

## 1 Statement of Need

Thirteen (13) Missouri community colleges have formed a collaborative partnership to provide opportunities for Missouri's TAA-eligible, long-term unemployed and other dislocated workers (target population) to obtain strong science, technology, engineering and math (STEM) skills tied to occupations in the state's targeted and growth economic clusters. Missouri STEM Workforce Innovations Networks (**MoSTEMWINs**) is designed to allow members of the target population to overcome the challenges they face and connect to employment that is sustainable and pays earnings that support families.

MoSTEMWINs creates, expands and redesigns new and existing STEM programs at member institutions throughout the state to fill gaps identified by STEM employers in multiple industries. MoSTEMWINs also addresses the fundamental, underlying barriers that prevent the target population from entering and completing STEM programs by: (1) accelerating entry into career programs by offering opportunities to improve underdeveloped academic skills; (2) creating clear pathways to STEM careers; and (3) improving employment attainment for the target population. The 13 colleges have a single statewide focus of improving retention and completion rates for the participants. Table 1 lists the members of the consortium.

<b>Table 1: MoSTEMWINs Consortium Colleges</b>	
<b>College</b>	<b>Counties in Service Region</b>
Metropolitan Community College (MCC) ( <b>Lead</b> ) Kansas City, MO	Bates, Buchanan, Cass, Clay, Clinton, Jackson, Lafayette, Platte, Ray
Crowder College (CC) Neosho, MO	Barry, Barton, Cedar, Dade, Jasper, Lawrence, McDonald, Newton, Vernon
East Central College (EC) Union, MO	Crawford, Dent, Franklin, Gasconade, Maries, Osage, Phelps, Washington
Jefferson College (JC) Hillsboro, MO	Jefferson
Mineral Area College (MAC) Park Hills, MO	Iron, Madison, Perry, Shannon, St. Francois, Ste. Genevieve, Texas, Washington, Cape Girardeau

Moberly Area Community College. (MACC) Moberly, MO	Adair, Audrain, Boone, Chariton, Clark, Howard, Knox, Lewis, Macon, Marion, Monroe, Ralls, Randolph, Schuyler, Scotland, Shelby,
North Central Missouri College (NCMC) Trenton, MO	Andrew, Atchison, Caldwell, Daviess, DeKalb, Gentry, Grundy, Harrison, Holt, Linn, Livingston, Mercer, Nodaway, Putnam, Sullivan, Worth
Ozarks Technical Community College (OTC) Springfield, MO	Christian, Dallas, Douglas, Greene, Laclede, Lawrence, Ozark, Polk, Pulaski, Stone, Taney, Webster, Wright,
St. Charles Community College (SCC) St. Charles, MO	Callaway, Lincoln, Montgomery, Pike, Warren, St. Charles
St. Louis Community College (SLCC) St. Louis, MO	Franklin, St. Louis City, St. Louis County, Ste. Genevieve
State Fair Community College (SFCC) Sedalia, MO	Bates, Benton, Camden, Carroll, Cole, Cooper, Henry, Hickory, Johnson, Miller, Moniteau, Morgan, Pettis, Saline, St. Clair
State Technical College of Missouri (STCM) Linn, MO	Statewide
Three Rivers College (TRC) Poplar Bluff, MO	Bollinger, Butler, Cape Girardeau, Carter, Dunklin, Howell, Mississippi, New Madrid, Oregon, Pemiscot, Reynolds, Ripley, Scott, Stoddard, Wayne

**(a) Serving the Education and Training Needs of TAA-Eligible Workers**

*(i) Impact of Foreign Trade.* Between January 2010 and May 2014, the U.S. Department of Labor (USDOL) certified 110 TAA petitions in Missouri covering an estimated 11,941 workers.<sup>1</sup> Most of the affected workers were employed in manufacturing, and most of those who lost their manufacturing jobs had been employed in production occupations. While large numbers of applications were filed in metropolitan areas, TAA certifications have impacted the entire state. Rural areas have suffered profoundly, especially in industries supporting automotive and apparel manufacturing. Table 2 contains a number of the most impactful TAA certifications in the state.

<sup>1</sup>Source: [www.doleta.gov/tradeact](http://www.doleta.gov/tradeact)

<b>TAW Number</b>	<b>Company</b>	<b>Location</b>	<b>Decision Date</b>	<b>Estimated Workers Impacted</b>
85234	Nordyne	Poplar Bluff, MO	7/24/2014	475
83340	Noranda Aluminum	New Madrid, MO	2/4/2014	75
83008	Quest Diagnostics	St. Louis, MO	10/25/2013	275
82928	Doe Run Company	Herculaneum, MO	8/15/2013	242
82259	Yellow Pages	St. Louis, MO	3/15/2013	101
82165	Hostess Brands, Inc.	Entire State	3/14/2013	1,198
82369	Energizer Holdings, Inc.	Maryville, MO	2/28/2013	471
82219	TeleTech Services Corporation	Springfield, MO	1/31/2013	130
82199	Regal Beloit Manufacturing	Springfield, MO	1/24/2013	448
81589	Hydro Aluminum North America	Monett, MO	11/20/2012	346
81580	Sanofi-Aventis US LLC	Kansas City, MO	5/8/2012	337
81466	Gates Corporation	Charleston, MO	4/30/2012	168
80460	Briggs and Stratton	Poplar Bluff, MO	2/24/2012	1,144
81002	GFSI, Inc. dba Gear for Sports, Inc.	Chillicothe, MO	12/09/2011	92
80505	Haldex, Inc.	Kansas City, MO	11/18/2011	155
74882	Fasco Industries, Inc.	Cassville, MO	3/1/2011	383
75200	RBC Manufacturing Corporation	West Plains, MO	2/25/2011	368

*(ii) Education and Training Needs of TAA-eligible Workers.* TAA-eligible Missourians must overcome significant education and skill deficits to re-enter the workforce and earn pay comparable to their prior position. The majority are middle-aged, white, high school graduates. Table 3 provides a snapshot of TAA-eligible worker characteristics.

<b>Gender</b>	<b>Age</b>	<b>Education</b>	<b>Race</b>
Male: 46% Female: 54%	30-39 years: 17% 40-54 years: 42% 55+ years: 33%	GED only: 12% HS Diploma: 58%	Caucasian: 83%

Most were employed in manufacturing, usually in production work that required few, if any, skill certifications. Seventy percent have no postsecondary credential. Many have poor

technology skills, weak study skills, and underdeveloped soft skills. Other challenges such as personal debt and lack of child care make it all the more important that these individuals have access to flexible, short-term programs that offer industry-recognized high-quality credentials. The educational standards in the target occupations have increased substantially in the years since most of these individuals began their work lives, and MoSTEMWINs target occupations are characterized by rapidly changing technologies or increasing regulatory requirements. MoSTEMWINs will build on the existing skill sets of Missouri's TAA-eligible, unemployed, and dislocated worker adults to equip them to compete for today's careers with short-term, modularized instruction leading to portable certifications.

In addition to the large number of TAA-eligible individuals in Missouri, the state struggles to provide opportunities to the long-term unemployed. A recent study found that there are 78,400 individuals who are classified as long-term unemployed, representing 40% of all unemployed persons in the state. These individuals have very low levels of educational attainment, with 53% having a high school diploma or less, 28% having some college or an associate degree, and 19% having a bachelor's degree or higher. Clearly, these individuals will only be able to reenter the workforce if they participate in timely, high-impact training programs that offer an opportunity to prove themselves on the job through internships and other work-based learning opportunities.

*(iii) Strength of Partnerships with Applicable TAA Agencies.* MoSTEMWINs colleges have developed close working relationships with the Missouri Department of Economic Development (DED) and its Division of Workforce Development (DWD), which serves as the state's TAA agency, and the Missouri Economic Research and Information Center (MERIC). These relationships have been strengthened through each organization's collaborative efforts in MoHealthWINs and MoManufacturingWINs (1<sup>st</sup> and 2<sup>nd</sup> round statewide TAACCCT grants).

The relationship consists of a workforce education network that provides vital information about what programs are of greatest value to Missouri’s citizens, employers, and economy. Data provided by MERIC indicate that the target occupations in MoSTEMWINs are high-demand jobs with good short- and long-term employment and earnings prospects. This information is confirmed by Missouri’s local workforce investment boards (WIBs). As part of its partnership in MoSTEMWINs, DWD will refer TAA-eligible workers to consortium colleges for services, coordinate employer engagement with colleges, and assist with outcomes tracking and reporting.

**(b) Evidence of Job Opportunities in the Targeted Industries and Occupations**

*(i) Labor Market Information.* Labor market data from state and federal sources and information received from the public workforce system and employers demonstrate that employment opportunities exist in five high-growth STEM occupational clusters: information technology, health sciences, transportation, manufacturing, and general/life sciences. Each cluster includes multiple occupational titles that are classified as “in demand” by Missouri’s Department of Economic Development. Table 4 lists the target occupations for the project.

**Table 4: Target Occupations and Openings**

<b>Industry Cluster</b>	<b>Occupation Title</b>	<b>Real-Time Job Postings, Jan-May 2014<sup>2</sup></b>	<b>Short-Term Job Openings 2012-2014<sup>3</sup></b>
<b>Information Technology</b>	Computer Specialists and Occupations 15-1179	832	265
	Computer Support Specialist 15-1150	1,567	1,060
	Database Administrators 15-1141	960	231
	Computer Occupations, All Other 15-1799	8	103
	Computer Systems Analysts 15-1121	2,125	813
	Network and Computer Systems Admin 15-1142	1,017	467
<b>Health Sciences</b>	Registered Nurse 29-1111	6,668	3,840
	Respiratory Therapists 29-1126	235	189

<sup>2</sup>Burning Glass, June 2013

<sup>3</sup>MERIC, Department of Economic Development, June 2013

	Dental Hygienists 29-2021	57	132
	Diagnostic Medical Sonographers 29-2032	92	74
	Radiologic Technologists 29-2037, 29-2034	160	276
	Pharmacy Technicians 29-2052	459	454
	Licensed Practical Nurses 29-2061	1,227	1,232
	Health Information Management 29-2071	672	176
	Nursing Assistant 31-1012, 31-1014	2,146	1,814
	Occupational Therapy Assistant 31-2011	272	64
	Medical Assistants 31-9092	766	290
	Community Health Care Worker 21-1094	604	181
	Physical Therapist Assistant 31-2021.00	250	119
<b>Transport.</b>	Heavy and Tractor-Trailer Truck Driver 53-3032	13,039	1,927
	Light Truck or Delivery Services Drivers 53-3033	2,130	669
	Industrial Truck and Tractor Operators 53-7051	206	902
<b>Manufact.</b>	Engineers, All Other 17-2199	292	62
	Electrical and Electronics Repairers 17-3023	3	74
	Electro-Mechanical Technicians 17-3024	7	11
	Industrial Engineering Technicians 17-3026	2	65
	Quality Control Technician 19-4099	11	65
	Motor, Tool, and Related Repairers 49-2092	23	11
	Electrical and Electronics Repairers 49-2094	115	45
	Industrial Machinery Mechanics 49-9041	22	427
	Maintenance and Repair Workers, General 49-9071	2,379	1,204

These occupations are projected to grow at the national level. O\*Net characterizes more than three-quarters (78%) of the occupations listed above as “bright outlook” or growing faster than average. The outlook in Missouri is just as strong. MoSTEMWINs consulted with MERIC for short-term, statewide projections, O\*NET for projections of the number of annual job openings, and Burning Glass for real-time labor market information. Table 4 indicates the number of immediate and projected openings in Missouri for each occupation.

