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Final Evaluation Report
Implementation and Outcomes of Credentials to Careers

Funded by US DOL – Trade Adjustment Assistance Community College
and
Career Training Program (TAACCCT)

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INTRODUCTION & BACKGROUND

Background of the C2C Consortium

The Larger Context*

NOVA's Credentials to Careers (C2C) USDOL-TAACCCT Project was a consortium among seven community colleges, along with their strategic partners, is designed to address changes in the economic and employment outlook. This employment outlook is increasingly driven by science, technology, engineering and mathematics (STEM) related employment; particularly in the areas of advanced manufacturing, information technology and health care technology. Representing diverse programs, needs and geographic areas of the country, seven leading community colleges, along with their strategic partners from business and non-profit sectors as well as the Aspen Institute and Achieving the Dream, the consortium was purposefully assembled to meet contemporary employment challenges for unemployed and displaced workers. Recognizing that STEM jobs have grown three times faster in the past ten years than other sectors of the job market, that these job will be more stable and pay more (USDOC, 2011), the C2C consortium is uniquely designed to both prepare employees for and transition to these new careers.

In many respects, community colleges are particularly well suited to meet the needs of unemployed, displaced and incumbent workers as they are well experienced in providing non-academic support, case management and job placement. However, while community colleges have tremendous resources and expertise to address these challenges, by themselves they lack essential capacity needed to keep pace with the need. Without greater support networks, these workers are less likely to complete their programs and reenter the workplace in more stable and better paying jobs. With the collaboration of the strategic partners and the cumulative knowledge and experience of the consortium members, the aim is to leverage resources, skills and experience to help the target population increase attainment of credentials and ultimately employment. To attain this goal, the consortiums efforts are strategically aligned with five innovative core design elements:

1. Evidenced-Based Design
2. Stacked and Latticed Credentials
3. Online and Technology-Enable Learning
4. Transferability and Articulation
5. Strategic Alignment

The seven community colleges in the consortium, outlined in the table below along with their target STEM industries and occupations, represent a wide range workforce development need, strategic partnerships and experience meeting regional employment needs.

C2C Community College and Their Targeted STEM Industries and Occupations**

Consortium Site	Targeted Stem Industries	Targeted STEM Occupations
Shoreline Community College Seattle, WA	Machining Technology	Technician, machinist, programmer, operator
Austin Community College Austin, TX	Health Care and biotech (a cluster of 16 related occupations	Health care technicians (ophthalmic, radiographic, pharmacy, MRI, biological), surgical assistants and technologists, phlebotomists, occupational therapists, PTs, and nursing assistant, RN, LVN, emergency medical, medical and clinical lab, medical records and health information
Northern Virginia Community College VA	Computers/IT	Software developer/analyst, project manager, database administrator, IT security, systems engineer
Los Angeles Trade Technical College Los Angeles, CA	Biomanufacturing	Technician, pharmaceutical
Virginia Western Community College Roanoke, VA	Computers/IT	Software developer/analyst, project manager, database administrator, IT security, systems engineer, medical records administration, health records coding, database administrator, project administrator
Muskegon Community College Muskegon, MI	Machining Technology	Technician, machinist, programmer, operator
Flint, MI	Health Care	Health care technicians (Pharmacy Technician Medical Administrative Specialist, Medical Assistant)

*NOVA's Credentials to Careers USDOL-TAACCCT Proposal Abstract, Updated from Original Proposal, as of March 2013 & Technical Proposal Credentials to Careers NOVA
**Proposal

Research Questions

The following research questions are drawn from the Department of Labor's Guidelines for the Program Implementation section of the evaluation for TAACCCT grants (p. 34).

1) How was the particular curriculum selected, used, or created?

2) How were programs and program design improved or expanded using grant funds? What delivery methods were offered? What was the program administrative structure? What support services and other services were offered?

3) Did the grantees conduct an in-depth assessment of participant's abilities, skills and interests to select participants into the grant program? What assessment tools and process were used? Who conducted the assessment? How were the assessment results used? Were the assessment results useful in determining the appropriate program and course sequence for participants? Was career guidance provided and if so, through what methods?

4) What contributions did each of the partners (employers, workforce system, other training providers and educators, philanthropic organizations, and others as applicable) make in terms of:

    a) Program design,
    b) Curriculum development (also see #1)
    c) Recruitment,
    d) Training,
    e) Placement,
    f) program management,
    g) Leveraging of resources[1], and
    h) Commitment to program sustainability?

5) What factors contributed to partners' involvement or lack of involvement in the program?

6) Which contributions from partners were most critical to the success of the grant program? Which contributions from partners had less of an impact?

References

US Dept. of Labor. (2012). Notice of Availability of Funds and Solicitation for Grant Applications for Trade Adjustment Assistance Community College and Career Training Grants Program. Funding Opportunity Number: SGA/DFA PY 11-08
Catalog of Federal Domestic Assistance (CFDA) Number: 17.282

[1] Here, and throughout this report, reference to "leveraging of resources" should not be confused with co-mingling of funds.

Research Methods

The broader program evaluation—of which this Interim Report is part--has two linked elements:

1) Program implementation – to understand the particular features of these programs so lessons learned and promising practices identified can be disseminated to the broader field and contribute the sustainability of the effort.

2) Participant outcomes and impacts -- The degree to which the program's activities impacted employment outcomes for grant participants evaluated with non-experimental cohort comparison design.

This report involves the both of these two elements and uses qualitative and quantitative methods and includes individual interviews and focus groups of students, teachers, career navigators, community partners, and administrators; as well as observations of class sessions and analysis of artifacts such as curricula.

Interviews generally lasted 45 minutes and classroom observations lasted 1 hour. During classroom observations we sat with one of the small student work groups as they collaborated on tasks and were able to conduct informal focus groups during the flow of conversation.

Interviews were semi-structured, using interview protocols that were based on the research questions derived from TAACCCT/Dept. of Labor criteria for the grant evaluation.

Interviews, focus groups and observations were all audio-recorded so that sections missed as we took notes could be added after the fact.

Notes were uploaded to *Dedoose*® qualitative software for coding and analysis.

Structure of the Final Report

This final report is divided into major sections, Part 1: Program Implementation, and Part 2: Program Outcomes. In part one we provide final program implementation reports for each of the seven consortium members. Each of these is a standalone report with its own executive summary. These are followed by a detailed synthesis of four key observations made across all seven colleges. Part 2: Program Outcomes and Impacts reports on the programs impact on participants' self-efficacy as well as participant employment and wage outcomes. The overall structure is outlined below:

INTRODUCTION & BACKGROUND

- Background of the C2C Consortium
- Research questions
- Research methods
- Structure of the Final Report

PART 1: PROGRAM IMPLEMENTATION

- Chapter 1: Austin Community College
- Chapter 2: Los Angeles Trade and Technical College
- Chapter 3: Mott Community College
- Chapter 4: Muskegon Community College
- Chapter 5: Northern Virginia Community College
- Chapter 6: Shoreline Community College
- Chapter 7 – Virginia Western Community College
- Chapter 8 – Synthesis Observations Across all Seven Colleges

PART 2: PARTICIPANT OUTCOMES AND IMPACTS

- Chapter 9 – Participant Self-Efficacy
- Chapter 10 – Participant Outcomes – Employment and Wages

Chapter 1: Austin Community College
Credentials & Careers Program

ABSTRACT

At ACC the C2C grant was used for the redesign of prerequisite courses that have in the past proven to be stumbling blocks for student entry into high-need health care and biotech positions. This redesign involved the creation of on-line modules giving students flexibility to master the materials and in-class interactive problem sets that faculty could assign based on the data from the on-line modules. In addition, it was used to support expanded course offerings within the partnership between Capital Idea and ACC to offer more low-income adults with low skills job training and a pathway to middle skill/middle income careers.

Data on whether the redesigned courses are functioning less as weed-out courses is mixed. On the positive side, for two out of the three redesigned courses (Fundamentals of Biology and Intro to Anatomy and Physiology) the pass rates are higher than those of the traditional versions of those courses. In the third course (Anatomy) the pass rates are identically high (90%) as the traditional course. [See Tables 1-3 below]

On the down side, a much smaller percentage of the students who took the *redesigned* BIOL 1308 course (28%) took the test to pass into the pre-requisite sequence beginning with the Anatomy course than did those students who had taken the *traditional* version of BIOL 1308. This is significant insofar as Austin's main goal in their redesign work was to increase the number of students ultimately taking, and succeeding in the pre-requisite courses.

