



GRANT DELIVERABLES REPORT

MARCH 2017



ABOUT THIS DOCUMENT

The eight community colleges in the Michigan Coalition for Advanced Manufacturing (M-CAM), which include Bay College, Grand Rapids Community College, Kellogg Community College, Lake Michigan College, Lansing Community College, Mott Community College and Schoolcraft College, led by Macomb Community College, have transformed their policies, practices and programs to align manufacturing training more closely with the needs of 21st Century employers. Using a Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the U.S. Department of Labor, the colleges simultaneously trained nearly 4,000 workers for new careers or upgrades while also undertaking and achieving an integrated set of systems changes.



This report was prepared by Susan Lupo, Senior Policy Associate at Corporation for a Skilled Workforce. It reflects input received through interviews with M-CAM leads and other key staff at the eight participating colleges.

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ORIENTATION, INTAKE & CAREER COACHING

Intent of the Deliverable — The eight Michigan Coalition for Advanced Manufacturing (M-CAM) colleges proposed to align and enhance their orientation, intake, and career coaching activities based on best and leading practices from within the consortium and from across the country. The colleges decided to use the M-CAM initiative as a means to augment and improve student services functions that serve both credit and non-credit students.

Lead College: Mott Community College

Participating Colleges: Bay College
Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan approved by the U.S. Department of Labor focused on M-CAM colleges rethinking their student services functions in order to better serve both students and employers. Specifically, colleges set out to define what information would be included within orientation sessions, how data and information would be shared for intake processing, and how to provide and gather assessments that would best place students in appropriate courses.

In addition, the colleges committed to hiring career coaches to work with students in their search for a manufacturing career, and to do the framing of that role within their institutions. Each college also committed to collaborate with their local Michigan Works Agency (MWA) about roles the MWA could play in student

referrals, recruitment, liaison to local and regional employee partners, and assistance in job placement.

Project Plan

The project plan focused on aligning existing college efforts and service expansions with the prescribed goals within the work plan. The project plan was designed to ensure that each college's organizational context and constraints was recognized while efforts to improve and augment services were implemented. In short, the M-CAM colleges agreed that the overall structure and sequencing of services did not have to be identical from one institution to the next. Instead, the colleges committed to ensuring that M-CAM students received comprehensive services as part of this work.

Mott Community College served as the lead college for organizing the collective efforts of all eight M-CAM colleges on this deliverable. Mott has a long history of successfully developing and implementing comprehensive supports for their students, including both those in non-credit and credit pathways.

When appropriate, the colleges integrated all stakeholders, including employers and MWAs. Each college took a separate approach to stakeholder involvement.

ORIENTATION, INTAKE & CAREER COACHING

Deliverable Outcome

For orientation and intake, M-CAM colleges developed a comprehensive process that included basic requirements for college enrollment as well as consideration for student-specific services and support that enables long-term student success. This process generally includes the following components:

- Catalyzing event, which leads to a scheduled appointment to begin the process (either in groups or one-on-one);
- Enrollment and eligibility is defined;
- College application complete;
- Basic registration occurs, including acquiring student demographic information;
- Individual education development plans are created. This step in the process is designed to help the student complete components required for enrollment as well as to provide appropriate student academic and non-academic services. These items include, but are not limited to: assessments, goal development, career planning, defining previous employment and/or education history, defining a training plan, beginning job placement activities, and understanding necessary follow-up actions;
- Define and work through barriers and obstacles identified during previous steps;
- Complete program evaluations; and
- Complete additional tools or steps necessary for each program, including (when appropriate) interviews with potential employers, drug screening, and/or criminal background checks.

For career coaching, M-CAM colleges developed a process to help students better define their short and long term career goals, and how training and/or job development strategies will assist them in reaching these

goals. This process generally includes the following components:

- Orientation and intake processes which includes referral to a career coach;
- Enrollment and intake activities led by the career coach;
- Career coach and student meet to focus on assessments, career planning, relevant and local labor market information, evaluation of activities for career planning, funding eligibility, necessary supportive services, and determining next steps;
- Student begins pre-training/training activities and/or job development activities, as recommended by the career coach. Job development activities don't include specific training programs;
- Based on the individual's needs, the next steps can vary based on skill development requirement, including further training along specific M-CAM career pathways, and/or job placement activities; and
- Once an individual has finished training and job development activities, follow up for specific support of the student occurs at 30, 60, and 90 day intervals.

The colleges integrated these activities within the broader scope of support services for M-CAM students, so that a more holistic approach could be applied from intake up to and through job placement. Accordingly, the major buckets of work within that holistic approach include: outreach and recruitment, enrollment/intake/evaluation, academic and non-academic support services, training, job development, placement, and follow-up. The functions within each of these areas are provided by each college and/or external partners with strong ties to the college.

Based on this consortium-wide work, the following tables highlight specific changes made at each college as a result of M-CAM. These examples provide a comprehensive review of the kind of changes that were instituted throughout the consortium.

ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
BAY COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Not offered prior to M-CAM.	Role done by grant funded project manager.
Application Process	Takes place through student services.	No change.
Case Management Engagement	Not offered prior to M-CAM.	Performed by grant funded project manager who meets individually with students.
Informational Meetings	Not offered prior to M-CAM.	Meetings take place as needed to keep communication open between grant staff and Bay faculty.
Orientation This occurs during the first day of class.	Student Services offer orientation for new students in June, August and December.	No change.
Assessment/Evaluation	Student services performs placement testing that is required for all new students.	No change.
Job Development	Not offered prior to M-CAM.	Performed by grant funded project manager.
Educational Development Plans	Not offered prior to M-CAM.	No change.
Intake Forms/Processing	Not offered prior to M-CAM.	Performed by grant funded project manager.
Barriers & Obstacles Identification	Not offered prior to M-CAM.	Performed by grant funded project manager.
Role of Career Coaches	Not offered prior to M-CAM.	Grant funded project manager works with students from the first day of class and meets regularly to focus on job readiness skills. Career readiness workshops offered throughout the year.
Role of Job Developers	Not offered prior to M-CAM.	Grant funded project manager organizes job fairs and works with local employers to identify placement opportunities.
Role of Case Managers	Not offered prior to M-CAM.	Student Success performs this role through grant funded intake coordinator position. Grant funded project manager meets with students on a regular basis, as well as tracks attendance and follows up on absences.

ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
GRAND RAPIDS COMMUNITY COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	College non-credit staff performed this role for specific grants.	Enrollment eligibility part of college application process for credit and non-credit students.
Application Process	Handled separately for credit and non-credit job training programs.	One application for all students (credit and non-credit). Only continuing education programs have a different process.
Case Management Engagement	College non-credit staff performed this role for specific grants.	Student Success Center, Counseling and specific grant staff perform this function. College developed referrals to community partners as part of this project such as West Michigan Works, Goodwill of Greater Grand Rapids, Hope Network, Urban League of Greater Grand Rapids and the West Michigan Hispanic Center.
Informational Meetings	Had occasional open houses or tours.	Weekly informational meetings at college for the general public. Informational meetings (at least monthly) at public and non-profit partner locations (i.e., West Michigan Works, neighborhood associations, churches, etc.).
Orientation	Had orientations for programs.	Mandatory orientation for all Grand Rapids students. Non-credit orientation was revised to include more information on career pathways.
Assessment/Evaluation	Non-credit used WorkKeys (National Career Readiness Certificate). Credit used ACT. Grant staff did additional assessments as needed for programming (i.e., computer literacy).	Assessments can be done for credit and non-credit students at any college assessment center. Still use specialized assessments (CASAS, TABE, ACT Talent & Fit) for specific program focused assessments.
Job Development	Not offered prior to M-CAM.	M-CAM students meet job developers at orientation and at the half-way point of their training program. Job developers also work on job readiness skill training.

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
GRAND RAPIDS COMMUNITY COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Job Development (continued)	Not offered prior to M-CAM.	<p>Job developers actively cultivate relationships with area employers to find needs and match students to open positions. Job developers feed program information into the faculty and staff teams in various M-CAM related departments.</p> <p>College now includes job development as part of all non-credit job training programs as a result of the success of M-CAM.</p>
Educational Development Plans (EDPs)	Only existed for grant funded programs.	<p>Career coaches do EDPs with all participants. They have been working with staff from the college counseling office to share this work. College is moving to a model, through faculty negotiations, to include a form of EDPs for all students.</p>
Intake Forms/Processing	Not offered prior to M-CAM.	Intake forms are completed during orientation or in set meetings with coaches.
Barriers & Obstacles Identification	Only existed for grant funded programs.	<p>Barriers and obstacles are now a part of mandatory orientation work that students do with coaches and counselors. Mandatory orientation works with individuals to figure out how to conquer the identified barriers.</p> <p>In non-credit job training programs, college works with external partners to help individuals overcome barriers and help students plan for success (i.e., Goodwill, West Michigan Works, etc.).</p>
Role of Career Coaches	Only existed for grant funded programs.	<p>Vital part of non-credit job training process, beyond only M-CAM programs.</p> <p>College is working through faculty negotiations to add career coaches for all students coming to Grand Rapids, regardless of their program of study.</p>
Role of Job Developers	Not offered prior to M-CAM.	<p>Purchase of Handshake software has allowed closer connection between students and employers looking for talent.</p> <p>M-CAM participants meet job developers at orientation and at the halfway point of their training program. Job developers also work on job readiness skill training.</p>

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
GRAND RAPIDS COMMUNITY COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Role of Job Developers (continued)	Not offered prior to M-CAM.	<p>Job developers actively cultivate relationships with area employers to find needs and match students to open positions. Job developers feed program information into the faculty and staff teams in various M-CAM related departments.</p> <p>College is expanding job developers to be a part of all non-credit job training programs as a result of the success of this project.</p>
Role of Case Managers	Not offered prior to M-CAM.	<p>College uses community partner organizations to provide case management services if appropriate.</p> <p>Student Success Center provides some case management functions or referrals.</p>



ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
KELLOGG COMMUNITY COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Any student was eligible to apply to college and register for classes.	Industrial Trades students are enrolled in M-CAM and offered M-CAM services if they are using equipment purchased with the M-CAM grant. Advanced Manufacturing students are enrolled if they are interested in the field of manufacturing and are willing and able to attend the full 160-hour program.
Application Process	Each Kellogg student completes an application in order to register for classes.	Advanced Manufacturing students receive one-on-one assistance in completing a Kellogg application so that they can be registered for the program. Industrial Trades students also receive assistance as needed.
Case Management Engagement	Very little case management was provided to students during their program of study.	Staff is in close contact with each M-CAM student throughout their program of study and for one year after. Students are offered assistance to overcome barriers as well as with job search.
Informational Meetings	Information was provided to each student but there was not a formal meeting.	Formal information meetings are held for all Advanced Manufacturing students. Information about M-CAM services is provided to Industrial Trades students.
Orientation	One-on-one orientation sessions were provided to Industrial Trades students.	Formal orientation is held for all Advanced Manufacturing students. Includes a short video and information about Kellogg and the program. One-on-one orientation sessions are still provided to Industrial Trades students.
Assessment/Evaluation	Assessment/evaluation were only provided to those students who were completing an associate degree program.	Assessment/evaluation provided to all incoming Advanced Manufacturing students. Accuplacer is administered at the beginning of the program and WorkKeys is administered at the end.
Job Development	Not offered prior to M-CAM.	Job development provided for all M-CAM students.
Educational Development Plans	Not offered prior to M-CAM.	EDPs provided for all M-CAM students.
Intake Forms/Processing	Minimal intake forms were completed for students.	More detailed intake forms are now completed for all M-CAM students.

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
KELLOGG COMMUNITY COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Barriers & Obstacles Identification	Not offered prior to M-CAM.	Addressed for each student in the EDP.
Role of Career Coaches	Not offered prior to M-CAM.	Career coaches are very involved with recruitment, placement and retention of all M-CAM students.
Role of Job Developers	Not offered prior to M-CAM.	Job developers are very involved with recruitment, placement and retention of all M-CAM students.
Role of Case Managers	Not offered prior to M-CAM.	Case managers are very involved with recruitment, placement and retention of all M-CAM students.

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
LAKE MICHIGAN COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Not offered prior to M-CAM.	Career coach works with students who need additional assistance with funding, support services and career guidance tools.
Informational Meetings	Not offered prior to M-CAM.	Now provided in coordination with Michigan Works Agency.
Intake Forms/Processing	Not offered prior to M-CAM.	Now performed by career coach.
Barriers & Obstacles Identification	Not offered prior to M-CAM.	Now performed by career coach.
Role of Career Coaches	Not offered prior to M-CAM.	Talent development specialist performs the roles of career coach and case manager.
Role of Job Developers	Not offered prior to M-CAM.	Michigan Works agency Business Solutions team fulfilling this role.
Role of Case Managers	Not offered prior to M-CAM.	See above for career coaches.

ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
LANSING COMMUNITY COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Not offered prior to M-CAM.	The college's manufacturing business development manager is working with the M-CAM job developer and career coach to promote M-CAM programs.
Application Process	College online application.	Non-credit students are encouraged to also enroll and take Lansing placement test.
Case Management Engagement	Not offered prior to M-CAM.	Both career coaches and success coaches have a role in case management. The success coach is also now called academic success coach and role will have more of a case management feel (indirect result of M-CAM).
Informational Meetings	Not offered prior to M-CAM.	Informational meetings held at West Campus, Michigan Works Agency, and at local employers upon request. Will continue to run informational meetings for Mechatronics and Production courses.
Orientation	Not offered prior to M-CAM.	Orientation programs for Mechatronics, Welding Basics, and Production were developed through this grant and will continue after.
Assessment/Evaluation	Accuplacer offered at West Campus.	Foundations instructor at West Campus to help students prepare for Accuplacer and improve. Accuplacer required for non-credit workforce development programs will continue for Welding Basics and Mechatronics.
Job Development	Career and Employment Services located at West Campus.	Work with local employers to identify job needs in the area was expanded.
Educational Development Plans	Advising at West Campus.	EDPs were already somewhat in place but were reinforced under the grant and have been made part of the formal intake process. This was a new process for non-credit students in Welding Basics and Mechatronics. Academic advisory (credit) and academic success coaches (non-credit and credit) at Lansing will be responsible for the development of EDPs. The process has become more formal and no longer optional.
Intake Forms/Processing	Not offered prior to M-CAM.	Intake processes started through M-CAM will continue for Welding Basics and Mechatronics as a part of orientation meeting with prospective students.

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
LANSING COMMUNITY COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Barriers & Obstacles Identification	Advising at West Campus (not a formal process).	<p>The college has hired 4 academic success coaches at Main Campus and 1 at West Campus. The academic success coaches will be actively supporting students enrolled in credit program at main campus. The West Campus academic success coach also supports non-credit programs for students enrolled in Production, Welding Basics, and Mechatronics programs. This is new for non-credit and is a direct result of the grant.</p> <p>Reading and Writing and Career Readiness credit classes now offered at West Campus incorporating manufacturing terminology.</p>
Role of Career Coaches	Was part of Career and Employment Services.	Working with the college's experiential learning career coach, the grant career coach linked Michigan Works Agency and the college. This role did not exist previously and has provided additional support for both credit and non-credit students. It has helped to strengthen these partner connections.
Role of Job Developers	Was part of Career and Employment Services.	<p>Manufacturing business development manager is working with the M-CAM job developer and career coach to promote M-CAM programs and to connect employers to students within the grant.</p> <p>Job developer has also assisted Lansing in determining the specific skills an employer may need of potential new hires. The role was enhanced by the grant.</p>
Role of Case Managers	Not offered prior to M-CAM.	<p>Connecting students, employers, and college. Assist in connecting Michigan Works Agency programs to students and college programs that help lead to employment.</p> <p>Also, help with placement services for students finishing programs. Job leads, job trends and other resources are provided by career coaches.</p> <p>Career coaches have also provided orientation sessions at the Michigan Works Agency and West Campus for both credit and non-credit programs.</p>

ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
MACOMB COMMUNITY COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Workforce and Continuing Education-Engineering and Advanced Technology (WCE-EAT) staff funded through specific grants performed this role.	Enrollment performs this role through grant-funded recruitment coordinator position.
Application Process This occurs during WorkKeys Workshop and Intake Day.	WCE-EAT staff met with students to collect appropriate documentation.	Student Success and Enrollment performs these roles through grant funded intake coordinator and enrollment coordinator.
Case Management Engagement	WCE-EAT staff performed this role, through daily contact with students.	Student Success performs this role through grant funded intake coordinator position.
Informational Meetings	WCE-EAT staff held informational sessions as needed to keep the pipeline of participants full.	Enrollment performs this role through grant funded recruitment coordinator position.
Orientation This occurs during the first day of class.	WCE-EAT staff performed this role the first day of class.	WCE-EAT staff funded by the grant continue to perform this role; all grant staff are included.
Assessment/Evaluation	WCE-EAT staff worked with WorkKeys staff and used this assessment as the determining factors for admittance. Some courses required an interview and resume review as well.	Student Success and Enrollment perform this role through grant funded positions of intake coordinator and recruitment coordinator. WorkKeys is used as the determining factor for admittance.
Job Development	WCE-EAT staff funded through specific grants performed this role and job developers were hired for specific grants.	Career Services performs this role through grant funded employer development coordinator position.
Educational Development Plans	WCE-EAT staff funded through specific grants performed this role.	Student Success performs this role through grant funded intake coordinator position.
Intake Forms/Processing	WCE-EAT staff funded through specific grants performed this role.	Student Success performs this role through grant funded intake coordinator position.
Barriers & Obstacles Identification	WCE-EAT staff performed this role on an "as needed" basis with the support of community partners.	Student Success performs this role through grant funded intake coordinator position.
Role of Career Coaches	Included in job developer role.	Career Services performs this role through grant funded career coach position. The career coach works with students from the first day of class and meets regularly with students to work on job readiness skills.

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
MACOMB COMMUNITY COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Role of Job Developers	WCE-EAT staff funded through specific grants performed this role, including job fairs, networking events, job placement, interview preparation, mentoring and follow-up data collection.	Career Services performs this role through grant funded job developer position. Organizes job fairs, works with employers to match students through Macomb Career Link website maintained by Career Services.
Role of Case Managers	WCE-EAT Project Coordinator funded through specific grants performed this role along with job developer and other partners.	Student Success performs this role through grant funded Intake coordinator position. The intake coordinator works with the students from intake through completion of training. Attendance collection and follow-up on absences. Continually addresses obstacles and barriers.



ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
MOTT COMMUNITY COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Determined during Intake for non-credit students.	Added in-class survey for credit students.
Application Process	Not offered prior to M-CAM.	Done during intake.
Case Management Engagement	Began at Information Session for non-credit students. On credit side, student driven via Student Supportive Services.	Made available to students in the classroom.
Informational Meetings	Twice monthly for non-credit students. Credit students notified via email.	Added in-class announcements about informational meetings.
Orientation	Part of first day of class for non-credit students. Part of admissions process for credit students.	No change.
Assessment/Evaluation	Assessments administered during intake; Evaluation began during information session.	No change.
Job Development	For non-credit students, pre- and post-training job development services available. Credit students use Student Employment Center.	Made available to students in the classroom.
Educational Development Plans	Developed throughout the intake and case management process for non-credit students.	Expanded to include credit students and developed through intake and case management process.
Intake Forms/Processing	Administered during Intake for non-credit students.	Program documents processed in classroom for credit students.
Barriers & Obstacles Identification	Part of the non-credit intake process; reviewed/verified by career navigator.	Expanded to include credit students; delivered in classroom during intake process and follow-up one-on-one with case manager.
Role of Career Coaches	On non-credit side, shared responsibility of case manager and job developer.	No change.
Role of Job Developers	Interaction begins pre-training with non-credit students. On credit side, interaction was student driven with job developers available.	Credit side more staff driven with job developer classroom visits permitted by instructors.
Role of Case Managers	Interaction begins during information session with non-credit students. Interaction student driven with staff available as requested on credit side.	Credit side more staff driven with case manager classroom visits permitted by instructors.

ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
SCHOOLCRAFT COLLEGE		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Enrollment Eligibility Process	Not offered prior to M-CAM.	Students meet with M-CAM career coach and/or M-CAM job developer to determine eligibility and learn about M-CAM program benefits.
Application Process	Prospective students were processed through standard college application process (open door admissions policy).	<p>M-CAM staff or faculty meet with student to discuss M-CAM programs areas.</p> <p>Credit students are assisted through the standard application process.</p> <p>Non-credit students complete the M-CAM intake form and an additional course registration form before the training.</p> <p>M-CAM participants are checked for Selective Service registration. Veterans are identified and given priority service information.</p>
Case Management Engagement	Not offered prior to M-CAM.	<p>M-CAM participants (students) are encouraged to work closely with the M-CAM career coach and job developer throughout their entire Schoolcraft College/M-CAM experience. The M-CAM staff is available by appointment and has established regular walk-in hours.</p> <p>The M-CAM team conducts monthly outreach to M-CAM students via email, newsletters and phone calls to ensure the students are making progress on their education and employment goals.</p>
Informational Meetings	Not offered prior to M-CAM.	<p>M-CAM information is shared with credit students in the classrooms of all M-CAM related programs.</p> <p>College collaborates with several local Michigan Works Agency offices to share program information during the MWA's orientation sessions.</p>
Orientation	All new students are encouraged to participate in the New Student Orientation.	<p>M-CAM orientations are given upon intake of students.</p> <p>Participants are informed of the M-CAM wrap-around services as well as other helpful campus resources.</p>

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
SCHOOLCRAFT COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Assessment/Evaluation	Students entering the college from high school submit ACT/SAT test scores or take placement tests for English, Math and Reading.	Credit students are assessed through the traditional means. Non-credit students are TABE tested by MWA for 9th grade Reading/Math levels. Additional assessments are given as needed using Edmentum/Plato.
Job Development	Career Services Office provides general resources to students needing assistance with career direction or employment. Some faculty members, who have good company relationships, work with students to facilitate job leads. Due to the informal nature, there is no tracking method for results.	Students meet the M-CAM career coach and the M-CAM job developer immediately upon entering the program. The M-CAM job developer actively cultivates relationships with area employers to find needs and match our students to open positions.
Educational Development Plans	All new students must meet with an academic advisor prior to registering for classes.	Individual Service Strategy forms are completed with all M-CAM students. The M-CAM staff works closely with a counselor, who is very knowledgeable about manufacturing programs and helps students overcome any challenges.
Intake Forms/Processing	Not offered prior to M-CAM.	Intake form ensures a potential M-CAM student has met eligibility requirements and begins relationship with that student. Individual Service Strategy form is also completed at this time, or soon after, in order to help the college's M-CAM team discover what goals the student has for education and employment.
Barriers & Obstacles Identification	Learning Support Services offers Student Success Seminars in topics including course-specific skills, career issues, learning strategies, research, etc. The seminars help students develop knowledge, skills, and attitudes necessary for successful completion of college work. Disability Support Services ensures equal access to programs and activities by facilitating accommodations and by providing encouragement and support for individuals with disabilities.	Individual Service Strategy form is used to capture any potential challenges the student is facing, so a strategy for success can be developed and obstacles foreseen and overcome. As needed, participants may be referred to Counseling Services and/or their local Michigan Works Agency representative for additional assistance/resources.

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ORIENTATION, INTAKE & CAREER COACHING

ORIENTATION, INTAKE & CAREER COACHING CHANGES AT EACH M-CAM COLLEGE		
SCHOOLCRAFT COLLEGE (continued)		
COMPONENT	BEFORE M-CAM	M-CAM IMPROVEMENTS
Barriers & Obstacles Identification (continued)	Counseling Services are available to provide assistance or referrals in dealing with stress management (school, work and personal commitments) and using time-management skills to create an effective balance. The Counseling Department also provides a confidential online mental health screening tool for depression, anxiety, alcohol, and eating disorders.	Individual Service Strategy form is used to capture any potential challenges the student is facing, so a strategy for success can be developed and obstacles foreseen and overcome. As needed, participants may be referred to Counseling Services and/or their local Michigan Works Agency representative for additional assistance/resources.
Role of Career Coaches	Not offered prior to M-CAM.	The M-CAM career coach encourages the student from the start of their program through completion. They are very active in goal-setting, outreach to students, career readiness, resume writing and interview preparation.
Role of Job Developers	Not offered prior to M-CAM.	The M-CAM job developer works with the student to establish career goals and look for employment or work-based learning opportunities. Job Developer is also continually building a collaborative relationship with employers so they can better serve the employers' needs and students are directed to apply to those businesses that need their skills.

Work Plan Exceptions

There are no identified work plan exceptions.

Work Products (Samples available in Skills Commons)

- Orientation/Intake & Enrollment System
- Intake Form
- Barriers and Obstacles Activity
- Individual Service Strategy/Education Development Plan
- M-CAM & Michigan Works Agencies Action Plan
- M-CAM & Michigan Works Agencies Barriers, Challenges, and Opportunities
- Validating College-Based Credentials for Michigan Works Agencies Co-Enrollment Form
- M-CAM Student End-to-End Journey-Comprehensive Map & Individual College Maps

FOUNDATIONAL SKILLS

Intent of the Deliverable — The eight Michigan Coalition for Advanced Manufacturing (M-CAM) colleges proposed to develop, augment, and/or improve competency-based, contextualized foundational skills programs to ensure that students would have access to at least one contextual foundational skills program or one bridge curriculum in manufacturing. These programs were to be offered in conjunction with the technical competencies required in the respective program area.

Lead College: Grand Rapids Community College

Participating Colleges: Bay College

Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan approved by the U.S. Department of Labor (DOL) focused on ensuring inclusion of six foundational skills areas derived from DOL's Advanced Manufacturing Competency Model, which employers frequently found to be missing from job applicant skill sets. The colleges committed to contextualizing their programming in order to relate foundational competencies to manufacturing occupations. As part of this work, the colleges agreed to the following:

- Each college would develop at least one contextual foundational skills program.
- All colleges would develop bridge/competency based programs to address the six prioritized foundational skills.

Project Plan

M-CAM colleges took two different approaches:

- Institutions with existing programs focused on augmenting provision of foundational skills development using technology and ensuring that programs were contextualized where possible.
- Institutions with no foundational skills programs focused on integrating provision of foundational skills with provision of technical skills. For instance, one institution created standalone modules that served students beyond formal classroom time so as not to interrupt existing curriculum.

The project plan also called for the use of technology, including Edmentum/Plato, as a significant tool to help students contextualize foundational skills content.

FOUNDATIONAL SKILLS

Deliverable Outcome

M-CAM colleges agreed to develop, enhance, and/or improve foundational skills content offerings at each institution, focused on:

- Basic Computer Skills
- Communication Skills
- Financial Literacy
- Math Skills
- Reading Skills
- Study Skills

These six areas align well with generally accepted descriptions of essential foundational skills, as articulated by employers in manufacturing and other industries. Accordingly, the colleges agreed to provide content that would help position students for both academic and professional success.

Grand Rapids Community College served as the lead institution for this work. In this role, the college led efforts to leverage and incorporate resources from Edmentum/Plato, a web-based content management system that provides both faculty and students with expansive curriculum, content, and assessments in a variety of disciplines. To make this an effective tool for M-CAM students requiring foundational skills, the colleges worked with Edmentum/Plato to develop specific content for each of the six skill areas.

Based on this work, each college was tasked with assessing their current foundational skills content offerings, defining their aspirational goal for content, and working to bridge that gap. The following information highlights that work for each college.

The M-CAM colleges undertook improving their foundational skills offerings in locally relevant partnerships. Among the eight colleges, extensive engagement of faculty, employers, and workforce agency staff occurred. Each college worked with local manufacturers, either individually or through advisory boards to ensure foundational competencies aligned with workforce needs. Several colleges fully integrated Edmentum/Plato and Tooling U in instructional design and delivery systems to ensure students could learn these skills online, then apply them in the learning environment.

Although most colleges did not work specifically with their local Michigan Works Agency to develop foundational/contextual curriculum, several colleges engaged MWA staff in learning how to use Edmentum/Plato and made the MWA aware of expanded and contextual foundational skills development opportunities within college manufacturing programs.

Each college worked with local manufacturers, either individually or through advisory boards to ensure foundational competencies aligned with workforce needs. Several colleges fully integrated Edmentum/Plato and Tooling U in instructional design and delivery systems to ensure students could learn these skills online, then apply them in the learning environment.

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS: M-CAM CONSORTIUM	
COLLEGE	OUTCOMES
Bay College	Faculty and Student Success Center staff offer supplemental instruction (SI) for traditionally difficult courses. SI includes study sessions where students develop study tools, practice problem solving and prepare for exams. These sessions are facilitated by trained SI leaders and coordinated with program faculty.
Lake Michigan College	Faculty and staff evaluated curriculum to determine how best to deliver contextualized, competency-based coursework. The Michigan Works Agency and employer partners helped evaluate students upon completion.
Lansing Community College	<p>Credit Programs Director for Workforce Transition, faculty, and instructional designer came together to define program scope for contextualized programs, including Pathway Skills for Professionals and Integrated Reading and Writing.</p> <p>Non-Credit Programs Director, faculty, and subject matter experts identified basic skills needed in the workplace, which included additional courses for Welding and Certified Production Technician in team building, problem solving, communication, resume writing, interviewing and presentation.</p> <p>Employer Advisory Meetings Local manufacturing companies, the Manufacturing Council and faculty facilitated sessions were used to determine basic skills needed in the workplace. A list of skills was generated and incorporated in technical career programs. A standardized assessment rubric used to evaluate progress in class was produced.</p>
Grand Rapids Community College	<p>As a result of the M-CAM grant, Grand Rapids contextualized its fast track foundational skills program to manufacturing. The college hired an instructor, added online modules from Edmentum/Plato and built a bridge to the academic foundation programs that the college has for credit programs.</p> <p>Grand Rapids trained the West Michigan Works team in the coaching process, use of ACT WorkKeys and the availability of the Fast Track program to assist individuals who have foundational skills needs.</p> <p>Employer partners were informed of the work the college was doing related to foundational skills. Employers have not been interested in investing in foundational skills for their staff, but are willing to give information to their employees about programs that will assist them.</p>
Kellogg Community College	All industrial trades programs developed by faculty are modularized and competency-based. Edmentum/Plato has been integrated as supplemental support for the program.
Macomb Community College	Foundational skills trainers worked with faculty to gain an understanding of technical terms related to integrated foundational skill training, expanding the alignment of workplace competencies and foundational skills.
Schoolcraft College	CNC/Machining program faculty chose Immerse2Learn for simulation in labs and as supplemental instruction in short-term classes in conjunction with Tooling U. This instructional design is in keeping with Schoolcraft's integration of core abilities (employability skills) in all credit programs.

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
BAY COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	Not taught, except in the course of career coaching in terms of resume, cover letter, and online application preparation.	Lab of approximately 20 computers has been installed in the Welding Lab for student use. A standalone module for basic computer skills was developed and is now offered.
Communication Skills	Communication skills covered as needed in career coaching and job preparation workshops leading up to a Career Expo/Job Fair.	Activities began in August 2014, as a direct result of the presence of an M-CAM job developer.
Financial Literacy	Not offered prior to M-CAM.	A standalone module for financial literacy was developed and is now offered.
Math Skills	Math skills are taught in MATH-102 (Technical Math), a required course for the Welding Certificate, and supported by supplemental instruction and TRiO tutoring.	Contextualization: Supplemental instruction has been added as a result of M-CAM.
Reading Skills	Reading skills are taught as needed in response to Compass results or as identified in supplemental instruction.	Contextualization: Supplemental instruction has been added as a result of M-CAM.
Study Skills	All students are comprehensively tested using Compass. Based on testing results, students can be placed in transitional classes to address any gaps. TRiO tutoring is provided for eligible students from disadvantaged backgrounds. Supplemental instruction (SI) classes are provided to support Welding courses that traditionally have low pass rates - including Blueprint Reading, Technical Math, and Materials of Industry. The SI instructor attends class with students and then subsequently leads a follow-up class to support student success and give personalized attention to students in these historically difficult courses.	Supplemental instruction for welding began in August 2014 and was a direct result of the M-CAM and TAACCCT program and funding. Tremendously successful, the program has been extended to other welding courses (using college funds), after the M-CAM program demonstrated the value of SI in the welding program.

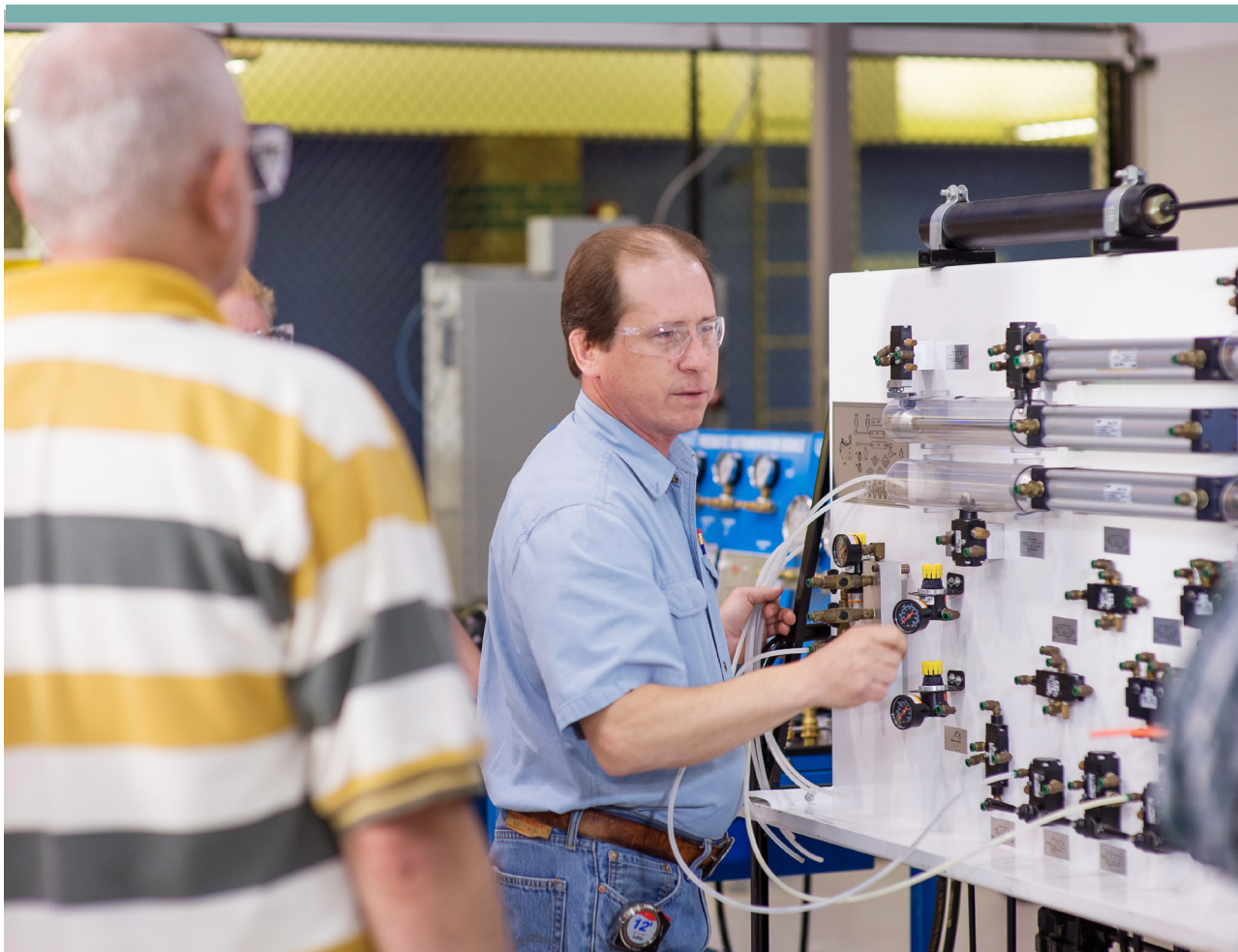
FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
GRAND RAPIDS COMMUNITY COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	<p>The two M-CAM programs in Welding and Machining in non-credit have limited basic computer skills that are necessary to the program, i.e., G&M coding for machining and basic Internet skills for welding video instruction. The following credit courses are offered:</p> <ul style="list-style-type: none"> • CIS 3 Fundamentals of computers • CIS 100 Introduction to computers systems • CIS 103 Introduction to Windows and Microsoft Office • CIS 106 Internet Essentials 	<p>Three new programs developed under M-CAM contain contextualized computer skills:</p> <ul style="list-style-type: none"> • Manufacturing Readiness, which uses the Edmentum Math module. • CPT (Certified Production Assistant) – Tooling U, Edmentum Math modules, as well as the MSSC testing modules, all require the student to use computers. • Handshake – Welding & CNC machining students in job training exit advising, enroll and post resumes and begin job search connections.
Financial Literacy	Not offered prior to M-CAM.	Financial Aid exit advising began in Fall of 2015. Students receiving loans complete loan counseling and financial planning to prepare for the loan repayment process.
Math Skills	<p>The following credit courses are available for foundational math skills:</p> <ul style="list-style-type: none"> • MA 95 Basic Math Review • MA 96 & 98 Pre-Algebra and Elementary Algebra • MA 97 Basic Mathematics Review and Pre-Algebra • FastTRACK/OnTrack (3 weeks immersion learning) • Noncredit Students use a Fast Track Lab which provides one on one tutoring and support for WorkKeys foundational skills. 	Noncredit programs incorporated the use of Edmentum/Plato WorkKeys modules as an additional resource of online learning.
Reading Skills	<p>Reading courses are available for credit students not meeting program entrance requirements as a result of Accuplacer.</p> <p>Noncredit Students use a Fast Track Lab which provides one on one tutoring and support for WorkKeys foundational skills.</p>	Noncredit programs incorporated the use of Edmentum/Plato WorkKeys modules as an additional resource of online learning.
Study Skills	Study Skills workshop is available to all students through Counseling and Career Center.	No additions or changes.

(continued next page)

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
GRAND RAPIDS COMMUNITY COLLEGE (continued)		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Contextual English as a Second Language (ESL)/ Foundational Skills/Work Readiness Skills	Not offered prior to M-CAM.	<p>Grand Rapids partnered with the Hispanic Center of West Michigan and the Literacy Center of West Michigan to design a program where individuals with a level 4 or above English as a Second Language (ESL) will continue to learn English, but at the same time will learn CNC Machining Skills with integrated foundational skills.</p> <p>New curriculum was developed by the partner organizations using Edmentum/Plato Math modules and Tooling U.</p>



FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
KELLOGG COMMUNITY COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	Curriculum has 16 hours of computer instruction. Microsoft Office skills are taught as well as general information about computer hardware and internet usage. Students also gain additional basic computer skills by working through computer-based OSHA modules.	Contextualization: Offerings are available through Edmentum/Plato. Credit for basic computer skills instruction is now offered as a result of M-CAM.
Communications Skills	Offered through the Professionalism and Writing classes.	Contextualization: Offerings are supplemented through Edmentum/Plato content. Credit for communication skills instruction is now offered as a result of M-CAM.
Financial Literacy	Up to 6 hours of financial literacy training is offered and taught by the Financial Opportunity Center.	Students can continue to work with the Financial Opportunity Center after they complete the manufacturing program and work toward financial independence. Students are encouraged to stay in contact with instructors if they need long-term support.
Math Skills	16 hours of foundational math skills are offered.	Contextualization: Offerings are supplemented through Edmentum/Plato content. Credit for math skills instruction is now offered as a result of M-CAM.
Reading Skills	Reading skills are offered through a Writing class and a Professionalism class. Two course books for Professionalism are provided and students are assigned chapters in the book to read. They also use reading skills in their Writing course.	Contextualization: Offerings are supplemented through Edmentum/Plato content. Credit for reading skills instruction is now offered as a result of M-CAM.
Study Skills	Study Skills instruction is offered on the first day of the manufacturing course. Two tutorials can also be accessed throughout the program to provide additional study time on a variety of subjects. These tutorials are Career Ready 101/Keytrain and Edmentum/Plato.	Changes: More soft skills and study skills instruction were added to Edmentum/Plato menu and use was customized for each class. Contextualization: Offerings are available through Edmentum/Plato. These courses are offered as a result of M-CAM funding.