State and national labor market and economic information was supplemented by critical input provided to MoSTEMWINs consortium members through their employer advisory committees, industry consortia, and workforce investment boards. Rural areas and smaller communities around the state are experiencing tremendous growth in STEM-related industries. Transportation

has surpassed healthcare as the fastest growing industry in the southeast and southwest parts of the state, and new cross-continental interstate highway projects will continue to drive this trend in Missouri. Joplin, a community in the southwest part of the state that is rebuilding after a massive EF5 tornado, has a new hospital that will need 1,000 nurses.

In addition, considerable evidence indicates that St. Louis and Kansas City are experiencing tremendous growth in the target industries. The 2013 *State of the St. Louis Workforce Report* examined both real time labor market information through *Burning Glass* and occupational projections through 2020. This data indicated strong demand and growth in the targeted sectors but particularly in healthcare and information technology. The top 30 certificates in demand in the St. Louis region included several from healthcare and information technology while the top ten specialized skills in greatest demand cited patient care and database development skills. A 2013 Labor Supply and Demand Analysis conducted by the Missouri Economic Research and Information Center revealed that the greatest demand over supply was in Science and Technology and Healthcare. Manufacturing is also flourishing. Aerospace giant Boeing has established a new information technology center in St. Louis that will bring at least 400 jobs to the area; Monsanto is in the process of adding 675 scientists and bio-technicians at its research facility in suburban St. Louis; and General Motors has announced locating new product lines to operations within 40 miles of St. Louis that will add more than 2,000 job in 2014.<sup>4</sup> Express Scripts, which is responsible for the pharmacy benefits of more than 100 million Americans, will add 1,500 jobs in the next five years at its new corporate headquarters in the urban core.<sup>5</sup>

Information technology firms are also growing. The St. Louis Information Technology

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<sup>4</sup>“Boeing to Add 400 Jobs to IT Center,” *St. Louis Business Journal*, June 18, 2013

[http://www.bizjournals.com/stlouis/morning\\_call/2013/06/boeing-to-add-400-jobs-to-it-center-in.html](http://www.bizjournals.com/stlouis/morning_call/2013/06/boeing-to-add-400-jobs-to-it-center-in.html)

<sup>5</sup>Express Scripts to add 1,500 jobs through \$56 million expansion,” *St. Louis Business Journal*, June 19, 2013

Entrepreneur Network (ITEN), highlighted explosive growth in the greater St. Louis region's tech startup ecosystem in its 2012 Tech Startup Report, which noted: more than 250 startups since 2008, \$30 million invested in 2012, and companies documenting a need to hire 420 new employees in technical IT positions.<sup>6</sup> A June 2013 report by Brookings showed that 22% of all jobs in the St. Louis metro area required specialized knowledge in STEM fields, ranking it 18<sup>th</sup> among the top 100 Metro areas.

Kansas City is undergoing its own STEM revolution. *The Wall Street Journal* has reported that information technology firms are growing faster in Kansas City than in Silicon Valley or Austin. Kansas City is home to industry leaders such as Sprint and Cerner, and has been selected to pilot the Google Fiber Network. Demand for workers with technology skills in manufacturing is also on the rise. Ford recently announced it will add 2,000 jobs at its Kansas City assembly plant, while American Performance Technologies (a manufacturer of recreational and utility products) will add 276 jobs. Logoplaste, which makes rigid plastic packaging, is investing \$31.5 million in a new Kansas City facility that will bring another 80 jobs to the area.<sup>7</sup>

*(ii) Skills Required in the Targeted Industries and Occupations.* STEM careers require a mix of technical and soft skills. Consortium members have consulted with individual employers, industry associations, and workforce system staff. They have also carefully reviewed the competencies required by the credentialing agencies that provide or validate the certifications to be offered through MoSTEMWINs. In addition to the technical skills learned through certification and degree educational tracks, workers in STEM-related fields must also possess personal effectiveness skills, the ability to learn new information and solve problems, and strong

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<sup>6</sup>2012 Tech Startup Report, ITEN - St. Louis's Information Technology Entrepreneur Network, December, 2012  
[http://mediad.publicbroadcasting.net/p/kwmu/files/201306/St\\_Louis\\_Tech\\_Startup\\_Report\\_-\\_ITEN\\_\(2\).pdf](http://mediad.publicbroadcasting.net/p/kwmu/files/201306/St_Louis_Tech_Startup_Report_-_ITEN_(2).pdf)

<sup>7</sup>Ford Shows Faith in Missouri, *Kansas City Business Journal*, May 2, 2013

<http://www.bizjournals.com/kansascity/news/2013/05/02/ford-shows-more-faith-in-missouri.html?page=all>

communication skills. Table 5 summarizes the competencies and credentials required.

<b>Table 5: Understanding of Skills, Abilities and Credentials Required</b>		
<b>STEM Occupational Cluster</b>	<b>Knowledge, Skills &amp; Competencies Required</b>	<b>Credentials Needed</b>
<b>Information Technology-</b> Computer/network support techs and administrators, project managers, database administrators, cyber security, health information technology	Technology, problem-solving, writing, math, and communication skills; systems thinking and troubleshooting skills	Hands-on Experience Vocational Training Industry Certifications Certificates Associate Degree Bachelor’s Degree
<b>Health Sciences-</b> Nursing; medical or therapy assisting; health info. management, technicians (ultrasound, radiology, respiratory), pharmacy techs, dental hygienists	Writing/reading, math, technology, problem-solving, and communication skills; equipment operation and control; safety and regulations	Hands-on Experience Vocational Training Certificates National or State Exam Associate Degree Bachelor’s Degree
<b>Transportation-</b> Drivers and operators	Computer and other technology, reading, problem-solving and communication skills; safety and regulations	Hands-on Experience Industry Certifications Certificates
<b>Manufacturing-</b> Production, robotics, mechatronic, industrial engineering, or electrical techs; repairers of industrial machines, motors and tools; quality control; power plant operators	Mechanical, computer, problem-solving, math, writing, communication skills; safety, assembly and quality assurance abilities; electrical and electronic controls; robotics; blueprint and schematic reading	Hands-on Experience Vocational Training Industry Certifications Certificates Associate Degree Bachelor’s Degree
<b>Life Sciences-</b> Biological and chemical techs, forensic science techs, environmental, life or physical science techs	Computer, writing, math, chemistry, problem-solving, communication skills; safety and regulations	Hands-on Experience Industry Certifications Certificates Associate Degree Bachelor’s Degree

**(c) Gap Analyses**

*(i) Gap Analysis in Existing Education and Training Programs.* The planning and community outreach process for MoSTEMWINs was multi-faceted and examined community, educational and infrastructure gaps from the viewpoints of WIBs, chambers of commerce, regional economic development boards, city and county governments, community-based

organizations and other education providers, including four-year universities. MoSTEMWINs members have collaborated extensively on the MoWINs projects currently underway, and are very knowledgeable about existing resources and opportunities to build on the successes of those projects. The consortium also examined other previously funded TAACCCT projects, especially consortia with a strong STEM or developmental education emphasis.

In most parts of the state, MoSTEMWINs consortium members are the primary providers of training in the target occupations. In urban areas, a few other entities, such as for-profit providers, meet some needs. However, community colleges remain the most affordable option for many Missourians, especially TAA-eligible and other adults facing financial challenges.

*(ii) Impact of Identified Gaps.* Employers reported to consortium members they are either happy with the quality of the workers prepared by institutions but need more employees than the colleges have the capacity to prepare, or are dissatisfied with the readiness of recent graduates and are pleading for revamped programs that teach the competencies and skills employers need. This indicates that consortium colleges face educational programming gaps impacting improved labor market outcomes: (1) currently limited capacity to produce more graduates; (2) underdeveloped or outdated curricula, including technology or equipment, that do not meet industry expectations; and/or (3) few support systems to help adult workers transition into employment. In addition, many unemployed and dislocated workers arrive at member institutions unprepared for college-level work, further delaying progress and decreasing likelihood of success. Table 6 details some of the gaps in programming that impact the capacity of institutions to meet employers' needs.

<b>Table 6: Analysis of Primary Community and Institutional Gaps</b>
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Gap	Analysis
<b>Lack of capacity to significantly expand or revise existing programs or add new programs</b>	
Quantity of programs and/or limited content	Colleges need to add new programs and revamp current programs to produce more participants with the competencies employers need.
Insufficient specialized equipment to provide effective training	Colleges need to add equipment to further develop programming or introduce new programs.
Participants face barriers of time and place	Programs of study need to be available online or otherwise overcome long distances and the schedules of working adults with multiple responsibilities.
<b>Lack of academic preparedness among adult learners impedes student progress</b>	
Inflexible schedules create barriers to completion for adults	Most college programs need to adjust their curricula, schedules, or both to offer short, chunked, and modularized content focused on mastering competencies rather than being present in a class for a semester.
Time to completion discourages students	Participants need accelerated learning options and credit for their prior learning, as well as stacked and latticed credentials that offer multiple re-entry points and advancement while working.
<b>Path to employment/reemployment is often unclear to TAA-eligible and other workers</b>	
Degree/certificate requirements can be confusing and inconsistent	Colleges have traditionally chosen not to interfere in students' choices, but now understand that, to be successful, participants need clear paths to earning the needed credentials and advice about career entry and success.
Participants do not understand requirements by their new occupation	Opportunities to visit places of employment, shadow workers, and gain on-the-job experience through internships and clinical placements help students understand what skills they must master to succeed and enable networking.