Chapter 1 Executive Summary

At Austin Community College, the Credentials To Careers (C2C) grant funds are being used to address a challenge and an opportunity identified in a report by the Aspen Institute on ACC's Courses to Employment program (2010). The problem/opportunity has three parts:

1) The Austin area has a high number of workers displaced from the high tech/ manufacturing sectors;

2) The Austin area also has a high need for workers in the relatively well paying health sciences and bio-tech areas;

3) In the years leading up to the grant, students intending to enter the health science/bio tech programs most frequently left this track at the pre-requisite stage where they struggled to complete the courses.

Biology instructor and curriculum design team leader Rick Fofi put the problem succinctly, "For the last 3-4 years, [the entry level biology course] was considered a weed out course. That was not what we wanted it to be." (9/26/13).

To stop the prerequisite courses from being a weed-out course, ACC's Dean of Math and Sciences, David Fonken chose to use C2C funds to redesign three courses. This effort is being carried out by faculty and an instructional designer under the label of the Bio Innovation Lab or "BIL." Ultimately, the goal is for students to *gain* momentum rather than losing it in these courses.

This report details preliminary findings about the use of grant funds to do this redesign.

Ultimately there are two goals for the evaluation of the C2C projects in the seven-college consortium:

- To keep the various stake-holders informed about the projects progress;
- To contribute to the field of research on community college practices that provide workers with skills and knowledge needed to succeed in STEM related careers.

This report focuses on the *implementation* of changes using grant funds, where future reports will do more to highlight the *outcomes*. As such, this report uses qualitative methods and includes individual interviews and focus groups of students, teachers, career navigators, community partners, and administrators; as well as observations of class sessions and analysis of artifacts such as curricula.

C2C funds have been used for the following:

- Purchasing faculty time to redesign of the Fundamentals of Biology (BIOL 1308) course in a blended model to use on-line modules and collaborative hands-on tasks in the classroom;

- Paying for the creation of a science lab on the Eastview Campus so that Fundamentals of Biology (BIOL 1308) could be taught there, reaching more under-served students;
- Hiring an instructional designer during Year 2 of the C2C Grant with funding from the grant;
- Purchasing faculty time to work with the Instructional Designer to redesign the Anatomy course (BIOL 2304 and its lab BIOL 2101);
- Purchasing equipment for the phlebotomy program run by ACC's Workforce Development Program;
- Paying part of the salaries of two career navigators to provide support to students at the Eastview campus;
- Hiring tutors for the assistance of Anatomy students.

In the remainder of the grant period the ACC team intends to expand the use of the redesigned courses to other campuses—5 campuses for Fundamentals of Biology and 3-4 campuses for Anatomy (BIOL 2304), although it is not currently intended to be used by all faculty, with the belief that not all faculty are well suited to the change in pedagogical style.

The redesign of these courses seems to enjoy strong support from the President's office and top administration, as well as among students, and administrators said that after the grant has finished they intend on redesigning other courses and disseminating the materials that they have created to other colleges nationally.

Administrative structures that may have allowed swift changes in the instructional model include the following:

- Hand-picked highly motivated faculty for the design team;
- Cross breeding instructional models brought by the design team leader from his experience in the military;
- Rotation of the department chair every three years is thought to keep anyone from becoming too entrenched;
- Communication between NOVA's community college president and Austin's President around strategic changes at both institutions;
- Austin's continuity of involvement in grant funds –a grant from the Carnegie Foundation for the Advancement of Teaching to work with them in developing the Statway math program led nicely into modular curriculum development work in biology.

Strong Partnerships seem to have helped facilitate and support the changes to the instructional program:

- Input from Seaton Health Systems on curricular change;
- The staff and leadership at Capital IDEA provide the support services that help low-income adults–those who have traditionally not been successful in higher education - to succeed and find living wage careers. Research on these services shows a high return on investment.

- Each entity involved in the partnership understands and respects the mission of the other organization. Everyone at Austin Community College seems to respect Capital IDEA's mission of helping working adults out of poverty and into living wage careers. Likewise, those at Capital IDEA understand and appreciate the mission of the community college generally and Austin Community College in particular. They recognize that their missions complement one another.
- Leaders, case managers, instructors, and others at both organizations share a commitment to addressing the real-life problems of people in the Austin area through an increase in services through the partnership.
- The faculty, staff, and administrators of Austin Community College have committed countless hours to re-designing the curriculum in order to individualize instruction through the use of modules and the flipped classroom concept. They are also focused on evaluation of these innovations.

Wrap-around supports provided by Capital IDEA Career Navigators were well regarded by instructors and the Dean of the Math & Sciences Department, but they noted disconnects between services provided by the wider College and the health sciences students.

Overview of findings:

Data on course completion/grades

Data on whether the redesigned courses are functioning less as weed-out courses is mixed. On the positive side, two out of the three redesigned courses (Fundamentals of Biology and Intro to Anatomy and Physiology) the pass rates are higher than those of the traditional versions of those courses. In the third course (Anatomy) the pass rates are identically high (90%) as the traditional course. [See Tables 1-3 below]

Two caveats should be mentioned before considering the data: first, the Anatomy Course and the Introduction to Anatomy and Physiology Course are very new. The trend with the one redesigned course that has been around the longest, BIOL 1308/Fundamentals of Biology, is that pass rates tend to get higher the longer the course is offered. Faculty say that it takes them a few iterations to work the bugs out of the software and get used to the materials. If this ends up being true with the other courses their pass rates will go even higher. For this reason, in the tables below, we follow the table with all semesters, with a second table showing just the two most recent semesters. In both cases the performance of the BIL/redesigned courses has improved.

Secondly, the assessments used in the BIL/redesigned courses and the non-BIL/traditional courses are different, instructors differ in how tough they are in grading, and so on, making course pass rates a subjective measure of effectiveness.

On the down side, a much smaller percentage of the students who took the *redesigned* BIOL 1308 course (28%) took the test to pass into the pre-requisite sequence beginning with the

Anatomy course than did those students who had taken the *traditional* version of BIOL 1308. This is significant insofar as the main point Austin's redesign work was to increase the number of students ultimately taking, and succeeding in the pre-requisite courses.

Table 1a – Comparison of pass rates for students to enter into the Anatomy course (Spring 2015)

Spring 2015 (Greater percentage passing appears shaded)	Students who took the Redesigned BIOL1308 (Capital Idea and non-Capital Idea)	Students who took the traditional BIOL 1308 course (Capital Idea and non-Capital IDea)
Total who took the course	98	90
Total who took the test	27	44
Percentage of those who took the course who took the test	28%	49%
Percentage of students who took the test who passed it (no matter how many attempts)	81%	68%
Percentage of students who passed the test the first time	68%	50%

Observations from the Table 1a, above:

- A higher percentage of those who took the traditional course took the entrance exam to get into the Anatomy course.
- A higher percentage of students who took the BIL course passed the test (81%), than those who took the traditional course (68%).
- A higher percentage of students who took the BIL course passed the text the first time they took it (68%) than those who had taken the traditional course (50%)
- While the data above suggest positive results for the BIL course, they are tempered by the fact that a larger percentage of the students who took the traditional course (49%) took the test than those in the BIL course (28%).

When I asked Alice Sessions, C2C Coordinator, and Meg Flemming, Biology Department Chair and BIOL 1308 instructor why they thought fewer students in the redesigned course took the test to pass into Anatomy they told me this:

Meg Flemming responded, "My best guess is that it is due to lack of confidence. I find that is the biggest obstacle for this demographic of students. They can succeed in the class, but still feel "dumb" because they "aren't good at science." (email 7/27/16)

Alice Sessions responded "Many of our 1308 students are preparing for health science programs that do not require Anatomy, such as Licensed Vocational Nurse, EMT and so forth and so don't need to take the assessment test." (Email 7/27/16

Table 1b – Comparison of pass rates for Capital Idea students on test to enter into the Anatomy course (Spring 2015)

Spring 2015 (Greater percentage passing appears shaded)	Students from the **redesigned BIOL1308 from Capital Idea** who took the test to pass into Anatomy who came from Capital Idea	Students from the **traditional BIOL1308 from Capital Idea** who took the test to pass into Anatomy who came from Capital Idea
Total who took the course	7	0
Total who took the test	2	0
Percentage of those who took the BIOL 1308 course who took the test	29%	N/A -- No Capital Idea took the traditional course.
Percentage of those who took BIOL1308 who took the test who passed it (no matter how many attempts)	100%	N/A -- No Capital Idea took the traditional course.
Percentage of those who passed the test the first time they took it	68%	N/A -- No Capital Idea took the traditional course.

