@Scale Continuation Grant
Final Report

Advanced Manufacturing Workforce Development

Berkshire & Pioneer Valley Vocational Education Partnership Proposal II

(Franklin County Technical School, McCann Technical School, Putnam Vocational Technical Academy, Westfield Technical Academy)

Partnership Agency:	McCann Technical School
Address:	70 Hodges Cross Road, North Adams, MA 01247
Contact:	James J. Brosnan, Superintendent P: 413-663-5383 F: 413-664-9424 E: jbrosnan@mccanntech.org

Advanced Manufacturing Workforce Development

Berkshire & Pioneer Valley Vocational Education Partnership

(Franklin County Technical School, McCann Technical School, Putnam Vocational Technical Academy, Westfield Technical Academy)

Towns and cities touched by our grant:

Adams
Agawam
Bernardston
Buckland
Cheshire
Clarksburg
Colrain
Conway
Deerfield
Erving
Florida
Gill
Greenfield
Heath
Lanesborough
Leyden
Longmeadow
Monroe
Montague
New Salem
North Adams
Northfield
Orange
Savoy
Shelburne
Southwick
Springfield
Sunderland
Warwick
Wendell
Westfield
West Springfield
Whately
Williamstown

@Scale Continuation Grant

I. Basic Information

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II. Goals and Objectives

Massachusetts STEM Plan Goal

5. STEM degrees and certificate attainment will be aligned with corresponding opportunity in STEM related fields to match the state's workforce needs for a STEM talent pipeline.

The focus of this @Scale Continuation Grant was to create a program guide that will serve as a model for other vocational technical school, community college and regional employment board partnerships across the Commonwealth. This model will include an online and printed guide, video and group presentations to interested organizations, and a 100 hour, 220 hour and 300 hour manufacturing curriculum. It is the development of the curriculum that inhibits many schools from participating and we will be able to offer these selected curricula to initiate program development. The program guide will enable these new consortia to better understand the planning and implementation process. Members of our consortium will also be available to conduct briefings and facilitate these new startups.

The purpose of the initial project was to increase employer and student focused vocational training in advanced manufacturing. The objectives of the project include:

- Retraining older, returning workers and veterans in advanced precision manufacturing.
- Creating postsecondary education training and pathways for advanced manufacturing in partnership with area community colleges.
- Increase the capacity of the advanced manufacturing training programs in Western Massachusetts to meet regional workforce demands.

The design of the project was to provide short term advanced CNC manufacturing training programs to rapidly inject graduates immediately into the workforce and to improve training equipment and technology within the four participating vocational/technical schools. The focus remains on building training capacity to provide a continuum of skilled technicians entering the workforce. This capacity included the development of curriculum utilizing the Massachusetts Department of Elementary and Secondary Education, Career Vocational Technical Education department's new draft manufacturing curriculum frameworks for a 100 hour, 220 hour and 300 hour CNC training program. It also included updating manufacturing software and training equipment. Critical to the success of the program was leveraging training funds from complimentary agencies including regional employment boards, other state agencies and community colleges. The @Scale funding provided the impetus for all four schools to create an evening manufacturing training program where none had previously existed. This was a monumental accomplishment that will not only have near term positive results but will provide the opportunity to continue these evening training programs in the future to meet employment demands.

III. Implementation

The goals of the continuation @Scale Grant were to validate the different training programs, produce a program guide to enable future consortiums across the Commonwealth to replicate, and to produce videos for each school and area to help recruit students for both high school manufacturing technology programs and to allow unemployed, veterans, and underemployed adults to better understand the manufacturing business sector and the training opportunities available to them.

IV. Scale

1. The consortium will provide both an online and printed program guide to facilitate the manufacturing training to be replicated through 5 or 6 similarly structured consortia regionally across the Commonwealth.

   Faculty from each of the schools revised their individualized curriculum for their respective training programs validating the topics and time necessary using the experience of the initial training done in 2013 and 2014. This process resulted in a more refined and vetted curriculum with an accurate timeline for implementation.

   Using the Massachusetts Career Vocational Technical Educational, CVTE, curriculum frameworks for machine technology as the base curriculum provided the standardized scope, sequence and outcomes that will be used consistently across the Commonwealth by all schools thereby including quality control in all programs. These curriculum frameworks were revised in 2013 to meet national standards and provide a consistent and technology based format to meet the requirements of all manufacturers.

