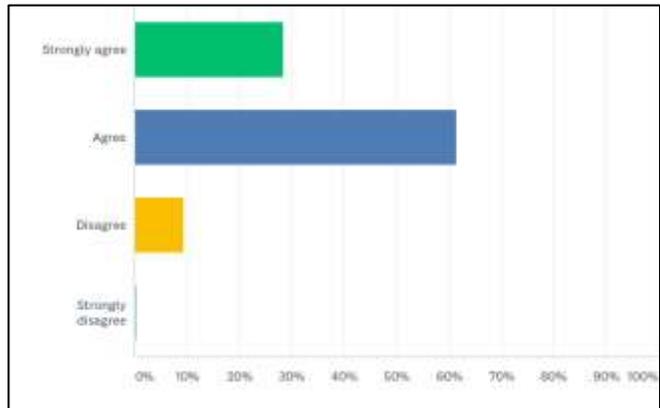
Of the 218 participants (89.71%) responding to this item, 165 (75.69%) disagreed or strongly disagreed they needed some help to be ready for college; however, 53 (24.31%) agreed or strongly agreed with this statement.



8 - Doing Well in College

(221 responded – 22 skipped)

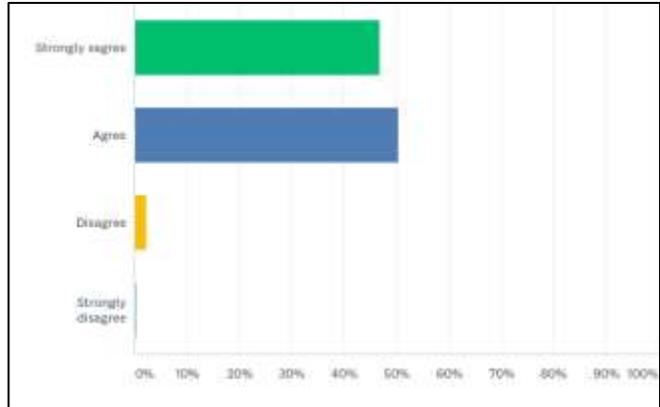
Of the 221 participants (90.95%) responding to this item, 199 (90.05%) agreed or strongly agreed they tended to do well in college. The Year 3 responders were slightly more positive about their ability to do well, as the percentage agreeing or strongly agreeing rose by 1.86 percentage points as compared to Years 1 and 2.



9 - Learning Enjoyment

(224 responded – 19 skipped)

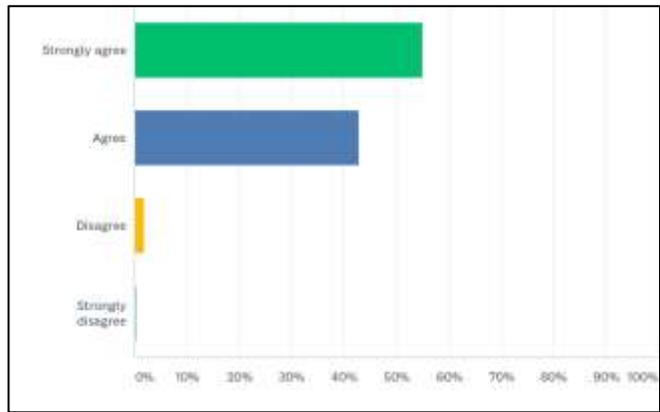
Of the 224 participants (92.18%) responding to this item, 218 (97.32%) agreed or strongly agreed they enjoyed learning in school/college. This is an increase of 1.23 percentage points over Years 1 and 2, and may have some relationship to the increased percentage of those expecting to do well in college.



10 - Expectations for Success

(222 responded – 21 skipped)

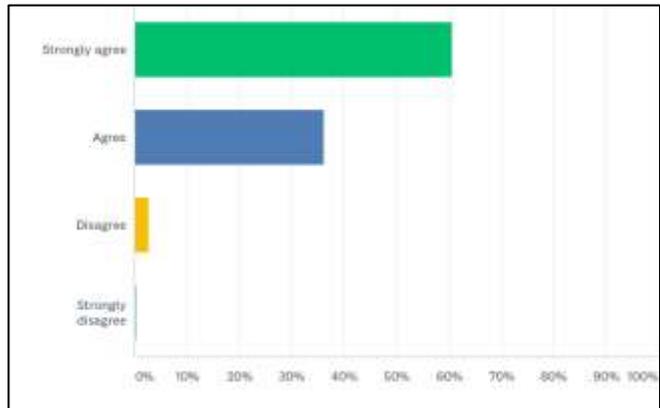
Of the 222 participants (91.36%) responding to this item, 217 (97.75%) agreed or strongly agreed they expected to succeed in whatever work they did. .



11 - Success Depends on Willingness to Work Hard

(224 responded – 19 skipped)

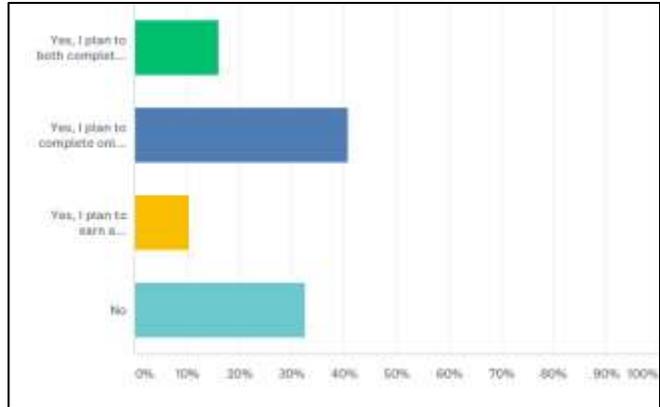
Of the 224 participants (92.18%) responding to this item, 217 (96.88%) agreed or strongly agreed that success mainly depends on being willing to work hard. This is a decrease of .76 percentage points from Years 1 and 2.



12 - Future Plans to Complete or Earn Any Work (Credentials) or Education Certificates

(218 responded – 25 skipped)

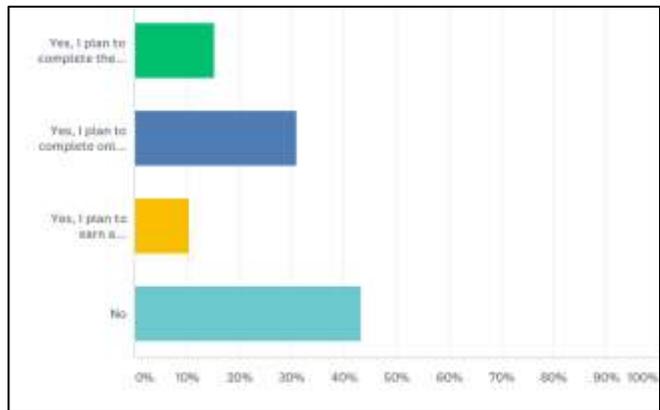
Of the 218 participants (89.71%) responding to this item, 71 (32.57% - down from 37.40% in Years 1 and 2) had no plans to earn any additional credentials, and 89 (40.83% - up from 34.15% in Years 1 and 2) planned to complete only the program in which they were enrolled. 35 (16.06% - up from 15.45% in Years 1 and 2) planned to earn an additional credential or certificate, and 23 (10.55% - down from 13.01% in Years 1 and 2) planned to earn a different credential or certificate and enroll in a different program



13 - Future Plans to Complete or Earn Any Degree or Diploma

(210 responded – 33 skipped)

Of the 210 participants (86.42%) responding to this item, 91 (43.33% - down from 54.62% in Years 1 and 2) had no plans to earn any additional degrees or diplomas, and 65 (30.95% - up from 23.53% in Years 1 and 2) planned to complete only the degree or diploma they were working on. 32 (15.24% - up from 13.45% in Years 1 and 2) planned to earn an additional degree or diploma, and 22 (10.48% - up from 8.40% in Years 1 and 2) planned to earn a different or additional degree or diploma.

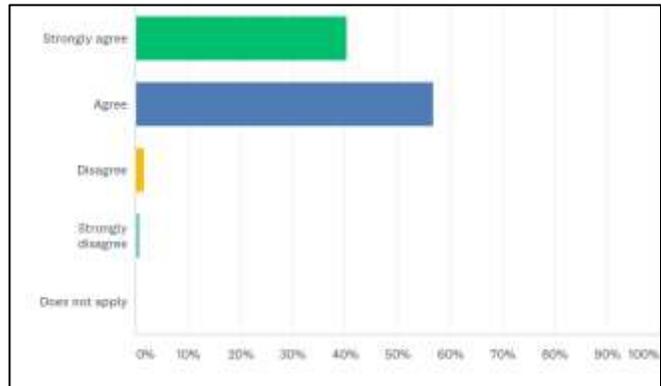


B. Views on the Programs of Study

14 - Content of the Courses Was Well Organized

(225 responded – 18 skipped)

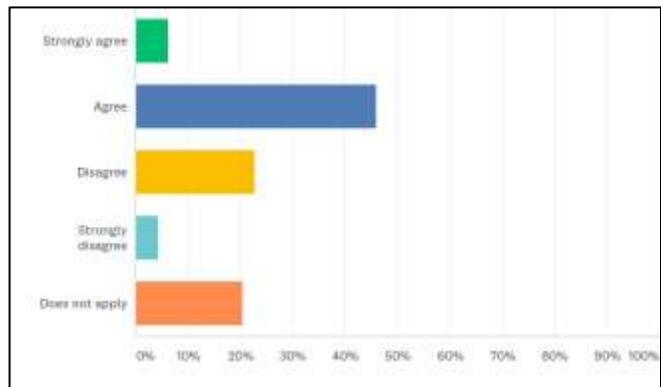
Of the 225 participants (92.59%) responding to this item, 219 (97.33%) agreed or strongly agreed that the course content was well organized.



15 - Difficulty of Courses

(224 responded – 19 skipped)

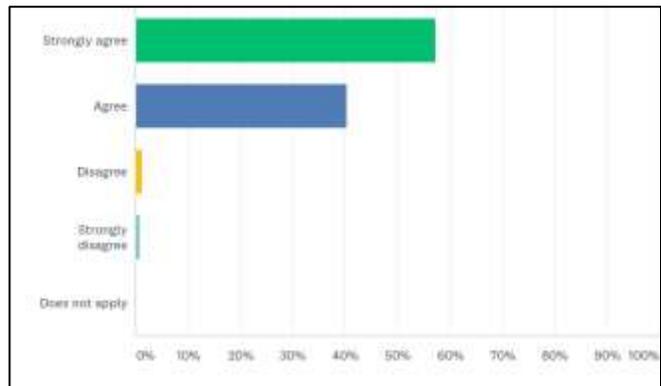
Of the 224 participants (92.18%) responding to this item, 46 (20.54%) said this item did not apply. Of those for whom it applied, 117 (65.73% - down from 73.15% in Years 1 and 2) agreed or strongly agreed that the courses were difficult.⁸²



16 - Learned a Lot in the Courses

(225 responded – 18 skipped)

Of the 225 participants (92.59%) responding to this item, 220 (97.78%) agreed or strongly agreed that they learned a lot in the courses.¹

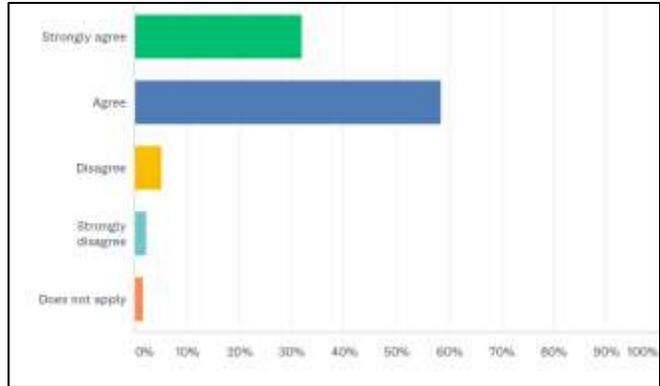


⁸² Percentages reflect only those agreed and strongly agreed, or disagreed and strongly disagreed.

17 - Courses Covered Everything Needed to Get a Job in This Field of Study

(225 responded – 18 skipped)

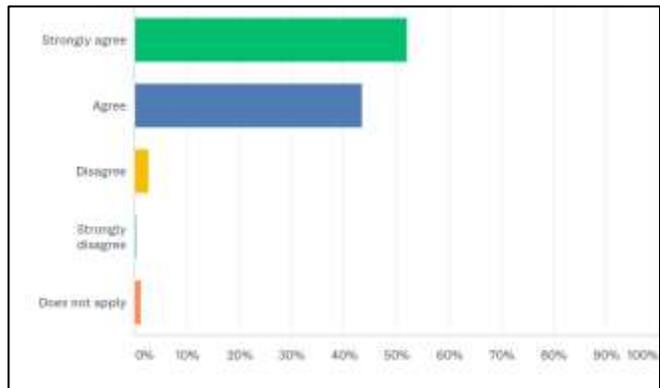
For 4 participants (1.78%) this item did not apply. For those for whom it did apply, 204 (92.31%) agreed or strongly agreed that courses covered everything they would need to do in a job in their field of study. This is an increase of 1.04 percentage points over Years 1 and 2. Although almost 60% agreed they learned a lot in the courses, just over 30% strongly agreed the courses covered everything they believe they would need for a job in their field of study.⁸³



18 - Faculty Availability

(225 responded – 18 skipped)

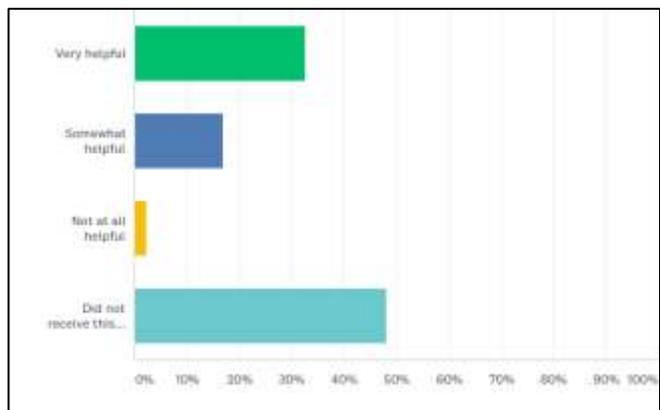
For 3 participants (1.33%) this item did not apply. For those for whom this did apply, 215 (96.85%) agreed or strongly agreed that faculty were available if participants wanted to talk to them.



19 - Helpfulness of Financial Aid

(219 responded – 24 skipped)

Of the 219 participants (90.12% responding to this item, 91 (41.55%, up from 39.84% in Years 1 and 2) did not receive any financial assistance. Of the 128 who received financial aid, 127 (99.22%) found it very helpful or somewhat helpful.⁸⁴



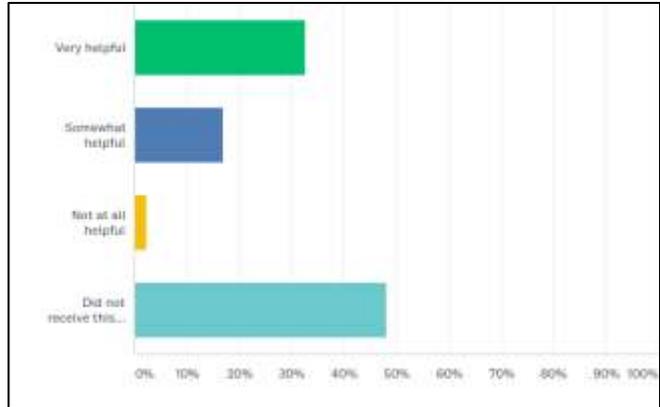
⁸³ Percentages reflect only those agreed and strongly agreed, or disagreed and strongly disagreed.

⁸⁴ Percentages reflect only those who found the assistance very helpful and somewhat helpful, or not at all helpful.

20 - Helpfulness of Educational Advising

(212 responded – 31 skipped)

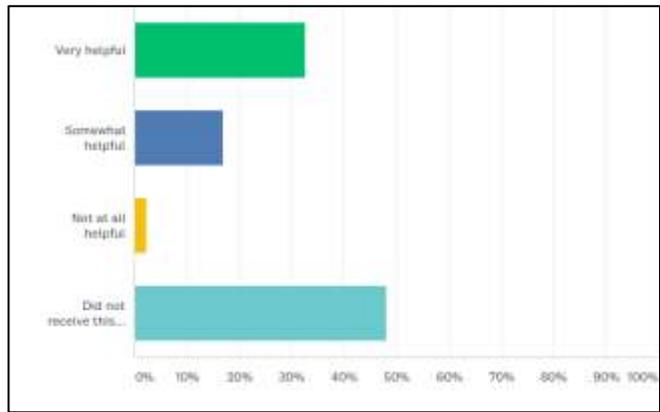
Of the 212 participants (87.24%) responding to the item, 102 (48.11% - down from 50.00% in years 1 and 2) did not receive any educational advising. Of the 110 who received educational advising, 105 (95.45%) found it very helpful or somewhat helpful.



21 - Helpfulness of Tutoring

(212 responded – 31 skipped)

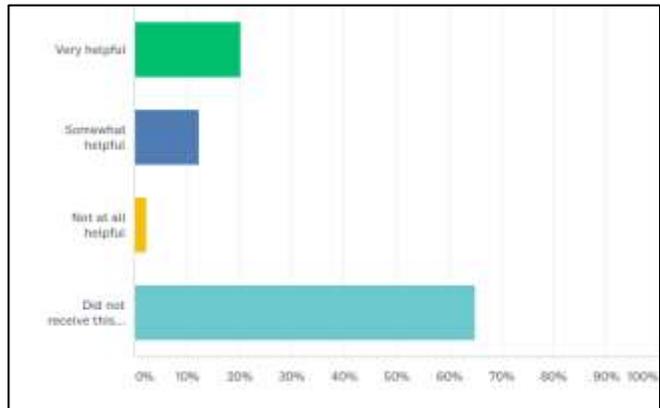
Of the 212 participants (87.24%) responding to the item, 153 (72.17%) did not receive any tutoring. Of the 59 who received tutoring, 58 (98.31%) found it very helpful or somewhat helpful.