Observations from the Table 1b, above:

- Of the small number of Capital Idea (CI) students who took BIOL 1308 (7) a low percentage (29%) those students took the test to pass into the Anatomy course
- Of the small number of CI students who did take the test both of those students (i.e. 100%) passed the test the first time.
- There was no comparison cohort (the column furthest to the right because no Capital Idea took the traditional course.

Table 2– Comparison of Pass Rates: Biology Fundamentals Redesigned vs. Traditional All Semesters

Biology Fundamentals (Greater percentage passing appears shaded)				
Year	# Enrolled – Redesigned	# Enrolled Traditional	Redesigned-- % passing with A, B or C	Traditional % passing with A, B or C
Fall 2013	119	64	87%	75%
Spring 2014	106	73	94%	73%
Summer 2014	117	26	100%	64%
Fall 2014	210	118	85%	88%
Spring 2015	140	86	89%	83%
Summer 2015	33	38	91%	84%
Fall 2015	107	75	86%	88%

Observations from the Table 2 above:

- More students are now taking the redesigned course than the traditional one;
- Pass rates, on average, were higher for the redesigned course than the traditional one—in five of 7 semesters those student in the redesigned course passed at a higher rate than those in the traditional course.

Table 3a -- Comparison of Pass Rates: Human Anatomy Redesigned vs. Traditional

	Bio Innovation Lab [BIL] course (grant-funded / redesigned)		Non-Bio Innovation Lab [Non-BIL] course (traditional)	
Semester	# Enrolled – Redesigned	# Enrolled – Redesigned	Redesigned % with A,B, or C as a grade	Traditional % with A, B, or C as a final grade
Sp 2014	90	105	87%	92%
F 2014	87	104	92%	88%
Sp 2015	158	99	90.5%	90%
F 2015	107	75	87%	85%

Observations from the Table 3a, above:

- More students are now taking the BIL/redesigned course than the traditional course;
- Those in the redesigned course a greater percentage of students have passed in the redesigned course than the traditional course in 3 of 4 semesters.

Table 3b -- Comparison of Pass Rates: Human Anatomy Redesigned vs. Traditional for *most recent two semesters*

	Enrollment		Percentages passing with an A, B, or C	
Semester	# Enrolled – Redesigned	# Enrolled – Redesigned	Redesigned course % with A, B, or C as a final grade	Redesigned course % with A, B, or C as a final grade
Sp 2015	158	99	90.5%	90%
F 2015	107	75	87%	85%

Observations from the Table 3b, above:

- Taking into consideration the faculty's observation that it takes a few semesters for BIL courses to begin to show their full potential and looking at the most recent two semesters, there was only the slimmest of margins by which the redesigned course had greater percentages of students who passed with an A, B, or C. It will be interesting to see if this margin increases as the faculty gains experience with the redesigned course.

Table 4a –Comparison of Pass Rates: Anatomy & Physiology BIL and Non-BIL Grade Comparison

Introduction to Anatomy & Physiology (Greater percentage passing appears shaded)				
Year	# Enrolled – Redesigned	# Enrolled Traditional	Redesigned-- % passing with A, B or C	Traditional % passing with A, B or C
Spring 2015	42	68	79%	70%
Fall 2015	49	50	67%	83%
TOTAL/MEAN	91	118	73%	76.5

Observations from the Table 3, above:

- For the Anatomy & Physiology course there were mixed results regarding the pass rates, with higher percentages passing the traditional course for two out of three semesters.

Challenges / Room for growth

An important area for improvement if Austin is to achieve it's ultimate goal of getting more students to matriculate into its health science programs will be to get more students from the redesigned Fundamentals of Biology (BIOL 1308) to take the exam to get into the Anatomy course. It's important to remember that these courses are new, and—at this point—we don't know why fewer of the students from the redesigned courses are taking the exam. This is a place where Austin's instructors and career navigators should have some conversations with students who chose not to take the test and pool their data, and see what patterns they observe.

As of this writing, data was not available on whether students who passed the redesigned Fundamentals of Biology class had higher pass rates once they took the Anatomy course, the next in the health science prerequisite series. Those data will be important indicators of whether the BIL/redesigned version of BIOL 1308 is providing as-good or better preparation than the traditional version of that course.

More data is needed on those students who are failing. Given the many other anecdotal indicators that the new model is helping students to *lean in* and feel successful in learning, what's happening for the 29% of students who did not pass Fundamentals of Biology (BIOL 1308)?

While Capital IDEA's model shows promise, currently, faculty report disconnects between services provided by the wider College and the health sciences students.

Outreach to males—(Note: currently a challenge for many community colleges)

Faculty at the program we talked to say that the predominance of women is related to Capital IDEA attracting single mothers seeking extra support. In contrast, men tend to feel the need for immediate money and seek full-time employment.

That said, it seems like there may be some feedback loops here: men lacking credentials are less likely to commit to long-term relationships… single motherhood is highly correlated with poverty…

In this way, finding ways around the problem that men are less likely to come to ACC's programs may allow deeper changes to local communities.

How could ACC do more to attract male students? Are there ways that ACC could strengthen and/or promote stepping stone programs that allow men to support their families while continuing with programs? Could ACC use males who complete the program to do outreach to other males? How is ACC doing in the number of male faculty members? Particularly minority faculty members?

References

Aspen Institute: Workforce Strategies Initiative (2010). *Courses to employment: Sectoral approaches to community college/non-profit partnerships: Initial education and employment outcome findings for students enrolled in healthcare career training 2003-2009; Capital IDEA and Austin Community College Partnership*. Wash. DC: Aspen Institute.

Table 4 – Data Sources for this Report

Position	Name	Title/Affiliation	Interview?	Focus Group?	Observation?
Administrators	Alice Sessions	C2C Project Director	Yes (Yr. 1 & Yr. 3)		Yes, (Yr. 3, Anatomy class)
	David Fonken	Dean of Math & Sciences	Yes (Yr. 1, 3)	Yes	Yes
Instructional Designer	Virgil McCullough	Instructional Designer	Yes (Yr. 3)		
Community partners	Eva Rio-Lleverino	Career Navigator, Capital IDEA	Yes (Yr. 1, 3)		
	Teresa Soto	Career Navigator, Capital IDEA	Yes (Yr. 1, 3)		
	Nancy Laudenslager	Director, Workforce Development	Yes (Yr. 1 & 3)		
	Pam Thomas	Career Navigator, Capital Idea	Yes (Yr. 3)		[Cont.]
Instructors	Rick Fofi,	Biology Innovation Lab Team leader, Biology Fundamentals (BIOL 1308) Instructor	Yes (Yr. 1, 3)	Yes	
	Flo Oxley	Instructor, Biology Fundamentals (BIOL 1308)	Yes, (Yr. 3)		Yes
	Mary Parker,	Math Statway class instructor	Yes (Yr. 1, 3)		Yes

Table 4 – Data Sources for this Report (cont.)