   Since each of the participating schools developed separate training programs, from a 100 and 220 hour course of study to a 300 hour course, each program sequenced from introductory to more advanced topics depending on the time allocated and the requirements of local businesses.

   The program guide will include three different options for trainers and includes the topics from the CVTE frameworks, time and sequence, textbooks and related teaching resources and suggested materials lists. The concept was to offer to future consortiums of vocational schools and community colleges a well-designed and vetted program of studies to enable schools to quickly respond to training needs across the Commonwealth without having to waste time trying to develop such training programs and expend funds in preparation rather than in implementation.

   The online program guide provides all of this information in several formats for easy access and includes school and instructor contact information so that future users may contact experienced instructors to gain a better understanding of implementation strategies and techniques. The inclusion of teaching resources and a suggested materials list will assist in preparing budget projections for future training programs.

2. The new regional consortia will consist of 3 or 4 regional or municipal vocational schools with 2 or 3 community colleges and similar numbers of regional employment boards. This expansion has the potential to involve over 40 vocational schools, 10 community colleges and 12 regional employment boards.

   Our Western Massachusetts consortium collaborated with three regional employment boards and three community colleges with a concept to build a cooperative strategy that can be repeated by other groups of vocational schools, community colleges and regional

employment boards. The program guide contains contact information of all of the statewide organizations to facilitate easy access.

3. Employer training needs surveys will be used in conjunction with the regional employment boards to insure accurate training programs.

   An employer needs survey was produced in conjunction with the regional employment board and distributed through the regional employment boards contact to area employers to determine the precise training needs. This method ensures that training programs remain focused on employer needs not solely on provider expectations. Specific training variables gleaned from these surveys enabled providers to tailor and develop new training programs based on need. A sample of these surveys is attached as and addendum.

4. Teachers will visit, survey, interview and video 10-12 area companies to create industry validation and assist in student recruitment efforts.

   One of the most beneficial sequences of the project was allowing instructors to visit employers at the workplace. This gave them the opportunity to view the equipment in operation and better understand employer needs. It also gave them first hand knowledge and manufacturing techniques in use to better tailor both the school based and the incumbent worker training. The training needs surveys, which provided basic information, were discussed to provide more elaborate and focused understanding of training needs. The interviews with employers, especially operations managers provided great insights. Interviews were video taped with these managers as well as additional alumni of each of the schools which enhances the recruitment of students into the programs. The videos provide the basic career information for aspiring machinists and help identify the career with the local school

5. The program guide will include blended videos depicting currently enrolled students, teachers, employers, regional employment boards and community college representatives to assist in recruitment and involvement.

   Individual videos of varying length were produced by each of the vocational schools involved using local instructors, businesses and alumni. The goal was to provide a greater awareness of manufacturing careers both of the high school and the adult populations. The site visits provided the opportunity to highlight the equipment and technology of the modern manufacturing workplace with the training provider as a conduit to new careers and a better understanding of manufacturing in the Commonwealth. These videos are easily viewed on area websites and appeal to a variety of audiences

6. The expansion will create a working model, approved curricula and subject matter experts to guide new organizations.

   The development of curricula, videos, and processes were all designed because none had existed in any of our schools and the time and resources necessary to develop then was not available. We now are able to share all of the information with vocational schools, community colleges, regional employment boards, and related agencies so that training programs can be operational throughout the Commonwealth almost instantly. The program was also developed to insure that as technology and practice change to meet the ongoing evaluation of manufacturing systems, the materials can be simultaneously changed to reflect the latest changes. The materials are accessed through school and agency websites allowing for relative ease in updating insuring that the training curricula does not become out dated.

7. The expansion will afford the opportunity to cross train staffs, enhance marketing opportunities and to reach out to new business partners.

The creation of the three training programs provided an opportunity to introduce an introductory, sustainable and advanced system of training all designed to meet area employer needs. Faculty had not participated in the development of this type of employer needs based training over a short duration and with a part-time evening delivery model. Instructors met with area manufacturing operations managers and owners, re-focused priorities and re-developed the curricula.