22 - Helpfulness of Job Placement Assistance

(212 responded – 31 skipped)

Of the 212 participants (87.24%) responding to this item, 138 (65.09% - up from 61.21% in Years 1 and 2) did not receive any job placement assistance. Of the 74 who received job placement assistance, 69 (93.24 – down from 95.56% in Years 1 and 2) found it very helpful or somewhat helpful.⁸⁵

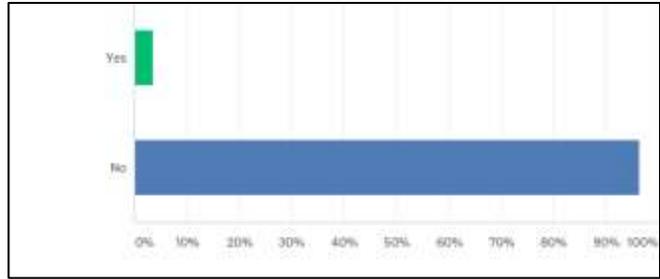


⁸⁵ Percentages reflect only those who found the assistance very helpful and somewhat helpful, or not at all helpful.

23 - Registered Apprenticeships and Cooperative Arrangements

(225 responded – 18 skipped)

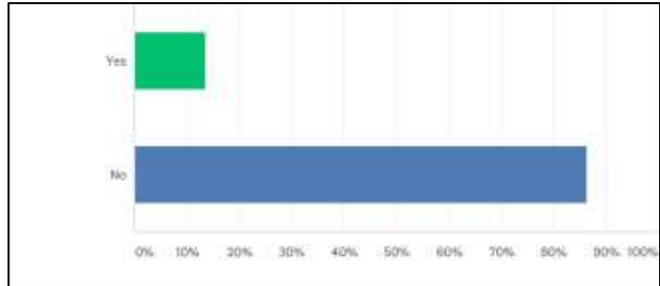
Of the 225 participants (92.59%) responding to this item, 8 (3.56%) worked in a business in a registered apprenticeship cooperative arrangement with the college.



24 - Internships and Externships

(222 responded – 21 skipped)

Of the 222 participants (91.36%) responding to this item, 30 (13.51% - down from 17.97% in Years 1 and 2) worked in a business in an internship or externship cooperative arrangement with the college.

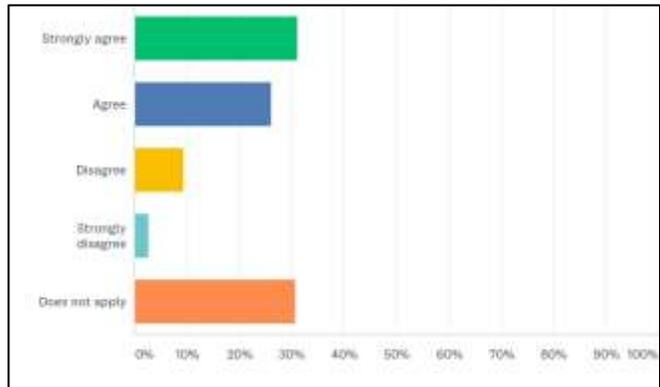


C. Programs of Study and Employment

25 - Courses Helped Get the Job They Have Now

(225 responded – 18 skipped)

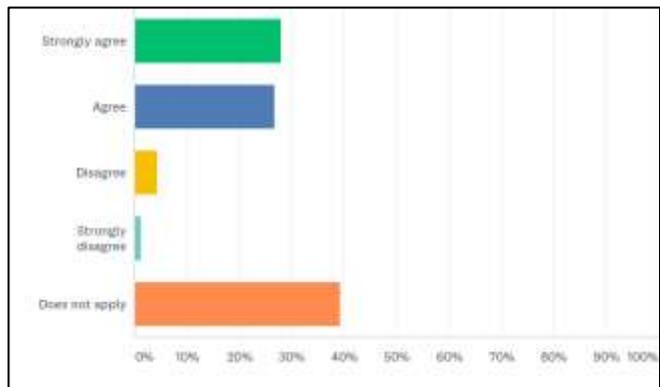
For 69 participants (30.67%) this item did not apply. For those for whom this did apply, 129 (82.69%) agreed or strongly agreed that the courses helped them get the job they now have.⁸⁶



26 - Participation Will Help Get and Keep Future Jobs

(224 responded – 19 skipped)

For 88 participants (39.29% up from 35.94% in Years 1 and 2) this item did not apply. For those for whom this did apply, 123 (90.44%) agreed or strongly agreed that the program will help them get future jobs.

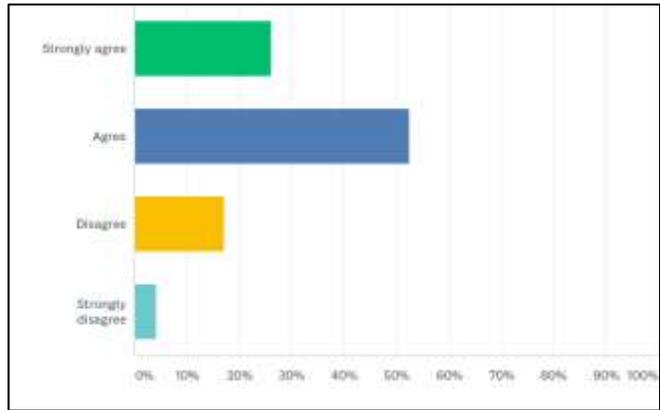


⁸⁶ Percentages reflect only those agreed and strongly agreed, or disagreed and strongly disagreed.

27 - Program Helped in Obtaining a Job in Field of Study

(211 responded – 32 skipped)

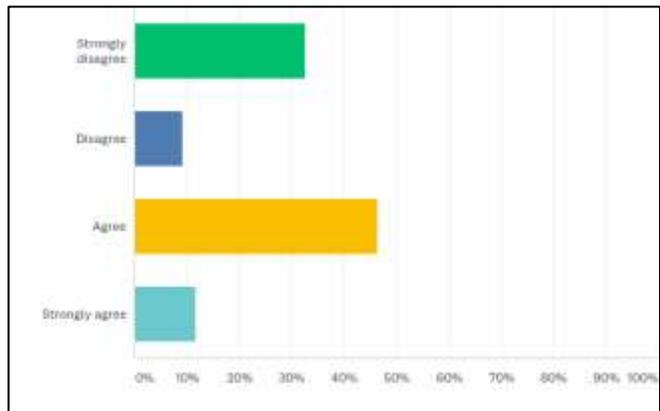
Of the 211 participants (86.83%) responding to this item, 166 (78.67% - up from 74.17% in Years 1 and 2) agreed or strongly agreed the program helped them obtain a job in the field of study upon completion.



28 - Program Helped in Getting Better Job Prospects

(215 responded – 28 skipped)

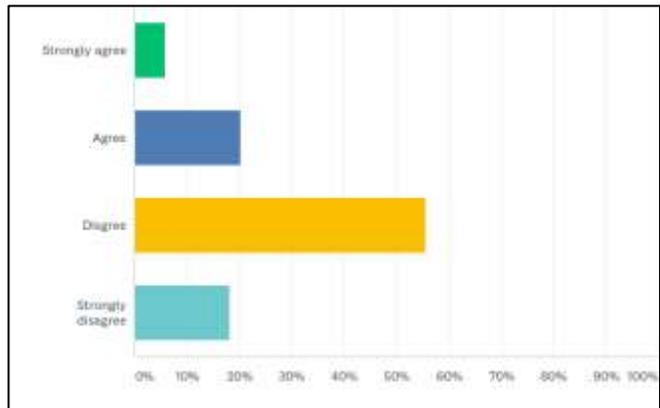
Of the 215 participants (88.48%) responding to this item, 125 (58.14% - up from 56.56% in Years 1 and 2) agreed or strongly agreed they had better job prospects after completing the program.



29 - Role of Luck in Finding a Good Job

(221 responded – 22 skipped)

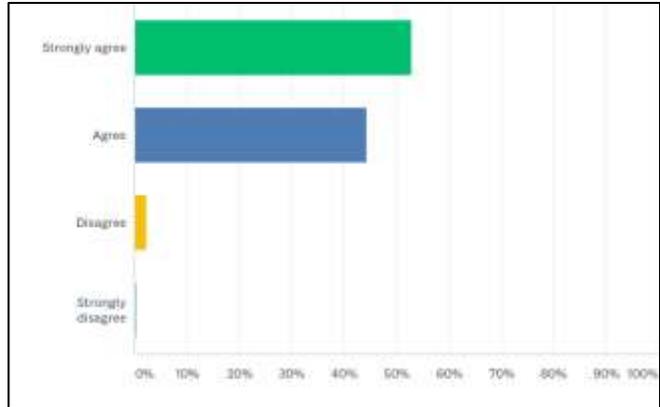
Of the 221 participants (90.95%) responding to this item, 163 (73.76%) disagreed or strongly disagreed that finding a good job is a matter of luck.



30 - Importance of Education in Finding a Job

(223 responded – 20 skipped)

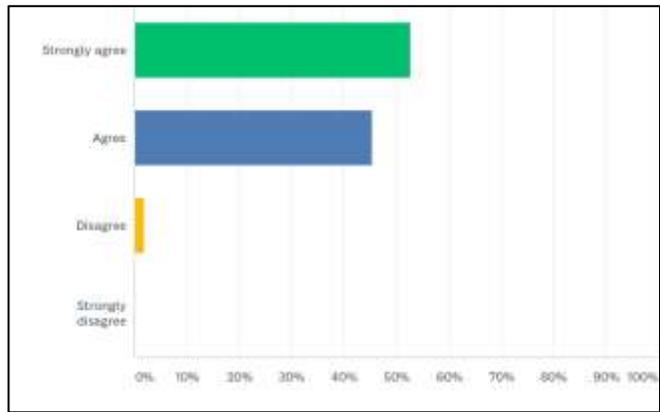
Of the 223 participants (91.77%) responding to this item, 217 (97.31% - up from 96.09% in Years 1 and 2) agreed or strongly agreed that education is important in finding a job.



31 - Preference for Education with a Practical Application

(222 responded – 21 skipped)

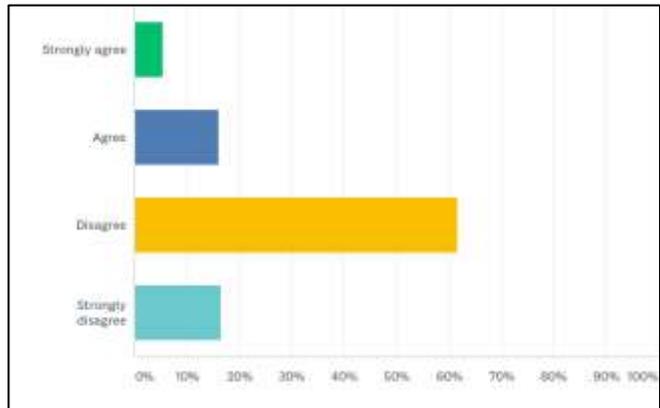
Of the 222 participants (91.36%) responding to this item, 218 (98.20%) agreed or strongly agreed they preferred an education with a practical application.



32 - Skills Are Not Rewarded in Education

(217 responded – 26 skipped)

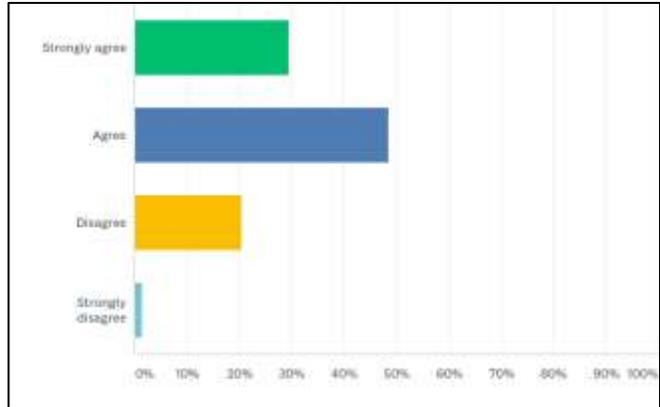
Of the 217 participants (89.30%) responding to this item, 47 (21.66% - up from 18.70% in Years 1 and 2) agreed or strongly agreed that their skills are not awarded in education; however, 170 (78.34%) disagreed or strongly disagreed with the statement.



33 - Work Giving Life Meaning

(220 responded – 23 skipped)

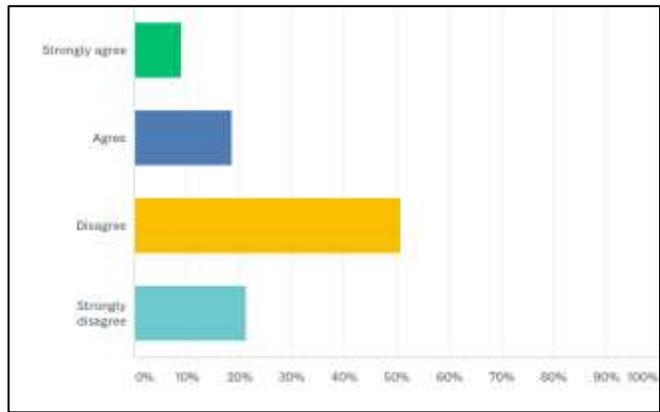
Of the 220 participants (90.53%) responding to this item, 172 (78.18% - up from 76.19% in Years 1 and 2) agreed or strongly agreed that going to work gives their life meaning; however, 48 (21.82%) disagreed or strongly disagreed with this statement.



34 - Not Working, if Given That Choice

(220 responded – 23 skipped)

Of the 220 participants (90.53%) responding to this item, 159 (72.27% - down from 75.40% in Years 1 and 2) disagreed or strongly disagreed that if they had a choice, they would not work; however, 61 (27.73% - up from 24.60% in Years 1 and 2) agreed or strongly agreed with this statement.

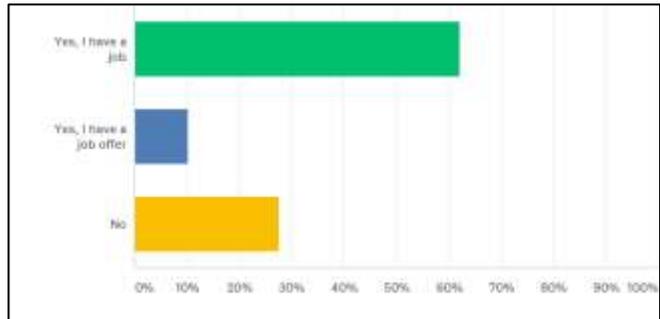


D. Participant Employment

35 - Having a job or Job Offer

(224 responded – 19 skipped)

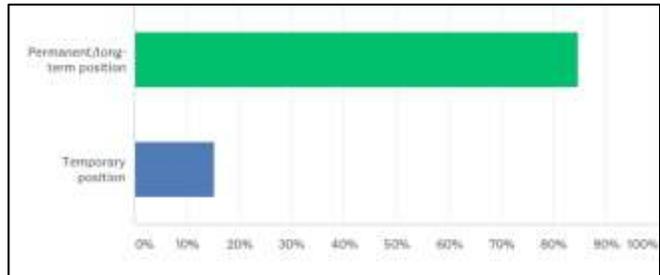
Of the 224 participants (92.18%) responding to this item, 139 (62.05% - up from 60.63% in Years 1 and 2) have a job, and 23 (10.27% - down from 11.02% in Years 1 and 2) have a job offer. 62 (27.68%) have neither a job nor a job offer, down from 28.35% in Years 1 and 2.



36 - Permanent or Temporary Position

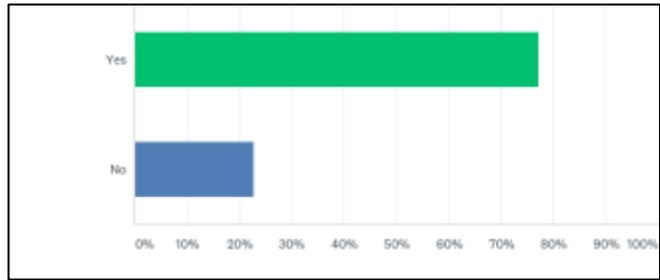
(158 responded – 85 skipped)

Of the 158 participants (65.02%) responding to this item, 134 (84.81% - up from 80.68% in Years 1 and 2) have a permanent job or job offer. 24 (15.19%) have a temporary job or job offer.



37 - Area of Training Related to Job or Job Offer

(158 responded – 85 skipped)
 Of the 158 participants (65.02%) responding to this item, 122 (77.22% - up from 73.86% in Years 1 and 2) have a job or job offer in the area of training they just completed.