Position	Name	Title/Affiliation	Interview?	Focus Group?	Observation?
	Meg Flemming,	Biology Dept. Chair, Instructor Biology Fundamentals (BIOL 1308)	Yes ((Yr. 1, 3)		Yes
	Laura Juarez	Biology Instructor, Biology Fundamentals (BIOL 1308) I	Yes, (Yr. 1)	Yes	
	Anita Thomas (Yr. 3)	Biology Instructor, Anatomy (BIOL 2304)	Yes, (Yr. 3)		
	Felix Villarreal	Biology Instructor, Biology Fundamentals (BIOL 1308) I	Yes, (Yr. 3)		
Lab technicians	Kelly Harper	Lab Technician, Biology Fundamentals (BIOL 1308)	Yes, (Yr. 3)		
Students	[Omitted] (male)	Fundamentals (BIOL 1308)	Yes (Yr. 1)		
	[Omitted] (female)	Fundamentals (BIOL 1308)	Yes (Yr. 1)		
	Bio students	Fundamentals (BIOL 1308)		Yes (Yr. 1)	Yes
	Math students	Math Statways		Yes (Yr. 1)	Yes
	[Black or Latina Female]	Fundamentals (BIOL 1308, Anatomy (BIOL 2304)		Yes, (Yr. 3)	
	[White female]	Anatomy (BIOL 2304)		Yes, (Yr. 3)	
	[White female, career changer with BA]	Fundamentals (BIOL 1308)		Yes, (Yr. 3)	
	[White female]	Fundamentals (BIOL 1308)		Yes, (Yr. 3)	
	[White male]	Fundamentals (BIOL 1308, Anatomy		Yes, (Yr. 3)	
Career Navigator	Sonia Alexander-Okafor	Capital Idea Mentor Project	Yes (Yr. 3)		

V. Curriculum: How was the particular curriculum selected, used, or created?

Summary of findings in this section

Changes in curriculum and instruction lie at the heart of the changes undertaken at ACC under the C2C grant. The impetus for this redesign was that pre-requisite courses for the health sciences pathway were acting as "weeder" courses, sending too many students away feeling like they were not cut out for further study. The redesign was intended to give students a more supportive start and help them to be successful in subsequent courses.

The redesign includes three courses: Fundamentals of Biology (BIOL 1308), Anatomy (2304) and Introduction to Anatomy and Physiology (BIOL 2404). The nature of the redesign of these courses was consistent with what is known as "flipping the classroom"—providing content outside of the classroom rather than providing it in class lectures, and then using class time to use that content in more interactive and integrative ways.

At the heart of the redesign of courses at ACC was the following:

a. the creation of on-line, interactive modules that introduce content bit by bit, contextualizing each of the parts within the broader whole;
b. data collection on the students' performance of the module to inform the instructors' use of class time;
c. in class hands-on small group activities differentiated at the discretion of the instructor.

Regarding these redesigned courses data in Year 3 showed

- higher percentages of students passing with an A, B, or a C among all students in the course;
- higher percentages of Capital Idea students passing with an A, B, or a C;
- an increase in the number of students taking BIOL 1308;
- high satisfaction among students for the flexibility afforded by the on-line modules;
- high satisfaction among students for the interactive nature of the in-class modules;
- high satisfaction among faculty for their increased ability to adjust in-class activities to meet the needs of students.

Suggestions for improvement from students regarding the curriculum and instruction were as follows:

- Make explicit to students that they are learning a new language—the language of science—and so they need to familiarize themselves with the language before class by doing the modules or they will be confused;
- Redesign all of the courses so that they didn't have to go back to the traditional instruction that they found less effective for long-term retention;
- Making sure that the activities in the initial course, BIOL 1308 aren't too easy;
- More variety in hands on activities in class.

Development of the Bio Innovation Lab Curriculum

Need and opportunity: Displacement of workers in high tech and a high demand for workers in the Health Sciences & Bio-tech

There were two parts to the problem that ACC was attempting to address with the use of C2C funds. The general problem addressed by use of C2C funds was that Austin had a high number of workers who had been displaced from the sectors of computers/ software, semi-conductors, electronics and communications manufacturing. Thirty two percent of these workers had less than a high school diploma (DOLETE Database, 2013)

Along with this challenge, the economy of metropolitan Austin help an opportunity--a high need for workers in a cluster of 16 related healthcare and bio-tech occupations:

Occupations with high need in Healthcare/Bio-Tech

- Health care technicians (ophthalmic, radiographic, pharmacy, MRI, biological),
- Surgical assistants and technologists,
- Phlebotomists, occupational, physical therapist and nursing assistant,
- Registered Nurse (RN)
- Licensed Vocational Nurse (LVN)
- Emergency medical technician
- Medical and clinical lab technician
- Medical records and health information personnel

Table 5: Evidence of Employer Demand cited in Proposal

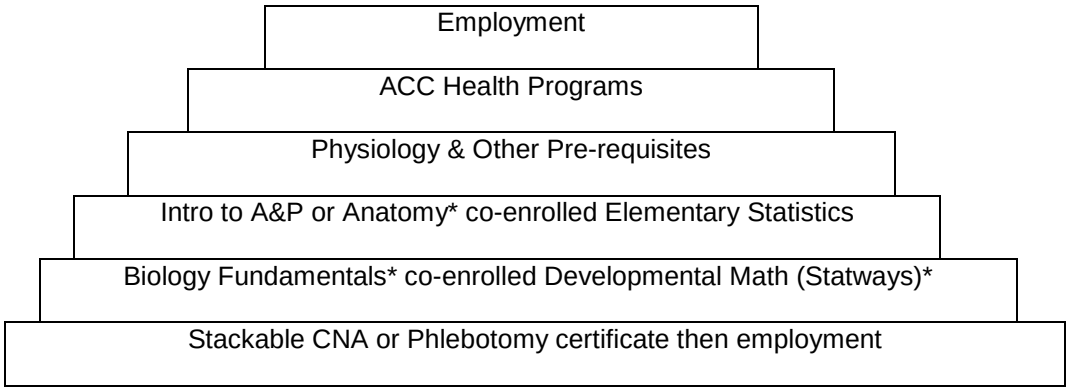
Consortium Site	SOC Code	Occupation	Short-term employment projections (thru mid-2015)	Long-term employment projections (thru 2018)	Annual Mean Wages
Austin, TX	Cluster of 16 SOC codes	Health Information	Projected growth for 16 targeted positions is 2,700 between 2012 - 2015	Projected growth for 16 targeted positions is 7,600 between 2012 - 2121	$35,920
		Coders, Health			
		Information Systems			$41,830
		Technicians, Health			
		Information Technicians			
		(16 health care and			
		bio-tech occupations)			

Source: USDOL and state workforce commissions

Bottleneck to be addressed—Pre-requisite courses were keeping students from pursuing health sciences

In spite of demand for workers in the health sciences and bio-tech areas, the problem that Austin was facing in getting workers prepared for these jobs was that the students were not being successful in the pre-requisite courses that served as a gateway to a wide range of health sciences courses. For the previous 3-4 years it had been a "weed out course," despite the need for it to be a confidence building initial experience (Instructor, Rick Fofi).

Figure 1 –Progression of courses at ACC in the Health Science / Bio-tech Fields



*Redesigned courses

In the Aspen Institute report from 2010 on ACC's programs in the health sciences, the most common "off ramp" for students to exit the learning process was the prerequisite phase (P. 36). Similarly, the most common off-ramp for students who left the program but did not enter the healthcare field was the prerequisite phase.

Students who withdrew before earning a healthcare degree but were helped by Capital IDEA to get a job *did* still have impressive gains in their income (from $13,559.57 annually to a median of $22,376.85 in their first full year of service, an increase of 54.7% [p. 11]). It was, however, those students who persisted and received a degree that received the greatest increase in income:

> Students graduating from healthcare programs saw a remarkable increase in earnings. In the year prior to enrolling, students who eventually earned a healthcare degree earned a median of $13,544.93 annually. In the year following their graduation (the first full year of employment), these same students were earning $44,222.39, an increase of 226.5%. (p. 11)

These data raised the question of what could be done to support students at this phase so they do not need to leave before the big pay-off of completing a healthcare program degree. Similarly, since students who did not graduate most frequently left the program during the prerequisite phase: What can be done to support students who leave in getting a healthcare position?