**(2) Methodology and Workplan**

To address the gaps identified above, MoSTEMWINs will implement three major strategies:

- 1) Accelerate Entry Into Career Programs**—by refining assessment, transforming developmental education and adding support services to meet the needs of TAA-eligible and other participants, **2) Create Clear Pathways to STEM Careers**—by expanding access to and developing new stacked and latticed credentials in programs that meet employer needs, and **3) Improve Employment Attainment**—by working with employers; industry; local WIBs; state agencies including the Department of Laborers Division of Employment Security, which can facilitate communication with individuals unemployed; and community-based organizations to

engage, guide and employ participants. Each of these strategies and their accompanying activities will be described in detail below. In these sections, MoSTEMWINs also demonstrates how the project design addresses all of the required Core Elements.

**(a) Evidence-Based Design.** The consortium colleges conducted research to support the program design. Colleges reviewed numerous studies, white papers, and research articles to identify effective strategies. The programs planned are based on moderate or strong evidence of effectiveness. The research greatly impacted program design as the colleges are replicating or adapting existing evidence-based strategies. MoSTEMWINs proposes a comprehensive program design that brings together three types of strategies, all of which have moderate or strong evidence to support their use. The consortium is committed to using data for continuous improvement of programs. Table 7 lists the project activities that are supported by evidence and summarizes the evidence basis for engaging in those activities.

<b>Table 7: Evidence-Based Strategies Informing Project Plans</b>		
<b>Strategy</b>	<b>Evidence Basis</b>	<b>Actions Based on Evidence</b>
<p><b>Accelerate Entry Into Career Programs</b>—by refining assessment, transforming developmental education and adding support to meet the needs of participants</p>	<p><i>Effective Assessment and Placement Essential to Success</i><sup>8</sup>  <b>Strong evidence</b> that, used properly, assessment tools accurately predict student success in college-level courses. Evidence also shows current remediation practices do not lead to improved academic outcomes.</p> <p><i>Redesigning Developmental Education Increases Gains</i>  <b>Strong, moderate, and promising evidence</b> that acceleration can increase success: Contextualized developmental education/mainstreaming has <b>strong</b><sup>9</sup> and <b>moderate</b><sup>10</sup> evidence and</p>	<ul style="list-style-type: none"> <li>• Improve placement</li> <li>• Award credit for prior learning</li> <li>• Accelerate progress through developmental education</li> <li>• Add/enhance intrusive advising</li> <li>• Add portal model of tracking and advising</li> <li>• Introduce/expand self-paced online academic remediation resources</li> </ul>

<sup>8</sup>Hughes, K., and Scott-Clayton, J., “Assessing Developmental Assessment in Community Colleges,” *Community College Review*, 2011

<sup>9</sup>As cited in, Rutschow, *Unlocking the Gate* (the white paper is a literature review; ranks research results as rigorous or promising)

	<p>condensed/fast-track and modular courses have <b>promising</b> evidence of performance gains.<sup>11</sup> The evidence also reveals concerns about scalability of strategies, need for faculty development, and the need to change academic culture to encourage more collaboration.</p> <p><b><i>Prior Learning Assessment Increases Completion</i></b><sup>12</sup>  <b><u>Preliminary evidence</u></b> that students with Prior Learning Assessment (PLA) credit had higher graduation rates, better persistence, and lower time to degree, compared to students without PLA credit.</p> <p><b><i>Support Services Contribute to Student Success</i></b><sup>13</sup>  <b><u>Strong evidence</u></b> that enhanced advising leads to increased credits earned, persistence, and success in mathematics.</p>	<ul style="list-style-type: none"> <li>• Increase access through flexible times, rolling entrance, and online/hybrid courses</li> <li>• Enhance training with virtual simulations</li> <li>• Assess students for the ability to benefit from online learning</li> <li>• Develop technology skills through digital literacy education</li> <li>• Faculty development for incorporating new modalities</li> </ul>
<p><b>Create Clear Pathways to STEM Careers</b>—by expanding access to/developing new stacked and latticed credentials in programs that meet employer needs</p>	<p><b><i>Certificates Lead to Positive Employment Outcomes</i></b><sup>14</sup>  <b><u>Moderate to strong evidence</u></b> from a compilation of studies that indicate completing a certificate of at least 30 hours (a 1-year certificate) leads to higher employment and earnings outcomes. However, the most valuable certificates are clustered in certain industry sectors (healthcare, technology, and mechanic/repair trades).</p> <p><b><i>Sector-Based Training Leads to Higher Earnings</i></b><sup>15</sup>  <b><u>Strong evidence</u></b> from a three-site random assignment study of sector-focused training found participants earned 18% more than controls over a 24-month period. Partnerships among the workforce system, educational institutions, and employers enhance employment and wages.</p> <p><b><i>Effective Online Learning</i></b><sup>16</sup></p>	<ul style="list-style-type: none"> <li>• Align competencies, courses and credentials with industry needs</li> <li>• Create stackable/ latticed credentials and career pathway models</li> <li>• Revise existing and add new certificates and degrees to align with industry-endorsed certifications</li> <li>• Increase capacity to serve more participants in high-demand yet geographically-restricted programs</li> <li>• Outreach to employers and educate them about</li> </ul>

<sup>10</sup>Perin, D, *Facilitating Student Learning Through Contextualization*, Community College Research Center, 2011

<sup>11</sup>Rutschow, *Unlocking the Gate*

<sup>12</sup>Brigham, C., and Klein-Collins, R., *Availability, Use and Value of Prior Learning Assessment Within Community Colleges*, CAEL, 2010

<sup>13</sup>As cited in Rutschow, *Unlocking the Gate*: Scrivener, S. and Weiss, M. (2009); Visher, M., Butcher, K., and Cerna, O. (2010); and Bahr, P. (2008)

<sup>14</sup>Bosworth, B., *Certificates Count*, 2010, www.completecollege.org

<sup>15</sup>Maguire, et al., *Job Training That Works: Findings from the Sectoral Employment Impact Study*, Public/Private Ventures, 2009

<sup>16</sup>Neuhauser, "Learning Style and Effectiveness of Online and Face-to-Face Instruction," *American Journal of Distance Education*, 2002

	<p><b>Moderate evidence</b> that well-structured online courses taught by instructors adept at online formats are as effective as face-to-face instruction in terms of student test scores, assignment quality, participation, and grades.</p>	<p>specific certifications.</p>
<p><b>Improve Employment Attainment</b>—by working with industry, local WIBs, the state, and community-based organizations to engage, guide, and employ participants</p>	<p><i>Developing Soft Skills Can Enhance Employability</i><sup>17</sup></p> <p><b>Preliminary evidence</b> finds that students who only develop hard skills may be as difficult to employ as those who learn no skills at all. The research also found that support services and soft skills complement each other.</p> <p><i>Industry Participation Positively Impacts Outcomes</i><sup>18</sup></p> <p><b>Moderate evidence</b> that strong industry participation results in clear pathways and programs through which more students and/or graduates are better prepared for work and find higher-wage jobs with benefits.</p> <p><i>Community/Workforce Partnerships Increase Employment</i><sup>19</sup></p> <p><b>Preliminary evidence</b> that direct services from community nonprofits help low-income students succeed; internships and career counseling seem to increase employment outcomes.</p>	<ul style="list-style-type: none"> <li>• Add career education and guidance</li> <li>• Career navigators provide services at WIBs</li> <li>• Embed career navigators in occupational areas</li> <li>• Develop articulation and transfer agreements within the consortium and with universities, and trade schools</li> <li>• Ramp up industry internships available in target occupations</li> <li>• Continue community outreach to increase partnerships</li> </ul>

**(b) Career Pathways**

Aligning programs with the skill competencies required for certifications endorsed by the relevant industries is the crux of MoSTEMWINs. The intent is that all participants will exit career-ready with one or more industry-recognized certification that can be stacked and latticed for greater skill attainment and employment flexibility. In addition to purposefully creating short-term certificates that stack into longer certificates, and ultimately degrees, awarding credit for prior learning helps stack and lattice career pathways. Under MoSTEMWINs, consortium

<sup>17</sup>Houghton, T. and Proscio, T., *Hard Work on Soft Skills: Creating a Culture of Work in Workforce Development*, Public/Private Ventures, 2001

<sup>18</sup>Maguire, S., et al., *Tuning in to Local Labor Markets: Findings from the Sectoral Employment Impact Study*, 2010

<sup>19</sup>Conway, M., et al., *Courses to Employment: Partnering to Create Paths to Education and Careers*, Aspen Institute, 2012

members will further implement the statewide policy regarding credit for prior learning developed in MoHealthWINs and implement new assessment tools and best practices.

Consortium members will also participate in a pilot program with the Carpenters' District Council of Greater St. Louis and Vicinity to develop an approach for awarding academic credit for competencies obtained during apprenticeships.

*(i) Contextualized, Accelerated Remedial Coursework.* A key strategy is to compress and accelerate the traditional remedial sequence, thereby allowing participants earlier entry into their desired occupation program. This set of sweeping, systemic changes will enable participants to overcome the barriers that traditional developmental education places in their paths. The colleges will improve assessment tools used to determine students' academic readiness, train advisors on developing competency-based individual student success plans, modularize or accelerate course content and incorporate more contextualized and competency-based courses.

*(ii) Career Services and Guidance.* MoSTEMWINs consortium members will incorporate activities to enhance and expand student services, such as intrusive advising, career pathway mapping, and ensuring individual student learning gaps are addressed. Other institutions want to better accommodate awarding credit for prior learning and completion of learning modules.