38 - Job or Job Offer Occupations

(157 responded – 96 skipped)

Of the 157 participants (64.61%) responding to this item, 112 (71.34%) have a job or job offer in an area of training offered by MnAMP. 23 (14.65%) have a job or job offer in areas related to areas of training offered by MnAMP. The highest percentage of jobs or job offers was in welding or metalworking (57 – 36.31%), although this percentage is down from the Years 1 and 2 percentage of 43.18%).

| What of the following occupations best describes your job or job offer | Participants | |
|--|--------------|---------|
| | Number | Percent |
| Welding or metalworking* | 57 | 36.31% |
| Machining* | 22 | 14.01% |
| Mechatronics* | 20 | 12.74% |
| Manufacturing | 17 | 10.83% |
| Certified Production Technician* | 13 | 8.28% |
| Maintenance | 6 | 3.82% |
| Customer Service/Retail | 5 | 3.18% |
| Food Industry | 3 | 1.91% |
| Education | 3 | 1.91% |
| Construction | 2 | 1.27% |
| Other | 9 | 5.73% |

* Training offered by MnAMP

39 - Hours

(140 responded – 103 skipped)

Of the 140 participants (57.61%) responding to the question about hours worked, 118 (84.28%) said they were working or would be working 40 or more hours per week.

| If you have a current job or job offer, how many hours per week do you work or will you work in the new job? | | |
|--|----------------|-----------------|
| Working Hours per Week | Number Working | Percent Working |
| Fewer than 10 | 2 | 1.43% |
| 10 – 19 hours | 4 | 2.86% |
| 20 – 29 hours | 7 | 5.00% |

| If you have a current job or job offer, how many hours per week do you work or will you work in the new job? | | |
|--|----------------|-----------------|
| Working Hours per Week | Number Working | Percent Working |
| 30 – 39 hours | 9 | 6.43% |
| 40 hours | 87 | 62.14% |
| More than 40 hours | 31 | 22.14% |

40 - Wages

(127 responded – 116 skipped)

Of the 127 participants (52.26%) responding to the item about the hourly wage in their job or the job for which they had an offer, slightly over half (50.39% - down 1.04 percentage points from Years 1 and 2) indicated an hourly wage of \$15.00 - \$19.99 per hour. Based on a 40 hour work week, weekly earnings would be \$600.00 - \$799.60 per week, or \$31,200.00 - \$41,579.20 per year.

| If you have a job or job offer, what is your hourly wage? | | | | |
|---|----------------------------|---------|--------------------------------|---------|
| Wage | Participants Years 1 and 2 | | Participants Years 1, 2, and 3 | |
| | Number | Percent | Number | Percent |
| Less than \$10.00 | 3 | 4.29% | 3 | 2.36% |
| \$10.00 - \$14.99 | 10 | 14.29% | 21 | 16.54% |
| \$15.00 – \$19.99 | 36 | 51.43% | 64 | 50.39% |
| \$20.00 – \$24.99 | 12 | 17.14% | 24 | 18.90% |
| \$25.00 - \$29.99 | 6 | 8.57% | 12 | 9.45% |
| \$30.00 – \$34.99 | 1 | 1.43% | 1 | 0.79% |
| Unknown | | % | 2 | 1.57% |

According to the MN Department of Employment and Economic Development (DEED) the 2017 estimate of the annual cost of living for basic needs in Minnesota counties for a family of four with one adult working full-time varied between \$41,245 annual/\$19.83/hr. (Stevens County) and \$64,575 annual/\$31.05/hr. (Chisago County).

The estimated cost for a family of four with one adult working full-time in each MnAMP county is shown in the table below.⁸⁷

| MnAMP College | County | 2017 Estimated Cost of Living | |
|---------------|----------|-------------------------------|---------------------------|
| | | Annual Compensation | Hourly Rate (2,080 hours) |
| Century | Ramsey | \$62,069 | \$29.84 |
| St. Paul | Ramsey | \$62,069 | \$29.84 |
| MCTC | Hennepin | \$61,768 | \$29.70 |

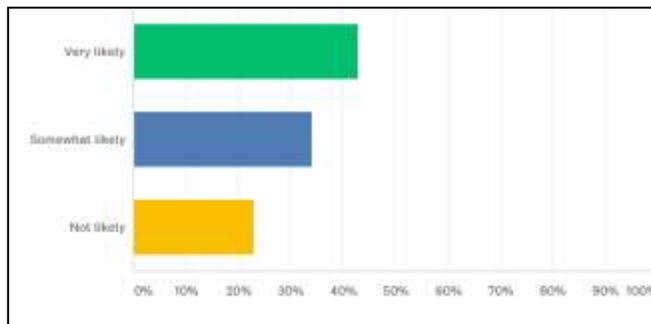
⁸⁷ Minnesota Employment and Economic Development. (n.d.). *Cost of Living in Minnesota*. Retrieved from <https://mn.gov/deed/data/data-tools/col/>

| MnAMP College | County | 2017 Estimated Cost of Living | |
|-----------------------|------------|-------------------------------|------------------------------|
| | | Annual Compensation | Hourly Rate (2,080 hours) |
| Normandale | Hennepin | \$61,768 | \$29.70 |
| DCTC | Dakota | \$61,256 | \$29.50 |
| Northland | Polk | \$50,181 | \$24.13 |
| South Central College | Nicollet | \$49,251 | \$23.68 |
| MnState | Otter Tail | \$47,980 | \$23.07 |
| Lake Superior College | St. Louis | \$47,456 | \$22.82 |
| Riverland | Mower | \$46,922 | \$22.56 |
| MnWest | Nobles | \$46,268 | \$22.24 |
| Ridgewater | Kandiyohi | \$46,091 | \$22.16 |

**41 - Working at Same Company
5 Years from Now**

(170 responded – 73 skipped)

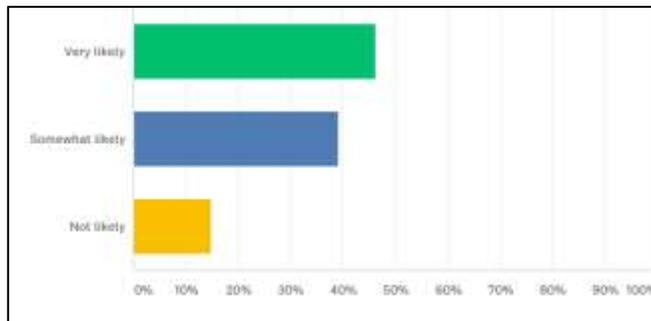
Of the 170 participants (69.96%) responding to this item, 131 (77.06% – up from 72.04% in Years 1 and 2) thought it somewhat likely or very likely they would be working for the same company 5 years from now.



42 - Getting a Promotion 5 Years from Now

(169 responded – 74 skipped)

Of the 169 participants (69.55%) responding to this item, 144 (85.21% - up from 83.87% in Years 1 and 2) thought it somewhat likely or very likely they would have received a promotion 5 years from now.

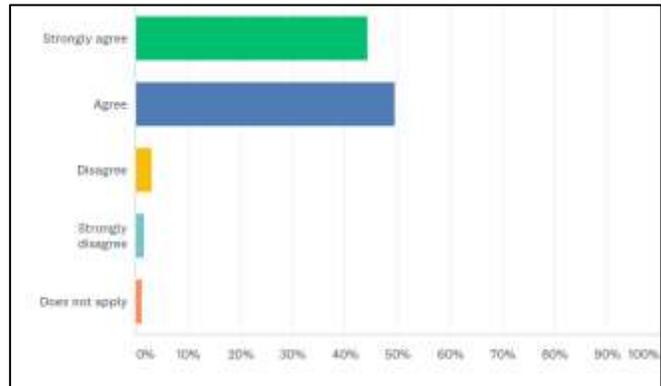


E. Satisfaction with MnAMP

43 - Satisfaction with the Level of Knowledge and Skill Developed in the Courses

(226 responded – 17 skipped)

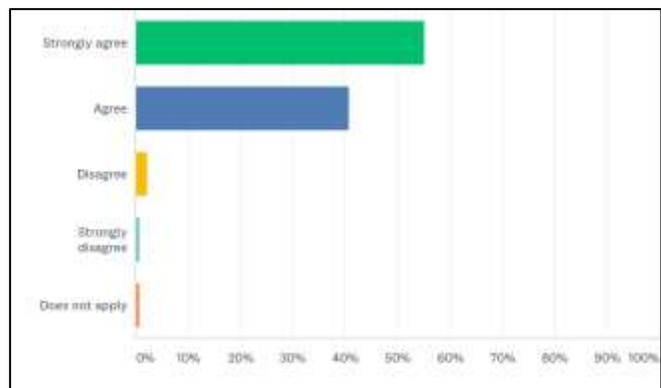
For 3 participants (1.33%), this item did not apply. For those for whom this did apply, 212 (95.07%) agreed or strongly agreed they were satisfied with the level of knowledge and skill gained.



44 - Willingness to Recommend the Manufacturing Program Courses to Others

(223 responded – 20 skipped)

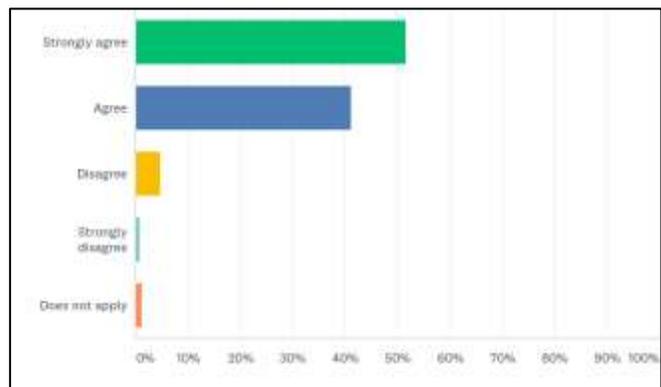
For 2 participants (0.90%) responding to this item, this item did not apply. For those for whom this did apply, 214 (96.83%) agreed or strongly agreed they would recommend the manufacturing program courses to others.



45 - Personal Satisfaction with the Program

(226 responded – 17 skipped)

For 3 participants (1.33% of the respondents) this item did not apply. For those for whom this did apply, 210 (94.17%) agreed or strongly agreed they were satisfied with the program.



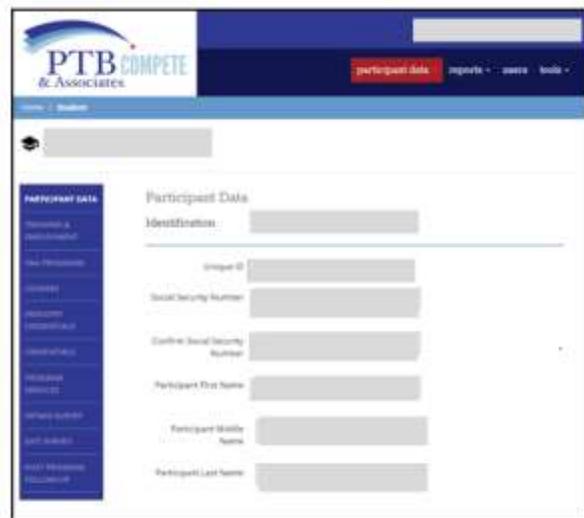
Appendix F – Description of the COMPETE Database

PTB's secure, Web-based Longitudinal Data Tracking System (LDTS), called COMPETE (College Outcomes Management and Performance Learning Environment for Tracking and Evaluation), the foundation upon which the LWE database was constructed, provides data collection, warehousing, and reporting services to support project and program evaluation and data-driven decision-making. COMPETE is designed to help colleges, districts, schools, educators, and other stakeholders make data-informed decisions to improve student learning and outcomes, as well as to facilitate research to increase student achievement and close achievement gaps.

Individual student unit record data (including demographic, program and support services participation, and performance data such as course grades and standardized test scores) are loaded directly into the database using a web-based user interface or uploaded from Excel/.CSV spreadsheets. Data are exported in .CSV and Excel formats for analysis and/or uploading into statistical software programs such as SPSS or SAS.

COMPETE:

- Is available to users in multiple, disparate locations 24x7 via the Internet;
- Offers real-time review of stored data;
- Integrates data from multiple sources into a single authoritative database;
- Permits access assignment based on individual roles and responsibilities;
- Automatically assigns a unique ID to each student;
- Features user-friendly navigation and easy entry of data using data entry screens and upload from Excel and .CSV spreadsheets;
- Generates real-time, standard, and custom reports for analysis and decision making;
- Tracks participant and comparison groups in order to conduct rigorous quasi-experimental design outcome program and cost effectiveness evaluations;
- Tracks, measures, and compares students' educational and employment outcomes to determine which innovations work;
- Helps close the performance gaps of demographic subgroups by identifying those interventions most likely to raise their achievement levels; and



The screenshot displays the PTB COMPETE & Associates web interface. The header includes the logo and navigation links for 'participant data', 'reports', 'users', and 'tools'. The main content area is titled 'Participant Data' and contains a form with the following fields: 'Identification', 'Unique ID', 'Social Security Number', 'Confirm Social Security Number', 'Participant First Name', 'Participant Middle Name', and 'Participant Last Name'. A sidebar on the left lists various menu items under the heading 'PARTICIPANT DATA'.

- Can:
 - Be customized to draw on post-program attainment and performance data on graduates;
 - Track postsecondary enrollment and persistence data by matching graduates with enrolled college students in the National Student Clearinghouse database; and
 - Include individual post-education employment and wage data of graduates, subject to agreement with employment agencies.

Data Typically Collected in the COMPETE Database

| Data | Description |
|---------------------------|--|
| Demographic Data | Name, DOB, gender, ethnicity, race, disability status, educational barriers, employment status, current wage, most recent occupation, prior experience in the field, prior experience overall |
| Tracking Data | A unique student identifier, social security number, e-mail address, alternate contact, alternate contact phone number and e-mail address, cohort assignment |
| Program Data | Entry date, expected year of completion, number of unexcused absences, Student Education Plan status, previous education and training, full- or part-time status, Pell Grant eligibility, basic skills deficiency, year and term certificate/degree awarded, exit year, program completer information including employment, wages, further education, internship |
| Course information | Course number, prefix, term, and name, college name, program of study assignment, certificate assignment, course level, number of credits, grades, GPA, whether course is Dual Credit, whether course is remedial or college level |
| Participation information | Name and brief description of the activity, the year the activity took place, the start and end date, the number of sessions if more than one, the number of hours per session |
| Surveys | Attitudes toward education and work, surveys of levels of satisfaction, and other surveys as defined by the client |
| Other | Because the database is relational, the data can be indexed using any value the user chooses. For example, performance of students with prior learning assessments can be compared with performance of students without prior learning assessments |

COMPETE is a secured web-based database with prime focus on data-security. The system employs SQL Server 2012, ASP .NET, Javascript, JQuery, HTML and CSS

Appendix G – Student level Data Elements for Use in a Longitudinal Data Tracking System

| Data Element | | Definition |
|--------------|--|--|
| 1 | Database ID | Unique ID automatically assigned by the database |
| | Participant Data | |
| 2 | College of Enrollment | Alpha or dropdown of MnSCU colleges |
| 3 | College Student ID | Student ID assigned by College |
| 4 | Social Security Number | Self-explanatory |
| 5 | Participant last name | Self-explanatory |
| 6 | Participant first name | Self-explanatory |
| 7 | Participant middle Name | Self-explanatory |
| 8 | Former Name | Self-explanatory |
| 9 | Street Address 1 | Self-explanatory |
| 10 | Street Address 2 | Self-explanatory |
| 11 | City | Self-explanatory |
| 12 | State | Self-explanatory |
| 13 | Zip Code | Self-explanatory |
| 14 | County | Self-explanatory |
| 15 | Phone Number | Self-explanatory |
| 16 | Cell Phone | Self-explanatory |
| 17 | Preferred Email | Self-explanatory |
| 18 | Alternate Email | Self-explanatory |
| 19 | Best Way to Contact | 1. Home phone; 2. Cellphone; 3. Mail; 4.Email; 5. Other with text box to type in other method |
| 20 | Allow Text Messages | Yes/No |
| 21 | Selective Service Registration (males, only) | Yes/No |
| 22 | Selective service number (if registered) | If registered with selective service |
| 23 | Military Status | 1. Current Military (Active, Guard, Reserve, etc.); 2. Veteran; 3. Eligible Spouse of Military/Veteran; 4. No military affiliation |
| 24 | US Citizenship | Yes/No |
| 25 | Eligible to Work (if “No” to #24) | Yes/No |
| 26 | Non-citizen status (if “No” to #24) | 1. Student Visa; 2. Legally registered Alien |

| Data Element | | Definition |
|--------------|---------------------------------------|--|
| 27 | Expiration Date (if "No" to #24) | MM/DD/YYYY if on student visa or legally-registered alien |
| 28 | Alien Status (if applicable) | 1. Temporary; 2. Permanent |
| 29 | Felony status | Have you ever been convicted of a felony? Yes/No |
| 30 | Gender | M – male and F - Female |
| 31 | Date of Birth | MM/DD/YYYY |
| 32 | Ethnicity | 1. Hispanic/Latino 2. Non-Hispanic/Latino |
| 33 | Race (if Non-Hispanic/Latino) | 1. American Indian or Alaska; 2. Asian; 3. Black or African American; 4. Native Hawaiian/Pacific Islander; 5. White; 6. More than one race; 7. Unknown or prefer not to answer |
| 34 | Disability | Persons with a Disability - known, or self-identified "disability," as defined in Section 3(2)(a) of the Americans with Disabilities Act of 1990 (42 U.S.C. 12102) i.e., a physical or mental impairment that substantially limits one or more of the person's major life activities |
| 35 | Primary Language | 1. English; 2. Other |
| 36 | Marital Status | 1. Married; 2. Single; 3. Separated; 4. Divorced |
| 37 | Home Ownership | 1. Own home; 2. Rent home; 3. Live with other(s) 4. Live with Parents |
| 38 | Children (under 18) at Home | Yes/No |
| 39 | Annual Household Income | Household income ranges: 1. \$0-\$14,999; 2. \$15,000-\$24,999; 3. \$25,000-\$34,999; 4. \$35,000-\$54,999; 5. \$55,000-\$74,999; 6. \$75,000 and above |
| 40 | Distance from home to school | 1. 0-5 miles; 2. 6-10 miles; 3. more than 10 miles |
| 41 | Referred by | 1. Advisor; 2. Employer; 3. Veterans' center; 4. Self-referred; 5. Basic Education; 6. Workforce Center; 7. Other with box to enter |
| 42 | Alternate contact | Name of individual who will know how to contact participant if the participant contact information is out of date |
| 43 | Alternate contact phone number | Self-explanatory |
| 44 | Alternate email contact | Self-explanatory |
| 45 | Alternate contact address information | Street, City, State, Zip |