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
LAKE MICHIGAN COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	The following courses are offered: <ul style="list-style-type: none"> • 100 Introduction to Computer Literacy. • 102 Basic Computer Literacy. • 121 Windows Skills. • 122 Word-processing Skills. 	Contextualization: offerings are available through Tooling U.
Communications Skills	The following courses are offered: <ul style="list-style-type: none"> • Comm 101 Introduction to Public Speaking. • Comm 102 Voice and Diction. 	Contextualization: offerings are available through Tooling U.
Financial Literacy	Not offered, except as a Community Education course.	No additions or changes.
Math Skills	Math 060 - 095 are basic math mini-courses designed to provide remedial or review work for students with deficiencies in specific areas of basic math.	Contextualization: offerings are available through Tooling U.
Reading Skills	Read 080 and 081 improve student academic preparedness. Read 082 and 083 provide techniques and strategies to help develop college-level vocabulary and reading proficiency. 14 other reading/vocabulary building courses are available to students.	Contextualization: offerings are available through Tooling U.
Study Skills	Lake Michigan offers a variety of 1, 2 and 3 credit hour options for students interested in increasing their potential for success. Below are some of the available courses: <ul style="list-style-type: none"> • CLS 102 College Learning and Success Strategies • CLS 103 Higher Learning Strategies • CLS 104 Applied Learning Strategies • CLS 114 Fundamentals for Success • READ 090 Power Study Skills • READ 101 Developing better study skills 	Contextualization: offerings are available through Tooling U.
Additional Course Offerings/Content	Lake Michigan also offers other coursework for students interested in increasing their potential for success: <ul style="list-style-type: none"> • 110 Career Decision Making • 216 Stress Management • 217 Self Esteem – establishing a healthy balance 	No additions or changes.

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
LANSING COMMUNITY COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	<p>Basic computer skill classes are offered as credit classes.</p> <p>Lansing also offers computer classes at Michigan Works office through the college's Center for Workforce Transition.</p>	<p>As part of new hybrid Mechatronics class which began January, 2016, Computer Literacy is the first class offered for students. It is a basic introduction to help students improve their computer skills.</p>
Communications Skills	<p>Offered through reading and writing classes.</p>	<p>The CPT Safety, Quality, and Production classes have added communication skill activities into each of the classes.</p>
Financial Literacy	<p>The college offers various classes in financial literacy.</p> <p>A financial literacy class was offered through an adult Bridge Program in 2014-2015.</p>	<p>Financial literacy will be part of a new class — Pathways Skills for Professions — which has not yet been offered.</p>
Math Skills	<p>Math tutoring is available at Main Campus and the Center for Workforce Transition.</p>	<p>Edmentum/Plato math is being offered for students who need to raise their math level to 5, a requirement for the AMTEC Mechatronics Program.</p> <p>M-CAM students were offered foundational math classes to help raise their math scores for Accuplacer assessments. The instructor held weekly labs on an individual basis to work with students needing additional help.</p>
Reading Skills	<p>Reading skills are offered through a writing class and a professionalism class.</p>	<p>Foundational/Developmental classes are offered through the Center for Transitional Learning.</p> <p>A Reading/ Writing class at West Campus was offered for the first time in 2016.</p>
Study Skills	<p>Foundational classes being offered through college Center for Transitional Learning on Main Campus.</p> <p>Foundation classes offered through LCC Center for Workforce Transition at Capital Area Michigan Works.</p> <p>Math, Reading, and Writing tutors offered at Main Campus.</p>	<p>The Center for Transitional Learning (CTL) is offering a Reading/Writing class at West Campus that began January 2016. This is an integrated, contextualized Reading/Writing class.</p> <p>A Pathway Skills for Professions which covers Study Skills, Basic Computer Skills, Financial Literacy, Communication, and Career Skills has been developed and is being offered.</p> <p>Both classes will integrate manufacturing technology into these classes. They will be offered as credit classes for the first time at West Campus.</p> <p>Two CTL faculty developed contextualized foundation classes related to manufacturing.</p>

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
MACOMB COMMUNITY COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	Basic computer skills have been a part of some of the technical training programs prior to M-CAM. If a technical program does not include basic computers, these skills are then incorporated into the foundational skills content offerings.	No changes or additions.
Communications Skills	Communication skills are included in the Foundational Skills week content offerings.	No changes or additions.
Financial Literacy	Financial literacy is included in the Foundational Skills week content offerings.	This content offering is a direct result of M-CAM funding.
Math Skills	Basic math is part of the technical training for CNC. Students must obtain a level 4 on the WorkKeys math portion to enter these programs.	No changes or additions.
Reading Skills	Reading skills are included in the Foundational Skills week content offerings.	No changes or additions.
Study Skills	Study skills are typically scheduled the first week of each cohort for M-CAM participants. They are delivered by trainers who have spent time with subject area vocabulary to incorporate it into the study skills.	Incorporating study skills into training was a direct result of M-CAM.



FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
MOTT COMMUNITY COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	Non-credit offerings as part of Fast Track basic computer skills are delivered contextually. Digital Literacy and Basic Computer Skills are also offered.	No additions or changes.
Communications Skills	Non-credit offerings for communication skills are refined during Fast Track as part of presentation lessons and mock interviews. Comm 131 – Fundamentals of Public Speaking is also offered.	No additions or changes.
Financial Literacy	Financial Literacy is offered as part of the Fast Track program. The curriculum was developed and implemented out of the Financial Opportunity Center (FOC).	No additions or changes.
Math Skills	Non-credit offerings for open lab for math remediation utilizing KeyTrain and Edmentum/Plato are provided. As part of the program design, Technical Math is embedded in the training content (36-40 hours). Credit offerings include 10 courses offered below the Math 100 level.	Contextualization: Edmentum/Plato added.
Reading Skills	Non-credit offerings for open lab for reading utilizing KeyTrain and Edmentum/Plato are provided. Credit offerings include 3 courses offered below the Reading 100 level.	Contextualization: Edmentum/Plato added.
Study Skills	Non-credit content is offered in Fast Track sessions utilizing Career Ready 101 and Edmentum/Plato. Credit offerings include CASD 121 – Study and Learning Skills.	Contextualization: Edmentum/Plato added.
Role of Job Developers	Not offered prior to M-CAM.	Job developers actively cultivate relationships with area employers to find needs and match students to open positions. Job developers feed program information into the faculty and staff teams in various M-CAM related departments.

FOUNDATIONAL SKILLS

FOUNDATIONAL SKILLS CHANGES AT EACH M-CAM COLLEGE		
SCHOOLCRAFT COLLEGE		
COURSE/CONTENT AREA	ORIGINAL COURSE/CONTENT OFFERING	IMPROVED COURSE/CONTENT OFFERING
Basic Computer Skills	<p>Computer courses at varying skill levels are available to students in the traditional credit format.</p> <p>Schoolcraft's Continuing Education and Professional Development department has an extensive offering of non-credit computer courses.</p>	No changes or additions.
Communications Skills	<p>Writing Rescue Workshops are offered through the Learning Assistance Center and other communication skills workshops are offered through the Career Services team, which are ongoing.</p>	<p>Workshops now target M-CAM participants.</p> <p>Contextualization: Communication Skills workshops are offered as part of the Soft Skills Workshops facilitated collaboratively by the M-CAM career coach, job developer and Michigan Works! staff.</p>
Financial Literacy	<p>Financial Literacy workshops offered via the college's Learning Assistance Center.</p>	<p>Financial Literacy is part of new non-credit Career Readiness class.</p>
Math Skills	<p>Learning Assistance Center offers several workshops (i.e. JumpStart) and seminars throughout the academic year to all students.</p>	<p>Contextualization: Schoolcraft launched Technical Math 102, concurrently to the start of M-CAM in Spring 2014. This course is contextualized to Occupational Programs students.</p> <p>Math Skills resources available through Edmentum/Plato are a result of M-CAM grant activities.</p>
Reading Skills	<p>Learning Assistance Center offers several workshops and seminars throughout the academic year to all students.</p>	<p>Contextualization: Reading Skills tools available through Edmentum/Plato are a result of M-CAM grant activities.</p>
Study Skills	<p>Workshops are offered via the Learning Assistance Center.</p>	<p>Contextualization: Study skills supportive tools are available through Edmentum/Plato, as a result of M-CAM.</p>
Additional Information	<p>All Schoolcraft credit courses have "core abilities" embedded into the curriculum and each certificate/degree that is awarded must include these abilities in at least one class. The abilities are:</p> <ul style="list-style-type: none"> • Communicate Effectively • Think Creatively and Critically • Use Technology Effectively • Use Mathematics • Manage Information • Work Cooperatively • Act Responsibly • Demonstrate Social and Cultural Awareness 	<p>A non-credit Career Readiness program has been created as part of M-CAM, and is used in boot camp programs, but can also be used as a stand-alone resource. It includes:</p> <ul style="list-style-type: none"> • Campus resources • Networking to gain employment • Financial Literacy • Resume Workshops • Interview Preparation • Workplace Habits for Success

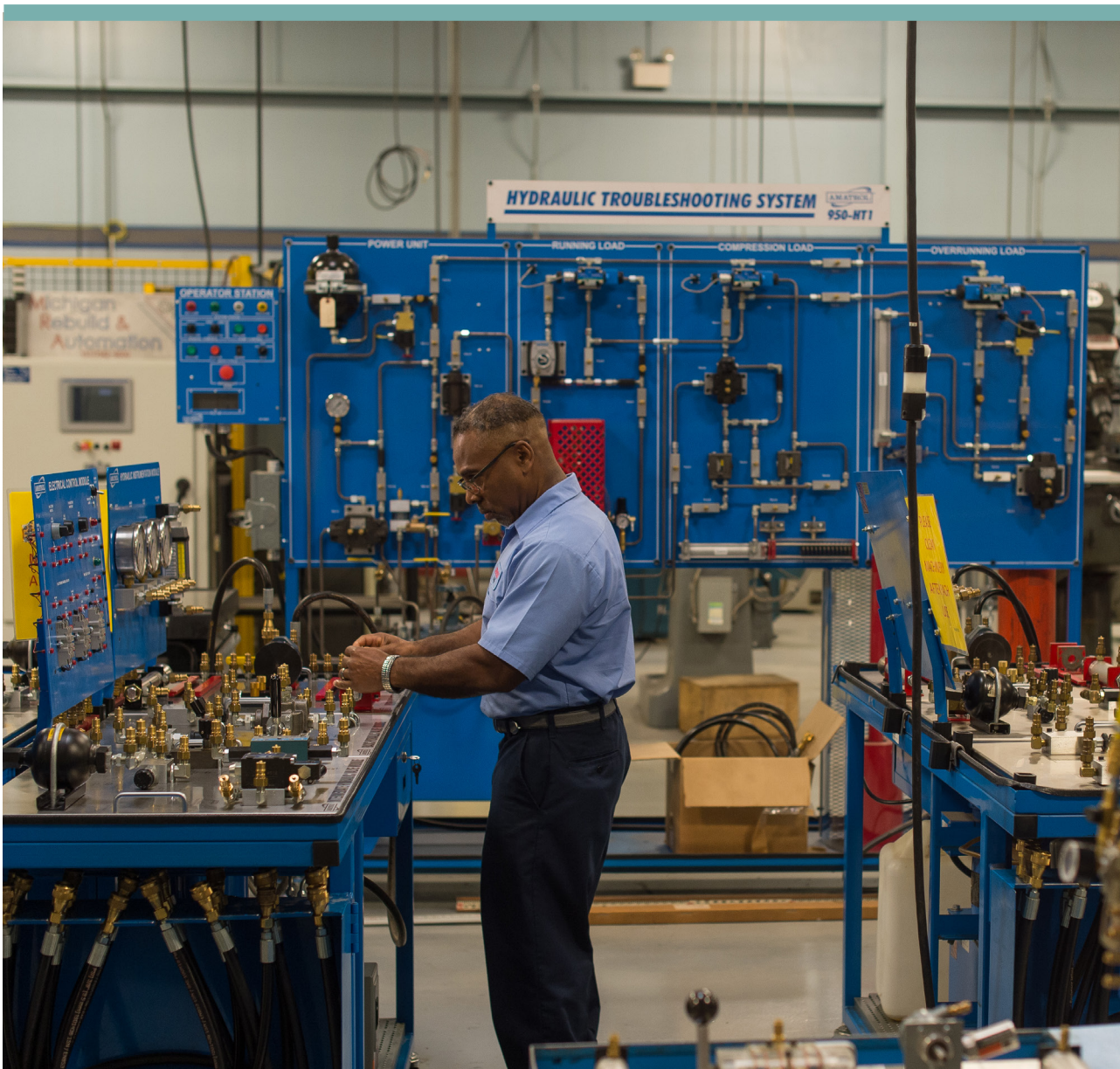
FOUNDATIONAL SKILLS

Work Plan Exceptions

There are no identified work plan exceptions.

Work Products (Samples available in Skills Commons)

- Tooling U Modules
- Edmentum Modules
- Course Content Packets (foundational skills content embedded into programs)
- Outreach About Foundational Skills Support
- Foundational Skills Guidebook



COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

Intent of the Deliverable — The eight Michigan Coalition for Advanced Manufacturing (M-CAM) colleges proposed to align their institutional learning objectives with each other so that competencies and skill development were consistent across the consortium. By aligning learning objectives, the colleges also sought to ensure that their programs and credentials were aligned as well so that M-CAM students from around the state would be completing programs with comparable knowledge, skills, and abilities. The M-CAM colleges also sought to develop clear, latticed career pathways, in which students could stack credentials to reach their goals. Each college engaged staff and faculty, local employers, and Michigan Works Agencies as appropriate to complete this deliverable. These relationships are described further in the Learning Outcomes Summary contained in this document.

Lead College: Grand Rapids Community College
(Welding/Fabrication)
Schoolcraft College
(CNC/Machining)
Lansing Community College
(Production Operations)
Macomb Community College
(Multi-Skill/Mechatronics)

Participating Colleges: Bay College
Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan approved by the U.S. Department of Labor focused on activities that would allow the colleges to scope, assess, and align learning objectives, programs, and credentials in a seamless manner. The colleges agreed to a multi-step process to achieve this work:

- Inventory current learning objectives for each discipline across all M-CAM colleges;
- Ensure inventory is comprehensive and aligned against national competencies and credentials;
- Develop new learning objectives, as needed;
- Align existing and new learning objectives across all four program areas for all colleges;
- Validate learning objectives with employers at the local level;
- Research and identify national credentials that are aligned with the new comprehensive set of learning objectives;

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

- Work with local and national industry stakeholders to select demand-driven credentials that will help M-CAM students secure employment and economic security;
- Create a comprehensive learning objective and national credential matrix for each program area;
- Work with industry to ensure the inventory is comprehensive; and
- Involve employers in the validation that the core learning objectives meet their needs.

Project Plan

The project plan for this deliverable included an implementation team for each program area in which faculty, program leads, and curriculum stakeholders were asked to define, refine, and/or expand learning objectives and credentials. For each of the colleges, significant work was focused on alignment of learning objectives with national credentials. Each program area went through an extensive assessment and analysis process to define those learning objectives and examine which national credentials would be a good fit. That process led to aligned learning objectives that were measured against the national credential.

Deliverable Outcome

The work of aligning learning objectives and national credentials was necessary to ensure that the M-CAM programs matched employer demand and provided students with an opportunity to develop comprehensive career pathways built on skills and competencies with labor market value. This work was the underpinning of M-CAM efforts to develop articulation strategies so that students had ultimate flexibility to move between institutions, as necessary, without losing academic credit. While this specific function does not occur with great frequency for these programs, the alignment nevertheless ensures skill portability between academic institutions and employers alike.

This work culminated in the development of learning objective matrices for each of the programs. This work was comprehensive and ensured that faculty could agree on common competency expectations within each school's program. An important note on this work should also be included: schools did not align learning objectives following the same course structure or course nomenclature. Each of the institutions maintained their existing course structure as it had been previously built. Instead, this alignment focused on the totality of the program with an understanding of where common learning objectives occurred within each specific college program.

Learning Objective Alignment

For each of the four program areas, faculty identified industry credentials as a starting point to align programmatic learning objectives within each college and across M-CAM colleges. This process made it easier to identify college courses delivering content found in industry credentials and to identify gaps in the existing courses. The process also helped some colleges quickly build curriculum not yet offered, allowing them to launch Multi-Skilled/Mechatronics programs. This analysis, in combination with new equipment, meant programs could be upgraded and delivered quickly, contained quality assurances and were relevant to industry. All of the equipment and content changes in each program area were discussed with employer advisory groups and were validated by subject matter experts in each of the four program areas.

Integrating Industry Credentials into Programs

Each M-CAM college sought to align their learning objectives in a way that created stacked/latticed credentials. In addition, this effort created alignment with national industry credentials. Building off of employer engagement as previously described, the

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

adoption and use of specific industry credentials was a major win for M-CAM, due to the following dynamics:

- The use of credentials provided a common mechanism for institutions to agree upon for learning objectives. In this model, no one institution could dominate another based on their academic or program model. Instead, the neutral (but employer-driven) national credential created a rational meeting point for all institutions.
- The use of credentials provided an opportunity for colleges to speak to the importance of industry recognized credentials, especially when working with small employers who don't recognize that these credentials represent the skills they need in their workforce. The increased focus on these credentials, as a result of aligned learning objectives, will positively impact employer recognition of these credentials at the local level. Further, the enhanced nature of collaboration between and among employers and M-CAM colleges will result in greater awareness about the utility and strength of a national credential as a means to signal a highly skilled workforce.
- Students now have stronger tools that represent the skills they have and this can lead to long-term success in an individual's career pathway. These tools, including national credentials, provide a consistent mechanism to symbolize the breadth of knowledge a student has attained by completing the associated learning objectives and earning a credential. While college-based credentials are certainly important, national credentials provide greater portability and allow a student to better convey their skills to potential employers.
- Career pathway maps were created for each college encompassing the four advanced manufacturing program areas that M-CAM focused on to make it easier for students to understand their choices in

reaching employability and to encourage them to progress toward advanced degrees.

The changes made to the programs at each of the schools are sustainable by nature. These changes have been implemented so as to become the new norm for each of the programs. New faculty are hired according to these changes, students are oriented based on the focus on credentials, institutions have a stronger relationship with national credentialing bodies, and employer involvement and relationships have increased.