*(iii) Explanation of Prior Learning.* Every consortium member is committed to refining methods by which participants can transition more smoothly into credit-bearing coursework. In MoHealthWINs, consortium colleges developed Missouri's first statewide credit for prior learning model. Consortium members have committed to scaling up implementation of the credit for prior learning policy through MoSTEMWINs, primarily by leveraging and adapting resources created by other TAACCCT grantees. These include the standardized test matrix from the Colorado Community College System, building the capacity of member institutions through

professional development and a library of policies and practices, and following the model of Indiana in collaborating with the state DWD to create policies that encourage and guide the use of prior learning assessments in the public workforce system.

**(iv) *Competency-Based Programs.*** MoSTEMWINs consortium members will redesign courses to incorporate competency-based course curriculum. Advisors will use assessments to develop competency-based individual student success plans. Each college has developed strategic plans for their targeted programs of study based on employer needs. The traditional information technology curriculum is being redesigned to provide the certifications in demand from employers; and incorporate competency-based curriculum tied to prior learning credit. Additionally, consortium members close to military bases will award credit for prior learning to veterans and develop programs to enable military personnel to meet requirements from national certifying bodies. Western Governors University will offer training on competency-based education designed to help faculty members understand the broad concept and more specific information targeted at administrators such as financial aid officers and registrars.

**(v) *Modularized Curricula.*** MoSTEMWINs consortium members will use technology to modularize and accelerate delivery of course content so that participants master required competencies and earn credentials more quickly. The colleges will offer many courses in modularized formats that provide participants with an opportunity to learn independently and interact with faculty and student support services in ways that promote learning, retention, and progress toward individual goals.

**(vi) *Stacked and Latticed Credentials.*** Programs are being structured so that participants may stop out, become employed and return to complete subsequent certificates or degrees while maintaining employment. The MoSTEMWINs strategy includes creating and revising short-term

certificates, long-term certificates, and associate degrees. The driving goal is to ensure the activities result in clear career pathways for TAA-eligible and other members of the target population, with stacked and latticed credentials. Table 8 illustrates latticed and stackable credentials for participants in the MoSTEMWINs occupational clusters. Many of the certificates, credentials, and credit for prior learning can articulate to associate and bachelor degrees.

<b>Table 8: Stacked and Latticed Credentials</b>		
<b>Industry</b>	<b>Credentials</b>	<b>Career/Occupations</b>
<b>Information Technology</b>	A.A.S. Computer Science/Info Systems: Systems Administration & Engineering, Healthcare IT Technician Certificate, COMPTIA A+ Hardware, COMPTIA A+ OS, Microsoft MCTS, COMPTIA Network+, ETA Customer Service Specialist, COMPTIA Healthcare IT, CISCO CCENT, Network Engineering, IT Help Desk, End User Support Specialist	Computer/network support techs and administrators, project managers, database administrators, cyber security, health information technology
<b>Health Sciences</b>	A.A.S. Nursing OR A.A.S. Health Information Management Certified Medical Assistant, Medical Office Assistant, Medical Billing/ICD-10, Pharmacy Tech, Patient Care Technician; Physical Therapist Assistant, Community Health Care Worker Cert.	Nursing; medical or therapy assisting; health info. management, technicians (ultrasound, radiology, respiratory), pharmacy techs
<b>Transport</b>	Advanced Driving, CDL, Logistics, Instrumentation	Drivers and operators
<b>Manufact.</b>	MSSC-Certified Production Technician, MSSC-Certified Logistics Technician, SME Certified Manufacturing Technician, AWS-Welding/fabrication, Mechatronics, Industrial Technology, Quality Control Technician, Applied Technology, Electrics Technology, ETA AC, ETA DC, ETA CETA, CTE, IFPS Connector and Conductor Technician and Mobile Mechanic, IFPS Mobile Mechanic, IFPS Pneumatic Technician, IFTS Hydraulic Mechanic,	Production, robotics, mechatronic, industrial engineering, or electrical techs; repairers of industrial machines, motors and tools; quality control, power plant operators
<b>Sciences</b>	Biological technician, Life Science Lab Assistant	Biological and chemical techs, forensic science techs, environmental, life or physical science techs

*(vii) Engagement of Employers and Industry Associations.* Consortium members have engaged employers and industry associations in discussions on programs. In response to employer requests, the colleges are adding, expanding, and revising programs. Employers have directed the updating of existing curricula to meet needs. For example, information technology curriculum is being revised to meet the needs and demand of local employers. Employers in every community are engaged as evidenced by the attached letters of commitment.

*(viii) Establishing transferability and articulation between institutions.* Consortium colleges will execute transfer agreements among themselves when applicable for all programs begun or redesigned through MoSTEMWINs. In fact, small working groups in each industry cluster will share the tasks of determining competencies and developing curricula, significantly streamlining the process of facilitating transfers.

Members are similarly committed to articulating relevant programs into other accredited public and private two- and four-year institutions. Many MoSTEMWINs consortium colleges already have articulation agreements with other colleges and universities. Jefferson College included letters of support from Central Methodist University and Missouri Baptist University referencing articulation and degree completion agreements in place. Other consortium members have begun articulation discussions for target programs that are not yet finalized, and the remaining members have committed to seeking out relationships to establish the transferability of their programs during the grant period. In addition, Western Governor's University has agreed to assist the consortium in developing statewide articulation agreements in relevant programs, so that Missouri residents may remain employed in the information technology field while completing a self-paced, competency-based bachelor's degree (see signed letter of commitment).

### **(C) Advanced Online and Technology-Enabled Learning**

**(i) *Incorporation of advanced technology into program design.*** Advanced technology elements are woven throughout the MoSTEMWINs project design and plan for delivery. At the curricular level, promising technology interventions are essential to modularizing and otherwise accelerating delivery of course content so that participants master required competencies and earn credentials more quickly. As many courses as possible will be offered in online or hybrid modalities, and a computer system simulation lab (leveraged from MoHealthWINs) at the lead institution is available to all participants in MoSTEMWINs information technology programs. Some consortium members will create MOOCS for selected developmental education courses. Technology, including the use of online, hybrid and other technology-enabled teaching methods, such as flipped classroom instruction, provides participants with the ability to time-shift their learning, learn at their own pace, and interact with faculty and student support services.

A primary strategy by which MoSTEMWINs will leverage previously created resources and tools is by obtaining learning materials from Open Educational Resource (OER) repositories, especially the Community College Consortium for Open Educational Resources<sup>20</sup> and Merlot (peer reviewed online teaching and learning materials by discipline).<sup>21</sup> The DREAM resource—Directory and Repository of Educational Assessment Measures (used in health science education)—a partnership between the MedEdPortal of the Association of American Medical Colleges and Georgia Regents University, may also be used.<sup>22</sup>

**(ii) *Expected impact of technology on program outcomes.*** The technology strategies described above were selected for their ability to positively impact program and participant outcomes. Accelerated and modularized developmental education and occupational courses

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<sup>20</sup><http://oerconsortium.org/>

<sup>21</sup><http://www.merlot.org/merlot/index.htm>

<sup>22</sup><https://www.mededportal.org/about/initiatives/dream/>

will enable participants to overcome deficits in basic skills and enter their desired career pathway more quickly, ultimately leading to earning a credential or multiple credentials and to re-entering the workforce. When developing or revising new courses and entire programs, consortium members will make use of Open Educational Resources whenever possible, in order to decrease development and implementation costs. Strategies such as IT simulation labs give participants essential hands-on experience in a safe environment where they can experiment with taking down an entire network and rebuilding it without damaging the operations of an actual business.

Also, the strategies focused on increasing organizational capacity of student data systems will facilitate smoother and accelerated career pathways as the systems are modified to accommodate awarding and tracking credits earned for prior learning, work experience, and self-paced skills-building modules, as well as courses offered on non-traditional calendars.

#### **(d) Strategic Alignment with the Workforce System and Other Stakeholders**

*(i) Alignment with Industry Sectors and Clusters.* As indicated in the attached letter of support from Missouri Governor Jay Nixon, MoSTEMWINs is closely aligned with and meets several objectives of Missouri's workforce and economic development plans. The Missouri Workforce Strategic Plan for 2012-2016 is explicitly linked to the *Strategic Initiative for Economic Growth* and identifies the seven target clusters that represent Missouri's strongest possibilities for job creation and economic growth. MoSTEMWINs targets five of these seven: 1) Advanced Manufacturing; 2) Life Sciences; 3) Health Sciences; 4) Information Technology; and 5) Transportation.<sup>23</sup>

*(ii) Targeting Education and Training Strategies.* In addition, the state workforce

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<sup>23</sup>The State of Missouri's Workforce Integrated Plan for Program Years 2012-2016  
[https://worksmart.ded.mo.gov/includes/secure\\_file.cfm?ID=2624&menuID=6](https://worksmart.ded.mo.gov/includes/secure_file.cfm?ID=2624&menuID=6)

development plan identifies specific tactics to help achieve the state's goals. The fourth tactic, "Develop optimized and coordinated cluster-based career-training pipelines, protocols and assessments," focuses on addressing workforce development needs and issues, including barriers to successful completion of education and training. The recommendations of this report have guided the development of the MoSTEMWINs priorities and strategies. Colleges recognize that adult learners have real barriers to obtaining the certificates, credentials and degrees they need to obtain high-paying jobs in high-demand industries. Eliminating barriers and speeding time to completion are essential to developing the workforce and to the state's economic development.

***(iii) Collaboration with the public workforce system.*** As was described in the section on ***Partnerships with TAA Agencies*** in the Statement of Need, the colleges that comprise the MoSTEMWINs consortium have long-standing strong collaborative relationships with Missouri's public workforce system, including the Division of Workforce Development within the Department of Economic Development and MERIC. Local WIBs, which serve as administrators of Missouri's one-stop career centers, are also essential to identifying, recruiting, and assessing participants and will assist them with re-entering the workforce. In addition to the strong relationships between individual institutions and their local WIBs, MoSTEMWINs consortium members have collectively collaborated with the state WIB during the prior MoWINs projects. The relationships are strong, lines of communication are open, and processes and procedures have been developed. Local WIBs have been essential in planning this project, as evidenced by the attached letters of commitment.

***(iv) Contract to Provide Services or Activities.*** The Missouri Division of Workforce Development and the WIBs have agreed to:

- Coordinate business outreach activities in order to mitigate duplication of effort and

using “one voice” to work with businesses;

- Communicate and coordinate on curriculum and credential needs for STEM industries
- Leverage similar workforce and economic development projects and funds;
- Develop strategies for sharing information relevant to employment and education outcomes;
- Develop outreach strategies to attract participants for the project; and
- Develop data-sharing agreements that allow use of DWD wage data and employment data to evaluate employment performance metrics.