| Data Element | | Definition |
|---------------------------------|--|--|
| Entering Employment Data | | |
| 46 | Employment status at time of enrollment | 1. Employed Full-time; 2. Employed Part-time; 3. Laid off or furloughed; 4. Unemployed; 5. Self-employed; 6. Underemployed; 7. Employed and have received notice of termination |
| 47 | Previous Technical Training | Industry recognized training and/or; name(s) of organization awarding the industry training. |
| 48 | Received wage increase any time after enrolling | Yes/No |
| 49 | Current occupation (if employed) | Position/Job Title for incumbent worker |
| 50 | Current employer (if employed) | Name of Employer for incumbent worker |
| 51 | Employed in field of study at time of enrollment (if employed) | Yes/No |
| 52 | Current Wage at time of enrollment (if employed) | Wage at time of enrollment |
| 53 | Hours worked per week (if employed) | numeric |
| 54 | DOL Job Category (if employed) | Drop down menu provided with DOL job categories |
| 55 | Previous Employment: multiple previous employers are allowed | Each previous employment will include the following information: Employer, Field, Job Title, Wage, Start Date, End Date, Full/Part time, whether it is in their field of study, DOL job category |
| 56 | Prior Experience – Field in which enrolling | Years of experience in chosen field of study |
| 57 | Prior Experience – Overall | Years of experience in any field |
| Educational Data | | |
| 58 | Entry date | Date participant enrolled |
| 59 | Entering Educational level | 1. Eighth grade or less; 2. Some high school; 3. High school diploma; 4. GED; 5. Some college; 6. Certificate; 7. Two-year degree; 8. Four year degree; 9. Graduate school |
| 60 | Parent/Guardian #1 Entering Educational level | 1. Eighth grade or less; 2. Some high school; 3. High school diploma; 4. GED; 5. Some college; 6. Certificate; 7. Two-year degree; 8. Four year degree; 9. Graduate school |
| 61 | Parent/Guardian #2 Entering Educational level | 1. Eighth grade or less; 2. Some high school; 3. High school diploma; 4. GED; 5. Some college; 6. Certificate; 7. Two-year degree; 8. Four year degree; 9. Graduate school |
| 62 | Education/Training Goal | List types of credentials available |
| 63 | Prior Learning Assessment | Whether or not a Prior Learning Assessment was conducted |
| 64 | PLA Credit (if PLS conducted) | Number of credit hours awarded for PLA |

| Data Element | | Definition |
|--------------|--|---|
| 65 | Basic Skills Assessment Placement Tool(s) | Include data elements for the scores in each of the academic areas for the specific assessment tool(s), date of test and if the student is cleared for college credit courses for each of these. |
| 66 | Basic skills deficiency | Not academically prepared to succeed in college level courses towards a degree or certificate. 1. Math; 2. Reading; 3. Writing; 4. Computer |
| 67 | Basic skills assessment Placement | 1. Developmental, credit; 2. Developmental, non-credit; 3. College level) |
| 68 | Demonstrated skills gains toward a certificate/ degree | Basic skills deficient student who demonstrates skills gains towards a degree or certificate by demonstrated skills gains on a valid, reliable, and standardized assessment or by success in a college-level course towards a degree or certificate. |
| 69 | Full-time/part-time student (by semester or quarter) | Full-time Status by semester; full-time =enrollment into 12 or more credit hours in the Fall or Spring semester and 6 or more credit hours in the Summer. Part-time Status - enrollment into less than 12 credit hours in the Fall or Spring semester and less than 6 credit hours in the Summer. |
| 70 | Pell grant eligible | Self-explanatory |
| 71 | Educational Barriers | 1. Disability; 2. Limited English; 3. Transportation; 4. Family responsibilities; 5. Employment (e.g., rotating shift work); 6. Financial; 7. Out of school for 15 or more years; 8. Other |
| 72 | Information release signed | Self-explanatory Yes/No |
| 73 | Education plan | Yes/No |
| 74 | Subsequent College(S) | If the student transfers to a different college or takes classes at a college other than the original college concurrently., these colleges will be recorded |
| 75 | Name of program | Program in which student enrolled |
| 76 | College program code | CIP or other code |
| 77 | Start date | |
| 78 | Exit date | |
| 79 | Reason for leaving the program | Check box Reasons for leaving: 1. Earned a certificate – one year of less 2. Earned certificate- more than one year 3. Earned degree; 4. Illness; 5. Non-job related injury; 6. Job-related injury; 7. Death; 8 Financial; 9. Work requirements; 10. Family obligations; 11. Moved out of area; 12. Academic dismissal; 13. Discipline dismissal; 14. Entered other grant funded program; 15. Entered non-grant funded program; |

| Data Element | | Definition |
|-----------------------|--|--|
| | | 16. Entered employment full-time; 17. Entered employment part-time; 18. Pursuing further education; 19. Other |
| 80 | Is the program technical? | Yes/No |
| 81 | Is the program a bridge program? | Yes/No |
| 82 | Credits earned | numeric |
| 83 | Length of credential | 1. Certificate/credential one year or less; 2. Certificate/credential/diploma 1 to 2 years; 3. Two Year Degree |
| 84 | Completion date | MM/DD/YYYY |
| 85 | Name of industry credential (if applicable) | Alphanumeric |
| 86 | Year and semester achieved (if positive response to #85) | Self-Explanatory |
| 87 | Typical preparation time for the industry credential (if positive response to #85) | 1. One year or less; 2. More than one year |
| 88 | Test score (if required) | |
| 89 | Completion or test date (only if successfully completing) | MM/DD/YYYY |
| 90 | Course Name | All courses in which a student enrolls |
| 91 | Course Level | college level, developmental – credit, developmental non-credit of non-credit |
| 92 | Credit hours | numeric |
| 93 | Grade | Alphanumeric |
| 94 | Semester taken | |
| 95 | Year taken | |
| Post Exit Data | | |
| 96 | Employed during or in quarter after exit (for those unemployed at entry) | Yes/no |
| 97 | Occupation if yes to #96) | Position/Job Title |
| 98 | Employer (if yes to #96) | Name of Employer |
| 99 | Employment status (if yes to #96) | 1. Full-time; 2. Part-time; 3. Self-employed |
| 100 | Hours worked per week (if yes to #96) | numeric |
| 101 | Employed in field of study at time of enrollment (if yes to #96) | Yes/No |

| Data Element | | Definition |
|--------------|---|---|
| 102 | Wage at time of employment (if yes to #96) | Wage at time of enrollment |
| 103 | DOL Job Category (if yes to #96) | Drop down menu provided with DOL job categories |
| 104 | Employed third quarter after exit (if yes to #96) | Yes/No |
| 105 | Continuing Education | Yes/No |
| 106 | College of continuing education | Alpha |
| 107 | Program enrolled in | alpha |
| 108 | Enrollment status | 1. Full-time; 2. Part-time |
| 109 | Credential sought | alpha |

Appendix H – Progress on Objectives, Strategies and Deliverables

To implement the MnAMP model, the consortium colleges undertook the following objectives and strategies⁸⁸ and made the following progress:

Objectives and Strategies

Table 7: MnAMP Objectives and Strategies

Objective 1.0: Create seamless career pathways in advanced manufacturing that offer stackable and latticed industry-recognized credentials in mechatronics, machining, and welding (the three manufacturing pathways).

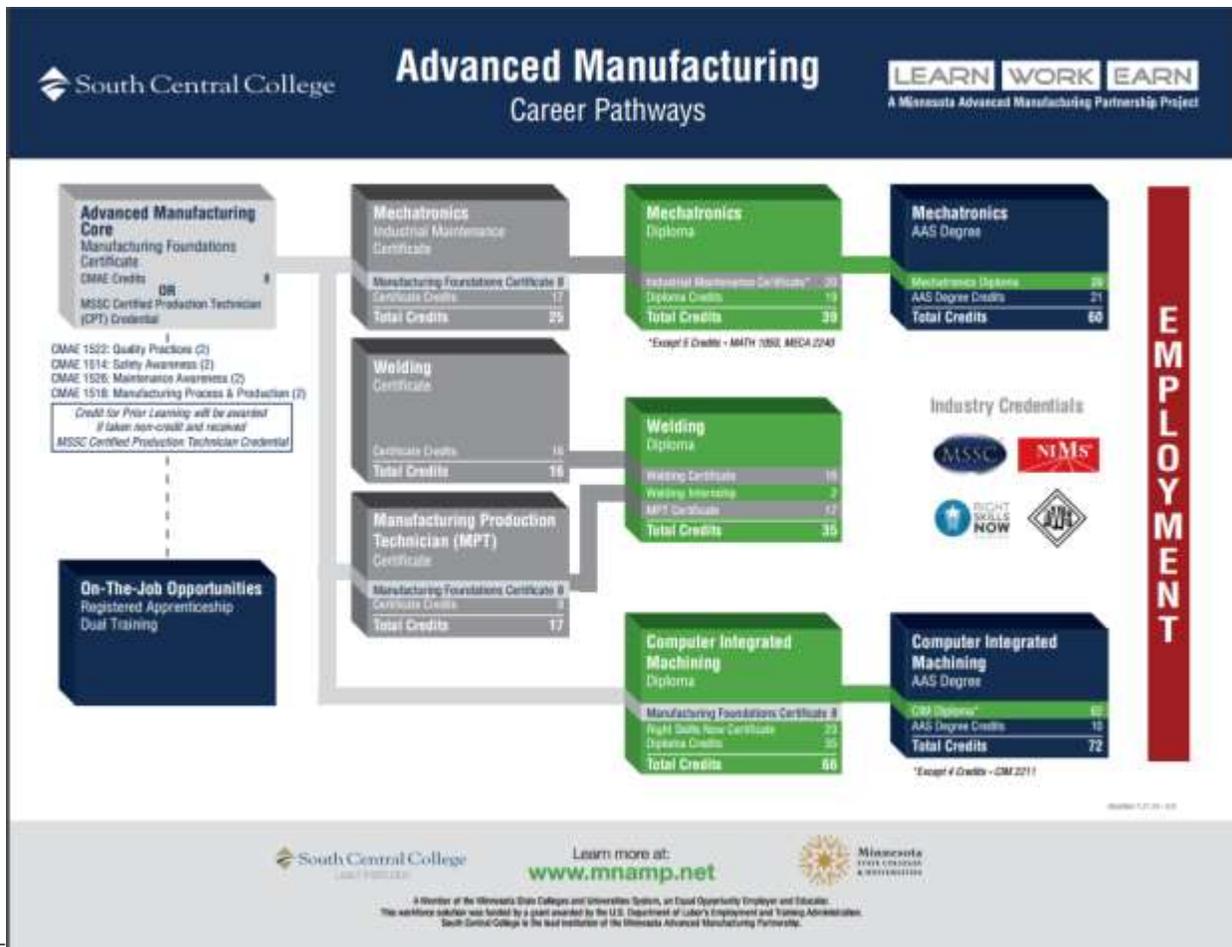
Strategy 1.1: Implement a core curriculum that directly aligns with the Certified Production Technician certificate awarded by the Manufacturing Skills Standards Council (MSSC) (Core Elements 1, 2, and 3)

Strategy 1.1 Outputs: Restructured academic framework in advanced manufacturing; Standardized core curriculum aligned with the Certified Production Technician certificate awarded by the Manufacturing Skills Standards Council (MSSC); Career pathways in advanced manufacturing for mechatronics, machining, and welding with multiple entry points that provide opportunities for earning portable, stackable, and latticed credentials; Curricula and competency-based instruction; Online curriculum in hybrid formats that align with the MSSC CPT certificate modules; 8-credit Manufacturing Foundations Certificate embedded into the welding, machining, and mechatronics pathways.

Year 1 Progress: Conducted faculty workshops to discuss the embedding of the MSSC curriculum into the three manufacturing pathways. Sent seven faculty through the MSSC faculty training workshop to be credentialed and develop a MN Manufacturing Foundation 8 credit 4 course standardized core curriculum. Eight colleges (LSC, M-State, Mn West, Northland, Ridgewater, Riverland, SPC and SCC) created pathways through embedding of the curriculum. All colleges agreed to use the same course code for consistency and to provide a portable transferable process (CMAE).

Year 2 Progress: *Pathways.* Each college has created a “Visual Pathway” for each career area offered by that college. Each pathway contains stackable and portable credentials. The pathways are accessible at http://www.mnamp.net/images/programs-pathways/pathways/scc_pathway.pdf. The career path shown below is from South Central College.

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Curriculum. The Manufacturing Foundations Certificate has been approved through the Minnesota Academic Affairs and Standards Council (AASC) at 11 MnAMP colleges and has been embedded in the pathway curricula. The 360 CPT curriculum was modified and updated to include the MSSC 2015 standards.

CPT Credentials. Over 34 participants passed and received their CPT credentials through the Manufacturing Skill Standards Council (MSSC). Several colleges are working with the MnAMP curriculum specialist to align their curricula with industry-recognized credentials. This is the first step in adopting a credit for prior learning (CPL) process that will allow participants to move into credit-bearing programs. A CPT Boot Camp is being designed to provide short-term prep for instructors, incumbent workers and veterans to help them earn a CPT credential and then receive credit for prior learning (CPL) as a pathway into the manufacturing programs.

Year 3 Progress: The Core manufacturing Foundation academic certificate (4 CPT Courses) has been approved and is being implemented in 8 of the 12 consortium colleges. The other 4 colleges embedded some of the 4 CPT courses through elective courses or are only offering them through the non-credit side of the college. 134 CPT credentials earned, 80 NIMS credentials earned, 57 AWS credentials earned, and 1 PMMI credential earned. 69 faculty received an industry credential.

Strategy 1.2: Implement a consistent, competency-based approach to awarding credit for prior learning (CPL) that aligns with national industry standards and includes formal and informal assessments of military, work, and other life experience (Core Elements 1 and 2)

Strategy 1.2 Outputs: Comprehensive personal, academic, and career assessment; System for awarding credit for prior learning; Military Occupational Standards/MnAMP programs crosswalk

Year 1 Progress: Held meetings with other TAACCCT recipients to understand the model they used within their institution to implement a CPL process. Lead College SCC held a faculty meeting with the MnSCU system specialist and started process of aligning the 4 CPT (CMAE) Courses.

Year 2 Progress:

CPL Process. MN-West, DCTC, Normandale, LSC, Ridgewater, M-State, SPC and SSC are working with a CPL specialist to develop a consistent process for awarding CPL for industry-recognized credentials and embedding them into their manufacturing pathways. Two colleges (SCC and MN-West) granted 66 credits through CPL. MnAMP created a CPL guidebook related to granting credit for industry related credentials.

MnAMP's CPL process flow is shown in the graphic below. This process is an adaptation of the methodology used by the Council for Adult and Experiential Learning and emphasizes an assessment protocol designed specifically for veterans and military personnel.

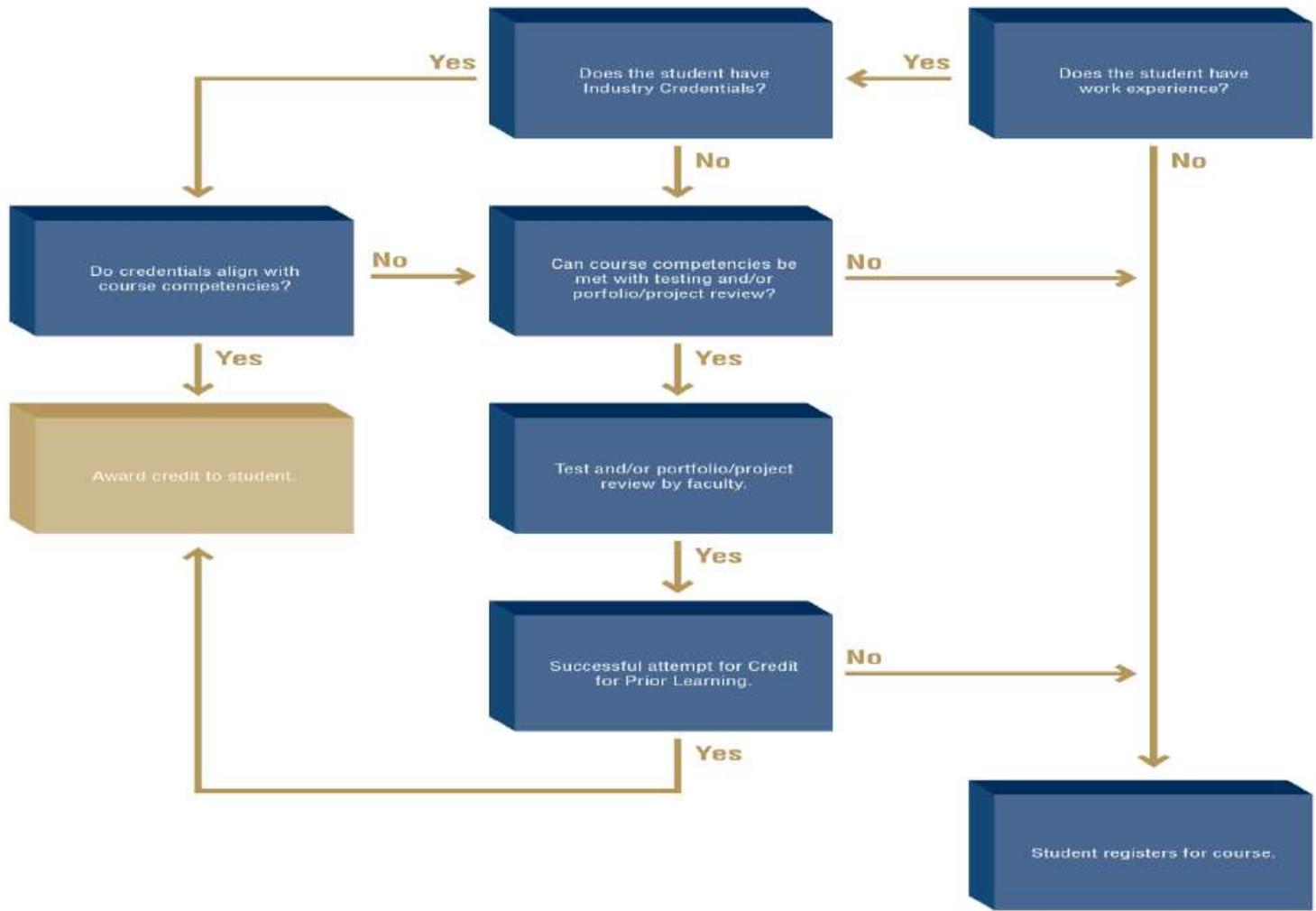
CPL for Veterans and Military Personnel. A Credit for Prior Learning Military crosswalk workshop was held for faculty. All the colleges are going through the process by which the Manufacturing Foundations courses will be approved under the crosswalk. The approved courses will be entered into the Veteran's Education Transfer System (VETS), accessible at www.mnscu.edu/college-search/public/military, so veterans can determine from which college's they can receive CPL based on their military experience. Three colleges approved the safety class on VETS. To date M-State, SCC, Ridgewater and Northland have approved and entered courses onto the VETS platform.

