Retooling America

Increasing capacity and capability to train skilled workers in precision machining technology

September 2018 | Final Evaluation Report Appendix Volume

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Danville Community College

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Appendix A. Logic Model

Table A-1. *Retooling America* Logic Model

Inputs	Activities	Outputs	Short-term Outcomes	Long-Term Outcomes
Breaking Through Goodwill Industries of South Central Virginia, NCRC PluggedIn VA Region XII Adult Education Student Completion Acceleration Toolkit (HFCC) Prior learning assessment models (CAEL) Working Families Success Network (WFSN) Program Lessons and resources from DCC expansion effort Donated equipment	Systems Development Address system-level improvements critical for student success Explore articulation agreements with four-year institutions Assessment and Preparation Develop competency-based model Enroll TAA-eligible and other adult learners and workers in *Retooling* program Assess students for remedial needs, prior learning, and competencies Leverage contextualized adult basic education and GED courses	Changes made at the college as needed to facilitate program delivery Articulation agreements are created Enrollment targets met; demographics of participants reflect demographics of region served by DCC Credit awarded for prior learning experience, including to veterans Students complete contextualized ABE and GED programs Students earn National Career Readiness Certification	Program operates smoothly Pathways include options for additional education and training Academic barriers to student success in the program are reduced or removed Students progress into college-level coursework Increased student retention in courses Increased completion of short-term credentials	Stronger relations between industry representatives, VEC, DCC, and the WPWIB Expansion of instructional concept to other programs of study serving other industry sectors Students transfer for further education along career pathway Increased student retention in programs of study Increased student completion of longer-term credentials Shorter time to program certification and degree completion Increased employment and retention

Table A-1. *Retooling America* Logic Model

Inputs	Activities	Outputs	Short-term Outcomes	Long-Term Outcomes
Institute for Advanced Learning and Research space and expertise Career coach and coaching models from Tidewater and RX Tennessee West Piedmont WIB Virginia Employment Commission Industry and employer partners/advisory group PeopleSoft/SIS, QUINN, labor market data TAACCCT grant funds and other resources	IMT Curriculum Development and Delivery Develop coaching model and identify supports Hire and orient career coach, precision machining instructional technology technician and program analyst Install and beta-test the equipment in the Work Flow Cell Lab Create industry-recognized career pathway Create open entry/exit course modules and develop requisite competencies for each module Develop and embed entrepreneurship elements into the IMT coursework Develop Capstone work flow cell curriculum Gather employer input on curriculum design and other program aspects Engage a software developer to build web-based content, including training videos Leverage wraparound support services and soft-skills training	Web software vendor and program staff hired Web-based programs released; students utilize Web-based curricula Employers' views are reflected in curriculum design and other aspects of the program Enhanced courses are delivered using new curricula Students receive supports and career coaching Students identified receive entrepreneurship training	Capstone provides simulated, real-world work experience Students complete a TAACCCT-funded program of study Students attain industry-recognized credentials Students gain employment in target industry Students are satisfied with the training and supports they receive Employers are satisfied with the program	Increased wage increments post-enrollment Students progress along career pathway through additional education and/or employment advancement

Table A-1. *Retooling America* Logic Model

Inputs	Activities	Outputs	Short-term Outcomes	Long-Term Outcomes
	Learning Use existing systems to track program and student outcomes Evaluation examines progress and outcomes of the program Participate in ongoing discussions with similar TAACCCT grantees and DOL Review progress at bi-annual learning meetings	Data reports run regularly Program meetings held Evaluation findings reported and discussed	Partners, college leadership, and faculty are satisfied with program Evaluation findings and other knowledge used to inform decision making	

Appendix B: Research Questions

The following research questions provided the focus for both the implementation and outcomes evaluation of the *Retooling America* program.

Table B-1. Research Questions and Data Sources

Questions	Data Sources				
	Interviews	Administrative Records	Observations	Surveys	Focus groups, roundtables
Implementation Questions					
1. What roles did employers play in the development and implementation of the program? a. Which employer contributions are perceived to be the most critical to the success of the grant program? b. How engaged were the employers in monitoring implementation, and what factors affected their degree of engagement?	x	x	x	x	x
2. Are program activities implemented with fidelity to the plan and timeline? a. What are the challenges encountered? b. Where variation occurred, did it help or hinder program implementation?	x	x	x	x	x
3. How were the choices made in designing *Retooling America*? a. What factors were considered? Who was involved? b. How were curricula selected and enhanced?	x	x		x	x
4. What was the process for incorporating technology enhancements into the IMT courses? a. What was the experience in training faculty to use these? b. How easy was it for faculty to integrate these into their courses?		x		x	
5. What role did assessments play in helping students make informed decisions about program enrollment, course selection, and their career paths?	x			x	x
6. What value did students and other stakeholders place on flexible learning, stackable and latticed credentials, technology-enhanced learning, assessments, soft-skills training, wraparound services, and career coaching?	x	x		x	
7. What were considered the advantages and disadvantages of these program features?	x			x	x