**(v) Collaboration with Partner Organizations.** MoSTEMWINs colleges are collaborating with a variety of partner organizations, especially those engaged in specific industries. The St. Louis Carpenters Joint Apprenticeship Program (CJAP) will partner with the colleges to provide participants with industry-certified training that offers national, portable certifications. KCnext – the Technology Council of Great Kansas City and its 115 industry members provided input regarding training and employment requirements during the planning phase and are committed to supporting the MoSTEMWINs project in numerous ways including curriculum design, internships, work experiences, priority for interviews, assistance with finding qualified adjunct instructors, and contributions to scholarships in targeted programs. In addition to technology partnerships, manufacturing organizations are also supporting the projects. The Mineral Area Training Consortium and its 16 members has a partnership agreement with Mineral Area College to support the project. Regional planning commissions, chambers of commerce, and regional economic development groups are also actively participating in the activities.

**(e) Alignment with Previously Funded TAACCCT Projects.** MoSTEMWINs will achieve alignment with previously funded projects in two ways. First, MoSTEMWINs members are

collaborating in the already-funded MoWINs projects. Some strategies proposed in this application scale up promising practices developed during MoHealthWINs. These strategies will be packaged so they can be adopted and adapted by other consortium members, thereby extending reach. Because a collaborative statewide consortium team is already in place and essential policies, procedures, resources, and communications strategies have already been built, a Round 4 project can begin immediately upon award. Consortium members will be able to focus their expertise, time and resources on implementing project strategies right away, rather than engaging in a long start-up process.

Second, the MoSTEMWINs planning team also conducted extensive research into previously funded TAACCCT projects, especially those with a STEM focus or for which refining developmental education was an essential strategy. Many elements of the projects designed by previous grantees inspired changes or additions to this project, and MoWINs leadership has contacted them to request their assistance or access to resources. For example, the Colorado Community College System has committed to consulting with MoSTEMWINs on developing online student portals and identifying best practices in developmental education. Similarly, MoWINs leadership has reached out to Northern Virginia Community College (NOVA) and the State of New York (SUNY) TAACCCT grantees to request versions of their comprehensive screening methodology developed for awarding credit for prior learning. Leveraging the tools and proven processes developed by NOVA and SUNY will enable MoSTEMWINs to move quickly and not duplicate already developed resources. Similarly, team members were intrigued by the changes implemented by Sinclair Community College, which provided the impetus to seek a relationship with Western Governor's University. MoSTEMWINs implementers will reach out to this grantee and request information on the redesigned curricular modules for non-

credit courses so they can adopt the designed curricula rather than having to begin from scratch.

***(f) Sector Strategies and Employer Engagement***

***(i) Successful Sector Strategies.*** Employers in every college's service area have been essential in planning this project, as evidenced by the attached letters of commitment. New programs have been planned and strategies to expand or revise existing programs have been developed in response to direct employer requests. In central and northeast Missouri, the regional economic development board communicated significant employer need for electrical/mechanical skills that led to Moberly Area Community College's creation of a new emphasis in its mechatronics program. In the Ozarks area, demand from a regional applied research firm (with multiple corporate affiliates) and a national geo-sciences firm informed the design of a new program of study with stackable credentials that lead to an associate degree in laboratory sciences at Ozarks Technical Community College.

***(ii) Employer Involvement in Program Strategies and Goals.*** Employers have directed the revamping of existing curricula as well. This is most evident in IT. Consortium members in St. Louis and Kansas City convened industry association groups, which communicated that traditional academic computer science programs were not producing employees with the skills employers need. Thus, in MoSTEMWINs, IT curricula are being revamped or completely restarted to consist of multiple stacked and latticed industry-standard credentials from such providers as Cisco, Microsoft and CompTIA. All consortium members have committed to continuing to provide candid input into the curriculum and guiding the colleges in creating or revising programs as needed.

***(iii) Level of Commitment for Employers and Industry Representatives.*** Employers have indicated their willingness to continue to be involved with the project in a myriad of ways

including serving on advisory committees, lending expertise to curriculum development, providing participants with training opportunities including internships, and providing participants with first consideration for available jobs. Unilever asked Three Rivers College to assess production workers’ skill levels in mechanical engineering, electrical engineering, and instrumentation to develop a program to cross-train workers. Table 9 and the attached letters of commitment provide a sample of the employers from which consortium members have obtained commitments to support the project.

<b>Table 9: Employer Commitments By College</b>		
<b>College</b>	<b>Industry</b>	<b>Commitment</b>
<b>Crowder</b>	Transp.	Transport Distribution Company, Conway Truckload, and Tyson Foods will provide internships and job shadowing, give priority interviews to completers, advise on competencies, provide adjunct instructors, and share resources to support education and training in classrooms and/or laboratory settings.
<b>East Central</b>	Manuf.	Henniges Automotive Sealing System and Aerofil Technology will provide feedback, recognize the competencies and skills, and provide hiring consideration.
	IT	Developmental Services of Franklin County and WashPC will implement project strategies, provide work-based training opportunities, and refer individuals to the college for training.
<b>Jefferson</b>	IT	Second Sight Systems will provide adjunct faculty, job shadowing and potential internship opportunities and hire JC graduates.
	Health	Crothall Healthcare will assist with curriculum, provide job shadowing and internships, and hire JC graduates.
	Manuf.	H-J Enterprises, C.A.P.S. Inc., and Production Castings will identify competencies, provide or share resources to support education and training, offer internships and job shadowing and hire JC graduates.
<b>MCC</b>	IT and Health	KCnext will provide paid or unpaid internships, job shadowing, career speakers, and share or provide equipment/supplies for educational use. Samuel U. Rogers Health Center will assist with curriculum, provide clinical experiences, and give priority employment interviews.
<b>Mineral Area</b>	Manuf.	The Mineral Area Training Consortium will provide feedback on curriculum, internships, facility tours, and provide hiring consideration. Mondi Jackson, Inc. will provide input on competencies and skills needed, internships, and hiring considerations.

	Health	Pharmax Pharmacy will serve as a clinical site and provide hiring considerations and program referrals.
<b>Moberly</b>	Manuf.	Spartan Light Metal Products will assist with curriculum, provide hiring consideration, and refer individuals to the college for training.
<b>Ozarks</b>	Science	Jordan Valley Innovation Center and Chesnut Labs will provide instructors in the Chemical Tech. program, internships and facility tours and will recruit participants.
<b>St. Charles</b>	Manuf.	Wainwright and Component Bar Products, Inc. will identify needed skills and competencies, advise on the curriculum, and refer individuals.
	Science	SunEdison will identify needed skills and competencies, advise on the curriculum and consider developing work-based learning activities as possible.
<b>St. Louis</b>	Health	SSM Health Care (7-hospital system) will serve as a clinical partner, provide job shadowing, and give priority interviews and career education. Casa de Salud, StL County Health Dept., Myrtle Hilliard Davis Comprehensive Health Centers, StL Public Schools to provide work based experience
	Science	The Donald Danforth Plant Science Center has agreed to provide paid or unpaid internships that provide work-based experience credit and give hiring considerations.
<b>State Fair</b>	Health	Golden Valley Memorial Healthcare, Bothwell Regional Health Center, and Katy Trail Community Health have all agreed to provide feedback, hiring consideration, and work-based training opportunities.
<b>State Technical</b>	IT	TEC is interested in providing job shadowing opportunities to participants.
		STCM will work with the Department of Corrections and their employment company Next Step 99 to provide participants and assist in their employment.
<b>North Central</b>	Manuf.	Donaldson Co., Inc and Modine Manufacturing will identify skills, provide work-based training, hiring consideration, and refer individuals.

**(g) Project Workplan**

MoSTEMWINs will implement three major strategies as described in Table 10. The three strategies are intertwined into a systemic approach to moving TAA-eligible, veterans, unemployed, underemployed, and low-skilled workers into high-demand, high-paying careers in STEM-related fields. Through the three strategies, the 13 colleges are working together to address a critical issue of retention and completion rates of participants.

<b>Table 10: Project Strategies</b>	
<b>Major Strategy</b>	<b>Methods</b>
<b>1) Accelerate Entry Into Career Programs</b>	Refine assessment, transform developmental education and add support services to meet the needs of participants
<b>2) Create Clear Pathways to STEM Careers</b>	Expand access to and/or develop new stacked and latticed credentials in programs that meet employer needs
<b>3) Improve Employment Attainment</b>	Collaborate with industry, WIBs, state, and community-based organizations to engage, guide and employ participants

**Strategy 1** will accelerate the entry of TAA-eligible workers and other members of the target population into STEM programs. Several MoSTEMWINs colleges are compressing and accelerating (and sometimes by-passing completely) the traditional developmental education sequence, thereby enabling participants to enter their desired occupational programs sooner.

Recognizing that having excellent occupational programs to meet employer demand is insufficient if the targeted participants never enter those programs, consortium members are committed to transforming developmental education statewide. A working group will meet immediately upon award and begin to collect and synthesize the most recent and reliable research documenting best practices and the characteristics of institutions that are successful at scaling up such innovations for significant impact. Whenever possible, actual course modules, syllabi and faculty training materials will be obtained from previous grantees, other sources, and consortium members for the MoSTEMWINs resource library for implementers to use as models, thereby accelerating the process and reducing duplication of effort.

However, this important effort will not delay colleges from beginning to revamp basic skills and developmental education programs in Year 1 and to lay the groundwork that can support the redesigned courses once they are developed. Some members, are responding to research indicating that the tools used to assess students' readiness to enter into college-level coursework

often result in improper placements,<sup>24</sup> and will obtain more precise assessment instruments and train advisors to develop competency-based individual student success plans and lay out a plan for students to achieve the necessary competencies. A third major effort will be to scale up a promising practice developed by one MoHealthWINs member, a career-specific portal that groups together targeted advising, career pathways mapping, accelerated basic skills building and developmental material that is customized to the targeted occupation. Multiple member colleges will implement that career portal in varying career specialties. Table 11 and the Workplan specifies which members are pursuing which major methods.