Program

- The curriculum for each of the CNC programing curricula, 100, 220 and 300 hour courses, will be reviewed and revised consistent with two or three cohorts of graduates. The current participating school faculties will be able to convene to review each of the specific training courses, review curriculum to meet industry standards and revise accordingly and share best practice. This process is critical to insuring that the 100, 220 and 300 hour courses are validated and relevant to area manufacturers.

  The original curriculum and instructional sequence was revised by all schools using the experience of two or three cohort graduates. This allowed each program to insert revisions appropriate to the knowledge level of each cohort group. The program guide contains two versions of each curriculum a standards based comparative chart that includes the CVTE standards and the hours for each topic. It also included combined syllabi that sequences the program, provides instruction resource information and sample materials.

- The expansion of these programs will allow for five or six similar cohorts to be established regionally to meet labor market needs. The coordination of the original 4 vocational schools, three community colleges and 3 regional employment boards may soon be expanded as a model throughout the Commonwealth.

  Once the program guide and videos are completed they will be posted on each of the participating vocational school websites and on the Massachusetts Association of Vocational Administrators, MAVA, website affording all vocational schools easy access. The guide and accompanying videos can easily be loaded on any appropriate site upon request. A presentation of the cohort accomplishments and the accompanying guide will be made at the MAVA summer training where teachers and administrators can share best practice implementation solutions.

V. Outputs, Outcomes & Evaluations

The focus of this @Scale Continuation Grant was to create a program guide that will be a model for other vocational school, community college and regional employment board partnerships across the Commonwealth. Validating the 100, 220, and 300 hour curricula also led to the development of new training program models all focused on providing adult workforce training. Putnam created a 20 hour incumbent worker program, McCann created, in conjunction with Berkshire Regional Employment Board and Berkshire Community College, two new training programs all of which resulted from conversations with area employers through the employer survey and video portion of the project. These programs were a 66 hour introduction to manufacturing for unemployed, veterans, and underemployed workers covering career development skills, introduction to computers, shop mathematics, metrology and blueprint reading. These essential job entry skills are focused on first time employment in manufacturing. Through conversations with employers it became evident that an 85 hour introductory welding program was needed for a number of area companies. These new programs were developed and will be implemented in the winter and spring of 2016.

The following tables illustrate students enrolled in manufacturing technology program both full time day students and adult evening students. Placement data is not available for current on going courses, but will be continuously updated as received.

Table I

School	Calendar	Course	Enrolled	Completed	Hired
Franklin	Fall 13	220 hour	15	15	9
	Winter 14		14		
McCann	Winter 13/14	100 hours	20	20	16
	Winter 16	66 hours	TBD		
	Spring 16	85 hours Welding	TBD		
Putnam	Fall 13	300 hours	13	11	8
	Spring 14		12	11	9
	Fall 15		10	9	7
	Winter 16	20 hour	TBD		
Westfield	Fall 13	300 hours	9	9	7
	Fall 14		11	8	6
	Fall 15		16	10	8

Table II
Full time manufacturing enrollments 2015/2016 Grade 9-12

School	Grade Level	Enrolled
Franklin	9	11
	10	12
	11	9
	12	10
McCann	9	14
	10	14
	11	16
	12	12
Putnam	9	17
	10	16
	11	21
	12	18
Westfield	9	12
	10	16
	11	14
	12	14

All schools have noted an increase in enrollment because of the enhanced software and equipment additions and it is anticipated that the video project will provide an excellent outreach tool to improve manufacturing enrollments in all schools

VI. Budget and Plans for Program Sustainability

The @Scale Continuation Grant funds were used to validate a variety of curricula, conduct employer surveys and visitations and produce videos to increase student enrollment and understanding of the manufacturing sector. The workplace employee needs throughout the area and across the Commonwealth are well documented and through this funding we were able to create a program guide that will enable similar consortia of vocational schools, community colleges and regional employment boards to implement a variety of training programs rapidly to meet employer requirements. The curricula has been validated and focused and will allow other training consortia to access saving considerable time and money. We were also able to purchase HAAS Computer Numerical Control, CNC, trainers for each school enabling them to integrate CNC program training consistent with industry standards. These trainers become a training multiplier by allowing students to learn the manufacturing software applications without operating expensive CNC milling and manufacturing centers. The trainers expand student access to this process eliminating wait time for machines and saves material costs.