Customized Training and Continuing Education. For those enrolling in this division, MSSC training or other industry related credentials are offered through a non-credit or closed-credit format that meets the same requirements as the credit-bearing versions. Workers may later opt to enroll in MnAMP programs and may be awarded college credit for credentials completed through the non-credit or corporate training.

Year 3 Progress: South Central College identified two CPL Faculty Champions and established a mini-grant process for faculty who wish to develop CPL course assessment instruments and templates during the 2017-18 academic year. Individual awards generally will be up to \$500 per individual CPL course assessment, for a total of \$15,000 budgeted for the mini-grant initiative. A consortium-wide training session was offered on the development and implementation of a military crosswalk for faculty. MnAMP's web site provides a CPL overview and resources for students, colleges and universities, and businesses and includes a MnAMP Credit for Prior Learning Guide. This Guide has been licensed and uploaded into Skillscommon (<http://mnamp.net/images/credit-for-prior->

[learning/MnAMP-CPL-Guide.pdf](#)). A total of 112 CPL credits have been granted to participants under the MnAMP grant.

MnAMP Recommended Process Assessing Students for Potential Credit for Prior Learning



Strategy 1.3: Collaborate with MnSCU Centers of Excellence and other four-year institutions to expand/refine articulation agreements

Strategy 1.3 Output: Seamless transfer options and career pathways that bridge gaps between non-credit and credit programming

Year 1 Progress: Consensus was reached among the 360 ATE Regional Center partners, AME TAACCCT Grant, and the MnAMP Consortium that they would collaborate to develop one consortium-wide approved curriculum that could be used online (eTECH), in the hybrid environment (+Connect), or in the face-to-face model.

Year 2 Progress: Six colleges (Century, MN West, Normandale, Northland, Ridgewater and SPC) have concluded nine articulation agreements with 4-year colleges. Nine of the 12 colleges are 360 Manufacturing Center of Excellence, ATE Regional Center members.

Year 3 Progress: Six colleges have 9 new articulation agreements established under the MnAMP Grant.

Objective 2.0: Create/Update academic programs in advanced manufacturing to match employer needs and industry-recognized credentials

Strategy 2.1: Align curriculum in mechatronics, machining, and welding with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS) (Core Elements 1, 2, 3, and 5)

Strategy 2.1 Outputs: Curricula in mechatronics, machining, and welding aligned with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS); Competency-based mechatronics, machining, and welding curricula; Faculty trained for respective NAM credentials

Year 1 Progress: Conducted WebEx calls with National Associations in Manufacturing (NAM), (MSSC), (NIMS), and (PMMI) to better understand how to best align the three manufacturing pathways with industry-recognized credentials. Together, MnAMP and employer partners began the process to review and revise the three manufacturing pathways to embed the newly defined core curriculum and the other industry credentials.

Year 2 Progress:

Curriculum Crosswalk. College faculty are crosswalking curriculum with the MSSC, NIMS, PMMI and AWS credentials.

Faculty Credentials. Thirty-five faculty have been credentialed in MSSC (CPT) and 9 faculty have been credentialed in National Institute for Metalworking Skills, Inc. (NIMS). Eleven (11) faculty have been credentialed in a number of American Welding Society (AWS), 2 faculty have been credentialed in PMMI, and 1 each has been credentialed in Mastercam and IPC.

Test Centers. Nine colleges have become MSSC test centers and 6 are granting NIMS credentials. One grants the Packaging Machinery Manufacturing Institute (PMMI), and 2 are test centers for the Association Connecting Electronics Industries (IPC). DCTC, Ridgewater and SPC have started the process to become AWS Accredited Testing Facility centers.

Year 3 Progress: An AWS seminar was held for the consortium and their employer partners. Saint Paul College offered an AWS Weld Quality Clinic at no cost to attendees, and two MnAMP colleges completed the rigorous process to earn designation as AWS Accredited Test Facilities. MnAMP students attending any consortium college may obtain AWS certifications by testing at either of these two colleges. Eight colleges have incorporated all four MSSC courses comprising the CPT stackable credential through academic, credit-bearing delivery, and 4 offer some of the courses as electives or through non-credit side of the college. Nine MnAMP colleges are MSSC-Authorized Assessment Centers. Six colleges contracted with a Curriculum Design Consultant to review the colleges' existing curricula, map learning outcomes, and recommend curricular changes to align the programs to NAM-endorsed standards. At the end of year three, 341 industry credentials were offered to either students or faculty. Offering industry credentials has created opportunity for the non-credit side of the college to align better with the credit side of the colleges and create pathways for incumbent workers. Credentials also have offered the opportunity to build our apprenticeship-related instruction by incorporating them into the curriculum.

Strategy 2.2: Engage employers, faculty, and other stakeholders in the development of content, coursework, and learning experiences to meet credentialing needs in mechatronics, machining, and welding (Core Element 6)

Strategy 2.2 Outputs: Content, coursework, and learning experiences that meet credentialing needs in mechatronics, machining, and welding; Program Advisory Committees with employer and industry representation

Year 1 Progress: Outreach to employer partners to serve on advisory committees. Developed content for informational sessions targeted to employer partners. MnAMP has partnered with the MN Pipeline Project (a legislatively-directed initiative managed by the DOLI) who's mission was to define competency standards for occupation in advance manufacturing, agriculture, health care services, and IT. MnAMP worked directly with Pipeline, as they define the occupational competencies in advanced manufacturing related to instruction and on the job training.

Year 2 Progress:

Employer involvement has included participation in advisory committees, offering scholarships and making equipment donations, recruiting participants and offering internships, making hiring commitments, developing OJT opportunities and internships, assisting with curriculum review and development, including curriculum development for a new program at Northland, and establishing Dual training programs at Riverland, SCC and LSC. Apprenticeship programs have been developed with employers at SCC and Mn West. Employers also provided training space, participated in Job Fairs, a Tour of Manufacturing, and dual training programs, and partnered with colleges to provide industry-recognized credential training to employees in the workplace via +Connect.

Financial support. Funds from an employer were used to purchase supplies and equipment, including welding scraps and parts. State FastTRAC funds helped support the development of training programs for diverse, low language skills, or 1st generation participants. The funds support "bridge" courses and can integrate with ABE instruction.

Employer workshops. SSC had 20 new employers attend their MnAMP Employer Workshops held in March. MCTC, Normandale, SPC, Century, and DCTC also held MnAMP Employer Workshops.

Year 3 Progress: Colleges developed “user-understanding” through faculty development and engagement. Four MnAMP colleges engaged manufacturing companies to deliver MSSC courses or other MnAMP programs. MnAMP had involvement by over 550 employers through advisory board meetings, equipment purchases, apprenticeships, curriculum design, hiring, internships, job fairs, +Connect or Tour of Manufacturing event.

Objective 3.0: Develop long-term, collaborative partnerships with advanced manufacturing employers

Strategy 3.1: Establish employer-driven apprenticeship and Dual training education programs in mechatronics, machining, and welding (Core Elements 1 and 6)

Strategy 3.1 Outputs: Employer-driven apprenticeships and dual training opportunities and Coalitions in seven regions; MN Statewide Apprenticeship standards and models for fields of mechatronics, machining, and welding; Competency-based education standards and models for field of mechatronics, machining, and welding; Apprenticeship and cooperative education cohort programs

Year 1 Progress: Met with the Minnesota Department of Labor and Department of Labor and Industry to learn how to align employer-driven apprenticeships and Dual training education programs into the three manufacturing pathways. Joined the Registered Apprenticeship College Consortium (RACC).

Year 2 Progress:

Registered Apprenticeships. Three models of related instruction for Registered Apprenticeships were established with 12 companies and 53 apprentices. Standards have been developed in all three manufacturing programs (welding, Machining, Mechatronics). One model is embedded in the college degree program and 2 are with incumbent employees through face to face or online video conferencing technology called +Connect (often referred to as telepresence).

Dual training. Five colleges are providing 60 participants with Dual training. Five MnAMP colleges partnered with 15 companies that received Pipeline grants to provide Dual training.

+Connect, a mediated telepresence instructional method, was launched in June. +Connect allows incumbent worker to receive training on-site at their place of work. Through +Connect, MnAMP provides the Certified Production Technician Manufacturing Foundations Certificate and other manufacturing courses in 8-week blocks so incumbent workers can receive an academic certificate and/or an industry-recognized credential. Currently, thirteen courses are available through +Connect.

Three sessions of +Connect served 130 employees at their places of employment in 13 different workplaces. The courses are aligned with an apprenticeship program and

designed for incumbent workers. For 5 companies, +Connect provides the required instruction for 31 Registered Apprenticeships.

Year 3 Progress:

Registered Apprenticeships. Three colleges (MN-West, SPC, and SCC) have 53 registered apprenticeship participants with 12 employers.

Dual training. Four colleges provided 127 participants with Dual training opportunities working with 15 different employers. Colleges providing Dual training were LSC, MN-West, Riverland, and SCC.

+Connect, the developed mediated telepresence learning platform continues to grow, 8 – 8-week sessions have run, serving 764 enrolled participants with over 55 employers. Twelve industry partners are providing 42 Industrial Manufacturing Technician Apprenticeships through this delivery method.

Strategy 3.2: Provide professional development opportunities for employers and other stakeholders designed to communicate and instill the value of industry credentialing and curriculum design (Core Element 6)

Strategy 3.2 Outputs: Professional development opportunities for employers and other stakeholders; Crosswalk that illustrates the alignment of MnAMP advanced manufacturing programs to the appropriate industry credentials

Year 1 Progress: MnAMP in partnership with 360 is working with individual colleges to plan and implement employer workshops in year 2. MnAMP is also working with Minnesota Precision Manufacturing Association, Central MN Manufacturing Association and National Association of Manufacturing the MN Manufacturing Association to create a statewide partnership called Minnesota Manufacturing Workforce Partnership (MMWP) whose mission is being designed but meant to serve as a networking association for past TAA grants, Associations, Chambers, TAA departments, Veteran Associations, Governor Workforce Development Councils, manufacturing colleges and others.

Year 2 Progress: Over 70 employers attended four employer workshops that educated employers and built new relationships. MMWP continues to meet quarterly (four meetings to date). MnAMP is working with Minnesota Center for Engineering & Manufacturing Excellence (MNCEME) and a number of the Manufacturing associations in MN to determine the sustainability and purpose of this partnership.

Year 3 Progress: Based on the data collected in years 1 and 2 the MnAMP leadership became involved in a number of different partnerships in order to increase participant numbers. These include becoming more active in the MN Yellow Ribbon veterans program, joining and participating in the newly developed charter of Women in Manufacturing (WiM), a delegation from Ridgewater College participated in the Women in Manufacturing Summit in Hartford, Connecticut. Many of the consortium colleges also participated in partnership with their local Workforce centers and the Adult Basic Education programs through the Partners to Prosperity (P2P) grants. These are grants to better serve displaced, dislocated and underserved populations. Other colleges built New American Programs - - funds from United Way and local non-profits to better serve

diverse populations by offering them career skills and courses in welding and the CPT courses.

Strategy 3.3: Collaborate with national industry partners to enhance the image of manufacturing and raise awareness of available high-wage jobs (Core Elements 4 and 6).

Strategy 3.3 Outputs: An adapted “Dream It. Do It.” campaign for adult populations; Consistent outreach strategies and materials for MnAMP colleges – Webpage, social media, hard copy, videos.

Year 1 Progress: Met with and created agreements through contracts with NIMS, PMMI, MSSC and AWS to provide discounted rates for faculty and participants in training and credentialing and to establish colleges and testing centers. Collaborating with NAM on each college becoming an M-Listed college. Lead Institute SCC became one of the first 100 colleges in Minnesota and the nation to become a RACC college.

Year 2 Progress: MnAMP is working with the Women in Manufacturing National Association to help support the implementation of two charters in Minnesota. Continue to partner with 360 on the “Dream It. Do It.” campaign. SCC as the lead institution is also working with a number of veterans programs (Yellow Ribbon, Southern MN Veterans Services, and Local WFCs) and with the Minnesota Department of Employment and Economic Development.

Year 3 Progress: MnAMP Grant Director, Anne Willaert, has collaborated with national industry partners to advance the MnAMP project and has delivered presentations at national conferences or through publications associated with the following organizations:

- Minnesota and National Workforce Centers, in support of the Workforce Innovation and Opportunity Act;
- Jobs for the Future (Additionally, Dr. Parker, SCC President, has been invited to present at a number of national Jobs for the Future conferences);
- National Council for Workforce Education (NCWE);
- American Association of Community Colleges (AACC) and the Workforce Development Institute (AACC – WDI); and
- Manufacturing Skills Institute of the National Association of Workforce Boards (NAWB – MSI).

Ms. Willaert also has:

- Promoted MnAMP’s dual training and apprenticeship initiatives through the Minnesota Regional Training Program and the Minnesota Department of Labor and Industry;
- Promoted MnAMP’s credit for prior learning initiative by collaborating with the Council for Adult and Experiential Learning;
- Promoted MnAMP’s dual-enrollment initiative by collaborating with the Minnesota Workforce Council; and
- Partnered with the Minnesota Governor’s Workforce Development Council to support the Workforce Innovation and Opportunity Act at the state-level.

Objective 4.0: Improve time-to-completion and job placement in advanced manufacturing through improved learner supports and wraparound services

Strategy 4.1: Create and implement a comprehensive enrollment management plan that emphasizes intrusive advising and job placement services (*Core Elements 3, 4, and 5*)

Strategy 4.1 Outputs: Comprehensive enrollment plan featuring intrusive advising and job placement services; Early alert tracking system; Enhanced career services and GPS LifePlan; Individualized career and personal plans for participants; Increased use of MNWorks.net for MnAMP job and apprenticeship postings; Real-time demand data for students and Employee Results Scorecard. *Note: Under a post-award option offered by the Department of Labor, MnAMP selected employing the Employment Results Continuous Improvement Plan instead of the Employment Results Scorecard.*

Year 1 Progress: Established a participant case management plan and process to track participants enrolled in MnAMP.

Year 2 Progress:

Intrusive Advising. A session on the intrusive advising concept took place for advisors in April. A quarterly WebEx is held for the data coordinator and advisors to share best practices and or to have a chance to ask questions - - a learning community. Two colleges have aligned their advising programs with the GPS LifePlan intrusive advising plan to assist participants with goal setting, graduation preparation, and career and life planning. Colleges are required to upload any time they work with a student into LWE. This includes faculty or any advising services.

Learning Support Services. At least eight of the colleges are providing orientation, tutoring, mentoring, academic success workshops, supplemental instruction, intrusive advising, and early alerts. Some provide this service and others are partnering with the WFB's or other non-profits in their communities.

Year 3 Progress: Nine of the colleges are providing orientation; 11 are providing tutoring; 8 are providing mentoring; 8 are providing academic success workshops; 6 are providing supplemental instruction; 2 have learning communities, and 11 use intrusive advising. Eleven have career pathways and career counseling; 7 support paid internships; 4 have apprenticeships or cooperative education; 7 have on-the-job training; and 10 support job fairs.

Strategy 4.2: Improve basic academic skills of participants through integrated education and language services for underrepresented groups (*Core Elements 2 and 4*)

Strategy 4.2 Outputs: Integrated education and language services for underrepresented groups; expanded p2p "super bridge" program; Language Academy curriculum for four populations (Spanish, Somali, Sudanese, Hmong); MN P2P curriculum; NCRC assessment pathway to apprenticeships or advanced manufacturing academic pathways

Year 1 Progress: MnAMP colleges partnered with their WFC and ABE to received FastTrack or P2P grants. Grants provide ability to assist those participants who required extra assistance and wrap around services due to language, first generation or other

barriers to be successful in college manufacturing courses starting with the CMAE core curriculum.

Year 2 Progress: Northland, DCTC, Ridgewater, Riverland, SPC, SCC, Century and MN-West continued to run programs in partnership with their local ABE and Workforce centers for diverse, low level English or 1st generation participants. Ridgewater developed an online advising platform. MN-West’s ABE Welding Academy graduated 10 participants. Seven received an AWS credential and three secured jobs and enrolled in a diploma program. M-State approved and implemented a New American Readiness Certificate program partnering with the Lakes and Prairies Action Council and their local United Way. This program is a 160-hour basic welding training along with career success and remedial courses. Northland’s 1st class graduated from the New American Program and received Manufacturing Workplace Skill Certificates.