Table B-1. Research Questions and Data Sources

Questions	Data Sources				
	Interviews	Administrative Records	Observations	Surveys	Focus groups, roundtables
8. To what extent is the veterans' employee-in-training program utilized?	x	x			x
9. To what extent are students satisfied with the program features? What can be done to improve the quality of the services? To what extent and in what ways do TAA grantees, veterans, female students, and members of minority groups perceive the value of the program or its features differently?	x			x	x
10. To what extent are employers satisfied with the employment readiness of students or completers of enhanced programs? To what extent are students and alumni satisfied with the preparation for employment they received with technology-enhanced learning components?	x				x
Outcome Questions					
1. Are students in the grant-funded programs of study more likely to have improved enrollment status (retained, transfer; not dropped) as compared to those in the comparison group?		x			
2. To what extent do students in the grant-funded programs have more positive employment outcomes than students in the comparison group?		x			
3. To what degree to do students who receive wraparound services experience more positive outcomes (retained; transfer; earn associate's degree; earn a greater number of credits; employed), as compared to students who received fewer or no wraparound services?		x			

Appendix C: Implementation Study Variables and Data Sources

Table C-1. Implementation Study Variables and Data Sources

Variables	Data Sources				
	Key informant interviews	Student survey	DCC administrative records	Focus groups and roundtables	Employer interviews
Enrollment targets reached			x		
Characteristics of students enrolled in IMT			x		
Short-term training courses developed	x		x		
Open-entry/exit course modules created	x		x		
Web-based course enhancements developed, tested, and refined	x		x		
System-level improvements made	x		x		
Competencies developed for each module	x		x		
Industry-recognized career pathways created	x		x		
Competency-based model for prior learning assessment completed	x		x		
Coaching model and wraparound support services mechanisms created	x		x		
Enhancements for work flow cell obtained and in place	x		x		
Capstone work flow cell curriculum developed	x		x		
Veterans' Employee-In-Training program implemented	x		x		
Employer input obtained on curriculum design and program implementation	x		x		x
Components of entrepreneurship training identified and curriculum developed	x		x		
Entrepreneurship modules employed	x		x		
Satisfaction with program components such as career coaching, prior learning assessment, technology course enhancements, career pathways, work flow cell	x	x		x	
Fidelity of implementation of *Retooling America*	x		x	x	
Student satisfaction with career readiness		x		x	
Employer satisfaction with job readiness of students					x

Appendix D: Participant Demographics

Table D-1. Demographic Information by Programs

	Programs[1]						
	PMT	**IMT**	**HTEC**	**DI**	**MT1**	**IW**	**All**
Age (median)	19	20	44	28	33	57	20
Gender							
Male	184	14	13	26	21	13	271
Female	10	1	-	8	2	6	27
Race & Ethnicity							
White	162	15	12	27	10	15	241
Black or African American	21	-	-	7	11	3	42
Asian	-	-	1	-	-	-	1
American Indian or Alaska Native	4	-	-	-	1	-	5
Native Hawaiian or Pacific Islander	1	-	-	-	-	1	2
Hispanic	6	-	-	-	1	-	7
Employed at entry	62	-	11	6	-	19	98
Veterans	10	-	-	1	-	-	11
TAA-eligible	-	-	-	-	-	-	0

[1] HTEC – Secondary school teachers, DI – Dimensional Inspection, MT1 – Manufacturing Technology, IW – Incumbent Workers.

Appendix E: Confirmatory Hypothesis 2

Table E-1. Student and Employer Perception of New Skills

Scale of 1-7, with 7 being "strongly agree"	**Mann-Whitney U[2]**	***p* Value[3]**
Can apply proper toolpath strategies	90	.691
Can utilize machine tool probes for initial setup and in process inspection	99	.966
Can program, set up, and operate 5-axis milling machines and 3-axis lathes	75	.312
Can use CAD/CAM software to model and produce CNC code for complex components	44	.392
Can program, set up, and operate a coordinate measuring machine	96	.876
Can apply Lean and Sigma Six principles to improve efficiency and quality	33	.0150
Can work as part of a high-performance team (collaborate in a tight-knit group to produce superior results)	87	.547
Can demonstrate good business ethics (such as honesty, trustworthiness, respect, excellence, and accountability)	57	.053
Scale of 1-5, with 5 being "strongly agree"		
Have learned the right skills to get a job	68	.137
Have earned the right credentials to get a job	78	.242
Feel are prepared to enter the workforce	89	598

[2] Mann-Whitney U test is the non-parametric alternative test to the independent sample t-test. It is a non-parametric test that is used to compare two sample means that come from the same population, and used to test whether two sample means are equal or not (http://www.statisticssolutions.com/mann-whitney-u-test/).