Table 6: Training steps where early placement occurred (Aspen Institute, 2010)

Placement Year	N	ESL	ACC English Prep	GED	THEA	Pre-requisites	LVN	RN	Other Healthcare program
2003	2	0	0	0	0	1	0	1	0
2004	15	1	0	1	0	11	2	0	0
2005	18	1	1	0	1	13	1	1	0
2006	18	0	0	1	1	11	3	0	3
2007	22	0	1	1	2	14	2	3	1
2008	17	0	1	1	1	9	5	0	0
2009	5	0	0	0	0	4	1	0	0
2010	1	0	0	0	0	0	0	0	1
Total	101	2 (2%)	3 (3%)	4 (4%)	5 (5%)	63 (62%)	14 (14%)	5 (5%)	5 (5%)

One of the community based organizations that had been involved in providing "wrap around" or comprehensive supports to help ACC students in making the transition to college had been Capital IDEA. David Fonken, Dean of Math & Sciences described the need this way:

> *We've had a longstanding relationship with Capital IDEA. For a number of years we've helped them out with their college prep academy. [Capital IDEA] was very successful in getting people ready for college. The students who got into the programs like nursing were very successful. But in between—in the pre-requisite courses--they weren't so successful. We decided that the grant would be the perfect way to address that. (*9-27-13)

ACC Bio Department Chair Meg Flemming agrees, explaining what students weren't getting:

> *Capital IDEA was being successful in preparing students for many areas of college readiness, but students were intimidated in pursing the health science pre-requisite courses. Capital IDEA has the capacity to bring students to college readiness, but they don't have the ability to bring them to science readiness…. They didn't know what a cell was… The idea of chem freaked them out* (9/27/13).

As scaffolding to student success in this area the college created a new course—BIOL 1308. The creation of BIOL 1308 occurred before the beginning of the C2C grant. Flemming explained, "It still wasn't in a form that allowed these very unprepared students to practice again and again and again."

The development of the curriculum—Leveraging an instructor's experience with innovative instruction in the Air Force and innovations from a previous grant from the Carnegie Foundation for the Advancement of Teaching

Led by Dean of Math and Sciences, David Fonken, the goal for the curriculum changes funded by C2C was to improve the success rates of students in the health science and bio-tech courses through the use of on-line and technology enabled learning. While Fonken seems to be the impetus for the program, the details were worked out by Instructor, David Fofi. Fofi's vision for the program was based in his 25 years of experience in the US Air Force. As Fofi explained,

> *I came with [the vision.] In the Air Force, they are assigned a job and they get into this pipeline. So, a lot of resources are put into training. They flipped the classroom, had hands on learning, and see one/do one. I just thought we should bring that here. And motivation—making it fun. (9/26/13)*

With his charge from the Dean, Fofi handpicked his team—all faculty members except for one lab technician. His job, as he saw it was to keep the team on deadline to design the courses using project management experience from work as a pilot instructor. (9/26/13, 11/14/14)

In the next three months of meetings, the team clarified the objectives for the course and then were told by Fofi to "Go out there and find what's out there. What's the best way to deliver those objectives?"

Like many C2C colleges (LATTC, Muskegon CC, and Shoreline CC) full time faculty who were involved in developing the curriculum taught multiple core topics, which allowed them to develop knowledge of, and relationships with, particular students, learning about the ways that the different stages of the curriculum can be made to fit more cohesively with each other.

When publishers heard that ACC had received the grant, they flocked to the team but, so that they would not be beholden to publishers over proprietary rights, they chose to develop their own modules.

The software they utilized was *Lectora***.** Fofi describes the challenges of creating the modules:

> *It's wonderful but very time consuming to build these modules. That is our biggest drag on our progress. I delegated different tasks. There are three who are building their modules. They're working many more hours. Buy-in is there, but you can only do so much. They are still teaching the courses. I'm 21 lecture hours –4 classes with labs. They get release time—6LEH—(6 extra hours, or 2 courses release time). But they're working above and beyond that. (9/26/13)*

While the C2C funds paid for 6-7 staff persons' time to create the curriculum, it also expanded ACC's physical capacity at the Eastview campus—a campus where they had previously not been able to offer the pre-requisites because there had not been the labs needed. Fonken explained,

> *At the Eastview campus… we had a science lab, and we had a nursing program but we were never able to provide the prerequisites for those programs on that campus. We lacked the [supplies], basically. And so one of the things that the grant did was allow us to buy the [supplies] to teach human anatomy, human physiology, introduction to anatomy and physiology, and also equipped the lab for the intro to biology. So that means that we're able to serve more students and we're able to serve them in the environment where they will belong to the health professions. (9-27-13).*

Prior institutional knowledge leveraged in developing the Bio Innovation Lab Curriculum

The curriculum development done using the TAACCCT Round 2 funding built from the experience ACC faculty and administration had developing the Statway Online curriculum using funds from the Carnegie Foundation for the Advancement of Teaching. The Statway program used a module-based curriculum for an introductory statistics class.

Fonken describes himself as a "true believer" in Statway's use of on-line modules and the intensive support from career navigators provided by Capital IDEA:

> *What the Statway folks do is to require a two-semester commitment from students. They take students at that same level—people who are ready for elementary algebra. They put them through a developmental course which has some elements of pre-statistical reasoning in it, and they put them through a college level stat course with a 1-semester lab course on the side. Their numbers are 50% [of their students] having credit for college level math course. Not 1 in 6 for three years. Compared to what's going on--it's fantastic…*
>
> *We have a cohort now that's doing the Statway course that is all Capital IDEA students. With all the scaffolding that Capital IDEA supplies I think we'll see numbers much higher than 50%. We'll find out at the end of the year. (*9-27-13)

The Statway program grew out of a problem in math pre-requisites that was analogous to the science problem. Mary Parker, an instructor in the Statway Program explained its origin this way:

> *We have maintained that intermediate algebra is not a good prerequisite. So we have statistics or math for liberal arts. If you are TSI complete you are able to take statistics. But, there are lots of faculty members and programs that would like their students to take statistics. But they were dropping it because it was hard. So we were encouraging people to take other courses and get used to the idea of taking courses and learn how to think like a college student. (*9-26-13)

Statway Instructors told us that there is high satisfaction among faculty for their increased ability to adjust in-class activities to meet the needs of students.

Key element of redesign: Helping students make meaning by contextualizing the parts and the whole

When we asked Virgil McCullough, the Instructional Designer about their approach in designing modules he explained it this way:

> *…We really break down the content, emphasizing words. I use the word chunking—that means breaking it down into smaller bites for digestion and comprehension so they don't have to separate as much of the content for themselves. We're making a lot more connections for them between the content and the image that goes with it--trying to help them see how things fit together. It's one thing to look at 2 pages of physiology with a lot of words and call outs to an illustration and it's another thing to see those separate parts of the illustration linked with the relevant text or content or ideas. (11/12/14)*

McCullough seems to be getting at one of the key elements of the redesign when discussing the relationships between the parts and the whole:

> *Graphics/illustrations play an intensive role in this work. So, for example, in the digestive track there are layers… Interior, muscle layers… We illustrate it so you see the whole picture, but you also see the component itself… So, at a very basic level, you see it in context, but you still see it separated…. Then, maybe you add another part. It's a building process. You add until you see the entire process… Thomas Samuels [a key instructor involved in the redesign] is very astute in terms of showing the elements within context. (11/12/14)*

McCullough emphasized how helping students see the relationships between the parts and the whole helped them to remember the content:

> *[What I think is most promising is that] we've reduced the complexity and cognitive load that the students have to bear. It's very dense content. I have a hard time reading it. There's lots to remember. Lots of systems—one thing flows into another. You have to know—it's not one isolated item… We're helping them make those relationships easier to digest and remember. (11/12/14)*

Related to this, five students in the Year 3 focus group told us that they found that if they finished the module and still didn't see how a part related to the whole then the in-class activities helped with that:

> *Sometimes I'm like, 'I remember this part about this part, but I have no idea where it fits in.' So I think a lot of the activities help with that overview of the organization. (11/12/15)*

The students we spoke to all agreed that the iterative process—coming back to the material multiple times in different ways—has been helpful and they contrasted this with the pressure to understand the first time material was presented in a traditional lecture. These responses from students were reinforced by classroom observations where we saw the instructor, Alice Sessions,

contextualizing the respiration of cells in terms of its wider purpose—for the body to do work by moving its muscles (11/13/14).