Year 3 Progress: M-State continued partnering with Lakes and Prairies Community Action Partnership to deliver CPT and welding courses on a non-credit basis. The program also includes an Occupational Workforce Readiness component, in which students complete the Strengths Finder assessment and learn how to be good employees. The partnership is designed to develop unskilled workers for advanced manufacturing jobs, specifically through enrollment in CPT and welding programs. Northland piloted a new approach to revising their developmental math courses by enrolling all participants into the lowest level math course and integrating an ABE instructor to teach and mentor students throughout the course, 100% of the participants passed.

Deliverables

Implementing these objectives and strategies, the consortium colleges produced the following deliverables:

| Table 8: Deliverables | | | |
|-----------------------|----------|--|---|
| Obj. | Strategy | Deliverable | Status of Deliverable |
| 1.0 | 1.1 | <u>Year 1:</u> An eight-credit 4 course standardized core curriculum in advanced manufacturing that aligns with the MSSC Certified Production Technician credential. Established and implemented in all 12 MNAMP institutions | <p><u>Year 1:</u> 7 of 12 colleges embedded and approved 4 CMAE core courses (CPT) (LSC, M-State, MnWest, Normandale, Ridgewater, Riverland, SCC)</p> <p><u>Year 2:</u> The Advanced Manufacturing Core Curriculum (Manufacturing Foundations Certificate) was approved through AASC at 11 MnAMP colleges.</p> <p><u>Year 3:</u> 8 of 12 colleges approved the Manufacturing Foundations Certificate. This includes the 4 CPT courses. The other 4 colleges have embedded some of courses as electives or are only teaching the CPT courses on the non-credit side of the college.</p> |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|---|---|
| | | <p><u>Year 1:</u> 72 MNAMP faculty certified or re-certified in program specific, NAM-endorsed credentials</p> | <p><u>Year1:</u> 8 MSSC –MN-West (1), SCC (7) 6 NIMS – MN-West (1), Ridgewater (1), Riverland (1), SCC (3) 7 AWS – M-State (2), Northland (2), SCC (2 CWI), (1CWE)</p> <p><u>Year 2:</u> Thirty-two faculty are credentialed in MSSC (CPT) and 11 faculty have been credentialed in National Institute for Metalworking Skills, Inc. (NIMS), American Welding Society (AWS), and Mastercam. Total of 59</p> <p><u>Year 3:</u> Participants: 134 received CPT, 80 NIMS, 57 AWS, and 1 PMMI for a total of 272. Faculty: 1 IPC, 45 CPT, 9 NIMS, 11AWS, 2 PMMI and 1 Mastercam for a total of 69</p> |
| | | <p><u>Year 1:</u> 12 MSSC testing centers located all MNAMP colleges</p> | <p><u>Year1:</u> 4 Of 12 (SCC, Riverland, MN-West and Ridgewater)</p> <p><u>Year 2:</u> Six colleges have become MSSC test centers, 6 grant NIMS, credentials, 1 tests The Association for Packaging and Processing Technologies (PMMI), and 2 test for Association Connecting Electronics Industries (IPC).</p> <p><u>Year 3:</u> 9 colleges are MSSC test centers, 2 IPC, 1 PMMI, 6 grant NIMS credentials and 2 AWS IFT Centers.</p> |
| | | <p><u>Year 1:</u> 1,900 participants receive a Certified Production Technician certification (By October 2017)</p> | <p><u>Year1:</u> Year 1 - 6 at SCC</p> <p><u>Year 2:</u> Over 34 participants passed and received their CPT credentials through the Manufacturing Skill Standards Council (MSSC).</p> <p><u>Year 3:</u> 134 participants from eight colleges have earned a CPT credential through the Manufacturing Skill Standards Council (MSSC).</p> |
| 1.0 | 1.2 | <p><u>Year 1:</u> A written protocol for competency-based</p> | <p><u>Year 1:</u> Currently in progress</p> <p><u>Year 2:</u> The CPL guidebook was created</p> |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|--|---|
| | | credit for prior learning and related assessments (by January 2017) | Year 3: Completed, licensed and uploaded into SkillsCommons |
| | | Year 1: Military Occupational Standards and MNAMP mechatronics, machining, and welding programs (by January 2017) | <p>Year 1: SCC Lead Institute meeting May 2015</p> <p>Year 2: Standards have been developed in all three manufacturing programs (welding, Machining, Mechatronics).</p> <p>Year 3: Faculty worked with the Veterans Education Transfer System (VETS) to crosswalk 102 courses and 1,582 occupations.</p> |
| 1.0 | 1.3 | Year 1: Six new/revised articulation agreements from MNAMP colleges to four-year manufacturing programs (by January 2017) | <p>Year 1: Currently in progress</p> <p>Year 2: Six colleges have concluded 22 articulation agreements with 4-year colleges.</p> <p>Year 3: Six colleges have 9 new articulation agreements with 4 year institutions.</p> |
| 2.0 | 2.1 | Year 1: Competency-based curriculum in mechatronics, machining, and welding programs at all MNAMP institutions | <p>Year 1: Currently in progress</p> <p>Year 2: See Strategy 1.1 above.</p> <p>Year 3: See Strategy 1.1 above.</p> |
| | | Year 1: 72 MNAMP faculty certified or re-certified in program specific, NAM-endorsed credentials | <p>Year 2: See Strategy 1.1 above.</p> <p>Year 3: To date 59 industry credentials.</p> |
| 2.0 | 2.2 | Year 1: Program Advisory Committees meet once a semester (minimum). | <p>Year 1: All 12 colleges held fall and spring advisory council meetings</p> <p>Year 2: All 12 colleges held fall and spring advisory council meetings</p> <p>Year 3: All 12 colleges held fall and spring advisory council meetings</p> |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|--|---|
| | | <p><u>Year 1:</u> Apprenticeship/ Dual training Coalitions in seven regions</p> | <p><u>Year 1:</u> Currently in progress</p> <p><u>Year 2:</u> 5 colleges do Dual- Training and 2 do apprenticeships</p> |
| | | <p><u>Year 1:</u> Presentations on the benefits of embedded industry credentials at manufacturing summits and engagement activities</p> | <p><u>Year 1:</u> Ongoing activity</p> <p><u>Year 2:</u> Employer workshops were hosted by SSC, MCTC, Normandale, SPC, Century, and DCTC.</p> |
| 3.0 | 3.1 | <p><u>Year 1:</u> MN Statewide Apprenticeship standards and models for fields of mechatronics, machining, and welding (by January 2016)</p> | <p><u>Year 1:</u> Worked to identify standards and work-processes with DOL; sent survey to 500 industry partners to gauge interest and understanding</p> <p><u>Year 2:</u> Three models of related instructions for Registered Apprenticeships were established with 12 companies and Dual training was established with 15 companies.</p> <p><u>Year 3:</u> Continue to offer Registered Apprenticeships and Dual training opportunities – assist industry with grants from PIPELINE and MN Apprenticeship Initiative Funds. Offer 180 apprenticeships with 27 companies.</p> |
| | | <p><u>Year 1:</u> Competency-based cooperative education standards and models for field of mechatronics, machining, and welding (by January 2016)</p> | <p><u>Year 1:</u> Worked with MN Pipeline to hold employer workshops to identify sector based occupational competencies in Machining, welding and mechatronics</p> <p><u>Year 2:</u> Standards have been developed in all three manufacturing programs (welding, Machining, Mechatronics).</p> <p><u>Year 3: Completed in Year 2</u></p> |
| 3.0 | 3.1 | <p><u>Year 2:</u> Curriculum for training employer apprenticeship mentors</p> | <p><u>Year 2:</u> Not currently being developed</p> <p><u>Year 3:</u> Worked with NIMS to develop an outline on a training for apprenticeship employer-based mentors.</p> |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|---|--|
| | | Year 2: Recruitment materials | Year 2: Being developed Year 3: Learn Work Earn Campaign was developed and implemented. Working on case studies for further outreach. |
| | | Year 3: MNAMP Apprenticeship Coalitions in seven regions across MN | Year 3: Attended and spoke at 5 regional events in MN about the MnAMP <i>Learn Work Earn</i> campaign and spoke at a number of national conferences on the MN apprenticeship model. AACC, NCWE, JFF, AACC – WDI, Apprenticeship Forward and WIOA |
| | | Year 2: Train 315 apprentices during the grant period (by October 2017). | Year 2: Fifty-three (53) participants are enrolled in an apprenticeship or dual training program. Year 3: 180 current apprenticeships. |
| 3.0 | 3.2 | Year 1: Workshop presentations & materials | Year 1: 36- hired Outreach Coordinator at 360 – started initial discussions on employer workshops Year 2: See Strategy 2.2 above Year 3: Spoke at national and state conferences, developed a MnAMP website and outreach materials for +Connect, MSSC-CPT and our <i>Learn Work Earn</i> model. |
| | | Year 1: Met with 120 employers over a three-year time period (by September 2017) | Year 1: Ongoing activity Year 2: Ongoing activity Year 3: Met with and have involved over 550 employers |
| | | Year 1: Recruitment strategies and materials highlighting the benefits of stackable industry credentials and apprenticeships | Year 1: Employer Advisory Boards reviewed new curriculum and program pathways, discussed apprenticeships, industry credentials and strategized how to recruit more participants. Year 2: Advisory Boards, employer 1:1 meetings, Employer Workshops Year 3: Demonstrating pathways from non-credit to credit, value of entry and exit points for students through stackable credentials, built apprenticeships in |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|---|--|
| | | | on the credit and non-credit side of the colleges. Created outreach materials to support and showcase guided pathways and <i>Learn Work Earn</i> model. |
| 3.0 | 3.3 | Year 1: An adapted “Dream It. Do It.” campaign for adult populations (by September 2017) | <p>Year 1: Currently in progress, however modifications for the “Dream It. Do It.” campaign are being developed. An LWE/MnAMP (http://mnamp.net) Website has been successfully launched.</p> <p>Year 2: On the MnAMP Website – video’s and news and events</p> <p>Year 3: Continue to work with 360 Center of Excellence on the MN Tour of Manufacturing campaign each year.</p> |
| | | Year 1: Consistent outreach strategies and materials for MNAMP colleges (by September 2017) | <p>Year 1: Created MnAMP.net and other standard outreach MnAMP recruitment materials for consortium</p> <p>Year 2: Created outreach materials for all the programs and for +Connect – can get through SharePoint</p> <p>Year 3: Available to all consortium members through SharePoint and the MN Website: mnamp.net</p> |
| 4.0 | 4.1 | Year 1: Increased use of MNWorks.net for MNAMP job and apprenticeship postings (by September 2017) | <p>Year 1: Ongoing activity</p> <p>Year 2: on website</p> <p>Year 3: On website</p> |
| | | Year 1: Real-time demand data for students and Employee Results Scorecard (by September 2017) | <p>Year 1: Scorecard has been completed and is sent to all partner colleges on a quarterly basis.</p> <p>Year 3: The scorecard is updated quarterly and sent to the colleges. Gainful employment is now required through Title IV so all promotional materials for manufacturing programs have this information available to students and on the college websites.</p> |
| | | Year 1: Individualized career | Year 1: Case management plan for tracking participants and input in LWE developed |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|--|--|
| | | and personal plans for participants (by September 2017) | <p><u>Year 2:</u> Two colleges have aligned their advising programs with the GPS LifePlan intrusive advising plan.</p> <p><u>Year 3:</u> Intrusive advising is implemented at 11 colleges. Case management is recorded in LWE</p> |
| 4.0 | 4.2 | <p><u>Year 1:</u> Language Academy curriculum for four populations (Spanish, Somali, Sudanese, Hmong) (by September 2017)</p> | <p><u>Year 1:</u> Undergoing development with some programmatic changes.</p> <p><u>Year 2:</u> Not complete at this point, but 2 colleges started New American Programs</p> <p><u>Year 3:</u> Northland and M-State have designed and implemented New American Programs. Four colleges have Pathway 2 Prosperity grants which include workforce English, integrated instruction and mentoring.</p> |
| | | <p><u>Year 1:</u> Language Academies delivered at 12 sites (by September 2017)</p> | <p><u>Year 1:</u> Undergoing development with some programmatic changes.</p> <p><u>Year 2:</u> Not complete at this point, but 2 colleges started New American Programs</p> <p><u>Year 3:</u> Implemented through 6 colleges and involves a number of industry partners</p> |
| | | <p><u>Year 1:</u> MN FastTRAC curriculum (by September 2017)</p> | <p><u>Year 1:</u> 4 colleges partnered on P2P grants and have created a learning strategy where an ABE teacher and faculty provide a shared teaching environment. Also lengthened the classroom time to assist participants with additional learning opportunities. Some colleges are working with CBO's to reach more diverse populations (Northland and Century).</p> <p><u>Year 2:</u> Northland, SCC, Century and MN-West, and Ridgewater continued to run programs in partnership with their local ABE and Workforce centers for diverse, low level English or 1st generation participants. M-State approved a New American Readiness Certificate program with WFC & ABE.</p> |

Table 8: Deliverables

| Obj. | Strategy | Deliverable | Status of Deliverable |
|------|----------|--|---|
| | | | <u>Year 3:</u> Four colleges partner with their Workforce Centers and ABE institutions. |
| | | <u>Year 1:</u> MN FastTRAC offered at sites (by September 2017) | <u>Year 1:</u> Currently offered at four sites. <u>Year 2:</u> Currently offered at four sites. <u>Year 3:</u> Offered through 4 partnerships throughout western and Southern MN, White Bear Lake and northern MN. |
| | | <u>Year 1:</u> NCRC assessment pathway to apprenticeships | <u>Year 1:</u> Because NCRC is not an approved credential by DOL, MnAMP will not track |

Appendix I – Assessment of Progress

4.1 Summary of Stakeholders’ Assessments of Progress from Site Visit Interviews, Focus Groups, and Questionnaire Responses.

Many of the innovative strategies of the MnAMP *Learn Work Earn* model have been implemented satisfactorily in MnAMP consortium colleges, according to stakeholder interviews, focus groups, and questionnaire responses from PTB’s Year 3 site visits. Below are selected stakeholders’ questionnaire responses and quotes on key strategies.⁸⁹ See the separate appendix that accompanies this report, MnAMP Consortium Colleges Comprehensive Site Visits Report: Year 2 (2015-16) and Year 3 (2016-17), for PTB’s complete site visit report

Strategy #1.1.

Implement a **core curriculum** that directly aligns with the Certified Production Technician (CPT) certificate awarded by the Manufacturing Skills Standards Council (MSSC).

Project Coordinators and Program Deans were asked to rate the extent to which they agree with the statement, “At my college, we’re making progress on Strategy #1.1, and for this strategy, we’re about as far along as it should be at this point.” Their responses are graphed in Figures 4 and 5, below and show high percentages of agreement with the statement in both Year 2 and Year 3.

Among Project Coordinators, 93% (13 of 14) agreed or strongly agreed with this statement in Year 2, and 77% (10 of 13) agreed or strongly agreed in Year 3.

Among Program Deans, the corresponding percentages were 58% (11 of 19) in Year 2 and 71% (10 of 14) in Year 3.

⁸⁹ Figure numbers are from the site visit report and shown as recorded in that report to allow the reader to easily access the chart and corresponding text in the report. “I don’t know” responses may be attributed to being newly hired by the college. Data are provided for only the consortium colleges that planned to contribute to this strategy in the specified year of the MnAMP Project.

Figure 4—Strategy #1.1 Progress: Rated by Project Coordinators

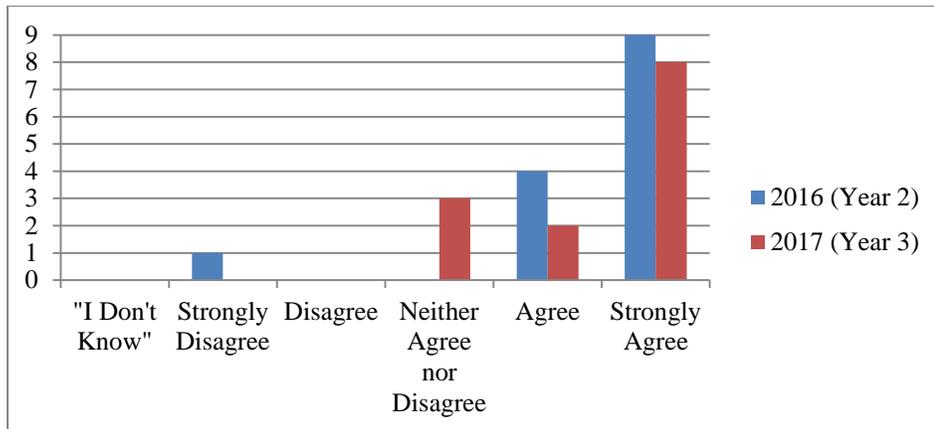
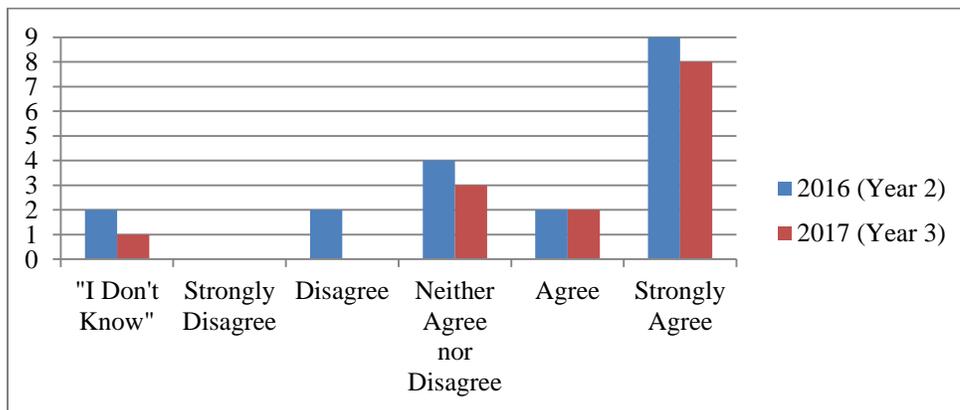


Figure 5—Strategy #1.1 Progress: Rated by Program Deans



A Project Coordinator said: “The CPT core was established over a year ago, and [as of the site visit date] we’ve awarded 78 credits of test-outs, [collectively] saving students \$18,000 in tuition. We have almost a 100% pass rate for test-outs.”