One additional factor contributing to sustainability is the enhanced nature of the relationships between and among faculty at all of the M-CAM schools. Prior to M-CAM, many faculty did not have working relationships with faculty from other schools, and thus the sharing of best/leading practices did not occur. As a result of M-CAM, faculty have created solid working relationships that allow for collaboration and critique. For instance, once the aligned learning objectives for Machining were tested by each of the schools, one institution came back to the group and indicated that one of the credentialed areas didn't fit their program model and wondered if other institutions had experienced a similar reaction. Some had, and some had not. But the conversation that followed allowed for the eight colleges to refine and improve their aligned learning objectives to be fully representative of both academic expectations as well as job readiness components. This kind of interaction has created the mechanism to ensure that this work is sustained for the long-term.

These changes are also sustained through the use of technology and equipment purchased with M-CAM funding. State of the art equipment matching up to date programs and learning objectives positions the M-CAM institutions to continue to provide relevant training programs that include the use of equipment that meets workplace standards well into the future.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
BAY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<p>Little discussion had taken place with employers.</p> <p>Learning objectives had not been intentionally defined or aligned with foundational skills.</p> <p>Industry certifications had not been identified or included in the delivery of programs.</p> <p>There was no Multi-Skilled/ Mechatronics Program and wait lists for the Welding Program.</p>	<p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • Compact PCS for PLC training (3) • DEPCO Industrial Maintenance trainers (2 units – Electronics Levels 1 and 2; 3 units - Industrial Motors Levels 1 and 3) • PLC & SCADA Virtual Simulation and Gaming • FANUC CERT carts - 3 stations <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • MIG/ARC and TIG Welders • Welding Booths to expand Escanaba program and add Iron Mountain location • Ironworker - 2 • Horizontal Hydraulic Band Saw - 2 • Shear - 2 • Gas carts, consumables, floor-mounted vertical drill press, air compressors, plug kits 	<p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • FANUC America’s Certified Education Robotics Training (CERT) • PMMI testing for students <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • All instructors were already Certified Welding Instructors but M-CAM has resulted in much more intentional alignment with industry-recognized credentials (AWS). 	<ul style="list-style-type: none"> • Employers, including Steward Manufacturing, Engineered Machine Products (EMP) and Systems Control, engaged in developing and validating common learning objectives aligning with workplace and technical competencies. • Learning objectives are available in the college catalogue. • Industry certifications are embedded and are being sought by local employers as validation of technical skills Bay students have upon completion of their programs. • The Mechatronics program was launched and the capacity of the Welding program doubled.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
GRAND RAPIDS COMMUNITY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<ul style="list-style-type: none"> • Grand Rapids had existing certificate and associate degree programs in Welding Technology. However, these programs were not aligned with national credentials, causing potential issues with lost credits for students during a transfer process. • The college did not have a Multi-Skilled/Mechatronics program. • Grand Rapids' Computer Numerical Control (CNC)/Machining program did not include any national certifications. • The college had existing certificate and associate degree programs but few specialized product programs and none that contained national credentials. 	<p>CNC/Machining</p> <ul style="list-style-type: none"> • Haas Milling Machine • Lab Volt Mobile Manufacturing Training Lab • Stratasys U-Print 3D Plastic Printer • EMCO Maier Concept Milling Center Mill and Concept Turn 60 Turn Center for Precision Machining CNC - and Control software <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • Mobile Lab • Fanuc LRMate 200iD/R30iA • Amatrol Mechatronics Learning System for AB Compact Logix • FANUC Robot <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • 3 Robotic Welding Cells <ul style="list-style-type: none"> ◦ Complete Turn-Key Robotic Welding Cells ◦ Blueco Modular Fixturing for Robotic Welding Cells ◦ Pyper Robotic Welding Cells • Virtual Welders <ul style="list-style-type: none"> ◦ Lincoln Electrical Virtual Welder ◦ VRTEX 360 Standard Frequency Virtual Welder • Robotic Welding Peripherals • Mobile Lab 	<p>CNC/Machining</p> <ul style="list-style-type: none"> • Use of Tooling U • Faculty member NIMS certified • Inclusion of 3 NIMS certifications to Job Training Machining Program • Contextualized ESL CNC Program <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • Use of Amatrol • Revision of electrical classes • Mechatronics Certificate • Revision of non-credit mechatronics (MAP classes) • PMMI certification alignment with classes <p>Production Operation</p> <ul style="list-style-type: none"> • Industrial Sewing class (consortium with Henry Ford, Detroit Garment Workers, St. Claire CC, Lansing CC) — Sewing machines, employer customizations • Certified Production Technician (MSSC) • Food Processing Certification (MMTC-West) • Manufacturing Readiness • Employer validation, creation of curriculum <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • Virtual Welders, Lincoln Electric Online learning integrated into credit and non-credit welding program • AWS certifications included in JT and Associate Degree programs • Faculty certified by AWS inspectors • Addition of robotic welding in automation classes 	<ul style="list-style-type: none"> • Grand Rapids' credit and non-credit Welding programs have been aligned with American Welding Society (AWS) standards so that students graduating from the Job Training Welding program will have the opportunity to complete portions of the AWS and students completing their One-Year Certificate or Associate Degree in Welding Technology will have the opportunity to complete their full AWS certificate. This is a key industry credential that employers demand (and often are forced to fund themselves unless they hire Grand Rapids' graduates). It also promotes a smooth transfer process if the students elect to continue their education within the M-CAM consortium or partner with 4-year universities that articulate credit for the AWS credential. There now is robotic welding equipment to be used by students in the new automation class. • Regarding stacked and latticed training programs, graduates from the Job Training Welding Technology program receive 14 credits towards their one-year certificate or associate degree. Similarly, students completing their one-year certificate have essentially completed the first year of their associate degree, and can transition easily from completing a one-year certificate to pursuing their

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COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
GRAND RAPIDS COMMUNITY COLLEGE (continued)			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
		<ul style="list-style-type: none"> • Revision of two classes to align to AWS certification. • Employer review, feedback, validation of curriculum and advise on equipment purchase. 	<p>associate degree the next year. Portions of the AWS are included throughout this pathway so that students are stacking portions of the AWS as they continue pursuing their associate degree.</p> <ul style="list-style-type: none"> • The college's Mechatronics credit certificate program now exists along with a full mechatronics lab. It includes several Packaging Machine Manufacturing Institute (PMMI) credentials. • Grand Rapids' CNC Job Training Program now has a certified National Institute for Metalworking Skills (NIMS) instructor and offers NIMS certification as part of the Job Training program. The non-credit program now articulates to 14 credits for students who continue on to an associate degree program. • The college's Industrial Sewing and Certified Production Technician programs include national certifications.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
KELLOGG COMMUNITY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<ul style="list-style-type: none"> • Kellogg Advanced Manufacturing Assembly (KAMA) did not exist. 	<p>CNC/Machining</p> <ul style="list-style-type: none"> • EDM • Manual CMM • 3D printer • Lathe • Optical Comparator • Trak Knee Mill • Tool Room Lathe • Mill & Rotary Table <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • Man Lift • Lift Truck • Hydraulic Trainer • Fluid Power Trainer • Lab Volt Process Control Trainer • Drives Trainer • Electronics Trainer • Fire alarm Trainer • Robots <p>Production Control</p> <ul style="list-style-type: none"> • Upgrade production line to XMC-401 model car • Developed fully integrated learning/lab environment on the shop floor that allows students to turn theory into practice. <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • Virtual Welder 	<p>CNC/Machining</p> <ul style="list-style-type: none"> • Added NIMS Measurement Materials Safety Certification. • Imported Machining curriculum modules to college LMS to allow for online and off-site 24/7 access <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • 2 PMMI Certifications added (Fluid Power, Mechanical Components). <p>Production Control</p> <ul style="list-style-type: none"> • KAMA — Short-term, modularized courses in production. <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • Imported Welding curriculum modules to college LMS to allow for online and off-site 24/7 access. 	<ul style="list-style-type: none"> • KAMA program is fully implemented: <ul style="list-style-type: none"> ◦ Learning objectives laid the foundation for short-term, modularized courses in production (30 credit hours over 1 semester), are occupation specific, and integrate foundational skills. • Industry certifications are integrated. • Better alignment to equipment that is actually being used in industry, thereby enhancing the learning environment, providing a better quality of instruction for students, and increasing completion and employment outcomes. • Having the curriculum online via college LMS access allows the college to better meet the changing needs of students and working adults. • New relationships built with employers. • Increase in enrollments at the Regional Manufacturing Technology Center; reaching non-traditional students. • Virtual Welder is big draw for young students and is a cost effective way to provide hands-on lab experiences without consuming physical materials.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
LAKE MICHIGAN COMMUNITY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<p>Learning objectives were defined through advisory committees and apprenticeship review.</p>	<p>CNC/Machining</p> <ul style="list-style-type: none"> • 2 new CNC Mills • 2 new CNC Lathes <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • 2 new Mobile Motor Control Stations • 1 new Basic Hydraulics controls learning system • 1 new Basic Pneumatics controls learning system • FANUC robot • PLC Training package designed by local manufacturer <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • Robot Welder • 7 MIG Welding Machines • 7 TIG welding machines 	<p>CNC/Machining</p> <ul style="list-style-type: none"> • NIMS Credentials • Incorporated Tooling U <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • Mechatronics AAS • Level 1 Mechatronics Technology • 3 new robotics courses • PMMI credential • Incorporated Tooling U <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • Welding AAS • AWS Credentials • Incorporated Tooling U 	<ul style="list-style-type: none"> • Programs align with local employer demands. • Employers involved in M-CAM review included Hanson Mold, Eagle Technologies, Vickers Engineering, Edgewater Automation, Kay Manufacturing, Mach Mold, KO Products, AccuDie Mold, Great Lakes Welding, Griffin Tool, and Standard Tool & Die. • The equipment purchases allowed for the accommodation of more students and facilitated more access to hands on applications.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
LANSING COMMUNITY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<ul style="list-style-type: none"> • Welding program needed improvements. • Certified Production Technician (CPT) program did not exist. • Foundational skills were not integrated or aligned to some technical programs learning outcomes. • Mechatronics non-credit programs did not exist. 	<p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • FANUC trainer and software • Lift Truck <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • 3 virtual welders - Lincoln Electric Welding cell; 2 Robotic Welders • Portable welding trailer 	<p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> • Modularized and flexible hybrid format. <p>Production Control</p> <ul style="list-style-type: none"> • MSSC certified production tech developed along with complementary programs in Team Build and a Simulated Production Program. <p>Welding/Fabrication</p> <ul style="list-style-type: none"> • Welding Basics updated and enhanced with Virtual Welders. • Print Reading revised. • New Manufacturing Exploratory class developed. • Credit programs were able to enhance their programs with additional equipment. 	<ul style="list-style-type: none"> • Employers, faculty and staff were engaged in the development of M-CAM learning outcomes for Welding and CPT as well as Multi-Skilled/Mechatronics hybrid. • Employers were surveyed to document the desire for Manufacturing Skill Standards Council (MSSC) industry credentials. • Virtual welders have been incorporated in credit and non-credit instruction. Robotic welders used for credit are being integrated in non-credit instruction. • CPT program was offered in both face-to-face and hybrid formats. • New Team Build class for CPT was piloted with employer partner Woodbridge. • Hybrid Multi-Skilled/ Mechatronics (three Blocks) completed: PMMI in Blocks 1&2 and Siemens Level 1 and 2 Mechatronics Certification in Block 3 capstone. • Mechatronics simulator used in credit instruction now used in non-credit as well. • Simulated Production Environment course developed as a part of CPT. • Ability to support AMTEC training and capstones.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
MACOMB COMMUNITY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<ul style="list-style-type: none"> Validation of core learning objectives has taken place over many years of employer partners hiring students and through contract training opportunities. For Macomb, all programs existed before M-CAM. Several non-credit to credit articulations had been established in Welding and CNC program areas. 	<p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> R-2000iB Robot + Carried Servo Gun R-2000iB Robot + Single Ped Servo Gun WTC - Mini Pack Weld Control WTC - MDFC Welder Control Robot Baseplate RoboDrill / Robotic Load Work cell 	<ul style="list-style-type: none"> Tooling U and Amatrol online training used to enhance training. Added PMMI, Siemens, and FANUC certifications. 	<ul style="list-style-type: none"> For Macomb, these programs were established years prior and with close employer engagement. These relationships were leveraged for M-CAM and will continue to evolve. Non-credit to credit articulation agreements were further fine-tuned and embedded within programs. Students completing the non-credit Welding program will receive 11 credits. Students completing the non-credit CNC program will receive 9 credits, and the students completing the Production Operator Program will receive 2 credits. The Multi-Skilled Technician and Mechatronics programs will utilize the Credential to Certification framework. Both credit and non-credit offerings were aligned to a national credential. Welding aligned to AWS, CNC to NIMS, Production Operator to OSHA 10 and MSSC CPT, Multi-Skilled Technician and Mechatronics to PMMI 1-6, Siemens Level 1 and FANUC Certifications. Macomb, leading the MST/ Mechatronics program area, adopted the chunking of credits aligned to a national credential. This overcame the many challenges in aligning course by course objectives as each of the colleges were at various stages of program development or implementation.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
MOTT COMMUNITY COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<ul style="list-style-type: none"> Prior to M-CAM, program advisory boards provided the majority of content input for credit programs. Workforce programs utilized employer company input/feedback. Curriculum was designed to provide skills for entry level employment. 	<p>CNC/Machining</p> <ul style="list-style-type: none"> Haas ST-10 CNC Lathe Surface grinder <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> SMC FMS-200 Mechatronics Trainer Stratasys Fortus 3D printer Epilog Laser Cutting/Etching System 2 FANUC Robotic CERT carts <p>Welding/Fabrication</p> <ul style="list-style-type: none"> 2 Soldamatic virtual welders 	<p>CNC/Machining</p> <ul style="list-style-type: none"> Revised Machine Tool Certificate program. Draft in place for AAS. <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> Revised/created hybrid/pneumatic & mechanical components courses. <p>Welding/Fabrication</p> <ul style="list-style-type: none"> Added AAS degree. 	<ul style="list-style-type: none"> Programs were updated and aligned to industry credentials. Multi-Skilled/ Mechatronics program was added. CNC/Machining was revised. New elements were added to Welding. Industry partners included Tri-Bar, Ally Equipment, Plumbers and Pipefitters Local 370 and Corsair. Provides current machining equipment platform used by industry partners and will also support future program expansions. Provides equipment to expand/improve robotics coursework and adds troubleshooting capacity to existing Electrical/ Controls courses/programs. STEM focus –summer camps, workshops, etc. New Mechatronics Certificate program. Supports product design instruction and services. New curriculum development leading to AAS degree. Virtual welders support recruitment/retention efforts and provide additional teaching/learning time for students.

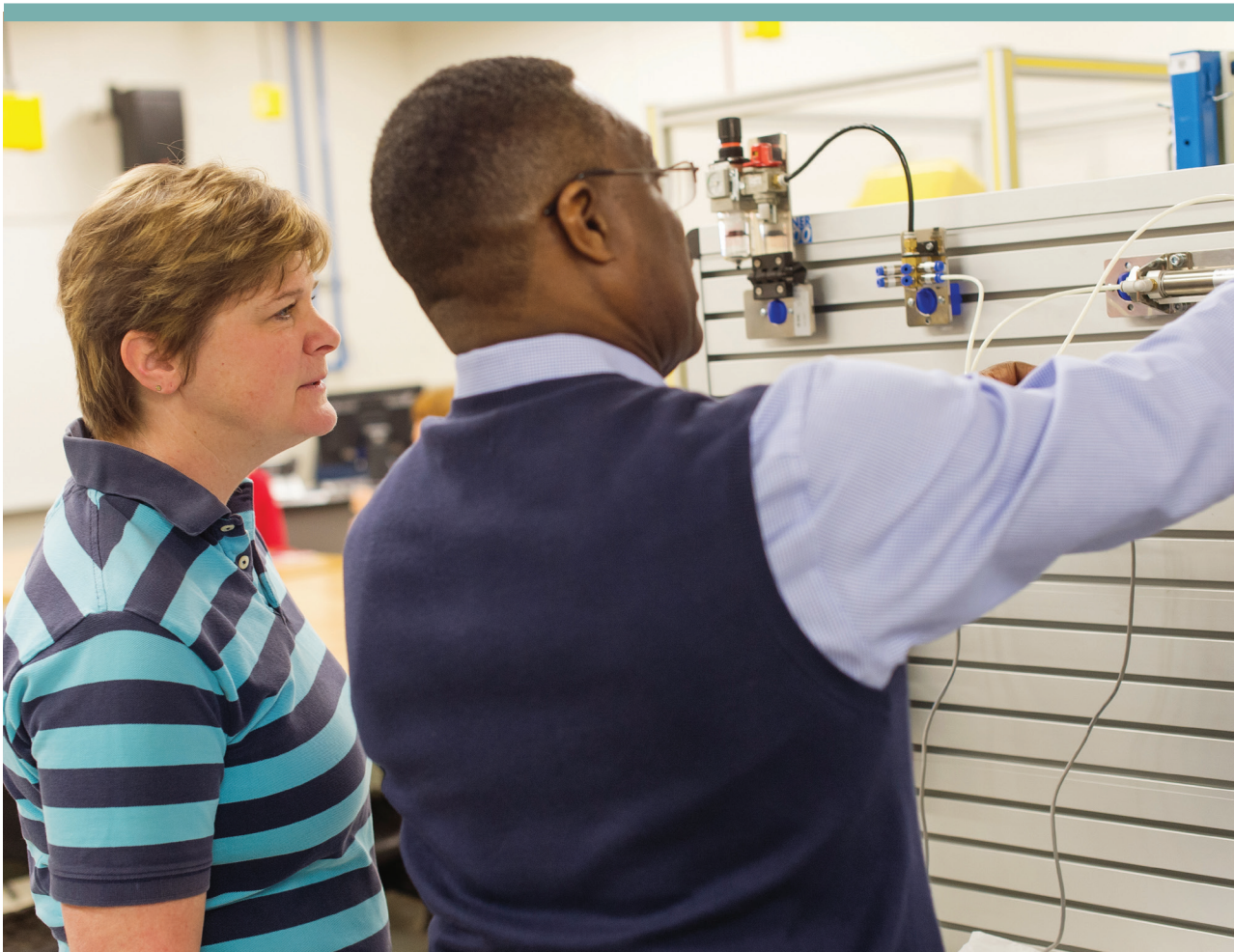
COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
SCHOOLCRAFT COLLEGE			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
<ul style="list-style-type: none"> Instructors created their own projects. There were no industry credentials offered. No Multi-Skilled/Mechatronics program existed. 	<p>CNC/Machining</p> <ul style="list-style-type: none"> 14 Haas Control Simulators Master Controller Software Instructor Workstation and display screens <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> Mechatronic learning System Portable Training Solutions Mechanical Drives Learning System Electrical Machine Learning System Fluid Power Learning System <p>Welding/Fabrication</p> <ul style="list-style-type: none"> Equipment added with non M-CAM funds: <ul style="list-style-type: none"> 5 welding cells Plasma Cutter Demonstration Camera 	<p>CNC/Machining</p> <ul style="list-style-type: none"> NIMS Credentials are earned Use of Blackboard Use of Immerse2Learn CNC virtual training Advanced manufacturing AAS Tooling U Short term “boot camp” training for CNC: includes NIMS and OSHA30 credential <p>Multi-Skilled/Mechatronics</p> <ul style="list-style-type: none"> New degree program developed with stackable credentials (skills certificate, one year certificate, AAS). Siemens and PMMI credentials offered. <p>Welding/Fabrication</p> <ul style="list-style-type: none"> AWS Credentials offered in each certificate/ degree program. Welding Pre-Apprenticeship Certificate Welding Fabrication Certificate Welding Technology AAS Use of Blackboard Short term “boot camp” training for Welding, includes AWS credential. 	<ul style="list-style-type: none"> AWS aligned to Welding Curriculum. NIMS (CNC/Machining certification) was adopted. NIMS standards were adopted and aligned to curriculum. Mechatronics program was developed with an alignment to Siemens Level 1 and PMMI. Advisory Boards worked to validate Boot Camp learning objectives and committed to interview successful program completers for CNC/ Machining Boot Camps and for Welding/Fabrication program completers. Students use CNC simulators and software to learn CNC programming. Tooling U is added to boot camp classes. Employer participation in on-campus interviews. Used by local employers to train current and future employees. Short term training program is offered to youth and unemployed individuals as a faster route to employment. Meeting local employers demand for mechatronics/ multi-skilled technicians.