The implementation of the training occurred with workforce training funds available through the regional employment boards. This funding paid for instructional time and materials and not on curriculum development greatly expanding the availability of training funds. The program guide and curricula will streamline access to these funds for sustainable and new training opportunities.

Form 1a: Expenditure Worksheet

Please complete the expenditure worksheet below. In the first column, identify how you divided your grant among the identified expense categories. In the second column, list your expenditures to date. The third column will automatically populate with the difference (remaining balance). Make sure to sign and date this worksheet before submission and include any necessary explanations or comments in the "Comments Box".

Instructions: Double-Click on the table for it to become an interactive spreadsheet. Click outside the table to return to MS Word. ONLY FILL IN CELLS HIGHLIGHTED IN YELLOW: Non-Yellow cells contain formulas and will fill in automatically. Also, all cells are formatted for currency; you do not need to type in $ signs.

Categories	Grant Funds Received		
	Grant Funds Received	Grant Funds Expended	Grant Funds Remaining
Total Salaries:	$ -	$ -	$ -
Administrator			$ -
Support Staff			$ -
Other			$ -
Fringe Benefits	$ 100	$ 46	$ 54
Contractual Services	$ 32,000	$ 24,548	$ 7,452
Travel/Transporation			$ -
Total Supplies & Materials:	$ 29,900	$ 21,809	$ 8,091
Curriculum	$ 8,000	$ 3,992	$ 4,008
Equipment	$ 21,900	$ 17,817	$ 4,083
Other			$ -
Training			$ -
Tuition & Stipends			$ -
Evaluation			$ -
Other (Identify)			$ -
Other (Identify)			$ -
Indirect Costs (10% Max)			$ -
Total	**$ 62,000**	**$ 46,403**	**$ 15,597**

Project Name/Organization: Northern Berkshire Vocational Regional School District

Project Manager: James J. Brosnan **Date:** 1/29/2016

McCann Technical School
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www.mccanntech.org

MANUFACTURING SURVEY

Manufacturing Design Software	Need Training	Number of Potential Training
Mastercam	_____	_____
CimitronE		
Siemens NX2	_____	_____

CAD Design Software	Need Training	Number of Potential Training
Pro/Engineer	_____	_____
CREO	_____	_____
SolidWorks	_____	_____
Autodesk Inventor	_____	_____
AutoCAD 2D	_____	_____
Corel Draw	_____	_____

Manufacturing Equipment	Need Training	Potential # Students	Comments
4 Axis Haas VF-1	_____	_____	_____
5 Axis Haas VF-2	_____	_____	_____
Haas SL-10 CNC Lathe	_____	_____	_____
Proto Trak TRL 1440 Ex Lathe	_____	_____	_____
Proto Trak EMX Mills	_____	_____	_____
Helmel CMM	_____	_____	_____
Agie EDM Sinker	_____	_____	_____

Metal Fabrication & Welding	Need Training	Potential # Students	Comments
SMAW	_____	_____	_____
GMAW	_____	_____	_____
FCAW	_____	_____	_____
GTAW	_____	_____	_____

We certify in AWS D1.1 Structural Steel Standards_SMAW/GMAW to AWS Standards

Other training:_____

_____

_____

From:

Company Name: _____ Phone:_____

Address: _____

Contact Person: _____ e-mail: _____

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MANUFACTURING SURVEY

Manufacturing CAM Software	Need Training	Potential # Students	Comments
Mastercam X7			
CimatronE CAM			
Siemens NX			

CAD Design Software	Need Training	Potential # Students	Comments
Pro/Engineer			
CREO			
SolidWorks			
CimatronE 11 Mold Design			
AutoCAD 2D			
Corel Draw			
Siemens NX			

Manufacturing Training	Need Training	Potential # Students	Comments
CNC Programing			
CNC Setup			
EDM			
Multi Axis CNC Setup Programing Operation			
Blueprint Reading			
Hard Machining/Milling Training			

We also have metal fabrication and welding with training in SMAW, GMAW, FCAW, GTAW and certify in AWS D1.1 Structural Steel Standards SMAW/GMAW to AWS Standards. Need Training _____

_____

_____

Other training needed: _____

_____

_____

From:

Company Name: _____ Phone: _____

Address: _____

Contact Person: _____ e-mail: _____