A Project Coordinator said: “When MnAMP began, the CPT was not widespread across the industry. Employers didn’t know about it and weren’t asking for it. We went out and shared the information. What I’d say now is that we have employers asking for the CPT—not gangbusters—but those that have new hires [can] go through four courses for an introduction to manufacturing.”

Strategy #1.2.

Implement a consistent, competency-based approach to awarding **credit for prior learning** that aligns with national industry standards and includes formal and informal assessments of military, work, and other life experiences.

Project Coordinators and Program Deans were asked to rate the extent to which they agree with the statement, “At my college, we’re making progress on Strategy #1.2, and for this strategy, we’re about as far along as it should be at this point.” Their responses are graphed in the figure below.

While 36% (4 of 11) of Project Coordinators strongly agreed with this statement in Year 2, 69% (9 of 13) agreed or strongly agreed with this statement in Year 3, reflecting additional strides made in implementation during Year 3.

There also was an increase in agreement among Program Deans, with 35% (6 of 17) agreeing or strongly agreeing in Year 2, and 50% (7 of 14) agreeing or strongly agreeing in Year 3.

Figure 9—Strategy #1.2 Progress: Rated by Project Coordinators

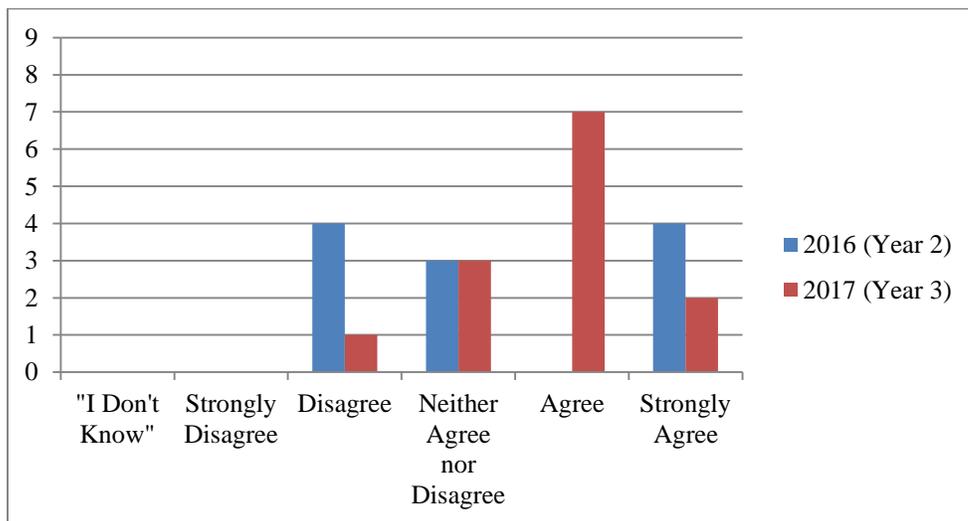
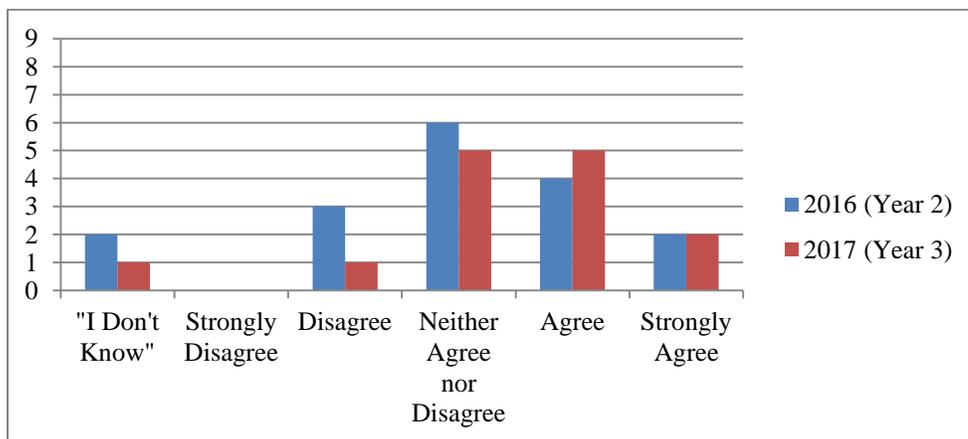


Figure 10—Strategy #1.2 Progress: Rated by Program Deans



A Dean said: “We’ve got a really good credit for prior learning policy and process. It involves lining up credentials to award credit for prior learning. It’s an effective process; we’re just not seeing people use it.”

A Project Coordinator said: “For credit for prior learning, we have a policy, but there’s not an easy way for students to get it. Students have to dig [to discover the policy and identify credit for prior learning as an option], and they need to get a faculty member to sign off on it. It’s not standardized. It’s pick-and-choose if the faculty [member] awards the credit.”

A Dean said: “At [our college], there’s not a single program that does not utilize credit for prior learning...[but] some programs use it more than others.”

A Dean said: “Five students have received credit for prior learning so far. They were career welders who tested out of courses, such as a welding fundamentals course. A couple students came in on the non-credit side and did two tests—written and hands-on tests—to test-out, and they received course credit by passing both tests.”

A Dean said: “I’m hopeful because the military [liaison, who received the MnAMP military crosswalk training] works in the Registrar’s Office, and she’ll be more aware of the credit for prior learning program and can share that when she meets with incoming military students...Before the grant, Minnesota colleges had a policy statewide, but it wasn’t actively shared with students.”

Strategy #2.1.

Align curriculum in mechatronics, machining, and welding with National Association of Manufacturers (NAM) endorsed credentials (NCRC, MSSC, NIMS, PMMI, and AWS).

Project Coordinators and Program Deans were asked to rate the extent to which they agree with the statement, “At my college, we’re making progress on Strategy #2.1, and for this strategy, we’re about as far along as it should be at this point.” Their responses are graphed in the figure below.

In both Year 2 and Year 3, 77% of Project Coordinators (10 of 13) agreed or strongly agreed with this statement.

Ten Program Deans agreed or strongly agreed with this statement in Year 2 (10 of 18) and Year 3 (10 of 14), but because of the number contacted, the percentages varied (56% in Year 2 and 71% in Year 3).

Figure 15—Strategy #2.1 Progress: Rated by Project Coordinators

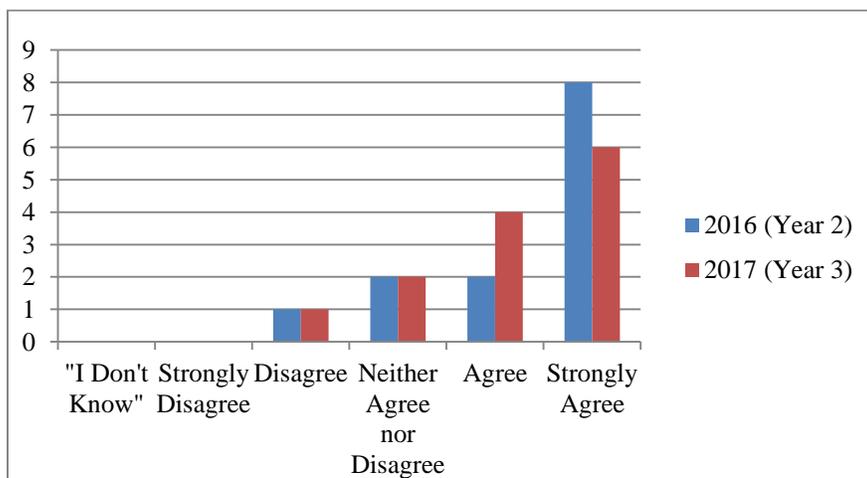
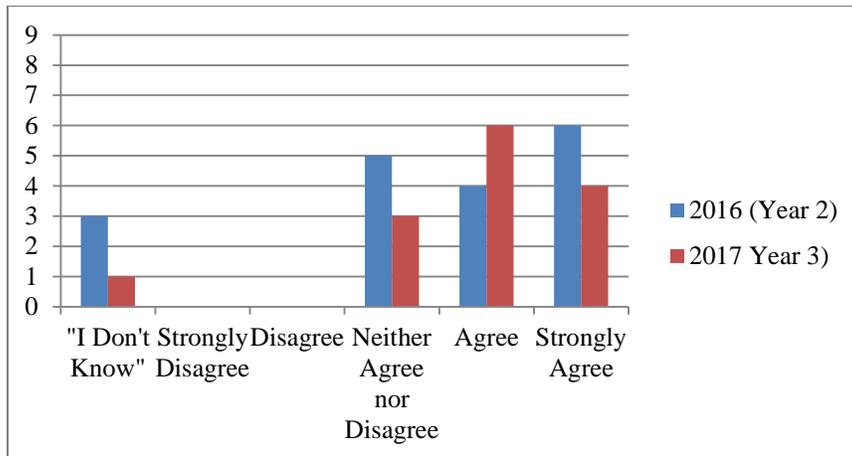


Figure 16—Strategy #2.1 Progress: Rated by Program Deans



A Dean said: “We have mapped the [curricula] and how they align with industry credentials.”

A Dean said: “Because of limited contact [in the one-year program] and high demand for welding and machining, the four MSSC courses are not yet embedded in [these] diploma programs... We are strategizing how to fit [the MSSC curriculum] in and are planning to have students start with the MSSC courses [and complete the CPT credential first], then complete the diploma in welding or machining.”

A Dean said: “Anytime anything new [*i.e.*, new industry credentials] comes out, we’re going to align... We’re going to pursue it. That would give students an advantage when pursuing jobs.”

A Dean said: “What’s been most fun from my perspective is the engagement of faculty. Our faculty [members] are [now] more thoroughly understanding of our college’s non-credit side. Faculty [members] are designing and building programs on the non-credit side.”

Strategy #3.1.

Establish employer-driven apprenticeship and cooperative education programs in mechatronics, machining, and welding.

Project Coordinators and Program Deans were asked to rate the extent to which they agree with the statement, “At my college, we’re making progress on Strategy #3.1, and for this strategy, we’re about as far along as it should be at this point.” Their responses are graphed in the figure below.

In Year 2, the majority of Project Coordinators and Program Deans were neutral on this question. Of the Project Coordinators, 27% (3 of 11) agreed with this statement in Year 2, and 57% (4 of 7) agreed in Year 3.

No Program Deans agreed with this statement in Year 2, and 43% (3 of 7) agreed in Year 3.

Figure 23—Strategy #3.1 Progress: Rated by Project Coordinators

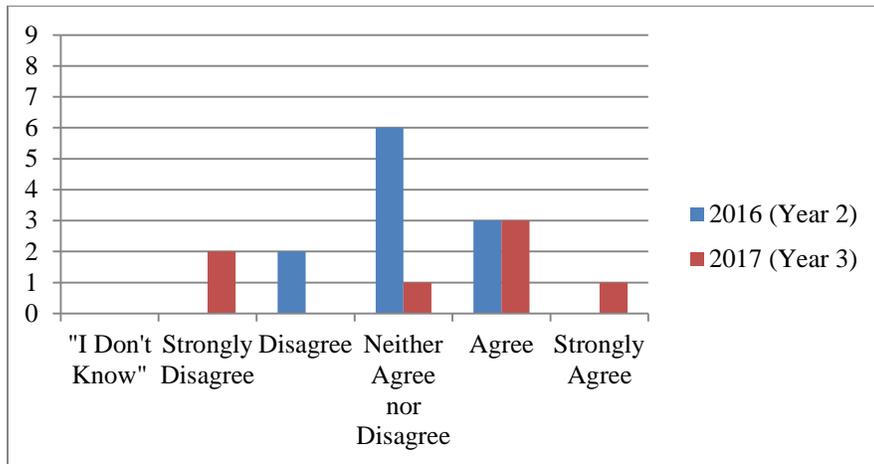
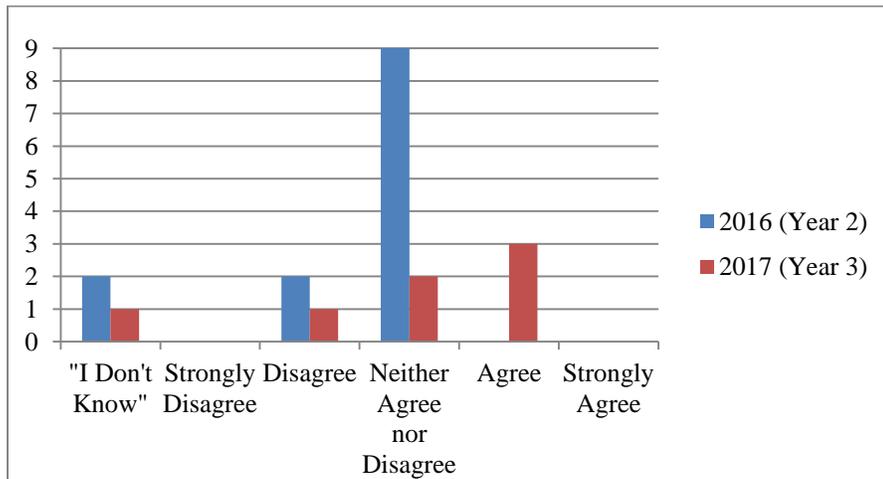


Figure 24—Strategy #3.1 Progress: Rated by Program Deans



A Project Coordinator said: “Our apprenticeship program is in development. We just need the ‘go ahead’ from the State. . . . We currently have internships, but [they’re] probably not at the same level of rigor that we need them to have. We have dual training [with students working part-time while completing the MnAMP programs], but it does not have the rules and regulations of apprenticeships. An apprenticeship is an ‘internship on steroids.’”

A Project Coordinator said: “We have apprenticeships. We’ve established them with [an industry partner], [with which we’ve had] a relationship for years, but in the past, internships and on-the-job training were common. The apprenticeship program is new and sometimes takes convincing. It’s structured, so that’s where some of the work comes in.”

A Project Coordinator said: “Employers that we’re working most closely with...they’re not interested in internships and apprenticeships because if a student is good enough, they want that student as an employee.”

A Dean said: “Employers are not yet excited about apprenticeships, but we continue to talk about it as a great opportunity.”

A Dean and Project Coordinator said: “[Through the MnAMP project], we approached [a long-term partner employer], and they started an apprenticeship program. They’ve had ten participants, [including] eight current apprentices and two who have completed.”

Strategy #4.1.

Implement a plan that emphasizes intrusive advising and job placement services.

Project Coordinators and Program Deans were asked to rate the extent to which they agree with the statement, “At my college, we’re making progress on Strategy #4.1, and for this strategy, we’re about as far along as it should be at this point.” Their responses are graphed in the figure below.

A majority of the Project Coordinators agreed or strongly agreed with this statement, with 92% agreeing or strongly agreeing in both years.

Of the Program Deans, 50% (8 of 16) agreed or strongly agreed with this statement in Year 2, though this was tempered by 31% (5 of 16) indicating they did not know. In Year 3, 86% (12 of 14) agreed or strongly agreed with this statement, coming closer to the levels of agreement expressed by the Project Directors in both years.