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COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

LEARNING OBJECTIVES OUTCOMES SUMMARY			
SCHOOLCRAFT COLLEGE (continued)			
BEFORE M-CAM	EQUIPMENT ADDED	IMPROVED COURSE CONTENT	M-CAM IMPROVEMENTS
			<ul style="list-style-type: none"> • Schoolcraft became an AWS Authorized Testing Center a great resource to provide students with certifications and offer testing to certify employees for area employers. • Welding demonstration camera allows lessons to be uploaded to Blackboard for student review.



COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

STACKED AND LATTICED TRAINING PROGRAM OUTCOMES		
COLLEGE	BEFORE M-CAM	M-CAM IMPROVEMENTS
Bay College	<ul style="list-style-type: none"> • Industry credentials were not available to students. • Career pathways were not defined. 	<ul style="list-style-type: none"> • College certifications and diplomas are aligned to/with AWS and PMMI (Multi-Skilled/Mechatronics) industry certifications. • Bay College's partner employers have committed to hiring students with these credentials and in some instances without interviews. • Customized career pathway maps were produced.
Grand Rapids Community College	<ul style="list-style-type: none"> • Industry certifications were not incorporated into programs. 	<ul style="list-style-type: none"> • Graduates from the Job Training Welding Technology program receive 14 credits towards their one-year certificate or associate degree. • Similarly, students completing their one-year certificate have essentially completed the first year of their associate degree, and can transition easily from completing a one-year certificate to pursuing their associate degree the next year. Portions of the AWS are included throughout this pathway so that students are stacking portions of the AWS as they continue pursuing their associate degree. • The Mechatronics credit certificate program now exists along with a full mechatronics lab. It includes several PMMI credentials. • The college's CNC Job Training Program now has a certified NIMS instructor and offers NIMS certification as part of the Job Training Program. The non-credit program now articulates to 14 credits for students who continue on to an associate degree program. • The college's Industrial Sewing and Certified Production Technician programs include national certifications. • Customized career pathway maps were produced.
Kellogg Community College	<ul style="list-style-type: none"> • Offered AWS and MSSC prior to M-CAM. 	<ul style="list-style-type: none"> • Added NIMS (CNC/Machining) and PMMI (Multi-Skilled/Mechatronics) certifications. • Aligned credentials to each Industrial Trades program. • Customized career pathway maps were produced.
Lake Michigan College	<ul style="list-style-type: none"> • Programmatic degrees and certifications were not offered in Welding. • CNC/Machining offered an Applied Industrial Technologies (AIT) and NIMS. • Multi-Skilled/Mechatronics offered AIT. 	<ul style="list-style-type: none"> • Added Welding Technologies certification, AAS degree and AWS. • Added Machine Tool Technology certification, AAS degree for CNC/Machining. • For Multi-Skilled/Mechatronics, added AAS degree and PMMI certification. • Customized career pathway maps were produced.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

STACKED AND LATTICED TRAINING PROGRAM OUTCOMES		
COLLEGE	BEFORE M-CAM	M-CAM IMPROVEMENTS
Lansing Community College	Need for industry recognized credentials in Welding, Production and Mechatronics. Need to align credit and non-credit programs and create bridges/links between.	<ul style="list-style-type: none"> • Identified MSSC as CPT (Production) credential awarding 2 credits for completion of Safety exams. CPT is the bridge to manufacturing credit programs. • Have AWS in place. AWS was also used for GM MIG Welding (fabrication course). • PMMI and Siemens offered in non-credit and credit programs. Created non-credit, pre-apprenticeship program to bridge credit and apprenticeship utilizing AMTEC Block 1. • Welding Basic is a bridge to employment/ further education. • Mechatronics Degree programs will expand using flexible delivery format with a goal of 20 new courses offered in 2017/2018. • Mechatronic non-credit customized career pathways were produced for local employer from modules developed in the grant.
Macomb Community College	<ul style="list-style-type: none"> • Several industry recognized credentials had been embedded into programs, including AWS for Welding, and OSHA 10 and MSSC CPT for the Production Operator. 	<ul style="list-style-type: none"> • The non-credit Multi-Skilled Technician program, the Control Robotics Technician program and the for-credit Mechatronics program offer Siemens Level 1 Certification. • Macomb has become an Educational Certified Training Institution for FANUC America's Certified Education Robotics Training (CERT) Program. Macomb's M-TEC is the only community college training center in Michigan scheduled for a FANUC FAST designation. • Students earning the Siemens Level 1 and PMMI 1-6 Certifications, will earn 15 credits toward a certificate of degree. • Customized career pathways were produced for each of the four program areas. • Chunking of credits was the approach for the Multi-Skilled/Mechatronics program area and was adopted by all eight colleges in this program area.

COMMON LEARNING OBJECTIVES & ALIGNING STACKED/LATTICED PROGRAMS AND CREDENTIALS

STACKED AND LATTICED TRAINING PROGRAM OUTCOMES		
COLLEGE	BEFORE M-CAM	M-CAM IMPROVEMENTS
Mott Community College	Discussions of industry-recognized credentials were incidental at best. The most extensive knowledge was of AWS for employer partners; little knowledge of NIMS or PMMI.	<ul style="list-style-type: none"> • College personnel evaluated competencies against industry credentials. • Competencies embedded in industry credentials were highlighted for employers. • NIMS, MSSC, PMMI and Siemens were adopted. • Customized career pathway maps were produced.
Schoolcraft College	Had stacked credentials in credit programs and participate in Guided Pathways Initiative.	<ul style="list-style-type: none"> • Offer non-credit training in Manufacturing and Welding. Non-credit students can earn credit based on completion of industry recognized credentials. • PMMI and Siemens Level one have been added to Multi-Skilled/ Mechatronics. • NIMS was added to Manufacturing. • AWS certifications are required for college certificates and AAS degree. • Customized career pathway maps were produced.

Work Plan Exceptions

There are no identified work plan exceptions.

Work Products (Samples available in Skills Commons)

- Learning Objective Inventories
 - CNC/Machining
 - Production Operations
 - Welding/Fabrication
- Career Pathway Maps
- Course Content Packets

WORK-BASED LEARNING OPPORTUNITIES

Intent of the Deliverable — To ensure work-based learning (WBL) opportunities were updated and in alignment with each of the four programmatic areas' Michigan Coalition for Advanced Manufacturing (M-CAM) learning objectives.

Lead College: Grand Rapids Community College
(Welding/Fabrication)
Schoolcraft College
(CNC/Machining)
Lansing Community College
(Production Operations)
Macomb Community College
(Multi-Skill/Mechatronics)

Participating Colleges: Bay College
Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan approved by the U.S. Department of Labor focused on activities that would allow M-CAM colleges to align work-based learning opportunities with learning objectives delineated in Common Learning Objectives, Stacked and Latticed Training and Job Placement. In execution of the work, the colleges:

- Reviewed existing internship, apprenticeship, and on-the-job training at each M-CAM college and national models;
- Updated work-based learning opportunities at each M-CAM school;
- Documented work-based learning opportunities by program (discipline);
- Developed work-based learning opportunities; and
- Aligned work-based learning opportunities to the learning objectives matrix.

To optimize the use of work-based learning, M-CAM colleges involved faculty, career services staff, partners from Michigan Works Agencies, employers, chambers of commerce, and other local organizations in developing and aligning strategies. Specific examples of that engagement are illustrated in the college by college WBL inventory below.

WORK-BASED LEARNING OPPORTUNITIES

Project Plan

M-CAM colleges created a comprehensive map of the End-to-End Student Journey from enrollment through job placement. The map identified, by college, work-based learning opportunities including apprenticeships, internships, job shadowing, cooperative education, and career mentoring within this process. After having identified where work-based learning opportunities could be found, colleges were then asked to identify improvement opportunities.

Deliverable Outcome

The work of aligning learning objectives and national credentials was necessary to ensure that the M-CAM programs matched employer demand and provided students with an opportunity to develop comprehensive career pathways built on skills and competencies with labor market value. Once learning objectives and career pathways were defined, the colleges engaged in an analysis of work-based learning opportunities that could function as a component of instructional design and delivery or could be accessed through other wrap-around services offered through the career coach/job

developer functions. The analysis was conducted in two steps.

The first step was to collect the “as is” state of work-based learning. Each college received a spreadsheet detailing all functions within the Job Placement deliverable with a column dedicated to experiential learning processes. Colleges were asked to identify the work-based learning activities currently being provided, the department responsible for the work-based learning, and the number of employees devoted to the activity.

Upon completion of the initial assessment, colleges then further identified WBL opportunities, augmentation and improvement activities that could be implemented during M-CAM and obtained feedback from students and employers.

Each college engaged other stakeholders during the WBL analysis, including job developers and administrators. They next engaged faculty to help improve their analysis and ideas for change. The local Michigan Works Agency was also involved in engaging employers in offering WBL opportunities.

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
BAY COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
◦ Welding/ Fabrication	Internships/Externships Paid or other summer or year-round employment opportunities and paid work experience.	<i>Internships</i> — Flex Force Workforce allows students to gain on-the-job experience at Boss Snowplow in conjunction with M-CAM training.

WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
GRAND RAPIDS COMMUNITY COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ Production Operation ◦ CNC/Machining ◦ Multi-Skilled/ Mechatronics 	<p>Job Shadowing</p> <p>Experiences may occur even prior to training to ensure that the nature of the work and the work environment are a good fit for prospective trainees.</p>	<p>Welding</p> <p><i>Industry Tours</i> — Credit and non-credit students participate in industry tours where they are able to see the applications of welding at the local employer and watch welders at those facilities perform the specific aspects of welding that are being taught in their classes.</p> <p>Production</p> <p><i>Job Shadowing</i> — All three M-CAM Production programs at Grand Rapids are newly developed since the implementation of M-CAM. Thus, the college was able to allocate extra time for the purpose of job shadowing and site tours in each of the three programs. Whereas other programs are already stretched for time, these programs dedicate specific time for the purpose of shadowing individuals in their industry. Manufacturing Readiness students participate in one site visit, Certified Production Technician students participate in two site visits and Industrial Sewing students participate in four site visits. The practice and application of their skills are incorporated into the visit as necessary.</p> <p>Machining</p> <p><i>Shadowing at Training Center</i> — Students interested in the non-credit Computer Numerical Control/Machining Job Training program first participate in an information session where they are taken on a tour of the college's M-TEC Machining facility. During this tour, they shadow current machining students and receive a brief lesson on the applications of precision machining.</p> <p><i>Worksite Visits</i> — Once in the program, students are taken on site visits of hiring employers, where they see specific applications of machining skills and have an opportunity to speak with machinists currently in the industry. Also during these visits, they have an opportunity to hear about open positions within the company, and hear directly from the hiring-manager what skills are required to fill those positions. Upon completing the program, graduates are taken on tours of machining shops during job interviews in the industry.</p> <p>Mechatronics</p> <p><i>Incumbent Workers Learning</i> — 94% of Mechatronics students (both credit and non-credit) are currently employed at intake and most are employer funded through registered and informal apprenticeship agreements. As such, students are familiar with the impact of specific mechatronics topics at their place of employment, and have expressed an interest in learning more based on personal experiences, shadowing, and testing.</p>

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WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
GRAND RAPIDS COMMUNITY COLLEGE (continued)		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ Production Operation ◦ CNC/Machining ◦ Multi-Skilled/ Mechatronics 	<p>Registered Apprenticeships</p> <p>Possibly combined with pre-apprenticeships which are “earn as you learn” training models that combine job-related technical instruction with on-the-job learning experiences.</p>	<p>Welding</p> <p><i>Registered Apprenticeships</i> — The number of registered welding apprentices has more than doubled since M-CAM implementation in 2012. Although all apprenticeships are a little different, the typical apprentice takes 1 class per semester (3 per year) and completes a minimum of 576 instructional hours during their 4-year, 8,000-hour apprenticeship. Staff have increased recruitment efforts for DOL-registered apprenticeships, reaching out to companies by email and phone. The Customized Training department provides information about registered apprenticeship programs to companies who could benefit from them. As a result of these efforts, the number of potential apprenticeship partners is increasing.</p> <p>Production</p> <p><i>Pre-apprenticeship</i> — Grand Rapids is working to produce a part-time Industrial Sewing course that would allow students the opportunity to work first shift and attend class at night. This development is the result of feedback from students that working full-time and studying full-time is practically impossible. This new format will allow students to work while attending class, and increase their ability to find employment in the industry before the program has completed.</p> <p>Machining</p> <p><i>Registered Apprenticeships</i>— Grand Rapids provides registered apprenticeship opportunities in Machine Tool/CNC for employers in the West Michigan area. Although each employer’s apprenticeship schedule is different, most apprentices receive about 8 hours a week of hands-on training using M-CAM funded equipment while working at least 4 days a week.</p> <p><i>Part time work, full time learn</i> — Employers looking to hire current students of the non-credit Job Training CNC/Machining program are encouraged to develop part-time positions that allow students to complete the full-time program of study while gaining applied experience. Demand for these students is high, and the college wants to increase pre-apprenticeship opportunities while ensuring that students stay in school long enough to complete their certificate.</p> <p><i>“While I was still in the class, the employer I interviewed with was willing to have me come in one day a week so I could begin working while I was still in the program. Once I finish the program I can begin working there full-time, shadowing an experienced CNC programmer for up to a year. That would allow me to build on the skills I’ve learned in the class.”</i></p> <p style="text-align: right;">Andrew, Non-Credit CNC/Machining Student</p>

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WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
GRAND RAPIDS COMMUNITY COLLEGE (continued)		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ Production Operation ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 		<p>Mechatronics</p> <p><i>Registered Apprenticeships and Pre-apprenticeships</i> — Mechatronics programs at Grand Rapids are offered in both credit and non-credit formats. 94% of M-CAM Mechatronics students had employment when they started the program. Most of those students are employed in manufacturing, and their school's costs are covered by their employer. On the credit side, many students are apprentices in registered DOL apprenticeship programs.</p> <p>Through the non-credit Mechatronics MAP program, almost all students are employed and their tuition is paid for by their employer. However, these are not registered apprenticeships and would be considered pre-apprenticeship programs.</p>
<ul style="list-style-type: none"> ◦ Production Operation ◦ CNC/Machining 	<p>Co-ops</p> <p>Cooperative educational experience.</p>	<p>Production</p> <p><i>Partnership with Courts</i> — The Pathways to Success in Manufacturing program at Grand Rapids is a result of a partnership with the Probation Department of the U.S. District Court, which identified a need to equip individuals exiting the court system with in-demand skills and industry-recognized qualifications. The college trains these students in the areas of manufacturing processes, safety, and quality inspection, equipping them with the knowledge they need to pass the Manufacturing Skill Standards Council (MSSC) Certified Production Technician (CPT) tests in those areas. Additionally, students are provided with employability and job readiness skills, while receiving their OSHA 30-hour certificate, CPR certificate, Forklift Certificate, and GRCC Certificate of Completion. Meanwhile, the parole office and transitional housing staff provide specific lessons on best practices for successful re-entry.</p> <p><i> Holding Class at a Company</i> — In the Industrial Sewing program, Grand Rapids has contracted services to the owner of a local sewing company to provide industry expertise for the purposes of curriculum development and classroom instruction. The class is held at this company's facility, housed inside of a local non-profit community-development building.</p>

WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
KELLOGG COMMUNITY COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Production Operation 	<p>WBL Career Academies/Career Mentoring</p> <p>A school-within-a-high school model with strong employer partnerships that integrates academics with an occupational curriculum.</p>	<p><i>Simulated Production Line</i> — Kellogg has improved its simulated production line to more closely mirror an actual production line. The college plans to incorporate more employer visits and presentations into the curriculum.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 	<p>Co-ops</p> <p>Cooperative educational experience.</p>	<p><i>Creating Credit-Based Co-op Program</i> — Kellogg plans to implement a more structured program that would incorporate a credit based co-op program into the industrial-trades modules, specifically for early college students. The college has had employers and students both ask about co-op internship/externship opportunities. Students would like to get more experience and employers would like to have the opportunity for this training period before hiring an individual full time.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 	<p>Internships/Externships</p> <p>Paid or other summer or year-round employment opportunities and paid work experience.</p>	<p><i>Creating Credit-Based Internships/Externships</i> — Kellogg plans to incorporate credit-based internships/externships into the industrial-trades modules, specifically for early college students.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 	<p>Registered Apprenticeships</p> <p>Possibly combined with pre-apprenticeships which are “earn while you learn” training models that combine job-related technical instruction with structured experiences.</p>	<p><i>Registered Apprenticeships</i> — Kellogg works with several employers who are registered with the Department of Labor and refer their employees to the college for a registered apprenticeship.</p>

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
LAKE MICHIGAN COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 	<p>Incumbent Worker Training</p> <p>Particularly to provide training for current low-skilled or low-wage employees that give them access to more advanced positions.</p>	<p><i>Enhanced incumbent worker training</i> — Lake Michigan increased hands-on opportunities for students who are incumbent workers, including through the use of Tooling U, Robotics hands-on instruction, expanded Hydraulics labs, more CNC Machining time, and increased Welding practice opportunities/testing. Incumbent workers now have the opportunity to obtain an American Welding Society (AWS) certification.</p>

WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
LANSING COMMUNITY COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 	<p>Incumbent Worker Training</p> <p>Particularly to provide training for current low-skilled or low-wage employees that give them access to more advanced positions.</p>	<ul style="list-style-type: none"> • <i>Increasing Skills, Advancement through Incumbent Worker Training</i> ◦ MIG Welding for GM, Certified Production Technician programs have led to higher skilled positions in companies. ◦ Mechatronics programs have all given working students the opportunity to advance. ◦ Some employers are thinking about or are using CPT and Mechatronics programs as incentives for proficiency promotion, pay raise and adjustments. ◦ Employers like the hybrid format and are looking at the different modules to pick out areas of training for employees from each block.
<ul style="list-style-type: none"> ◦ Welding/Fabrication 	<p>Internships/Externships</p> <p>Paid or other summer or year-round employment opportunities and paid work experience.</p>	<p><i>Internships</i> — Working on improving this system and connecting job developer and Experiential Learning coordinator to deliver this experience. Employers want more direction from the college. Lansing strongly encourages paid internships.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining ◦ Multi-Skilled/Mechatronics 	<p>On-the-Job Training</p> <p>Training is conducted by an employer and occurs while an individual is engaged in productive work.</p>	<p><i>On-the-Job Training</i> — Working with local Michigan Works Agency on putting together OJT funding opportunities for local employers -- Manufacturing Exploratory and CPT OJT.</p> <p><i>Experiencing Cross-Training</i> — Employers are trying to give Lansing students the experience of being cross-trained. Obstacles include some company policies that won't pay for apprentices to participate in online classes; however, Lansing is attempting to use Mechatronics hybrid as an approach.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication 	<p>Registered Apprenticeships</p> <p>Possibly combined with pre-apprenticeships which are "earn as you learn" training models that combine job-related technical instruction with on-the-job learning experiences.</p>	<p><i>Registered Apprenticeships</i> — In 2016, Lansing had 191 apprenticeships with 15 in-house. A local company sponsors registered apprenticeships as an opportunity to evaluate employees. M-CAM resulted in increased connections between non-credit and credit programs and between job developers, success coaches, and apprentice coordinators at the college.</p> <p><i>Pre-Apprenticeships</i> — Lansing is launching a Pre-Apprenticeship program pilot.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ Production Operation ◦ Multi-Skilled/Mechatronics 	<p>Job Shadowing</p> <p>Experiences may occur even prior to training to ensure that the nature of the work and the work environment are a good fit for prospective trainees.</p>	<p>Not currently offered; looking for opportunities within Welding and Production.</p>

WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
MACOMB COMMUNITY COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ CNC/Machining 	<p>WBL Career Academies/Career Mentoring</p> <p>A school-within-a-high school model with strong employer partnerships that integrates academics with an occupational curriculum.</p>	<p><i>Career Mentoring</i> — Employers engaged with M-CAM students throughout program; participated in orientation sessions, in class visits discussing skills and resume writing, and in attending employer job fairs embedded in every cohort class across all 4 areas. This is a component of the MAP+ Apprenticeship Program.</p> <p><i>Partnering with Michigan Works</i> — Engaged local Michigan Works Agency who made graduating students OJT eligible. MWA staff also assisted in referring students to Macomb's programs and in working with employers for their placement.</p>
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ CNC/Machining ◦ Multi-Skilled/ Mechatronics ◦ Production Operation 	<p>Incumbent Worker Program</p> <p>Particularly those that provide training for current low-skilled or low wage employees that give them access to more advanced positions.</p>	<p><i>Enhanced Incumbent Worker Program</i> — Macomb continued working with companies on incumbent worker training. Solutions are custom built for a company, multiple companies or industry needs. The college continued the approach of assisting companies with their short and long term talent needs through both non-credit and credit programs. Employers engaged with M-CAM students throughout their programs, participating in orientation sessions, visiting classes to discuss skills and resume writing, and embedded job fairs in every cohort class across all 4 areas.</p>
<ul style="list-style-type: none"> ◦ Multi-Skilled/ Mechatronics 	<p>Internships/Externships</p> <p>Paid or other summer or year-round employment opportunities and paid work experience.</p>	<p><i>Internships</i> — Ford brought an M-CAM supported student in under their internship program and then hired that student.</p>
<ul style="list-style-type: none"> ◦ Production Operation 	<p>On-the-Job Training</p> <p>Possibly combined with pre-apprenticeships which are "earn as you learn" training models that combine job-related technical instruction with on-the-job learning experiences.</p>	<p><i>Partnerships with Michigan Works</i> — Macomb engaged the local Michigan Works Agency which made graduating students OJT eligible. Michigan Works also assisted in referring students to Macomb programs and in working with employers for their placement.</p>
<ul style="list-style-type: none"> ◦ CNC/Machining ◦ Multi-Skilled/ Mechatronics 	<p>Registered Apprenticeships</p> <p>Possibly combined with pre-apprenticeships which are "earn while you learn" training models that combine job-related technical instruction with structured experiences.</p>	<p><i>Apprenticeships</i> — Macomb is continuing its MAP+ Apprenticeship program. Through M-CAM, two companies have hired a student that they registered in an Apprenticeship program.</p>
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ CNC/Machining ◦ Multi-Skilled/ Mechatronics ◦ Production Operation 	<p>Job Shadowing</p> <p>Experiences may occur prior to training to ensure that the nature of work and the work environment are a good fit for the prospective trainee.</p>	<p><i>Job Shadowing</i> — Continued with scheduling students to visit employers through Day at Work.</p>

WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
MOTT COMMUNITY COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ Multi-Skilled/ Mechatronics 	<p>Internships/Externships</p> <p>Paid or other summer or year-round employment opportunities and paid work experience.</p>	<p><i>Internships/Externships</i> — College works with employers who hire students upon completion of training and provide something similar to an internship/externship. One of these employers will hire students while they are in training to work part time. They are paid by the employer, acquire OTJ experience, and have the opportunity to apply classroom fundamentals to the work place. Another employer hires students upon successful completion of training, paid by the employer, and then provides them with additional On the Job Training internally. These companies offer both summer and year-round paid opportunities.</p>
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ Multi-Skilled/ Mechatronics 	<p>Registered Apprenticeships</p> <p>Possibly combined with pre-apprenticeships which are “earn while you learn” training models that combine job-related technical instruction with structured experiences.</p>	<p><i>Apprenticeships</i> — Currently, there are registered apprenticeships through the local Michigan Works Agency that students in these training programs can participate in, if interested. Mott provides soft skills training to students entering apprenticeships.</p>
<ul style="list-style-type: none"> ◦ Welding/ Fabrication ◦ CNC/Machining ◦ Multi-Skilled/ Mechatronics ◦ Production Operation 	<p>Job Shadowing</p> <p>Experiences may occur prior to training to ensure that the nature of the work and the work environment are a good fit for the prospective trainee.</p>	<p><i>Job Shadowing</i> — Multiple plant tours are done while students are in core training so they can observe industry.</p>
<ul style="list-style-type: none"> ◦ CNC/Machining 	<p>Co-ops</p> <p>Cooperative educational experiences.</p>	<p><i>Co-ops</i> — Mott works with one employer who will hire students while they are in training to work part time. They are paid by the employer, acquire OTJ experience, and have the opportunity to apply classroom fundamentals to the work place.</p>

WORK-BASED LEARNING OPPORTUNITIES

WORK-BASED LEARNING INVENTORY/IMPROVEMENT		
SCHOOLCRAFT COLLEGE		
M-CAM PROGRAM	TYPE OF WORK-BASED LEARNING	AUGMENTATION/IMPROVEMENT
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ CNC/Machining 	<p>Incumbent Worker Training</p> <p>Particularly those that provide training for current low-skilled or low wage employees that give them access to more advanced positions.</p>	<p><i>Boot Camps</i> — Through the M-CAM grant, Schoolcraft College developed and delivered two “boot camp” style short term training sessions:</p> <ul style="list-style-type: none"> ■ CNC Operator Training ■ Welding Basics Training <p>Both boot camps include a significant focus on job readiness and the OSHA 30 certification. The boot camps serve low skilled students and end with interviews with local companies committed to hiring.</p> <p><i>Expanded Incumbent Worker Training</i> — Schoolcraft College delivered customized/incumbent worker training to M-CAM employers in the following areas:</p> <ul style="list-style-type: none"> ■ Advanced Product Quality Planning (APQP) ■ Geometric Dimensioning & Tolerancing (GD&T) ■ Introduction to Tool Room Safety ■ Introduction to Welding ■ Lockout Tagout ■ Manufacturing Processes ■ Mechanical Drawing & Reading ■ Product Part Approval Process (PPAP) ■ Reading Metric Micrometers and Calipers
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ Multi-Skilled/Mechatronics ◦ CNC/Machining 	<p>Internships/Externships</p> <p>Paid or other summer or year-round employment opportunities and paid work experience.</p>	<p><i>Internships</i> — Schoolcraft College implemented credit internship courses, which are an elective in the AAS program.</p> <ul style="list-style-type: none"> ■ MFG 290 – 3 credit hrs. ■ WELD 290 – 3 credit hrs. <p>Schoolcraft encourages and supports all forms of internships, whether for college credit or employer sponsored without a formal tie to the AAS degree. The college’s main goal is to help students get exposure to a work environment and gain some work experience, while helping employers satisfy employment needs.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ Multi-Skilled/Mechatronics ◦ CNC/Machining 	<p>On-the-Job Training</p> <p>Training is conducted by an employer and occurs while an individual is engaged in productive work.</p>	<p><i>On-the-Job Training</i> — Schoolcraft has not conducted formal OJT. The college is currently exploring OJT opportunities with the local Michigan Works Agency, especially for Boot Camp completers.</p>
<ul style="list-style-type: none"> ◦ Welding/Fabrication ◦ Multi-Skilled/Mechatronics ◦ CNC/Machining 	<p>Registered Apprenticeships</p> <p>Possibly combined with pre-apprenticeships which are “earn while you learn” training models that combine job-related technical instruction with structured experiences.</p>	<p><i>Pre-Apprenticeship</i> — Welding Pre-Apprenticeship Certificate is a gateway into the Ironworkers Local Union, accelerating completion of Registered Apprenticeship.</p> <p><i>Promoting Registered Apprenticeships</i> — Schoolcraft has been actively working to promote Registered Apprenticeships with employers. As of this report, the college has placed four USDOL Registered Apprentices with two area companies.</p>

WORK-BASED LEARNING OPPORTUNITIES

Work Plan Exceptions

There are no identified work plan exceptions.

Work Products (Samples available in Skills Commons)

- M-CAM Student End-to-End Journey Comprehensive Map & Individual College Maps
- M-CAM Work-Based Learning Inventory & Improvement Template



TECHNOLOGY-ENABLED COURSES

Intent of the Deliverable — The eight Michigan Coalition for Advanced Manufacturing (M-CAM) colleges proposed to improve, augment, and create new learning models and opportunities for students through the use of technology in and out of the classroom. To ensure relevance, college staff, faculty and employers worked together to ensure that these learning opportunities would improve student experiences and provide qualified candidates to local employers.

Lead College: Kellogg Community College

Participating Colleges: Bay College
Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan approved by the U.S. Department of Labor included a significant focus on the development of hybrid course offerings using new technology that the M-CAM colleges had yet to implement. These offerings included: (1) online courses; (2) hybrid online/face-to-face courses; (3) gaming technology; (4) web-based instructional support; (5) mobile labs; and (6) learning communities.

In total, M-CAM colleges committed to creating a number of technology-enabled functions beyond the acquisition of major equipment, including:

- 26 hybrid/online courses/programs.
- 4 online learning communities.
- 4 MOOCs (massive open online courses).
- Technology-enabled learning activities.
- 2 mobile labs.

Project Plan

The project plan for this deliverable outlined the steps necessary to research, assess, prototype, and ultimately implement technology into the learning process for each of the program areas at all of the M-CAM colleges. The project plan included specific milestones for each program area, many of which were similar. These milestones included the following:

- **Computer Numerical Control (CNC) Machining:** Convening an implementation team to design specific solutions, including the use of Tooling U as a resource for both students and faculty. In addition, an online course was created, focused on safety within machining.
- **Multi-Skilled/Mechatronics:** This program focused on the use of various technologies, including the adoption of Amatrol and Tooling U for both students and faculty. Institutions also committed significant time to training on new equipment for mechatronics, including a week-long training session at Macomb Community College and a trip to Germany for advanced training opportunities.
- **Production Operation:** The faculty team led the development of a course for a Certified Production Technician (CPT) that utilized various forms of technology, including Tooling U. Enrollment of students in this course was also a major milestone.

TECHNOLOGY-ENABLED COURSES

- **Welding/Fabrication:** Faculty and project leads from this program area focused on the use of additional instructional tools including introduction of robotic welding cells and the use of Tooling U.

Deliverable Outcome

Development of non-traditional methods of learning through technology-enabled courses in hybrid, online and classroom delivery formats was a major win for the M-CAM colleges. This focus provided an opportunity to utilize state of the art technology that would better position students to both meet and exceed workplace standards in advanced manufacturing. In fact, many institutions had long developed “wish lists” of technology and equipment that were out of reach in normal operating budgets, but were now possible with the infusion of federal dollars. By thinking about the use of technology in a comprehensive manner, including equipment, pedagogy, and non-traditional classroom aids, M-CAM colleges had the opportunity to think differently about the use of technology to innovate in the classroom. The colleges leveraged the experience of their faculty and reached out to employers to make sure that the equipment and technology-enabled learning incorporated into M-CAM programs would meet workplace standards. For M-CAM, technology-based innovation meant:

- Faculty would have the ability to teach and facilitate in a more effective manner, using upgraded equipment and web-based tools that aided curricular delivery.
- Students would learn and train using technology that matched or exceeded workplace standards.
- Employers had confidence that prospective new hires coming out of M-CAM had learned theory and practice using the right tools developed by subject matter experts from around the world. For example, the integration of Siemens technology and processes within Mechatronics programs at some

of the M-CAM colleges provided a new mechanism for student learning. This process has gained traction internationally and provides students with comprehensive and systems-based tools to approach content and its application on the job.

Hybrid/Online Courses/Programs

The colleges committed to adapting and building 26 online/hybrid courses, 1 welding hybrid course and 1 online learning module. The results went far beyond that – a total of 232 courses were developed or modified:

- 220 online/hybrid courses were developed;
- 8 welding hybrid courses were developed; and
- 1 online learning module was developed.

Of all components created or enhanced, 209 courses were credit-bearing and 23 were non-credit. This is an important milestone, especially for traditional manufacturing programs that are largely non-credit in institutions across the country. This means that students have greater access to credit courses that have been improved through various technology-enabled courses.

Online Learning Communities

Kellogg Community College led efforts to create a comprehensive and efficient learning community infrastructure that was developed based on faculty input and needs. The college partnered with Higher Logic to use their cloud-based platform to build the learning communities, which were designed around each of the four program areas to achieve:

- A sustained method for faculty to engage with one another, both within an institution and across all M-CAM colleges.
- Allowing faculty to share best and leading practices that can easily be adopted across M-CAM colleges.

TECHNOLOGY-ENABLED COURSES

- A formal infrastructure that allows for informal and organic opportunities to develop among faculty following various change and innovation models.

The Learning Community site delivered multiple platforms and functions including the ability to create customized communities, create learning libraries, develop or participate in events, engage in dialogue and scan frequently asked questions (FAQ's). The site had a soft launch in December, 2015, with a plan, do, check, act phase from December-February, 2016. It had a finalize, build, and scale for launch phase in March, 2016, followed by ongoing development and enhancement. The official launch of the Learning Community, involving marketing it to faculty, occurred in September, 2016. Tools to recruit programmatic faculty, questions to “prime programmatic discussion” were developed and distributed to M-CAM Leads in August, 2016. Tracking mechanisms are in place to identify utilization and end-user engagement.

Massive Open Online Courses (MOOCs)

M-CAM colleges developed four videos to address their commitment to produce Massive Open Online Courses in Welding/Fabrication, Multi-Skilled/Mechatronics, CNC Machining and Production Operation. The career exploration videos provide prospective participants and program participants with an introduction to these four areas of advanced manufacturing. Interested students have an opportunity to capture a glimpse of what the program entails, the employment outlook and the employment opportunities for completers.

Technology-Enabled Learning Activities

Each college used at least two grant-funded technology-enabled learning activities, both of which, based on practitioner feedback, proved to be very helpful:

- Edmentum/Plato was utilized by all schools to help organize learning modules in manufacturing, with a specific focus on foundational competencies and skills. All institutions integrated the use of Edmentum/Plato, within at least one of the six foundational skills areas, as described in a separate report.
- Tooling U is now utilized by all institutions to aid faculty in content delivery for the four program areas. This function has been highly effective for students who have engaged. As of March 31, 2017:
 - 1,159 students among the eight institutions had enrolled in a Tooling U class;
 - 12,928 classes had been completed by these students;
 - 12,223 classes had been passed by these students (a 95% pass rate); and
 - 665,239 minutes had been spent in these courses. While time in and of itself is not an indicator of student learning, this is an important figure to understand. On average, engaged students spent 574 minutes, with a range of 272 to 1,627 minutes among the institutions, with Tooling U content. This additional instruction, and the pass rate specified above, has shown that Tooling U provides a very valuable service.

Mobile Labs & Trailers

Two mobile labs were purchased by Grand Rapids Community College focused on welding and manufacturing. These labs have been used for learning and outreach activities to both students and employers alike. The labs contain a virtual welder, a 3-D printer, a mini mill, a mini lathe, and CAD stations, all of which are available for students to use and experiment with. The labs are typically used at local schools and community events, and are used to highlight the employment outlook of careers in specific advanced-manufacturing areas and to help learners understand the different training options and educational pathways that are available.

TECHNOLOGY-ENABLED COURSES

Lansing Community College purchased a trailer that was used to take the virtual welders to off campus locations and enabled them to provide a class called Manufacturing Exploratory. Lansing also used the trailer to transport the virtual welders to the Michigan Works Agency office to provide welding information sessions to unemployed and underemployed service center visitors.

“Learn PLC” Gaming Application

The “Learn PLC” gaming function was developed in partnership by Bay College and Michigan Technological University for the benefit of all M-CAM colleges. The program features interactive modules that supplement faculty instruction in Mechatronics coursework. This feature was built using open source standards for broad adoption and adaptation.

This web application is a resource for instruction in learning the fundamental concepts and specific skills for Programmable Logic Controllers (PLC’s), the control mechanism for many industrial processes in advanced manufacturing. The concepts introduced are generic and independent of specific hardware or software and can be applied across a wide range of fields but have an emphasis on those skills relevant to advanced manufacturing. “Learn PLC” makes skills application concrete and visible and “gamification” (the use of games to teach) is used as a fun and motivational tool to encourage mastery of the concepts and skills involved.

The modules of Learn PLC include:

- **Module 1: Binary and Decimal** – learn how to use, convert, and recognize binary decimal numbers;
- **Module 2: Logic Gates** – understand simple gates and how they combine together to create complex circuits;
- **Module 3: Hardware** – identify the physical configuration and inner workings of PLCs;
- **Module 4: PLC Simulator** – use a sand box PLC simulator to solve real world problems;
- **Module 5: Timers** – add timers to your ladder logic;
- **Module 6: Counters** – add counters to your ladder logic;
- **Module 7: Sequences and Shift Registers** – advanced PLC instructions;
- **Module 8: Program Control** – fine control on your logic program;
- **Module 9: Math instructions** – data manipulations and calculations over math instructions;
- **Module 10: PLC Installation, Troubleshooting, and Safety;** and
- **Module 11: SCADA** – understand what SCADA is, why it’s used, and how it communicates with HMIs.