Contradictory data on the rollout of Fundamentals of Biology (BIOL 1308) (followed by data on steady improvement)

By our Year 3 site visit, the pass rates had caught up to the enthusiasm we heard from all corners in our Year 1 visit. As detailed in Section VI on Assessment, the percentage of students passing with a grade of A, B, or C was 85% in the redesigned courses over the previous 5 terms, compared to 76% in the non-redesigned (traditional) sections. What one can learn from these data, however, is limited by the subjectivity involved in grading. The assessments given are different in the redesigned course than the traditional ones making comparison inexact, at best.

Qualitatively, we heard a great deal about the improvement of the redesigned courses—both in comparison to when they were first rolled out, and in relation to the traditional courses. In our Year 3 Site visit, perhaps speaking more freely about the challenges of the Year 1 by the successes they were experiencing, C2C Director Alice Sessions told us frankly that the initial implementation of the redesigned BIOL 1308 had been rocky:

> *The first rollout was pure chaos. The designers chose a very complex tool*—Lectora. *It's not intuitive, not what our instructional designer had any knowledge of. It was taking hours and hours of people's time. Things were late. Things were not done. I had a Monday morning class and frequently I had not gotten the materials. Students didn't like it. I didn't like it. I was in the middle of radiation treatments. It was, frankly, a disaster. We recognized it.*
>
> *In January we reworked a lot of it—the in class modules that went along with it (for BIOL 1308). We reworked the schedule and rolled it out in the spring again. At that point we had all the modules. Life was much smoother. Students were giving positive feedback. Flo [Oxely] taught it in the summer time. We just got rave reviews. (11/13/14)*

In our Year 1 site visit—in contrast to Sessions retrospective view that things had been "pure chaos"--we heard great support for the redesign of BIO 1308 from all quarters.
Students, faculty, administration, and community partners enthusiastically told us that the new instructional methods make learning a more flexible, differentiated, collaborative and positive experience. Whether people were experiencing the changes as refreshing and exciting or chaotic and behind schedule—and it's possible that both were true--one thing that was clear was that in early stage the redesign had not yet made a difference in one of the key indicators: the percentage of students passing BIOL 1308.

Continued high satisfaction among students for the flexibility afforded by the on-line modules

All students - - whether those arranged for interviews or those approached independently - - praised the flexibility that the on-line modules gave them for mastering the work:

> *Oh, my gosh--It's so awesome. A couple weeks ago I got sick. I missed a whole week-- I had to miss two class periods. It was great how I could just go into the modules and keep up with my classmates. It explains everything. You come to class having learned. It makes it much easier. You don't have to learn it in class.*
>
> *You don't have to go back to your notes. If you're unclear about something it's all there as part of the module. (Student, 10/28/13)*

One student who had taken BIOL 1308 before and after the redesign explained the difference the changes made for him:

> *I'm originally an architect. I was in the field for 17 years. I decided that I wanted to become a nurse. I enrolled in ACC. When I enrolled I took an anatomy assessment test. I failed. I decided to take BIOL 1308. When I enrolled I had no idea it was an Innovation Lab.*
>
> *The registration process wasn't very clear. When I started—I had friends who were in other BIOL 1308 classes and I saw the difference. It's much more explanatory. It makes me prepared for the class before I attend the class. Everything is pictured and explained. I take notes while I'm taking the modules and so I know whether I know the materials or not. The study time is cut by about half because I've already learned it. I just have to review. (Student,* 10-28-13)

Career Navigator Theresa Soto, reported also hearing enthusiastic responses from students:

> *What the students have told me is that they like that it's in a module form, because they have a better understanding of the materials. The students rave about it. They love how interactive it is. (10/27/2013)*

Faculty and administration involved in BIOL 1308 were similarly effusive in their judgment of the changes. In a joint interview with Laura Juarez, an Instructor, and Rick Fofi, they highlighted the way the curriculum met the needs of students with demanding schedules:

> *Laura: It allows students flexibility—the feedback I've been receiving is that they can get the module night or day. With a classroom you either get it or not. Some work night jobs… At their night jobs they can get to the modules.*
>
> *Rick: The traditional way, I can know the ones who can't make it. The ones with children—ACC is staunch about no children allowed in class. This allows them to take it over and over again…*
>
> *Laura: Being able to track how they're doing. We just took a quiz and students see their progress…*
>
> *Rick: Eventually I want it to be more their own pace. I want a six-week course. I know many vets come out without any certifications and want to move ahead quickly.*

> *Laura: the way we've set it up, it lends itself to that. If they do well, they might do well for the five modules but need help with the sixth one.*
>
> *Rick: Eventually, I want it to be so they don't have to come to class except when they need it. Currently it is required. (09/27/13)*

It's important to note that the online modules are different than a textbook on a screen by the fact that they are interactive. When reading a textbook, a student might think they "get it" when they really do not and continue in their reading. The module tests their understanding and brings them back to content that they don't yet grasp but does so in a low-stakes way:

> *They click on the thing they think is a vein [and the computer will tell them if they are right]—trial and error. Next screen, they type in an answer and if it's wrong it tells you. It gives them stops in between, but there's no scoring on it.*
>
> *Interviewer: Can they go on if they got it wrong?*
>
> *It depends on the place. In the Concept Check you can go on if you have a problem that you got wrong. But at the end, it tells you which pages you have completed, which ones you have not. And you can go back. (11/12/14)*

Except for some issues with software bugs—which will be discussed below—students were enthusiastic in their support of the redesign. One student told us, "Once I realized what it was, I saw that it was just what I wanted. I like interactive. When I go to the practice anatomy test I'm already able to answer most of the questions. It makes the anatomy seem doable." (09/17/13)

When I asked a group of three students in class whether the in-class activities were helpful for learning the content all three said that they definitely were, in fact, helpful.

A different student, in an interview, offered a similar appreciation for the hands-on activities.

> *I like the fact that we do a lot of hands on activities in the class…. We put them together… A couple of classes ago we put the DNA together with marshmallows and candy. I know it was high school level, but because I am an architect it was really cool. They spend time and effort to make the modules. (10-28-13)*

Another appreciated that, unlike reading a textbook, the on-line modules involved interaction through student responses:

> *It's not as tedious as reading. It's more interactive and fun. (Student, 10/28/13)*

Eva Rios Lleverino, Director of Operations at Capital IDEA saw it as the beginning a reinforcing cycle of students' success:

> *They're loving the biology class, like the one you saw today. They need to see that they're capable. In this curriculum redesign they can be more successful and they have more supports. If they have a good experience they build on that… We're hearing that "I'm so hopeful that I'm in this different way of learning." (9/25/13)*

In our Year 3 site visit, a new group of five students was again, very enthusiastic about the flexibility the redesign allowed them and told us about some innovations that they had come up with using the cameras on their phones.

> *I take screen shots of the modules and then I can take my time and not have to be online. My sister gave me an I-phone, and I put the module photos on my phone. I have those with me. It's for when I'm writing me notes. I work for 50 hours per week at two jobs. I skim through the photos when I get a chance. (I1/13/15)*

Another student told us of making sure the models they created in their small groups were well-labeled and then snapping photos of those to study later.

Along these lines, one suggestion that the students made was to make the modules available off-line, allowing them to study them at times when they didn't have access to the Internet or to print them out and study them out of the order in which they appear.

Continued high satisfaction among students for the interactive nature of the in-class modules

In our Year 1 site visit, in the 11 interviews completed with students, faculty, administrators and community partners, as well as in the informal conversations with students when classes were observed, there was no one who was not in support of the changes. The only complaints were regarding bugs in the software, which were being addressed as they came up according to both students and members of the design team.

One student who the program's administration had not arranged for us to interview sought us out after class to let us know about her experience:

> *I just wanted to tell you that I really like this course. I was really nervous. I have test anxiety. But I'm really enjoying it. I'm doing great. I'm getting 100's. (9/27/13)*

In our observations of BIOL 1308, and the Statway class that uses a similar model, we observed a high degree of engagement among students and were told by them during class and in interviews that they found the class activities to be engaging and well integrated with the on-line modules.