Figure 30—Strategy #4.1 Progress: Rated by Project Coordinators

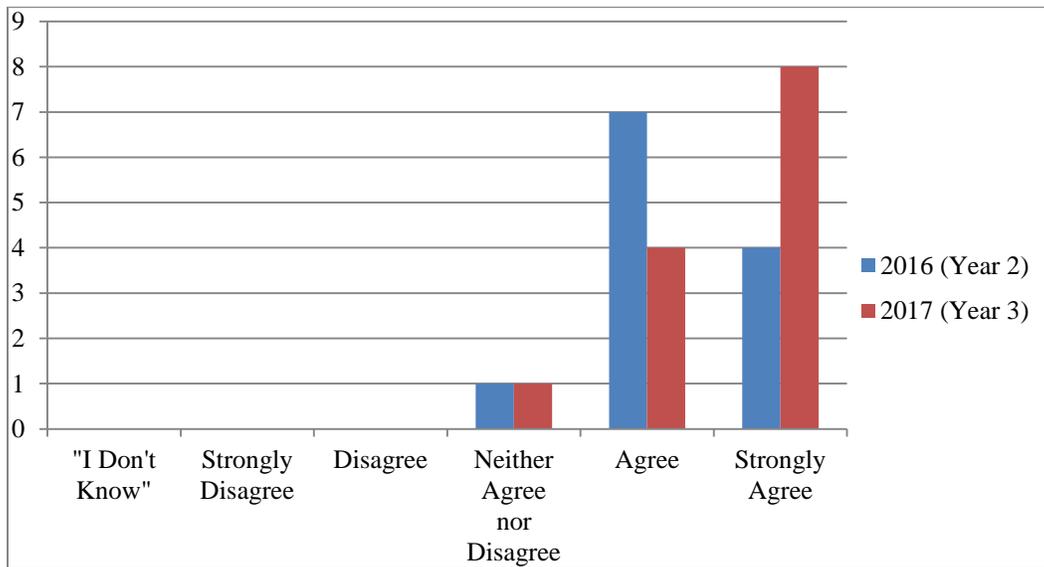
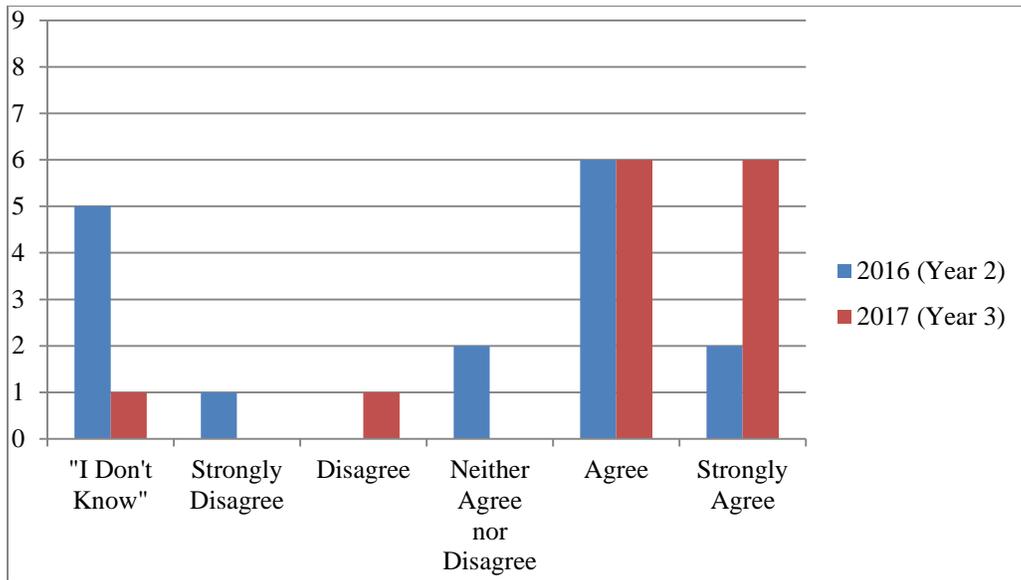


Figure 31—Strategy #4.1 Progress: Rated by Program Deans

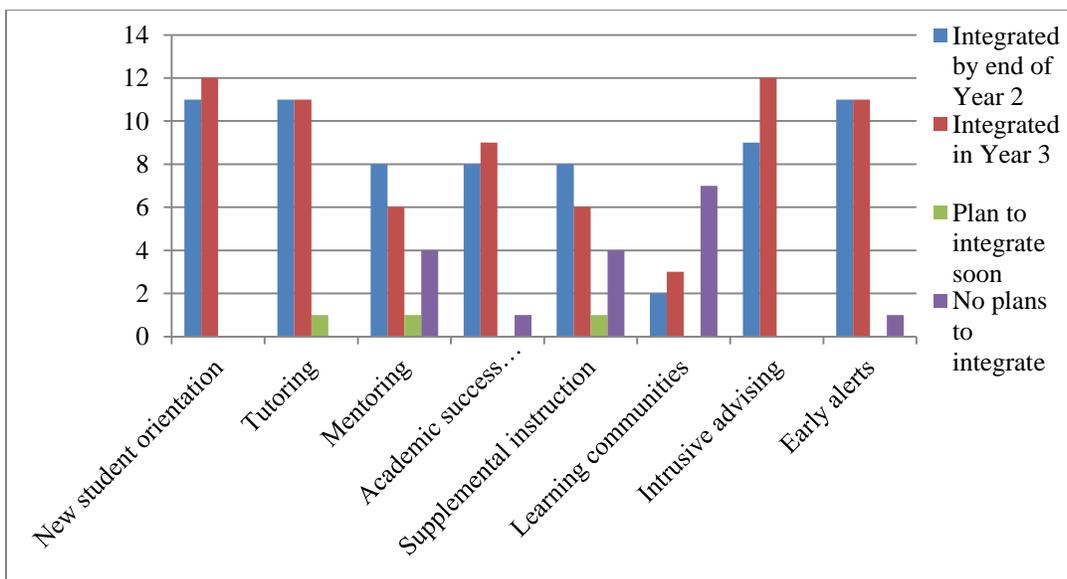


The following two figures illustrate the academic supports reported to have been provided to MnAMP students (see Figure 32) and Advisors' self-reports of their likelihood to refer students for these support services (see Figure 33).

The most widely adapted Academic Support Methods were New Student Orientation, Tutoring, Intrusive Advising and Early Alerts.

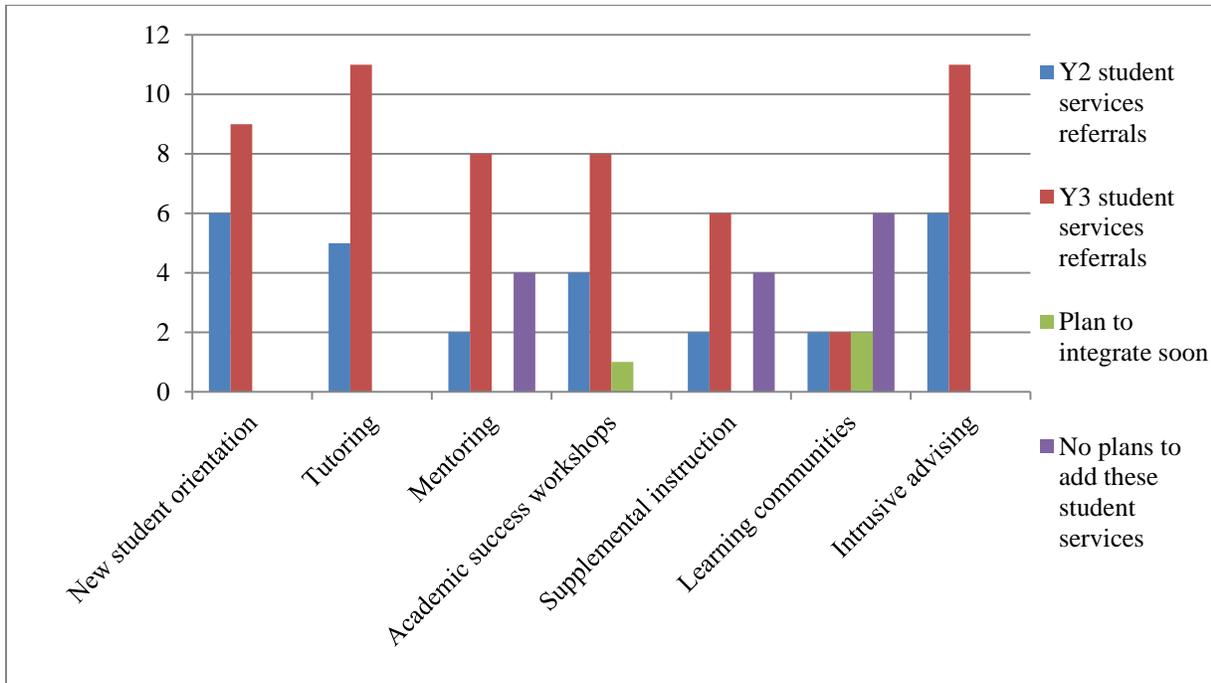
Advisors were most likely to refer students to New Student Orientation, Tutoring, and Intrusive Advising.

Figure 32—Academic Support Methods Provided to MnAMP Students



Source: MnAMP Project Evaluation Questionnaire: Project Coordinators (Years 2 and 3).

Figure 33—Advisors’ Academic Support Referrals

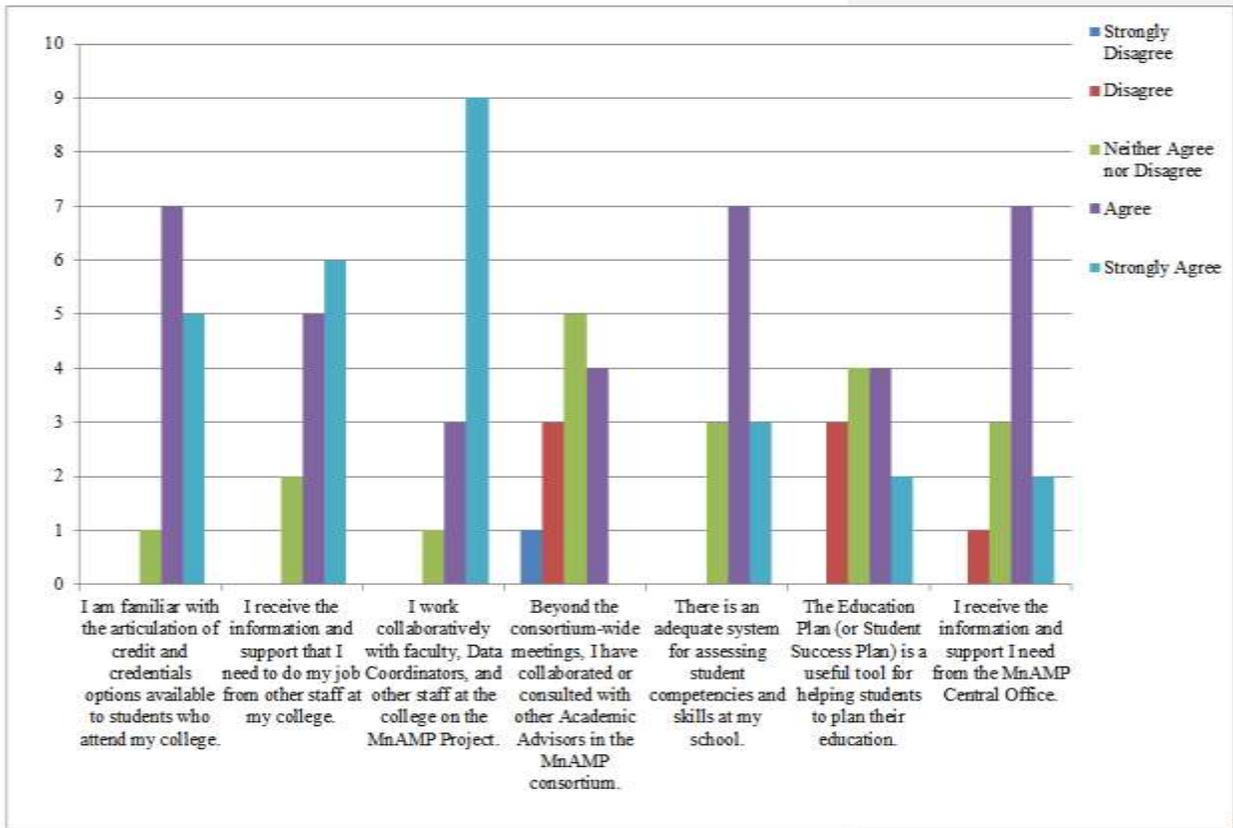


Source: MnAMP Project Evaluation Questionnaire: Advisors (Years 2 and 3).

The Advisors were asked a series of questions, by questionnaire, about their perceptions of: (a) their roles as Advisors and (b) the overall MnAMP project. Their responses are provided in Figure 35.

Of the 13 advisors, 12 (92%) believe they were familiar with the articulation of credit and credential options available to their students, received the information and support needed to do their job from other college staff (85%), worked collaboratively with other staff on the MnAMP project (92%), believed their college had an adequate system for assessing student competencies and skills (77%), and received the information and support they needed from the MnAMP central office (69%). Fewer than half said they had collaborated or consulted with other MnAMP Advisors beyond consortium-wide meetings (31%) or felt that an Education Plan or Student Success Plan was a useful tool (46%).

Figure 35—Year 3: Advisors’ Perceptions of their Roles and the Overall MnAMP Project



Source: Year 3 MnAMP Project Evaluation Questionnaire: Advisors.

An Advisor said: “Usually, we start by identifying the student, [to make sure] that we have their name and their student ID correct. We have them complete a brief survey on how familiar they are with the E-services, and I help them get logged into their account. We walk through the degree audit, the classes they’ve taken, and the classes they still need to complete the program. I ask what’s going on in their lives, how work/family is going, how are things progressing. I provide space for them to ask questions. Their questions tend to be about employment and jobs. [Faculty members are] really good at referring students to employers for jobs.”

An Advisor said: “It’s not just a ‘check the box approach’ to meeting with students. It’s people-centered. I know the students. I believe that’s the key to persistence: establishing rapport. Letting them know of the support services available. It’s important to build trust.”

An Advisor said: “My position focuses on proactive advising and wrap-around services, not just academic services. Anything that might affect student’s ability to complete school... Transportation, child care concerns, *et cetera*. I take the time to establish relationships with students, so if these things do occur, they know me and can meet with me for assistance.”

An Advisor said: “When students enroll, I meet with them and review their Accuplacer. I help them register for classes. I tell them [that] if they have any difficulty in any of their classes, I will work with the Learning Center to find a tutor for them. I try to support them and keep on track.

When they graduate, I try to help them get a job. I have an open-door policy. I also help them find housing, get [them] connected to financial aid, and set up interviews [for them] with employers.”

A Project Coordinator said: “We have a great advisor, an intrusive advisor. I’m confident [the advisor] will impact retention and job placement. We have 100% [job] placement for [machining] already, so we don’t need a lot of help with that program, but [the advisor] will help with placement of welding students.”

Appendix J – Full Impact Analysis Results

See separate Excel file included with this report.

Appendix K – DOL APR Outcomes by College as of the End of Year 4

| DOL APR Outcomes – Cumulative Numbers as of End of Year 4 | | | | |
|--|--|----------------|-------------|------------|
| Outcome Number | Outcome | Century | DCTC | LSC |
| 1 | Total unique participants served/enrolled | 1,03 | 204 | 206 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 44 | 69 | 29 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 29 | 58 | 16 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 18 | 199 | 131 |
| 4 | Total number of participants retained in other programs | 0 | 0 | 0 |
| 5 | Total number of grant-funded credit hours completed | 330 | 5,877 | 2,917 |
| 5a | Total number of participants completing credit hours | 92 | 254 | 128 |
| 6 | Total number of earned certificates/degrees | 58 | 69 | 32 |
| 6a | Total number of participants earning certificates (1 year or less) | 44 | 0 | 9 |
| 6b | Total number of participants earning certificates (more than 1 year) | 1 | 53 | 12 |
| 6c | Total number of participants earning degrees | 0 | 16 | 11 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 5 | 0 | 1 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 12 | 2 | 8 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 12 | 2 | 8 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 46 | 120 | 108 |

Source: LWE APR – October 8, 2018.

| DOL APR Outcomes – Cumulative Numbers as of End of Year 4 | | | | |
|--|--|-------------|----------------|-----------------|
| Outcome Number | Outcome | MCTC | MN West | MN State |
| 1 | Total unique participants served/enrolled | 104 | 229 | 152 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 32 | 146 | 125 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 18 | 88 | 83 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 93 | 134 | 3 |
| 4 | Total number of participants retained in other programs | 5 | 1 | 0 |
| 5 | Total number of grant-funded credit hours completed | 2,025 | 4,734 | 0 |
| 5a | Total number of participants completing credit hours | 135 | 294 | 115 |
| 6 | Total number of earned certificates/degrees | 37 | 194 | 187 |
| 6a | Total number of participants earning certificates (1 year or less) | 14 | 112 | 125 |
| 6b | Total number of participants earning certificates (more than 1 year) | 13 | 31 | 0 |
| 6c | Total number of participants earning degrees | 10 | 11 | 0 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 5 | 11 | 1 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 11 | 28 | 16 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 11 | 28 | 12 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 42 | 118 | 27 |

Source: LWE APR – October 8, 2018.

| DOL APR Outcomes – Cumulative Numbers as of End of Year 4 | | | | |
|--|--|-------------------------|------------------------|-------------------------|
| Outcome Number | Outcome | Norman- dale | North- land | Ridge- water |
| 1 | Total unique participants served/enrolled | 71 | 117 | 381 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 16 | 45 | 150 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 14 | 34 | 95 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 14 | 101 | 300 |
| 4 | Total number of participants retained in other programs | 0 | 0 | 0 |
| 5 | Total number of grant-funded credit hours completed | 138 | 1,664 | 8,590 |
| 5a | Total number of participants completing credit hours | 16 | 124 | 473 |
| 6 | Total number of earned certificates/degrees | 18 | 58 | 163 |
| 6a | Total number of participants earning certificates (1 year or less) | 12 | 22 | 58 |
| 6b | Total number of participants earning certificates (more than 1 year) | 1 | 18 | 85 |
| 6c | Total number of participants earning degrees | 5 | 10 | 20 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 0 | 4 | 18 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 1 | 4 | 27 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 1 | 4 | 26 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 19 | 52 | 174 |

Source: LWE APR – October 8, 2018.

| DOL APR Outcomes – Cumulative Numbers as of End of Year 4 | | | | |
|--|--|-------------------|------------|------------|
| Outcome Number | Outcome | River-land | SPC | SCC |
| 1 | Total unique participants served/enrolled | 113 | 491 | 1,013 |
| 2 | Total number of participants who have completed a TAACCCT-funded program | 62 | 177 | 371 |
| 2a | Total number of incumbent worker participants who have completed a TAACCCT-funded program | 45 | 105 | 285 |
| 3 | Total number of participants still retained in their program of study or another TAACCCT-funding program (duplicated) | 106 | 354 | 552 |
| 4 | Total number of participants completing credit hours | 2 | 0 | 3 |
| 5 | Total number of grant-funded credit hours completed | 3,057 | 10,289 | 9,789 |
| 5a | Total number of participants completing credit hours | 139 | 490 | 1,077 |
| 6 | Total number of earned certificates/degrees | 94 | 278 | 496 |
| 6a | Total number of participants earning certificates (1 year or less) | 59 | 121 | 348 |
| 6b | Total number of participants earning certificates (more than 1 year) | 23 | 116 | 20 |
| 6c | Total number of participants earning degrees | 0 | 14 | 54 |
| 7 | Total number of participants enrolled in further education after grant-funded program of study completion and college exit | 10 | 8 | 60 |
| 8 | Total number of participants employed after grant-funded program of study completion and program exit | 10 | 31 | 44 |
| 9 | Total number of participants retained in employment after program of study completion and college exit | 10 | 29 | 41 |
| 10 | Total number of those participants employed at enrollment (incumbent workers) who receive a wage increase post-enrollment | 68 | 162 | 628 |

Source: LWE APR – October 8, 2018.

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