<b>Table 11: Activities to Accelerate Entry into Career Programs</b>	
Assessment, Advising, and/or Coaches	MCC, CC, EC, JC, MAC, MACC, NCMC, OTC,
Digital Literacy	CC, JC, NCMC, MAC
Modular/Accelerated and/or Competency-Based Course Redesigns	MCC, CC, EC, JC, MAC, MACC, NCMC, OTC,
Portal	JC, SLCC, STCM, SCC

**Strategy 2** focuses on creating clear pathways to STEM programs in the five Missouri priority industries—Information Technology, Health Sciences, Transportation, Manufacturing, and Life Science. Colleges determined which MoSTEMWINs programs to offer based on employer identified workforce needs. It is a sector-based approach that depends heavily on the leadership and candid advice of employers and other industry partners to enable the colleges to improve their training programs to better meet local and statewide workforce needs. However, it is important to note that Strategy 2 is inextricably linked to Strategy 1 because developmental education strategies must be redesigned to accelerate entry into the target occupational programs. Table 12 lists credentials to be added or revised through MoSTEMWINs and which are linked pathways for completers of the entry strategies.

<sup>24</sup>Hughes, K., “Assessing Developmental Assessment in Community Colleges,” *Community College Review*, 2011

<b>Table 12: Credentials to be Created or Revised and Existing Credential Pathways for Participants</b>			
<b>Program of Study</b>	<b>New Credentials to Be Created</b>	<b>Credentials to Be Revised</b>	<b>Existing Credentials - Enter Through Portal</b>
<b>Information Technology</b>	<ul style="list-style-type: none"> <li>• Add at least 25 industry certifications (such as IC<sup>3</sup>, Microsoft, Cisco, CompTIA)</li> <li>• Cert. Assoc. Health. Info. Systems</li> <li>• AA Cyber Security</li> <li>• AA Systems Admin &amp; Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Add industry certification to existing courses</li> <li>• Comp. Supp. Spec., Database Analyst, Desktop Supp. Tech.</li> <li>• Network Admin., Info. Systems. Tech., Comp. Supp. Tech.</li> <li>• Network Engineering</li> <li>• COMPTIA A+ Hardware</li> <li>• COMPTIA A+ OS</li> <li>• Microsoft MCTS</li> <li>• COMPTIA Network+</li> <li>• ETA Customer Service Specialist</li> <li>• COMPTIA Healthcare IT</li> <li>• CISCO CCENT</li> </ul>	<p><i>Computer Information Systems (CIS) and CIS: Criminal Justice Cyber Security Option, Network Tech., Info. Tech. Project Manager, Health Info. Tech. Management, Cyber Security, Microsoft Support Tech., Database Analyst, Help Desk/End-User Support Specialist, Network Engineering, Certified Ethical Hacker and AAS Network Engineering (SLCC), Non Credit Cert. of Completion MSW Portal (STLCC)</i></p>
<b>Health Sciences</b>	<ul style="list-style-type: none"> <li>• Ultrasound Tech Cert</li> <li>• Medical Billing</li> <li>• Medical Office Assistant</li> <li>• Certified Medical Assistant</li> <li>• Certified Associate Healthcare Information and Management Systems</li> <li>• AAS Radiology</li> <li>• Community Health Worker</li> </ul>	<ul style="list-style-type: none"> <li>• PharmTech-add business management</li> <li>• PharmTech-become accredited</li> <li>• PharmTech-make 16 hours of credit transferable</li> </ul>	<p><i>LPN/RN, PT Assist., OT Assist., Cert. Respiratory Therapist, Resp. Therapy Assist, Radiologic Tech., CNA, Cert. Health Info. Tech., Nurse Aide, Nurse Aide Prof. Cert., Patient Care Tech., Prof. Cert. in Medical Coding Medical Assist., Ultrasound Tech, Certified Dental Hygienist), Non Credit Cert. of Completion MSW Portal (STLCC), Non Credit Cert. of Completion MSW Portal (STLCC), Non Credit Cert. of Completion MSW Portal (STLCC) ), Non Credit Cert. of Completion MSW Portal (STLCC) ), Non Credit Cert. of Completion MSW Portal (STLCC)</i></p>
<b>Transport.</b>	<ul style="list-style-type: none"> <li>• Cert in Advanced Driving</li> </ul>		<p><i>CDL, Advanced driving cert. (Safety, Double-Triple Trailer, Haz-Mat), Instrumentation, Logistics, First Responder Operator</i></p>

<p><b>Manufact.</b></p>	<ul style="list-style-type: none"> <li>• MSSC-CPT, CLT</li> <li>• IFPS Cert. Connector &amp; Conductor</li> <li>• Technician and Mobile Mechanic</li> <li>• IFPS Cert Mobile</li> </ul>	<ul style="list-style-type: none"> <li>• AAS Indust. Tech.</li> <li>• Mechatronics</li> <li>• MSSC-CPT</li> <li>• AWS Basic, Specialty</li> <li>• SME Cert.</li> </ul>	<p><i>Electronics and Automation Technology, Applied Technology, Industrial Technology-Electrical Technician or Industrial Technician or Quality, Precision Machining Technology), Cert of Specialization Prec. Mach. Technology (STLCC), Non Credit Cert. of Completion MSW Portal (STLCC)</i></p>
	<p>Mechanic</p> <ul style="list-style-type: none"> <li>• AAS Indust. Tech.- Mechatronics</li> <li>• ETA: AC, DC, CETA, CTE</li> </ul>	<p>Manufacturing Tech</p> <ul style="list-style-type: none"> <li>• IFPS Cert Pneumatic Tech</li> <li>• IFTS Cert Hydraulic Mechanic,</li> <li>• Electronics Technology CTE Cert.</li> </ul>	<p><i>Control Technician</i></p>
<p><b>Science</b></p>	<ul style="list-style-type: none"> <li>• AAS Chemical Technology</li> <li>• AAS Environment Sciences</li> <li>• Cert. as Chemical Tech.</li> </ul>	<ul style="list-style-type: none"> <li>• Life Science Lab Assist.</li> <li>• Chemical/Biological Techniques and Protocols</li> </ul>	<p><i>Certificates as Chemical Technician; Biological Technicians; Life, Physical, Social Science Technician; Forensic Science Technician and AAS in Biotechnology</i></p>

The strategy includes creating new short-term certificates, long-term certificates, and associate degrees while also expanding access to and the capacity of existing high-demand programs through new locations, mobile learning units, and flexible scheduling.

MoSTEMWINs proposes to open a career pathway by 1) providing the certifications most in demand by local employers, and 2) developing uniform standards for prior learning by allowing credits to stack into certificates and degrees. In all industries selected, the driving design factor is ensuring that MoSTEMWINs activities result in stronger career pathways for participants, with clearly stacked and latticed opportunities. Each member college has developed strategic plans of action for their targeted programs of study based on differences in regional employer needs. For example, rural institutions with vast service areas are expanding their locations and developing mobile labs to help participants overcome barriers of time and transportation.

Finally, **Strategy 3** focuses on aggressively seeking out employment and internship opportunities and connecting participants to them. It is common for students to enroll in college believing they want to pursue a career in “computers” or “health” having little understanding of specific job requirements and their own aptitudes and interests. This lack of understanding and direction leads students to drift from course to course as they “try out” one possible career path and then another. Unfortunately, such an approach can be deadly to a student’s progress.<sup>25</sup> Thus, several members will add career exploration courses, workshops, speakers’ series, and job tours to help participants understand the career paths.

Colleges are also incorporating soft skills training as well as providing interview assistance and resume reviews. Then, career navigation services and career advising will continue to follow the participant through the educational sequence. At the same time, member colleges will continue to build on their existing strong relationships with the local WIBs to collaborate on recruiting participants into the programs, leveraging WIB resources, referring participants to relevant support services at community-based organizations as well as at the colleges, and identifying placement opportunities once participants are ready for employment.

When it comes to placement, consortium members, along with assistance from identified industry associations, will continue to broaden and deepen the pool of employer partners willing to host paid or unpaid internships or clinical experiences at their locations. Regularly assessing employer satisfaction with interns placed at their sites will enable colleges to make program changes if necessary to improve participant skills and knowledge. Strong employer relationships are also essential to identifying current and expected job openings, and the consortium will maintain regular communication with key employer partners to ensure that program participants receive full consideration and, sometimes, first consideration for employment opportunities.

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The Workplan that begins on the next page summarizes these strategies, indicating the implementers, major milestones, expected deliverables and budgeted cost per strategy. *Costs per strategy may not include non-strategy specific costs (e.g. indirect costs and some contractual costs); project management costs have been equally distributed across the three strategies.*

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<sup>25</sup>Scott-Clayton, J. “The Shapeless River: Does a Lack of Structure Inhibit Students’ Progress at Community Colleges?” Assessment of Evidence Series, Community College Research Center, 2011

**Table 13: MoSTEMWINS Workplan**

Activities and Implementers		Implementers	Costs	Time	Deliverables
<b>Strategy 1:</b>  <b>Accelerate Entry Into Career Programs</b> —by refining assessment, transforming developmental education and adding support services to meet the needs of TAA-eligible and other participants	<b>Year 1</b> Align basic skills and digital literacy with occupational courses and programs  Accelerate program entry through a combination of contextualized courses and competency-based methods	Consortium Member Colleges, MCCA, and subject matter experts in developmental education	Total Cost of Strategy: \$2,920,138  Equipment: \$0	Start Date: 10/1/14 End Date: 9/30/18  <b>Milestones:</b> <b>Year 1</b> Implementation of selected assessments  Collection of best practices, evidence-based methods for improving dev. Ed, support services	<b>Year 1:</b> Diagnostics implemented  Redesigned developmental courses  Targets set for increasing entry into college-level courses  Members trained on portals
	Accelerate and contextualize the developmental education experience incorporating competency-based and self-paced instructional delivery  Develop a STEM Readiness Portal for entering students providing assessment, career counseling, academic advising, remediation and orientation to STEM programs	<b>Portals:</b> JC, SLCC, STCM, SCC  <b>Assessment, Advising, Transitions, and/or Coaches:</b> All Colleges  <b>Modular/accel./comp. based Dev. Ed. course redesigns:</b> All Colleges but JC, SFCC  <b>Digital Literacy:</b> CC, JC, NCMC, MAC	Year 1: \$834,258  Year 2: \$918,993  Year 3: \$920,547  Year 4: \$246,341	Year 1: Develop and implement plan for supporting students through navigation program  <b>Year 2</b> Redesigned developmental curricula  New assessment and placement practices integrated into colleges  Advisors trained and guiding students  <b>Year 3</b> Professional development continues  Advisors guiding students  Outcomes data analyzed	<b>Year 2:</b> Enhanced programs and courses that combine learning modalities, including online, classroom, simulations  Target developmental courses aligned with occupational courses and programs supporting accelerated program entry/completion  Advisors trained and in place  Articulation and transfer