Another student said this about the small-group in-class activities:

> *They let me know what I don't know. It gives me an idea of what I can go back and refocus on. Actually seeing the modules—we went and saw the models of the DNA, it brings the whole concept together. (Student, 10/28/13)*

Another student—the man one with a background in architecture—appreciated the visual nature of the modules:

> *It's perfect for the students who are older adults—half online and half in class. It's much more visual—I like to see it, rather than having a teacher lecture. I can put the pieces of the puzzle together. It's easier for me. I love it. (Student,* 10-28-13)

In our focus group of students in Year 3, one student commented on the collaboration she found in her redesigned Anatomy (BIOL 2304) class, saying that she thought that the in-class activities "opened you up":

> *I think a lot of the collaborative spirit comes from the activities in class. I know that that kind of comes from the modules a little bit—you're supposed to do the module at home and do activities the next day. The activities I feel are really great because it kind of opens you up from that one-on-one tunnel you have with the teacher, to looking around at your neighbors. And that opens up a level of comfort that I really like. (11-13-14)*

Two faculty also talked about how flipping the classroom makes students take more active agency in their learning: Meg Flemming said that as she hands out her syllabus she tells students, "I won't spoon feed you but I'll give you the spoon." (9/27/13)

When we asked Flo Oxely (11/13/14) for examples of the formats that they use for the in-class examples she told us of these:

- Matching three types of cards related to the content of a chapter: photos or diagrams, definitions, and single vocabulary words.

- Building things: "They have a kit called 'Tangled proteins.' they build a protein by sticking amino acids together. They go from primary to secondary, to tertiary and then they take four of them put them together into quaternary. So they can actually visualize them instead of seeing them on a screen. It has plastic pieces that they put together."

- Edible projects: "We did a mitosis activity with chocolate doughnuts. The doughnuts were the cells and they used the sprinkles to show the different stages. Then they ate them."

- Dramatizing: "Getting them involved like being parts of the cell, making them lay down on the floor, so that now that have a hydrophilic tail and a hydrophobic cell, and seeing how molecules can move in and out of those membranes. They really seemed to like that.

One challenge that typically comes with collaborative learning is the varying degree of involvement from students. In the small group work in class that we observed, there was one student who was participating less than the others. After class, I asked Flo Oxley, the instructor, whether she finds some people less involved in the small group work:

> *Yes, there are some. But I'll tell you, they're getting over it. I target them. I tell them, "Come and see me during my office hours…"*

In our Year 3 focus group of 5 students, there was unanimous support for the redesigned courses. The students' main concern was whether they would have to go back to the traditional lecture courses.

Meg Fleming said that she is planning on seeing if the department can keep spaces in the redesigned anatomy class for those who have already completed the redesigned BIOL 1308 course "so that it's really a pathway, instead of having their fingers crossed that they can get in." (11/14/14)

When we pressed students for things that they were not satisfied with, one student said that she thought they needed more variety in the hands on activities, and another said that she felt that the activities sometimes feel too "dumbed down."

> *I feel a little bit stupid being in the class. There was one [in-class activity] we were supposed to do—I actually have a copy of it. None of us did it because we didn't think it would be important. It was like making a village and drawing people, versus the activity we actually did which was the life of a cell. I thought that was more relevant. (11/13/15)*

Another student suggested that they make more prominent the "side trips" (e.g. tip boxes) that one can take in a module and make sure that the module will let you easily return to the main pages without having to return to the beginning, as she said is sometimes the case. (11/13-15)

Stage 2: Redesign of Anatomy course (BIOL 2304) – learning from the experience of the previous redesign

As discussed detail later in Section VI regarding Assessment, both the redesigned Anatomy course and its traditional, non-redesigned counterpart have had 90% of their students passing with an A, B, or C over the three terms that the redesigned course was being used.

Following Fundamentals of Biology (BIOL 1308), Anatomy (BIOL 2304) and its lab were the second courses to be redesigned. The process of the redesign was similar to that of the earlier course, except for the important addition of Virgil McCullough, the newly hired Instructional Designer. The application used to create the modules was, again, *Lectora,* and the templates for the modules were designed by Thomas Samuel, an instructor who is described by his colleagues as particularly tech savvy. One difference with the redesign of Fundamentals of Biology was that for Anatomy—because it is a standard course taught across our nation and others—they found that there was a great deal more "off the shelf" materials (including computer applications) available that they could use as a resource for the modules. (Rick Fofi, 11/14/14)/

The eight instructors who are teaching the redesigned course meet with Rick Fofi, the project lead and Virgil McCullough all day every Friday to collaborate in their planning. For this time they receive a reduction in their course load and/or are given Learning Equivalent Hours (LEH's). Instructor Anita Thomas, for example, said when she began she went from a full-time

load of 3 courses down to 2, and received 6 LEHs. Still, she said, "The time we put in is way beyond that." She says this matter-of-factly, also including, "It's so exciting!" (11/12/14). Similarly, we asked Anatomy Instructor Stephanie Carlson, "How is your resentment level?" and "Do you feel exploited?" and she replied, "Exploited is a strong word. It takes a lot of time. I'm doing a lot more work for BIL than if I was teaching another course for those 3 LEH's." (11/12/14)

The instructors on this team were picked by Project Lead, Rick Fofi. When we asked Fofi about his picks, he explained that the people he was looking for this time were different than what he was looking for the lower level BIOL 1308:

> *I wanted a team that had high standards and was very meticulous with anatomy. Not as mothering. I didn't want at any time to establish that relationship where they're too generous. More tough love. More about "can you meet the standards." (2/10/15)*

Whereas Fundamentals of Biology was created to address the problem of students dropping out of the healthcare course series, and was intended to give them a positive, confidence boosting start, Anatomy is a course where the content is more-or-less standardized across the nation and entrance into later programs depends on their mastery of it. Alice sessions, C2C Director, echoed what Fofi told us:

> *The Anatomy people have a close eye on the fact that they need students to have this information. They won't put up with much, such as "toothaches that kept them from class." I can see their point. I think they are walking a tight balance. (11/13/14)*

When we asked C2C Director, Alice Sessions whether there were things that they had learned in the first redesign that informed the redesign of Anatomy, she explained that they have begun focusing the modules on the "3 to 4 areas that have historically proven to be most challenging for the students." (11/13/14). The less problematic material, she said, is covered in the course and the lab.

One of the other things that the team has learned from the experiences of Fundamentals of Biology is the importance of students doing the modules before they come to the corresponding class session. When we visited in Year 1, when the redesign was new, staff described how some students completed the modules before the class, and others did it afterwards. This seemed to be accepted by instructors in the spirit of different students learning in different ways. In our Year 3 visit, this seemed to have changed—we heard a greater emphasis on pushing students to complete the modules before class. Anatomy Instructor Anita Thomas' views were typical:

> *We still have some students who, despite our request to do before class, say "I didn't have the time to do it." The same students tell us it works better when they have done it. They're more responsive. The notes are a motivational aspect. The same students that are not doing it realize that this will help them. They move in that direction. They are doing that in intro to bio too. (11/12/14)*

Students concurred about the need to do the modules before class:

> *Student 1: I see Biology and Anatomy as learning a different language—a scientific language. If you aren't exposed to those before class you're going to freak out, "Oh these are such big words." [The students who do well in the redesigned courses] are the students who do take that initiative to do that work beforehand. (11/13/14)*

Agreeing with this, another student suggested what she saw as a simple way that the instructors could address this issue:

> *Student 2: But overcoming that could be as simple as being really directive with students about how they should be studying. We haven't talked about it, but the "Mastering A&P Activities" (from Pearson) online are huge. And if you take the notes from your module, read your notes again, and then do the Mastering A&P activities--I did this the other day with the Heart Activities and then I was like, "Alright, I'm ready to be tested on this." So maybe if they were really specific about it: "You have to take the module but then you have to read the notes again, and then—we get extra credit if we do all the Mastering A&P activities for the semester, but I don't think that should be an option. (11/13/14)*

One way that the faculty facilitate students' working with the material is to supply an outline of the module on Blackboard and require students to fill in this outline with their own notes.

While getting students to do the modules before coming to class may be an on-going challenge, we were told that the problem is less than in the traditional course, where it was even more common for students to have come to class having not done the readings (Anita Thomas, Anatomy Instructor, 11/12/14)

Stage 3: Redesign of Introduction to Anatomy & Physiology (BIO 2404)

The redesigned version of Anatomy and Physiology began to be implemented in fall of 2015, following our visit. This course, like Human Anatomy, is a pre-requisite for certificate level Health Science Programs.