[3] The P value, or calculated probability, is the probability of finding the observed, or more extreme, results when the null hypothesis (H0) of a study question is true (https://www.statsdirect.com/help/basics/p_values.htm).

Appendix F: Data-Collection Instruments

Danville Community College – Retooling America
IMT Student Survey Questions:

Intro
Classes will be ending soon and we want to know about your experience with the Integrated Machining Technology program and associated services. Since the Integrated Machining Technology program is new, your feedback will help us figure out what worked well and what did not.

This survey will take about 10 minutes to answer.

The survey is confidential. This means your instructors will not know your answers. When results are shared with DCC, everyone's answers will be combined together for reporting.

Your participation in the survey is voluntary. Your choice to participate will not change the services you get now or in the future. However, your feedback is very important and will help us improve this program for future students.

Services Used Outside the Classroom
Did you complete a National Institute for Metalworking Skills (NIMS) assessment prior to beginning the Integrated Machining Technology program?

Yes
No

Are you a military veteran?

Yes
No

Did you meet with a Veterans Specialist to discuss earning credit for your military experience?

Yes
No

Were you satisfied with assessment services and resources available to assess your prior experiences and apply that toward college credit?

1 2 3 4 5 6 7
Not -------- Very

Did you access any of the following career coach services?

Receive information about the labor market	Yes	No
Receive help with your resume?	Yes	No
Receive help with your job search?	Yes	No
Receive help with a job application?	Yes	No
Receive help preparing for job interviews?	Yes	No

About how many times did you meet with a career coach? _____

Did you have any problems accessing the career coach?

Yes, please explain:
No

Were you satisfied with your experience in the career coaching?
1 2 3 4 5 6 7
Not -------- Very

Competencies
How confident are you with your skills in the following areas?

Can apply proper toolpath strategies	1 2 3 4 5 6 7 Not -------- Very
Can utilize machine tool probes for initial setup and in process inspection	1 2 3 4 5 6 7 Not -------- Very
Can program, set up and operate 5-axis milling machines and 3-axis lathes	1 2 3 4 5 6 7 Not -------- Very
Can use CAD/CAM software to model and produce CNC code for complex components	1 2 3 4 5 6 7 Not -------- Very
Can program, set up and operate a coordinate measuring machine	1 2 3 4 5 6 7 Not -------- Very
Can apply Lean and Sigma Six principles to improve efficiency and quality	1 2 3 4 5 6 7 Not -------- Very
Can work as part of a high performance team (collaborate in a tight-knit group to produce superior results)	1 2 3 4 5 6 7 Not -------- Very
Can demonstrate good business ethics (such as honesty, trustworthiness, respect, excellence, and accountability)	1 2 3 4 5 6 7 Not -------- Very
Overall, do you feel prepared to enter the workforce?	1 2 3 4 5 6 7 Not -------- Very

Motivation
Please tell us how much you agree or disagree with the following ideas:

Getting the right training to develop new job skills can help me find and keep a job in my field of interest	SD	D	N	A	SA
With the right resources and support I could find a good job	SD	D	N	A	SA
I believe that I can improve my knowledge and skills by earning industry recognized credentials	SD	D	N	A	SA
I am doing everything I can to prepare for my career	SD	D	N	A	SA
Integrated Machining Technology has better prepared me for a career in precision machining	SD	D	N	A	SA

Demographics
What is your marital status?
Now married
Live with girlfriend, boyfriend, or partner
Divorced
Widowed

Separated
Never married

Do you have any children that have to be supervised or have a sitter when you are not at home?

Yes
No

What was your employment status when you began the Integrated Machining Technology program?

Employed, full-time
Employed, part-time
Self-employed
Unemployed

Comments

Is there anything else you would like us to know about your Integrated Machining Technology program experience?

[Comment box]

Thank you for your time!

Retooling America Employer Survey

1. On a scale of 1 to 5 where 5 is strongly agree and 1 is strongly disagree, how would you rate your agreement with the following statements?

(5-point Likert from Strongly Disagree to Strongly Agree)

a. The Third Year graduates learned the right skills to get a job in this company.

1	2	3	4	5

b. The Third Year graduates have the right credentials to get a job in this company.

1	2	3	4	5

c. The Third Year graduates overall are prepared to enter the workforce.