	<p>Adapt career pathway portal to their programs</p> <p>Enhance advising to participants</p> <p><b>Year 3</b> Assess early results of dev ed, contextualized support, intrusive advising and placement strategies to modify if necessary</p> <p><b>Years 1-4</b> Conduct consortium professional development and consulting</p> <p>Evaluate outcomes:</p> <ul style="list-style-type: none"> <li>• Participants completing credit hours</li> <li>• Participants earning credentials</li> <li>• Participants enrolled in further education</li> </ul>			<p>from Y1&amp; Y2 to inform any program changes</p> <p><b>Years 1-4</b> Evaluation results for process outcomes for this strategy, in addition to participant outcomes</p>	<p>agreements in place</p> <p><b>Year 3:</b> State approval of redesigned/ new courses and degrees ensure they are WIA and/or Pell-eligible</p> <p>Scaling plan for contextualized accelerated dev ed courses to career pathways</p> <p><b>Year 4:</b> Final evaluation of process outcomes for this strategy and participant outcomes</p>
Activities		Implementers	Costs	Time	Deliverables
<p><b>Strategy 2:</b></p> <p><b>Create Clear Pathways to STEM Careers</b> — by expanding access to/ developing</p>	<p><b>Year 1</b> Map education and career pathways and stackable credentials</p> <p>Identify &amp; validate courses, competencies, and credentials with business &amp; industry</p> <p>Articulate Credit for Prior Learning processes for target</p>	<p>Consortium Member College faculty, with Industry representatives, WIBs, Career Centers and universities</p> <p><b>STEM</b></p>	<p>Total Cost of Strategy: \$5,061,455</p> <p>Equipment: \$558,687</p> <p>Year 1: \$1,460,866</p>	<p>Start Date: 10/1/14 End Date: 9/30/18</p> <p><b>Milestones:</b></p> <p><b>Year 1</b> Framework for career pathways developed based on promising practices in the consortium, state, and nation</p>	<p><b>Year 1</b> Career/educational pathways guide and outreach materials for students created</p> <p>Industry partnerships and competency profiles in place</p> <p>Criteria and process for</p>

<p>new stacked and latticed credentials in programs that meet employer needs</p>	<p>programs Design new and revised curricula <b>Year 2</b> Continue to design and revise and begin to pilot new curricula Assess and offer credit for prior learning and competencies Establish transfer and articulation agreements <b>Year 3</b> Offer credit for prior learning, noncredit courses, OJT, military experience and other competencies Enroll participants in all new/revised programs <b>Years 1-4</b> Provide professional development and consulting across the consortium Conduct evaluation activities to report outcomes:  <ul style="list-style-type: none"> <li>• Total unique participants served</li> <li>• # who complete a grant-funded program</li> <li>• # retained</li> </ul> </p>	<p><b>programs focused on IT:</b> EC, STCM, MCC, SFCC, SCC, SLCC <b>Health Sciences:</b> JC, MAC, SFCC, SLCC <b>Transport:</b> CC, <b>Manufact:</b> JC, MACC, SLCC, TR, NCMC, SCC <b>Life/Physical Sciences:</b> OTC, SLCC</p>	<p>Year 2: \$1,790,268 Year 3: \$1,549,296 Year 4: \$261,025</p>	<p>Model, process, and timeline for each program area to complete business and industry validation Inventory and sharing of promising practices regarding prior learning Curricula ready to pilot, programs equipped <b>Year 2</b> New courses/programs offered Prior learning credit expands Transfer/articulation agreements completed <b>Year 3</b> Credit for prior learning/competencies accelerating participant progress <b>Years 1-4</b> Professional development activities Evaluation results for process outcomes for this strategy, in addition to participant outcomes</p>	<p>assessing prior learning for each program New/revised courses and credentials <b>Year 2</b> Participants enrolled in new /revised programs Model for offering credit for prior learning or training Transfer and articulation agreements in place for programs <b>Year 3</b> Participants enrolled in new/revised programs Rates of dev. ed. completion increased and accelerated More underprepared students' progress to college courses Participant outcomes (completions, credentials and credits earned, employment) <b>Year 4</b> Final evaluation of process and participant</p>
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				outcomes	
Activities		Implementers	Costs	Time	Deliverables
<p><b>Strategy 3:</b></p> <p><b>Improve Employment Attainment</b>—by working with industry, local WIBs, the state, and community-based organizations to engage, guide and employ participants</p>	<p><b>Year 1</b> Develop career exploration education for participants</p> <p>Career navigators collaborate with WIBs, working on-site when possible</p> <p>Enhance working relationship with WIBs, employers, social agencies, industry consortia and planning councils to recruit, refer, and help place students</p> <p><b>Years 2-3</b> Enhance career navigation services</p> <p>Strengthen relationships with and commitments from business and industry to increase hiring and retention outcomes</p> <p>Scale up industry internships</p> <p>Assess employer satisfaction with internship programs; modify as necessary</p> <p><b>Years 1-4</b> Evaluate outcomes:</p> <ul style="list-style-type: none"> <li>• Participants employed</li> <li>• Participants retained in</li> </ul>	<p>All Consortium Member Colleges (esp. career navigators, advisors), WIBs, industry partners, sector consortia, planning councils, social agencies</p>	<p>Total Cost of Strategy: \$5,508,860</p> <p>Equipment: \$0</p> <p>Year 1: \$1,197,445</p> <p>Year 2: \$1,530,521</p> <p>Year 3: \$1,773,687</p> <p>Year 4: \$1,007,208</p>	<p>Start Date: 10/1/14 End Date:9/1/18</p> <p><b>Milestones:</b></p> <p><b>Year 1</b> Career exploration materials developed for STEM programs</p> <p>Hire career navigators</p> <p>Inventory of best practices and gaps in recruitment, retention, and placement for programs</p> <p>Recruitment and outreach to industry plan developed</p> <p><b>Year 2</b> Career navigators embedded in the academic advising areas</p> <p>Inventory of promising practices and gaps regarding hiring, retention, and advancement in target sectors</p> <p>Inventory of promising practices and gaps in tracking employment related outcomes</p> <p>Expanded inventory of internships</p> <p><b>Year 3</b> Increased internship placements and participant</p>	<p><b>Year 1</b> Career navigation function in place</p> <p>Recruitment, referral, and placement processes in place</p> <p><b>Year 2</b> Hiring, retention, and advancement processes in place between colleges, partners, and business and industry</p> <p>Internship processes in place between industry and colleges</p> <p>Data collection system in place between consortium and state to track and report on employment, retention, and wage related outcomes</p> <p><b>Year 3</b> Records of internship placements and hiring</p> <p><b>Year 4</b> Final evaluation of process outcomes for</p>

	<p>employment after program of study completion</p> <ul style="list-style-type: none"> <li>• Incumbent worker participants who receive a wage increase post-enrollment</li> </ul>			<p>hiring</p> <p><b>Years 1-4</b></p> <p>Evaluation results and participant outcomes</p>	<p>this strategy, in addition to participant outcomes</p>
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### (3) Outcomes and Outputs

#### a. Analysis of Outcome Projections

(i) *Appropriate annual targets projected.* The annual numerical projections for each of the nine required outcome measures reflect the impact of MoSTEMWINs on participants (Table 14). Projections were carefully calculated by each individual consortium member for each of its targeted programs of study, and then combined into the total. Several factors informed the process of making accurate projections regarding participant numbers, including experience with previous TAACCCT-funded programs, college administrative data, employment demand identified through primary and secondary research, capacity of the planned training programs, resource constraints, anticipated higher completion for shorter-term certificate programs than for two-year programs, increasing industry support for certifications in the various occupations, and availability of tuition reimbursement programs, financial aid and/or scholarships.

(ii) *How targets were derived and how they fit into grant timeline.* Every consortium member completed a version of the Participant Outcomes form to add together the number of participants in every grant-funded program. Consortium member calculations were then rolled into Table 14. Calculations for subsequent items were based on a logical number of unduplicated participants progressing through the program of study. The projections also align logically with the grant calendar. The numbers to be served in Year 1 are the lowest because some programs must be developed before students can enroll. Numbers will rise in the second and third years as program outreach and education begins and classes fill.

<b>Table 14. MoSTEMWINs Outcome Measures</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4*</b>	<b>Total</b>
Total Unique Participants Served	424	908	521	-	1853
Total Number of Participants Completing TAACCCT-funded Program of Study	320	785	385	-	1490
Total Number of Participants Still Retained in Their Program of Study or other TAACCCT-	74	93	106	-	273

funded Program					
Total Number of Participants Completing Credit Hours	404	888	501	-	1800
Total Number of Participants Earning Credentials	310	765	370	-	1445
Total Number of Participants Enrolled in Further Education after TAACCCT-funded Program of Study Completion	42	90	52	-	184
Total Number of Participants Employed After TAACCCT-funded Program of Study Completion (non-incumbent workers only)	85	345	122	131	683
Total Number of Participants Retained in Employment after Program Study Completion (non-incumbent only)	73	294	104	112	583
Total Number of those Participants Employed at Enrollment Who Received Wage Increases Post-Enrollment (incumbent only)	195	395	138	114	842

*(iii) Reasonable mix of deliverables and outcomes.* Deliverables and outcomes are well balanced. The project will serve 1,853 unique students through new or revised programs leading to numerous types and levels of industry-recognized credentials. A reasonable number of unique students have been projected based on the size and capacity of the member institutions and the fact that the training is primarily accelerated and short-term. From that entry point, it is expected that participant numbers in subsequent categories will steadily decrease as participants exit along the pathway. Other deliverables are listed in the Workplan, but include completed courses, new/expanded/revised degree and certificate programs, inventories of best practices in developmental education and prior learning assessment, and an increased portfolio of internship opportunities. As these other deliverables are produced for the sole purpose of increasing participant outcomes, the balance is appropriate.