TECHNOLOGY-ENABLED COURSES

TECHNOLOGY-ENABLED IMPROVEMENTS		
COLLEGE	BEFORE M-CAM	M-CAM IMPROVEMENTS
Bay College	<p>Antiquated equipment in Welding with limited capacity.</p> <p>No Multi-Skilled/Mechatronics equipment.</p>	<p>New Welding equipment for credit and non-credit courses includes shears, ironworkers, band saws, MIG & TIG welders, additional weld stations/training booths doubling capacity.</p> <p>Compact PCS are used extensively for PLC training.</p> <p>Depco Industrial Maintenance Trainers are used in Industrial Electronics and Industrial Motors (Level 1 & 2).</p> <p>Learn PLC open source gaming platform is used as a supplement to instruction enabling independent or instructor guided learning for fundamental Multi-Skilled/Mechatronics knowledge and skills and PLC programming.</p>
Grand Rapids Community College	<p>Basic welding lab, no robotic welding.</p> <p>No mechatronics lab.</p> <p>CNC lab.</p>	<p>Grand Rapids now is able to offer robotic welding and include hands on activities as a part of the automation class in manufacturing.</p> <p>College now has a mechatronics lab and a credit certificate program in mechatronics that leads to an associate degree in electrical engineering.</p> <p>Grand Rapids worked in collaboration with Schoolcraft College to develop a 2-credit Industrial Safety class that is entirely online. This class will be used in various manufacturing programs by both Grand Rapids and Schoolcraft College, and is accessible by all M-CAM Colleges.</p> <p>The college's M-CAM Foundational Skills Trainer is using computer-based customizable training programs such as Edmentum/Plato to provide current and prospective students with the opportunity to advance their skills in a non-traditional setting.</p>
Kellogg Community College	<p>Tooling U and Amatrol online content used to supplement Industrial Trades curriculum.</p> <p>OSHA 10 and OSHA 30 delivered online.</p>	<p>Welding and CNC Machining curriculum put into college LMS system for 24/7 access by students.</p> <p>Multi-Skilled/Mechatronics equipment purchased; Tooling U and Amatrol integrated in instruction.</p> <p>Online Research Guides expanded for CNC/Machining, Welding and Multi-Skilled/Mechatronics, and Production programs.</p> <p>Edmentum used to supplement foundational skill training.</p>
Lake Michigan College	<p>Two courses using Tooling U.</p>	<p>Tooling U integrated into 19 courses — 9 in Welding, 6 in CNC/Machining and 3 in Multi-Skilled/Mechatronics. Employers providing feedback assessing success.</p>

TECHNOLOGY-ENABLED COURSES

TECHNOLOGY-ENABLED IMPROVEMENTS		
COLLEGE	BEFORE M-CAM	M-CAM IMPROVEMENTS
Lansing Community College	<p>Equipment enhancements for Production, Multi-Skilled/Mechatronics, and Welding needed.</p> <p>Online, supplemental and hybrid learning opportunities instruction needed.</p>	<p>Multi-Skilled/Mechatronics online community developed using Desire2Learn.</p> <p>CPT course using online content for all modules (Safety, Quality, Manufacturing Process and Production, and Maintenance Awareness).</p> <p>12 Multi-Skilled/Mechatronics courses using AMTEC content in wrap-around activities.</p> <p>Welding course enhanced with virtual welders and robotic welding equipment.</p> <p>Credit and non-credit Multi-Skilled/Mechatronics courses utilize manufacturing simulation equipment.</p> <p>Worked with Kellogg Community College to develop an online Production Community through the online Learning Community.</p>
Macomb Community College	<p>Equipment was older and not reflective of industry standards. Employers identified “wish list” of equipment which was prioritized for purchase. Four funding sources, including M-CAM were used to purchase \$2.6 million of upgraded equipment.</p>	<p>Equipment mirrors GM Assembly, Body Shop, Paint and Stamping Powertrain. New equipment increased capacity and quality of training.</p>
Mott Community College	<p>Edmentum/Plato and foundational courses were not used.</p>	<p>Contextualized Edmentum/Plato used to deliver foundational courses.</p>
Schoolcraft College	<p>NC/Machining equipment was outdated. No capability to run CNC simulation software.</p>	<p>New equipment includes HAAS simulators, new networking capabilities, and new computer work stations for CNC/Machining.</p> <p>Tooling U has been added to short-term training and Immerse2Learn for credit and non-credit classes.</p> <p>Welding program has integrated demonstration camera and video into Blackboard.</p> <p>Amatrol equipment purchased for Multi-Skilled/Mechatronics includes e-learning for each trainer.</p>

Work Plan Exceptions

There are no identified work plan exceptions.

Work Products (Samples available in Skills Commons)

- Tooling U Modules
- Learning Community Website & Usage Report
- Learn PLC (Gaming Application)

ARTICULATED PATHWAYS

Intent of the Deliverable — The eight Michigan Coalition for Advanced Manufacturing (M-CAM) colleges created seamless pathways from non-credit to credit programs leading to associate’s degrees and articulated pathways to four-year degrees through partnerships with Eastern Michigan University and Ferris State University.

- Students entering M-CAM training can easily move from non-credit to credit programs, providing opportunities to apply certificates and industry recognized credentials and continue toward associate degrees by building on aligned learning objectives and stackable credentials. Students completing associate’s degrees can then apply their degree toward a bachelor’s with two four-year institutions.
- The eight M-CAM colleges also established an articulation agreement using the industry recognized credentials chosen in CNC/Machining, Multi-Skilled/Mechatronics, Production Operation and Welding/Fabrication, making it possible for students to transfer credit between the M-CAM colleges. This significant achievement involved discussions with eight autonomous institutions with no prior history of articulating a mix of non-credit and credit courses.

Lead College: Lake Michigan College and
Macomb Community College

Participating Colleges: Bay College
Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan stated the colleges would:

- Develop eight transfer agreements with four-year institutions and Prior Learning with apprenticeships.
- Align short-term training and academic courses in four focus areas: CNC/Machining, Multi-Skilled/Mechatronics, Production Operation, and Welding/Fabrication.
- Develop short-term training (non-credit to credit) pathways.
- Generate credit of 30 hours for students that completed prescribed coursework within the advanced manufacturing area. This agreement would also allow students to transfer credits between the institutions toward a Technical Studies Associate Degree with coursework focused on applied technology and sciences.

ARTICULATED PATHWAYS

Project Plan

The project plan for this deliverable leveraged work done to produce and align learning objectives to courses, align competencies to industry recognized credentials, and produce defined career pathways to develop a basis for smooth articulation for students seeking to move from one M-CAM college to another.

Employers participated in the review and validation of learning objectives and industry credentials ensuring their relevance.

Major milestones included generating career pathway documents for all programs with all colleges. This process required significant data and fact gathering, analysis of other M-CAM deliverables/products including aligned learning objectives and credentials, and an iterative review process among numerous stakeholders to create accurate and demand-driven pathways.

Transfer Between M-CAM Colleges

In terms of articulation among the M-CAM colleges, the plan was designed to mitigate challenges that were associated with eight autonomous institutions working together. For instance, the amount of credit generated for specific course work from one institution to the other varies; in some cases, one institution might award 1 or 2 credits, in another case an institution would bundle that coursework and generate more than 4 or 5 credits requiring the institutions work through challenges of uneven credit transfers and the obvious implications that would result.

The project plan, therefore, was built on a process that included faculty, program leads, registrars, curriculum leads, and other college stakeholders necessary to create an agreement. The process was also dependent on the input of manufacturing employers with whom the colleges work, as industry certifications play a central role in the resulting strategy – which would only work

if employers valued those certifications. This process, described in detail below, allowed institutions to think of articulation in terms of competencies rather than by course.

The colleges agreed to an overall articulation strategy that was unique for each of them. This strategy was based on the following components:

- First, articulation among the colleges in a traditional format was seen as a limiting factor in an environment where institutions were trying to drive innovation. In the case of M-CAM, both non-credit and credit programs were at play and traditional articulation strategies didn't span both. This was especially challenging since the consortium was focusing on manufacturing curriculum. This technical area has struggled to adopt viable plans that mitigate the inherent challenges present when comparing credit and non-credit.
- Second, the colleges believed that alignment with a national credential for learning objectives and development of programs was a good strategy, and that articulation could follow that same kind of approach. Instead of aligning to one another for articulation purposes, using the industry recognized credential as a neutral third party would mitigate traditional struggles within academe about which program is superior and which institution accepts credit for a specific program. This alignment came after significant process review and design by all M-CAM colleges. The M-CAM leads invited their respective registrars, instructional leads, and other academic leaders to a series of planning meetings that addressed the following components and questions:
- How can an articulation agreement create opportunity for students that is consistent with various accrediting bodies that have jurisdiction over these content issues?

ARTICULATED PATHWAYS

- Can an agreement be made that doesn't adversely impact students with regard to financial aid? For instance, if one college were to accept a significant number of courses as electives, could that later impact the student's ability to receive financial aid based on overall credit limits that are regulated by student financial aid standards.
- Are there non-traditional or atypical models of articulation that can be replicated? Many institutions referenced transfer agreements for police officer training that used a non-traditional approach.
- How can institutions ensure that their programs remain true to local employer demand while still acknowledging learned content from other institutions?

As a result of this work, the colleges developed an articulation strategy that was based on competencies determined by third-party national credentialing bodies. Specifically, if an individual received a national credential, an M-CAM institution would articulate credit based on that credential. This innovation borrowed on traditional components of articulation, but also employed tools found in prior learning and experiential learning assessments. The colleges agreed to this strategy.

Transfer Agreements with Eastern Michigan and Ferris State Universities

The M-CAM articulation committee approached two four-year partner institutions, Eastern Michigan and Ferris State University, to develop and approve articulation agreements allowing students who complete an associate's degree in one of M-CAM's four programmatic areas to transfer credit toward a bachelor's degree. The committee approached Eastern and Ferris based on long-standing working relationships between most of the M-CAM colleges and the two universities, both of which

are innovators in articulating technical programs into bachelor's degrees.

In deciding which universities to approach, factors for a successful partnership that were considered included the university's understanding of a community college's mission, ease of transfer, work with prior learning assessments, the university's K-12 partnerships, and most importantly their appreciation of manufacturing training.

The schools selected to partner, Eastern Michigan University and Ferris State University, have long been recognized for collaboration and relationship building amongst community colleges in the state. Each school already has many partnerships with community colleges throughout Michigan, helping to facilitate a community college student's successful transfer. In order to maximize the success of M-CAM, it was important to maintain and build on these collaborative and effective relationships. Forging new relationships between two-year colleges and four-year universities isn't easy. These existing relationships minimized any obstacles that could slow the process.

Prior Learning Assessment

Additionally, the colleges undertook an examination of each college's system for assessing prior learning with the hope of creating a more aligned, cross-college system for assessing prior learning. The resulting report, "Awarding Prior Learning Credits — An Opportunity to Obtain College Credits", outlined synergies across institutions and made several recommendations to leverage those synergies, but ultimately concluded each college had mature prior learning assessment systems that could not easily be realigned to a more comprehensive M-CAM system.

ARTICULATED PATHWAYS

Deliverable Outcome

Defined career pathway visuals were integrated within the M-CAM website and, more importantly, within each institution's existing website as a feature to support students and as a tool to help job coaches, case managers, and others as they worked directly with students and employers alike.

These pathways provide important information for numerous stakeholders, including:

- A reasonable, sequenced path a student can follow to obtain a job within the manufacturing sector;
- Clear options for both non-credit and credit tracks, as well as the estimated level of effort needed (by credits); and
- An opportunity for employers to understand the sequence of training and how students come prepared for work.

Articulation agreements among the eight M-CAM colleges where credit is assigned to attained industry credentials included CNC/Machining (National Institute of Metalworking Standards), Multi-Skilled/Mechatronics (PMMI & Siemens), Production Operations (Manufacturing Skills Standards Council/Quality/Safety) and Welding/Fabrication (American Welding Society/Sense) at each institution. Upon entering any of the eight M-CAM institutions with the valid credential, the student automatically receives the assigned credit. The agreement is written broadly to include other industry recognized credentials that may come into use in the future. Additionally, all eight colleges agreed to further align the articulated industry recognized credentials to their existing Prior Learning Assessment systems.

Two articulation agreements with universities were produced — one with Ferris State University and the other with Eastern Michigan University. All M-CAM colleges have the opportunity to use these agreements in support of student transfer advancing toward a baccalaureate degree.

Work Plan Exceptions

The M-CAM consortium obtained two articulation agreements with four-year partners, Ferris State University and Eastern Michigan University. This is a deviation from the original work plan, which stated that the consortium would develop eight agreements with four-year institutions. Ferris State University and Eastern Michigan University are both innovative and flexible in developing articulation agreements to bachelor's degrees based on technical programs.

Because the M-CAM colleges offer widely varying scales of apprenticeship programs, no formal apprenticeship PLA agreement was produced. Instead, each college is working with relevant employers and labor organizations on how to recognize learner competencies documented by the chosen industry certifications in the design of apprenticeship programs.

Initially M-CAM colleges envisioned developing a targeted 30 credit hour lateral articulation agreement. As the articulation committee explored this approach, it found the variance of credit structures among the eight colleges were significant, and that it would be both easier and more powerful to build the agreement using alignment with relevant industry-valued certifications, as was ultimately done. This approach eliminated the need to explore current practices of bridging non-credit to credit transitions present in the Breaking Through model that were used in the Northern Virginia Community College-led round two grant through the Trade Adjustment Assistance Community College Career Training (TAACCCT) grant.

Work Products

- Articulation Agreement & Memo of Understanding between M-CAM and Four-year Institutions
- Articulated Programs with Eastern Michigan University & Ferris State University
- Articulation Agreement and Memo of Understanding among M-CAM & M-CAM Equivalency Matrix-Industry Recognized Credentials
- Transfer within M-CAM Colleges-Articulation Process

JOB SEARCH AND PLACEMENT

Intent of the Deliverable — The eight Michigan Coalition for Advanced Manufacturing (M-CAM) colleges proposed to implement an M-CAM job search and placement system for M-CAM partners and participants.

Lead College: Lansing Community College (Production),

Participating Colleges: Bay College
Grand Rapids Community College
Kellogg Community College
Lake Michigan College
Lansing Community College
Macomb Community College
Mott Community College
Schoolcraft College

Work Plan

The project work plan approved by the U.S. Department of Labor focused on activities that would allow the colleges to assess existing job placement services, analyze the capacity for alignment across colleges, and identify improvement targets. Essential to implementing were existing college placement service staff, job developers, success coaches, Michigan Works Agencies, employers, and students. Steps included:

- Review of existing job placement programs used by the colleges;
- Review of existing job placement tools;
- Review of successful job placement components needed;

- Identification of models to connect M-CAM program completers with potential employer job postings;
- Creation of a resume pool of M-CAM completers for employers to access;
- Identification of job placement services needed by M-CAM providers;
- Development of common job placement core practices for colleges, employers and consortium partners; and
- Implementation of job service and placement system across partner colleges and employers.

Project Plan

This process was integrated into and aligned with development of the Intake and Orientation and Career Coaching system. Each college completed a survey collecting detailed information about their existing job placement system, which served as a starting point. Forty plus staff, primarily career/success coaches and job developers, met to identify the common elements of the End-to-End Student Journey and produced a comprehensive model of the system. Each college then produced an End-to-End Student Journey map specific to their institution. A second meeting was held to identify areas of strength and improvement within the map. As a final step of the process, each college identified targets for improvement.

JOB SEARCH AND PLACEMENT

Deliverable Outcome

Inventories and End-to-End Student Journey Maps

Each M-CAM college completed a comprehensive inventory of the services provided to students from intake to job placement. The inventory template identified major categories of activity, whether or not the activity was currently provided by the college, the name of the department and division housing the service and the number of employees providing the service. Categories and activities were:

Career Placement

- Career Assessment
- Career Testing
- Personality Testing
- Interest Inventories
- Work Keys
- Career Counseling
- Career Coaching
- Career Resource Library
- Career Lab

Employment Services

- Resume Writing
- Resume Writing Workshops
- Cover Letter and Job Search Correspondence
- Cover Letter Meetings
- Soft Skills Workshop
- Job Fair Workshop
- Networking Workshop
- Career Coach Meeting
- On-Line Job Search Workshop
- Completing a Job Application (hard copy and online)
- Interviewing Preparation and Techniques
- Practice Interviewing
- Career Networking
- Career Events
- Career Workshops

Job Search Processes

- On-Line Database System Job Postings and Candidate Resumes
- Connecting Candidates with Employers
- Job Fairs
- Resume Referral Process
- Employer Information Sessions
- Campus Interviewing
- Employer Development

Experiential Learning Options

- Internships
- Cooperative Education
- Apprenticeship
- Job Shadow
- Informal Interviewing
- Career Mentoring
- Internship Course
- Faculty Involvement in Program

Infrastructure

- Advisory Committee
- Program Evaluation Process
- Employment Tracking System
- Career Services Budget
- Student Services, Academic Affairs, Reporting Structure

Personnel Specifically Hired to Support M-CAM Functions

- Career Coach
- Job Developer
- Student Employment Personnel

After completion of the inventory, two meetings were held with approximately 40 staff including career coaches, job developers, student services staff and M-CAM leads and project managers. During the first meeting, key components of the student journey from intake to job placement were identified and placed on a continuum. This process helped each college discover similarities and differences in their approaches

JOB SEARCH AND PLACEMENT

to helping students move from one component to another in order to eventually secure a job. At the end of this activity, a comprehensive map was produced representing the M-CAM Job Placement System.

Key functions in the End-to-End Journey include

- Enrollment
- Employment Resources
- Career Coordination
- Alignment to Job Opportunities
- Completion
- Begin or Advance Employment
- Employment Retention and Skill Development

Sub-functions include

- Educational Plans
- Workshops
- Career Coordinator
- Job Search Processes
- Degree, Certificate or Industry Certification Attainment
- Employer Connections
- Advanced Career and Training

Supporting the functions are activities identified through the project's initial survey. For each college, the most significant improvements to the systems were the Career Coach function and the Job Developer function. These additions to the colleges' workforce provided expanded capacity to produce customized, wraparound services, intensive and increased outreach to employers and Michigan Works Agencies, direct alignment of student's competencies to job opportunities as well as improved systems within existing services.

Targeted Job Placement Improvement Strategies

Additional improvement strategies were identified by M-CAM colleges and are summarized in the following table.



JOB SEARCH AND PLACEMENT

ALIGNMENT TO JOB OPPORTUNITIES	
COLLEGE	STRATEGIES
<p>Grand Rapids Community College</p>	<p>Coordinate services between faculty and staff with employers college-wide</p> <ul style="list-style-type: none"> • During the M-CAM grant, the faculty contract added faculty performance evaluations that now require faculty to participate in outreach activities to both employers and the community. • Job developers engage faculty about job openings and employers that are interested in presenting to students and instructors. • Faculty report employment information to job developers. Job developers attend faculty meetings. <p>Resume referrals with Michigan Works</p> <ul style="list-style-type: none"> • All resume assistance is being performed in house by M-CAM Job developers. The college believes that resumes should be personalized to the individual and thus chooses to create them during one-on-one appointments with students. <p>On the Job Training</p> <ul style="list-style-type: none"> • Continue the growth of college’s Manufacturing Apprenticeship programs using funding opportunities from STTF, MAP+, and Michigan New Jobs. • Propose posting apprenticeship opportunities to Handshake so current job training students – or students in other certificate programs – can transition smoothly into apprenticeship programs within the college. <p>Job Shadowing</p> <ul style="list-style-type: none"> • Faculty and Job Developers work together to arrange class site-visits of employer facilities and presentations on the applications of the specific skills they are learning in class. • M-CAM programs have increased the incorporation of “hands-on” learning during employer site-visits. For example, Industrial Sewing students not only tour facilities that perform Industrial Sewing, but they also get a chance to practice production sewing on the company’s machines while being coached by an employee from the sewing area. • Faculty in M-CAM areas are now the leaders advocating for employers coming into the classroom and students participating in job shadowing and tour events. <p>Online Position Posting</p> <ul style="list-style-type: none"> • All employers that communicate an interest in posting positions to the college are directed to register for Handshake and post positions to the college Handshake profile. Once the position is posted, it is assigned a “Label” to make it easily accessible to any student or staff looking for specific types of positions or those within a specific industry (i.e.: “Welding”, “CNC Machining”, etc.). M-CAM staff have been granted access to Handshake so they can monitor postings from within their industry and notify students of applicable job opportunities. • Additionally, job developers print M-CAM–related postings and pin them to a job board outside of the corresponding lab. This job board is a focal point of all facility tours, so that the employment-focused aspect of the trainings is stressed from the very beginning of the enrollment process. • Job developers are available to conduct 1-on-1 job searching sessions with students using this Handshake platform.