1	2	3	4	5

2. On a scale of 1 to 7 where 7 is very confident and 1 is not at all confident, how would you rate your confidence that …

(7-point Likert from Not at all Confident to Very Confident; probably have to include a DK)

a. Third Year graduates can apply proper toolpath strategies?

1	2	3	4	5	6	7	NA – does not apply

b. Third Year graduates can utilize machine tool probes for initial setup and in process inspection?

1	2	3	4	5	6	7	NA – does not apply

c. Third Year graduates can program, set up and operate 5-axis milling machines and 3-axis lathes?

1	2	3	4	5	6	7	NA – does not apply

d. Third Year graduates can use CAD/CAM software to model and produce CNC code for complex components?

1	2	3	4	5	6	7	NA – does not apply

e. Third Year graduates can program, set up and operate a coordinate measuring machine?

1	2	3	4	5	6	7	NA – does not apply

f. Third Year graduates can apply Lean and Sigma Six principles to improve efficiency and quality?

1	2	3	4	5	6	7

g. Third Year graduates can work as part of a high performance team (collaborate in a tight-knit group to produce superior results)?

1	2	3	4	5	6	7

h. Third Year graduates can demonstrate good business ethics (such as honesty, trustworthiness, respect, excellence, and accountability)?

1	2	3	4	5	6	7

Please offer any additional comments that you wish.

Thank you!

Capstone Program Student Focus Group
Danville Community College
Retooling America

MODERATOR GUIDE

[Make sure seating is arranged so all can be heard. Name tents usable in this setting?]

10:00 AM
Welcome. Please complete the profile form while everyone settles in. Please fill out this tent card/name tag with your first name and first letter of your last name. [Collect profiles and quickly analyze answers.]

10:05 AM - Overview
We appreciate you coming to share your perspectives on this new program with us. A focus group is really just a group discussion today, guided by some questions we have prepared. This is something like a discussion you might have in a classroom. You don't need to raise your hand to speak, but we would like to hear from everyone today so I may need to ask you to hold a thought or may call on someone.

There are just a few ground rules:

- Please turn off your cell phones.
- Please share your first name when you talk.
- What is said here is private.

We will not tie names to any comment in reports. We will record our conversation as a backup to our notes. This recording is not shared with anyone at DCC.

10:10 AM - Introductions

Let's begin by introducing ourselves. [Moderator, note-taker, students]. Please tell us your first name and when you first knew you liked machines.

10:20 AM - Awareness

Now, let's move into talking about how you came to be in the Capstone program.

1. How did you find out about this program?

2. Why did you think it would be a good program for you?

10:35 AM - The Integrated Machining Technology Capstone Program

3. So, you all have been attending classes for a while now. Are the Capstone classes what you expected?
   Which was your favorite course?

4. Has the pace of instruction right for you?

5. What has been the hardest part of the program for you?

6. What kinds of supports did you get from instructors, the coach, and others at DCC to help you succeed?
   Seeing or talking about a career pathway?
   Help with academics?

7. Technology is a big part of the Capstone program. How helpful have the online materials, videos, etc. been for you as a learner?

8. When has entrepreneurship come up in the program?
   How does entrepreneurship factor into your career plans?

9. When have "soft skills" come up in the program?
   How did that affect your thinking about your own approach to work?

10. When you came into the program, there was an opportunity to assess your prior learning. How valuable was this for you?
    Did it affect your experience with the program?

11:00 AM - Preparing for Employment in Advanced Manufacturing

Let's turn now to focus on getting employed in manufacturing.

11. What kinds of information did you get through your classes or the coach about opportunities in manufacturing?

12. What have your instructors said about what employers are looking for in program graduates?
    What are some examples?

13. What kind of help have you had to find employment in manufacturing? (Can be at DCC or elsewhere)
    What was the most helpful resource for you?

Stackable credentials

11:20 AM - Overarching Perspectives

We're moving into the last part of our discussion now.

14. What are your current questions as you finish up the program? Who could you ask these of?

15. What would you suggest DCC do differently as they bring in another group of students?

16. Would you recommend this program to a friend or family member?

17. Would you go through this program, if you had it to do over again?

11:45 AM - Closing

Thank you for your time today. Best of luck with your studies and your careers!

<u>Notes for Research Team:</u>

- Observe differences in perceptions by age/experience, minorities, women, vets. If only one representative, pull aside to ask any sensitive questions after session.
- Features of the IMT Capstone program: training videos, web-based curricula, new machines, working with classmates on building a product/experiential learning, prior learning assessment, stackable credentials
- IMT Capstone results in AAS degree. Must have complete PMT diploma first or a comparable program from other VCCS college.