**(b) System or Process for Tracking and Reporting Outcome Measures**

*(i) Existing student tracking procedures and systems.* All consortium colleges use enterprise data systems, such as Banner, PeopleSoft, Datatel, or Jenzabar, to record and track student data

for state and federal reports as well as their own assessment processes. Each student has a unique student identifier that allows data to be tracked for project participants and that also allows student information to be disaggregated by gender, race, age, and other factors. In addition, the colleges will track enrollment, retention, GPA, transfer credits, college placement scores, skill assessments, certifications, and certificates and/or degrees earned. Participant data are reported quarterly to the project's data team as referenced in the attached Evaluation Plan Summary. The data team will also assist colleges with data collection for non-credit workforce training (e.g., additional information on student demographics, skill assessments, course outcomes, etc.). An essential function of the data team is to standardize the data arriving from the different campus databases into the consortium's outcomes tracking database and to enable consortium reporting to USDOL and other stakeholders.

*(ii) Plans to address gaps in tracking procedures.* Tracking participants once they complete TAACCCT-funded programs to determine if they are continuing their education elsewhere, have re-entered the workforce, or have received a pay increase presents significant challenges. The data team assists the colleges by accessing multiple resources to track and verify participant outcomes. These strategies have proven effective for previous MoWINS projects. First, colleges and the data team can follow participants through their education and training into their employment future through Missouri's job matching portal, MissouriCareerSource.com (MCS), the online resource by which all Wagner-Peyser (Job Service), WIA, and Trade Act participants interact with the state. Second, all of the consortium members participate in the National Student Clearinghouse, which can be used to determine subsequent enrollment at another institution of higher education. Finally, the attached Employment Results Scorecard to be developed by this project will also help close this information systems gap.

**(C) Using Data for Continuous Improvement**

*(i) Processes and procedures to review data regularly.* Assessment is a critical component of how the consortium colleges make decisions about working with students and their learning outcomes and how to effectively support economic development in their respective communities across the state. As has been described, each consortium college reports participant and outcome data at least quarterly to the statewide data team for compilation and reporting to the Department of Labor and back out to the entire consortium. The colleges will also track and report their progress on meeting key milestones, lessons learned, leveraged resources obtained, and new employer partners added. Grant leaders from every college will meet monthly either in person or online web meetings to review the data, determine if milestones and outcomes are being met, and make recommendations for changes. This rigorous, regular formative evaluation process ensures that program activities can be adjusted quickly if they are not achieving their desired outcomes. Furthermore, the third-party evaluator will provide an extensive written annual report to enable MoSTEMWINs to make data-based decisions about how to sustain strategies and report on outcomes to their key stakeholders.

*(ii) Using Data to Ensure Sustainability.* MoSTEMWINs colleges will ensure that the strategies and activities that prove successful based on the data will be introduced, vetted, and written into institutional practice, thus sustaining them after the end of grant period. New courses and programs will be supported by tuition and traditional funding streams after grant funding ceases. Changes in training program design and delivery formats will open up more opportunities for collaborative relationships with local WIBs and other workforce development agencies, boosting the numbers of displaced workers who seek retraining at community colleges.

Furthermore, MoSTEMWINs will train consortium faculty and staff to ensure they are

equipped with the skills and knowledge to continue to incorporate the newly developed teaching and learning strategies into other courses, deliver wrap-around support services, and assist peers in doing the same. These strategies will be sustained after grant resources have been expended because increased student retention and completion generates additional revenue, which provides resources for the college to continue to deliver services that have proven to be effective.

Similarly, employer partnership will have become ingrained in all processes and procedures by the end of the grant's four years. If employers' needs are being met by the grant-funded strategies, colleges expect them to continue to participate and even increase their commitments to the programs, which may also include additional financial and in-kind contributions. Finally, other resources, such as the portals, require a substantial commitment of time from college personnel and an investment of funds to begin, but ongoing maintenance costs are much lower, making it financially possible for the college to sustain them post-grant.

Finally, efforts to ensure sustainability will be bolstered by activity occurring at the state level. Missouri's colleges are partnering with agencies including MERIC, the Department of Higher Education, the Department of Economic Development, and leaders in the state public workforce system to apply to participate in the National Governors Association Policy Academy on Aligning the Education and Training Pipeline to the Needs of the Economy. Those participating in the policy academy will use information including data collected through this grant to connect the state's education and training goals and to ensure maximum alignment and use of education, workforce, and economic development data. In addition, the state legislature and governor are interested in including data about job placement of higher education completers in the state's performance funding model. Legislation was passed and signed by the governor this year that requires such data to be one element of the performance funding model.

#### **(4) Organizational Profile**

**(a) Professional Qualifications of Project Staff.** Metropolitan Community College (MCC), based in Kansas City, will serve as the lead applicant for this consortium. MCC leaders, including the board of trustees and the chancellor, are highly committed to the success of MoSTEMWINS and will ensure appropriate management to deliver a project that is on time, on target and on budget. MCC's executive director of the Institute for Workforce Innovation will lead the planning and implementation of the grant. As is explained in detail below, MCC's personnel have extensive experience properly managing complex federal grants.

The experience of the MoWINS Executive Advisory Council from the MoWINS projects will allow MoSTEMWINS to leverage existing experience, knowledge, relationships, processes and procedures to quickly ramp up efforts, while avoiding duplication of effort. The MoWINS Executive Advisory Council also includes members from the public workforce state agency and a local WIB Director to ensure strong partnership accountability. As was the practice with Missouri's previous TAACCCT awards, the Missouri Community College Association (MCCA) will house and resource a statewide project director, deputy project manager, and administrative support. The statewide project director position will be the same individual currently performing as project director for two previous MoWINS TAACCCT grants, and thus will be able to begin work as soon as the grant award is made. Because the core responsibilities will be the same for both grants, utilizing the same project director will ensure leveraging of resources and sharing of information between the three initiatives and avoid duplication of effort. The statewide project director's core responsibilities will be identical to those in MoHealthWINS and MoManufacturingWINS, and include ensuring that all expenditures and performance measures are in compliance and reported to the lead college. Qualifications of the statewide project

director include a bachelor's degree, experience in workforce development, six years experience in community college job training programs, ten years in managing and directing federally funded grant projects, and the proven ability to work effectively with a broad range of constituencies, including USDOL, economic development entities, employer and industry partners, WIBs, educational leaders, advocacy groups, and state governmental agencies. The proposed management structures are illustrated in the attached *Organizational Chart*.

**(b) Management Structure - Efficient and Effective Communication.** Well-defined roles and responsibilities for consortium members include each college appointing a grant lead. These representatives will form the leadership team responsible for overseeing project strategy development, implementation, and sustainability. In addition, student services and academic staff from each consortium college will attend regular meetings focused on implementation of best practices and will be actively engaged in assessing project strategies. College personnel will contribute to an online library of documents including forms, information pertaining to the grant, other states' experiences implementing the grant, and data collection. Furthermore, MCC's grant accounting personnel will provide assistance and monitoring of grant-related financial procedures and reporting by member consortium colleges. Consortium college institutional research and budget staff will participate in ongoing training and collaboration.

MoSTEMWINs will also continue to rely on MCCA for statewide grant project coordination, communications, professional development, compliance, and data collection.

**(c) Effective Systems and Processes for Reporting.** MCC has a demonstrated history of effectively managing complex grants and contracts with government, business and industry. It practices sound fiscal management, has the necessary financial and administrative controls to manage the grant, and is prepared to meet required legal responsibilities. The accounting

methods and procedures adopted by the college conform to generally accepted accounting principles (GAAP), and the college is audited annually by an independent certified public accounting firm.

MCC complies with OMB Circulars A-110, A-21 (currently, 2 CFR Parts 215 and 220) and receives an annual A-133 audit. Other grant requirements, including maintaining an active System for Award Management account, are in place and updated annually by MCC's finance department, which has 2.5 FTE staff dedicated to grant financial management.

All grant purchases shall be handled in accordance with commonly accepted business procedures and must be substantiated with the necessary records to satisfy audit and inventory requirements and all applicable laws. MCC's procurement processes, systems and procedures are detailed in written policies and specify that items, including services and contracts, with an aggregate dollar amount greater than \$10,000 must be put out for formal bids and presented to MCC's board of trustees for approval before execution of any contract or purchase order. MCC's formal bid processes include public notice actions, as required by policy.

Consortium colleges may use their own procurement procedures, provided they conform to MCC and USDOL policies. All consortium colleges will maintain records, including but not limited to, requests for funds, invoices, and ledgers of revenues and expenses. Salaries and fringe charged to the grant budget will require documentation of time dedicated to grant activities and appropriate budget authority signatures. Colleges will submit all documentation to MCC in accordance with USDOL timelines. Grant funds will be disbursed as costs are incurred.

In addition, MCC's Office of Resource Development maintains a master file on every MCC grant project and assists project directors throughout the life of a grant, including reports. Grant awards to MCC for Fiscal Year 2013-14 totaled more than \$13.8 million, including participation

in the MoManufacturingWINS consortium grant. The table below shows federally funded awards made to MCC and performed within the past three years.

<b>Table 14: Recent Federal Grants Awarded to Lead Institution</b>			
<b>Federal Funding Agency</b>	<b>Award Years</b>	<b>Award Amount</b>	<b>Project Name</b>
U.S. Dept. of Labor	2012-2017	\$5,000,000	Earn IT & Learn IT
U.S. Dept. of Education	2013	\$975,918	Perkins
U.S. Dept. of Education	2012-2017	\$1,250,000	Veterans Upward Bound
U.S. Dept. of Health & Human Services	2012-2016	\$2,600,000	Scholarships for Nursing Students and Economic Development
U.S. Dept. of Education	2011-2016	\$2,371,090	Educational Opportunity Center
U.S. Dept. of Energy (sub recipient to Kansas City, MO)	2011-2013	\$220,000	EnergyWorks Job Training Grant Program
U.S. Dept. of Education	2010-2015	\$1,815,397	Student Support Service
U.S. Dept. of Commerce (sub recipient to MDHE)	2010-2013	\$2,225,114	Public Computer Centers