JOB SEARCH AND PLACEMENT

ALIGNMENT TO JOB OPPORTUNITIES	
COLLEGE	STRATEGIES
Kellogg Community College	<p>Co-op Education Fairs</p> <ul style="list-style-type: none"> • Implementation of a more structured program that would incorporate a credit based co-op program into the industrial-trades modules, specifically for early college students. A first step would be to speak with other M-CAM colleges and look at their models. <p>Internships/Job Shadowing</p> <ul style="list-style-type: none"> • Implementation of a more structured program that would incorporate credit based internships into the industrial-trades modules, specifically for early college students. Kellogg has contacted Gull Lake Community Schools to team up and expand job shadowing and internship opportunities for students. The program is titled Career Exploration Opportunities (CEO) and we hope to offer our students more community-based projects with local employers. Several employers have been contacted to pilot this program. <p>On the Job Training</p> <ul style="list-style-type: none"> • Kellogg uses its Incumbent Worker Program as an opportunity to provide the student with on-the-job training. The company handles this training. <p>Faculty Involvement</p> <ul style="list-style-type: none"> • Career coaches and program coordinators work with faculty to identify employers who hire students with various types of skill sets. Faculty provide feedback on resume development that is specific to the skill set that the student has learned in his/her skilled trade.
Lake Michigan College	<p>On the Job Training</p> <ul style="list-style-type: none"> • Lake Michigan’s Director of Employer Outreach has begun working with Michigan Works (Kinexus) staff, identifying employers who are hiring and providing OJT opportunities for students. <p>Resume referrals through Michigan Works</p> <ul style="list-style-type: none"> • Monthly meetings are taking place between college and Kinexus, providing direct coordination and referrals with the case managers and college talent development specialist. <p>Career Mentoring</p> <ul style="list-style-type: none"> • Lake Michigan is using College Central to connect students with mentors. This service also includes a portfolio builder to assist students in demonstrating their work competencies. <p>Online Job Posting</p> <ul style="list-style-type: none"> • The primary method Lake Michigan College is using for the posting and tracking of jobs is College Central. The Director of Employer Outreach manages this as well as work-based learning opportunities for students.

JOB SEARCH AND PLACEMENT

ALIGNMENT TO JOB OPPORTUNITIES	
COLLEGE	STRATEGIES
Lansing College	<p>On the Job Training</p> <ul style="list-style-type: none"> Lansing relies on its partnership with Michigan Works Agency for OJT opportunities with employers. Partnership with MWA business development managers continues. GOAL: to have a unified approach for OJT and to expand internship opportunities within the college. <p>Resume referrals through Michigan Works</p> <ul style="list-style-type: none"> Lansing is working to improve its relationship with Michigan Works. This not only applies to the M-CAM grant, but also to Technical Careers and the entire college. Lansing's career coaches and the Experiential Learning & Skilled Trades Apprenticeship Coordinator send out job announcements to students and staff weekly. GOAL: to unify postings being sent to students and to also connect with the college's Career & Employment unit. <p>Career Mentoring</p> <ul style="list-style-type: none"> There needs to be a better alignment within the college of who is working with employers. At the present time, there are different departments visiting the same employers which causes confusion with the employer. GOAL: To target companies which understand the importance of career mentoring. College is setting up monthly meetings with LCC West Campus success coaches and stakeholders to review Career Mentoring (Job Shadowing, Internship opportunities, etc.) and identify a common system for tracking students with the system. The college is rolling out a new student tracking system and hopes to use this software to assist in connecting students and staff.
Macomb Community College	<p>Align Talent Connect to job opportunities</p> <ul style="list-style-type: none"> Career coach meets with each student one-on-one to align their resumes to match them to job opportunities on the Michigan Talent Connect website. In addition, each student is asked to complete a profile on the Talent Connect for additional employment opportunities. <p>Add "A Day at Work" as part of job search</p> <ul style="list-style-type: none"> The job developer adds a Day at Work (when employers identify opportunities) as part of their course training under the job search module. The job developer combines classes to expose students to a day at work in advanced manufacturing. In the 4-8-hour day, the student learns from industry experts what the culture is like, what work expectations are, and what education and skills are required to gain employment in the industry. This day is mapped out to expose students to the equipment, procedures and staff to maximize the experience. There are activities that include simulation of work performed at the employer site. Breakfast and lunch are served by the employer. Each student leaves with a bag filled with employer related information and swag. Each Day at Work has generated interviews and employment for one or more of the students. <p>Better understand hiring requirements through external agencies</p> <ul style="list-style-type: none"> Job developer works with external agencies like Michigan Works to understand the hiring requirements. The external agencies with which the job developer has partnered work directly with employers who hire M-CAM students. The Michigan Works representative attends interview days to hire for those employers. The job developer invites representatives into the classrooms to do direct training and provide real time industry requirements in various class room workshops. This provides each student with a better understanding of what the hiring requirements are through external resources.

JOB SEARCH AND PLACEMENT

ALIGNMENT TO JOB OPPORTUNITIES	
COLLEGE	STRATEGIES
Macomb Community College	<p>Online posting and tracking</p> <ul style="list-style-type: none"> The primary method Macomb is using is MacombCareerLink. The Career Coordinator handles the posting of jobs, tracking of student employment, event invites, workshops and the data entry and tracking of each participant. In addition, the Employer Development Coordinator inserts all employers and external partners' documentation of involvement, such as a Day at Work, Interview Day, and classroom visits and tours. The Employer Coordinator also inputs all data into ETO used for tracking all M-CAM employers who have hired M-CAM students.
Mott Community College	<p>Connecting candidates to employers</p> <ul style="list-style-type: none"> Establishment of Employer Advisory Council provided additional opportunities that did not previously exist. Intense career navigation, along with employer input allowed for the expansion of offerings to meet the immediate, in-demand needs of local employers. Also, many employers became more open to accepting ex-felons into their employer pools. <p>Resume referrals</p> <ul style="list-style-type: none"> Currently and as an ongoing part of the process, Mott works with the college's Student Employment Center and local employers to screen individuals that apply directly to them or via postings in Mott's College Central Network (CCN). Mott also works with placement agencies for those individuals that come directly to the college for placement with partner companies. Mott's Career Navigation and Job Development staff also works in partnership with the Business Services division of Genesee/Shiawassee Thumb Michigan Works Agency to screen those individuals referred to the college by them.
Schoolcraft College	<p>Employer Information Sessions</p> <ul style="list-style-type: none"> Schoolcraft realizes the importance of employer engagement and has recently revamped its process to standardize how to best work with employers. Schoolcraft will take the approach of individual meetings with employers rather than information sessions. The M-CAM Employment and Internship Coordinator plays a key role in creating and developing strong relationships with employers. This also ensures that follow up is conducted in a timely manner. The Employment Coordinator adds additional staff and faculty to the engagement, as appropriate. <p>Physical Job Boards</p> <ul style="list-style-type: none"> Schoolcraft has updated its Jobs Board outside the M-CAM office with news articles and up-to-date job postings in a colorful, eye-catching design, resulting in more active student use. The college's career coach also receives updates on welding jobs from various online job boards, which helps the staff stay up to date on what employers are seeking from job candidates. <p>Online postings and job searches</p> <ul style="list-style-type: none"> Schoolcraft recommends that all employers and students use the college portal, College Central Network (CCN), to post and search for jobs. The College's Career Service department uses CCN exclusively and has a system for fanning out job opportunities to faculty and staff. The M-CAM staff expands upon this process by posting opportunities on a jobs board and actively recruits M-CAM participants by various means, including classroom visits and through email.

JOB SEARCH AND PLACEMENT

COMPLETION	
COLLEGE	STRATEGIES
Bay College	<p>Employer Info Sessions</p> <ul style="list-style-type: none"> The M-CAM project manager/career coach/job developer has established direct communication with potential employers with a specific focus on Welding. <p>Career Networking</p> <ul style="list-style-type: none"> The M-CAM project manager and grant lead annually attend the Upper Peninsula Talent Summit which attracts 200 people including employers, educators, and policy makers. <p>Connecting Candidates to Employers</p> <ul style="list-style-type: none"> Increase direct referrals when a potential candidate is a good fit for an employer. <p>Advisory Committees</p> <ul style="list-style-type: none"> In lieu of formal advisory committees, work more directly with Welding faculty for information. <p>Completion Rates</p> <ul style="list-style-type: none"> Review progress toward degree completion with students and refer students to the Degree Completion Specialist for follow-up.
Kellogg Community College	<p>Program Evaluation</p> <ul style="list-style-type: none"> Program Coordinator provides a written instructor evaluation to the manufacturing program students after each class that is completed. This is used to evaluate the instructor as well as the coursework. Plan is to implement an electronic evaluation quarterly for employer partners who have hired students from the program.
Lansing Community College	<p>Employers understanding the value of credentials</p> <ul style="list-style-type: none"> Job developer has been going with Lansing's business development managers (BDM) on sales calls to explain the value of credentials to the employer. GOALS: to continue Mechatronics and MSSC courses as open enrollment while highlighting potential credentials students can obtain; to further develop marketing strategies with college, and to develop tools for BDMs to use when presenting courses with credentials to customers. <p>Job Search Help</p> <ul style="list-style-type: none"> Experiential coordinators at Lansing works with students to help them prepare for job interviews through mock interviews and resume help. GOAL: to proactivity market support services to students at West Campus. <p>Career Pathways</p> <ul style="list-style-type: none"> The Success Coach Model that Lansing has identified is a way to help the students/employees achieve their skills identifying career pathways.

JOB SEARCH AND PLACEMENT

COMPLETION	
COLLEGE	STRATEGIES
Macomb Community College	<p>Making connections</p> <ul style="list-style-type: none"> The trainers in the career research and job search modules mention the importance of the Talent Connect link for additional job opportunities. In addition, the location of the Michigan Works offices is key. <p>Using customer feedback</p> <ul style="list-style-type: none"> The job developer receives verbal feedback from both the employer and participant at the end of the Day at Work course. In addition, Macomb has created a survey that has been sent out quarterly to all completers and employer partners that provides feedback. This survey is generated by MacombCareerLink. <p>Classroom visits from industry</p> <ul style="list-style-type: none"> The training coordinators and career coach use paper evaluations to determine if classroom visits by industry representatives is providing real-time hiring requirements. It has been determined that the information shared in the classroom by the external agencies about hiring requirements and expected wages is beneficial in the road to employment for the M-CAM students. <p>Day at Work</p> <ul style="list-style-type: none"> The Day at Work has been successful. It leads to a better understanding of the new advanced manufacturing environment, thus helping participant gain employment.
Mott Community College	<p>Program Evaluation</p> <ul style="list-style-type: none"> The college is positioned (at the instruction of the President) to respond in an immediate fashion to the ever-changing demands of industry. This allows for continuous review of current industry recognized credential training offerings as well as the ability to improve upon those offerings in real time.
Grand Rapids Community College	<p>Employer and participant follow-up</p> <ul style="list-style-type: none"> The implementation of Handshake software has given employers an avenue to post positions and track postings on independently, without having to call and leave a voicemail or email with a job developer. Job developers then monitor M-CAM related postings to engage with employers. Propose hiring a firm to conduct follow-up calls, prioritizing those students that have not yet been counted. <p>Employment Tracking</p> <ul style="list-style-type: none"> Working with college HR and procurement processes to hire an individual or firm to conduct follow-up calls for both employed and job-seeking students. Propose future use of Survey Monkey or another data collection tool to engage former students and gather employment information. This could also include use of Handshake's "First Destination" tool. <p>Wage Data</p> <ul style="list-style-type: none"> College has begun ensuring that full social security numbers (SSN) are being used for wage data purposes. Grand Rapids has been very successful in doing so. Entry paperwork completed early in the grant historically had only participants' last four SSN digits. Now, nearly all student records have full SSN numbers. Grand Rapids' M-CAM data specialist has engaged with Social Policy Research (SPR) to provide clarity in wage data reporting to enhance its usefulness.

JOB SEARCH AND PLACEMENT

ADVANCE IN EMPLOYMENT	
COLLEGE	STRATEGIES
Lansing Community College	<p>Job Development</p> <ul style="list-style-type: none"> Lansing’s business development managers (BDMs) and job developers are working with companies to show how training and credentials can retain employees and lead to internal promotions. OBSTACLE: MCAM relies on the BDM’s to work with employers and their HR Department. There is a high turnover in the manufacturing HR departments in the area. GOAL: Develop cross-divisional meetings with Center for Manufacturing Excellence (CME) Corporate Training Unit, success coaches, and other stakeholders to share local job development needs, changes in outside contacts, and industry needs. This is a new group that until recently, has only been focused on building expansion and is expanding scope of weekly meetings. <p>Resume referrals through Michigan Works</p> <ul style="list-style-type: none"> Lansing is working to improve its relationship with Michigan Works. This not only applies to the M-CAM grant, but also to Technical Careers and the entire college. Experiential Learning & Skilled Trades Apprenticeship Coordinator sends out job announcements to students and staff weekly. GOAL: to unify postings being sent to students and to also connect with college’s Career & Employment unit and to further connect with the CME team. <p>Expanding experiential learning</p> <ul style="list-style-type: none"> Lansing’s business development managers will assist in building a relationship between Michigan Works’ business development managers and the college’s Experiential Learning and Skilled Trades to expand OJT and internship opportunities.
Macomb Community College	<p>Follow-up</p> <ul style="list-style-type: none"> The career coach and job developer electronically and verbally reach out to participants and local Michigan Works representatives to follow-up on leads, jobs, employers who are hiring or employers who have hired and or provided OJT opportunities to M-CAM students. The career coach contacts students a week after they graduate to update their employment status either generated from the Day at Work or Interview Day. Two weeks after Interview Day or Day at Work, the job developer follows up with the employers and participants verbally and electronically to provide tools to help with employment. This type of follow-up will continue until the student is employed or continues with their education. The career coach and job developer maintain continuous contact with the student and employer. The job developer maintains all contacts with external agencies and participants regarding employment achievement that external agencies provided. The job developer will provide the career coach any feedback for improvement needed to ensure the participant gains employment.
Mott Community College	<p>Follow-up</p> <ul style="list-style-type: none"> Discussion with current employers has yielded a scholarship to allow current employees the opportunity to take Mott’s Advanced Robotics course at no cost to the employee and upon completion, the employee would receive a promotion and increase in salary. Although all employers cannot offer this same benefit, this will be an ongoing discussion to create innovative ways for companies to invest into their current and future employees.

JOB SEARCH AND PLACEMENT

EMPLOYMENT RETENTION/SKILL DEVELOPMENT	
COLLEGE	STRATEGIES
Bay College	<p>Obtain Job Placement Information from Program Completers</p> <ul style="list-style-type: none"> • Bay is contracting with Equifax for employment verification services.
Grand Rapids Community College	<p>Follow-up</p> <ul style="list-style-type: none"> • Increase focus on problem solving and employment retention in exit advising sessions to educate students on changing trends in the job market and importance of time-spent within an organization as it relates to priority staffing practices. <p>Resume referrals with Michigan Works</p> <ul style="list-style-type: none"> • All resume assistance is being performed in-house by M-CAM job developers. The college believes that resumes should be personalized to the individual and thus chooses to create them during one-on-one appointments with students. <p>On the Job Training</p> <ul style="list-style-type: none"> • Continue the growth of college's Manufacturing Apprenticeship programs using funding opportunities from STTF, MAP+, and Michigan New Jobs. <p>Apprenticeships</p> <ul style="list-style-type: none"> • Propose posting apprenticeship opportunities to Handshake so current Job Training students – or students in other certificate programs – can transition smoothly into apprenticeship programs within the college.
Kellogg Community College	<p>Increase Partnership Involvement in Employment Tracking</p> <ul style="list-style-type: none"> • Currently, career coaches keep in contact with partner organizations, e.g. Michigan Works, regarding employment retention and assistance with removal of barriers. They also keep in touch with employer partners on a quarterly basis to ensure success with each participant and can address any concerns before it is too late. Improvement strategy is to print out monthly workshop calendars from Michigan Works and encourage participation in these workshops and other Michigan Works services while the students are job searching. <p>Utilize the college job posting board and Career Services</p> <ul style="list-style-type: none"> • This ensures students are aware of all job opportunities and job search services.
Lake Michigan College	<p>Improve student tracking after training</p> <ul style="list-style-type: none"> • College is currently using ETO for this function, but is looking into ways to utilize College Central's database to track employment outcomes after graduation.

JOB SEARCH AND PLACEMENT

EMPLOYMENT RETENTION/SKILL DEVELOPMENT	
COLLEGE	STRATEGIES
Lansing Community College	<p>Collaborating with employers on retention strategies</p> <ul style="list-style-type: none"> • Lansing will work with companies to develop the soft skills to help retain employees. • Employers give their employees time off to attend trainings, classes, and labs to improve their knowledge and skills. Flexible delivery and hybrid classes help to improve this strategy. • Tuition reimbursement by the employer helps to retain employees. <p>Integrate college’s interaction with employers</p> <ul style="list-style-type: none"> • Schedule joint meetings with employers that connect both Corporate Training and Technical Career Division. <p>Increase completion</p> <ul style="list-style-type: none"> • Lansing’s experiential coordinators help students prepare for job interviews through mock interviews and resume help. Goal is to market this support serve to LCC West Campus students. Other tactics include job fairs and open sessions for drop-in. <p>Success coaches</p> <ul style="list-style-type: none"> • Lansing’s success coach model helps students/employees achieve their skills by actively working with students to stay on their individual career pathways.
Macomb Community College	<p>Promoting Skill Development Opportunities</p> <ul style="list-style-type: none"> • Macomb’s career coach informs all students/alumni verbally and electronically of skill development opportunities contained in various workshops held at the college and at local Michigan Works offices. <p>Collaborate with Michigan Works on Retention</p> <ul style="list-style-type: none"> • Macomb’s job developer keeps in contact with the Michigan Works representative to discuss employment retention on all students placed through Michigan Talent Connect. <p>Post-employment tracking and support</p> <ul style="list-style-type: none"> • Job developer maintains communication with both the employer and student to ensure employment retention until the quarter after placement. Career coach maintains contact with the student and provides skill development opportunities until employment or continued education is obtained by the student until the quarter after completion. <p>Open enrollment courses in advanced manufacturing</p> <ul style="list-style-type: none"> • For those that want to add to their skill set or are having difficulty finding work, Macomb offers open enrollment courses in advanced manufacturing. These courses improve employment opportunities and aid in job advancement. For example, welding graduates have returned to attend robotics courses to expand their skill set into the area of Robotic Weld Technicians. The career coach provides ongoing resume updates to include new skills, and interviewing tips for these students. <p>Track employment trends</p> <ul style="list-style-type: none"> • The job developer, career coach and training coordinators stay abreast of ever-changing hiring requirements and real-time employment trends by using feedback from external partners and other outside resources to keep the skill development of students current.

JOB SEARCH AND PLACEMENT

EMPLOYMENT RETENTION/SKILL DEVELOPMENT	
COLLEGE	STRATEGIES
Mott Community College	<p>Professional Development sessions</p> <ul style="list-style-type: none"> In conjunction with financial literacy training, these sessions will be an ongoing activity that will be co-sponsored by Mott and employer partners.
Schoolcraft College	<p>Employment Retention Follow-Up</p> <ul style="list-style-type: none"> Schoolcraft has initiated a 30-day follow up with employers after a job placement. The college also makes a follow-up inquiry at 90 days to check in on the employee's progress and to see if any wage increases were offered. <p>Continued Skill Development</p> <ul style="list-style-type: none"> Students are informed during the job placement process if the employer has tuition assistance and are encouraged to continue their studies if they have not completed their certificate or degree. <p>Marketing Training to Employers</p> <ul style="list-style-type: none"> The college also includes M-CAM employers in email campaigns to inform them of upcoming specialized classes that relate to manufacturing. Currently, classes are offered in Microsoft Excel, Geometric Dimensioning and Tolerancing (GD&T), among others. Employers are made aware that state training funds may be available to cover incumbent worker training.

Work Plan Exceptions

The M-CAM consortium's original plan had been to develop a common system for job placement, to link students to employer job opportunities, and to link employers to students needing work. In exploring that option, the colleges realized that their current systems although different, were robust and already provided these functions. Therefore, the colleges agreed to use their existing systems and methodologies for managing job placement and instead turned their focus to the support services that would be provided by career coaches and job developers to strengthen their processes and increase the level of service associate with career readiness and job opportunities for students.

Work Products

- M-CAM Student End-to-End Journey-Comprehensive Map & Individual College Maps