Looking ahead: Sustainability, continuous improvement and avoiding the pitfall of "one size fits all"

In our third year site visit, we found as the Bio Innovation Lab [BIL] was preparing for the migration of the redesign to other instructors and efforts were being made to create a culture of flexibility and hybridization, rather than a culture where "one size fits all." Project Lead Rick Fofi expressed this attitude when I asked him if it was becoming a problem when they hired new instructors who had not been part of the creation:

> *I'd like to think that the people we pick up, we look at them as—"Hey, maybe they will bring the next great idea." I want this to be a living thing." Let's evolve. The last thing I want is for this to be stagnant. We are expanding…. They will be part of the creative process. I don't think that the creative process will ever end. The new people—they're*

> *all open minded. 34:15… We come to a consensus… Sometimes if the debate goes on, that's my [place to make a decision]. (11/14/14)*

Listening to the Biology Department Chair, and the Design Team Leader we got the impression that differences in learning style were "to be expected" rather than to be eliminated, and this view was shared by Dean Fonken. Both also seemed to encourage opportunities for cross-fertilization among instructors. (Alice Sessions, 11/13/14, Rick Fofi, 11/14/14)

Along with minimizing faculty resistance, Flo Oxely, Instructor for Fundamentals of Biology made the point that maintaining diverse forms of instruction is also well suited for the diversity of students' needs:

> *We're still looking for different ways to hit all of the different learning styles that we have in the class. Some people--all they seem to need is the lecture. Some other people need to be taken through some of the harder modules step by step by step. Some people need to work on the vocabulary. Some people, they've got to build it. (2/17/15)*

As mentioned in the Chapter V (Curriculum), the culture of continuous improvement also seems to extend to the students, who have been innovating in their own ways, for example labeling the 3D models that they create in class, and then snapping photos of these models to use as study aids (Anita Thomas, 11/12/14). "It's a simple thing to do but it's so effective!" said Anita Thomas, who teaches Anatomy. (11/12/14)

While there are aspirations to move the redesign of courses into a culture of continuous improvement, there are, of course, constraints that create tension regarding how far this can go. For example, to accommodate students' needs for tutoring despite students' demanding work schedules, all faculty make themselves available during office hours for any student taking the course, not just those in their own section. Along these same lines, faculty members offer "open learning labs" in which the activities used in class are available (Anita Thomas, 11/12/14). This kind of collaboration—unheard of in most of higher education—requires a degree of standardization in teaching. "You do lose a lot of your academic freedom; there's not a lot of flexibility for the timelines for meeting the objectives. They're in the pipeline," explained Rick Fofi (11/14/14). Whether the need for standardization will eventually conflict with the emphasis on flexibility remains to be seen.

Fofi says that because Fundamentals of Biology is a new course, he intends for all sections to eventually be taught in the redesigned way. While he says there are some outliers, he "has many instructors who are waiting to teach that way." Anatomy (BIOL 2304), on the other hand, is not a new course, and instructors have spent years developing their particular styles. Because of this, Fofi expects that there will be a mixture of sections where the redesign is used and others where it is not (11/14/14). Fofi, who is taking over as Department Chair, said that his goal is that any new hires be oriented towards innovation in the use of technology.

Broader responses – Effects on relationships with community partners and possibilities for sharing the model

For his part, David Fonken, also views the development of the curriculum as one that buttressed their relationships with the community based organizations that collaborate with them:

> *We had done good work with Carnegie and Statway before that. It seemed like a natural thing to use that for the Statway/math portion and use the C2C money to buttress the science portion. And at the same time it helped us build our capacity. So I would say that it definitely helped our culture of collaboration with non-profits and community programs. (9/26/2013)*

Along with Capital IDEA's contributions, Fonken also referred to the contributions from another community based program, the Dana Center, a statewide initiative which runs the Pathway program—a program akin to Statways, but with a 3-credit study prep course which ACC is helping them to write. By having the two, Fonken says that they will be able to compare the two and ask "What is more effective?"

According to Fonken, the program has the support up the hierarchy of the college administration:

> *The President is very supportive. We had a meeting with him in late August. We showed him the software. He's behind us. My boss, the Vice President for Instruction is behind us too. The next layer is on board too…*

Asked about her feelings about whether ACC is thinking about sharing lessons they've learned in the redesign of Fundamentals of Biology, Meg Flemming, ACC Bio Department Chair said,

> *What we're producing should be shared with other institutions. Pigs are flying all over the place. We didn't think we would get the grant so we put in all these great ideas. I don't see reason why this can't be shared around the world. I'm an army brat. I think globally. (9/27/13)*

Sustaining the success initiated by the grant is clearly important to all stakeholders, particularly those at ACC. The redesign of courses at ACC is rapidly expanding to other ACC campuses and to additional academic programs. According to Alice Sessions, the Grant Director, ACC teaches about 25 sections of BIO 1308—a group of several hundred students. Plans are in place to redesign about 75% of these classes. Additionally, ACC is looking to the future and the easiest ways to export the redesign to colleges around the country.

One place to begin this important expansion might be other community colleges in the C2C Grant Program. Los Angeles Trade Tech College was specifically discussed, although students in LATTC are taking a considerably higher level of biology.

Sessions went on to suggest that sustainability of the program will be promoted if it is demonstrated that it was (a) successful with at-risk students and (b) helpful in promoting students' critical thinking skills. She suggested that when the program expands--either within

ACC or to other institutions--it should not be seen as "an all or nothing," but that the redesign is flexible and adaptable. This was evident in comments on the type of student who might be most likely to benefit from the redesign:

> *I would say those who are not auditory learners are advantaged. Some people can have something explained to them; they can hear it and understand it. I think most don't learn like that. People who are more visual learners benefit.. They're not as tired--students who work outside of class, in the traditional classroom when you're lecturing to them, you can just tell that you're losing them. Now, even if they work outside of class, they can do the modules when they are the sharpest. So students who work outside of class benefit from BIL.*

> *An at-risk student who doesn't engage in a traditional class, who finds a traditional class a little boring might be successful here. But most of the students do pretty well in this course. This is more anecdotal for me, when I look at students, no matter what learning style, they do really well with this. I tell them, this is not your normal classroom. You are expected to engage in these modules before class.*

The Biology Department Chair, Meg Fleming, was even more enthusiastic about the prospects for sustaining the program. She preferred to discuss *how* the program would expand rather than *whether* it would be sustained. Fleming said: "Not only will it be sustained but it will grow. I have no doubt. . . .As I hire more full time and part time adjuncts, they will be encouraged to become involved in the BIL program. Three of the four people hired this summer are involved in the BIL program." (9/27/13)

When discussing expansion to other ACC campuses, Fleming did not see any barriers to success, with the possible exception of some pockets of faculty resistance. This challenge may be more likely to arise if, and when the redesign is started in other courses such as physiology and microbiology. The conflict between the flexibility of academic freedom and the standardization of the redesign is a consistent point of discussion.

Fleming is also eager the see the program expand all over the country. She has been contacted by officials from several institutions, including Temple College in Austin. "They face the same challenges we do concerning prerequisites for health sciences. They have heard about what we are doing and would like to offer something similar." (9/27/13)

Pam Thomas of Capitol Idea feels the program is sustainable and that it should be exported to other colleges around the country. She cites the partnership between ACC and her non-profit organization. The non-profit provides vital wrap-around services and the college determines and updates the curriculum. In her view, the updating of the curriculum is the key to sustainability:

> *The curriculum has to be aligned to the outcomes. There's the written, taught, and learned curriculum; they must continue to be vertically aligned if the students are to be successful. You have to have input from all stakeholders. (11/13/14)*

Challenges– The labor-intensive process of creating online modules

Regarding challenges in the development in the Fundamentals of Biology curriculum some students and mentioned tech glitches with software. One example offered was that for a period when an incorrect answer would prompt the software to return the student to the start of the module. Instructors concurred that this had been an issue and said that they were working on fixing that. Flo Oxley, the instructor for Fundamentals of Biology, said:

> *We were doing an in-class quiz and Google crashed. Some students were having trouble getting to the modules. That's all it's been. The activities are working. Anything that's a problem, we let them know they have to tell us." (9/25/13)*

David Fonken, David Fofi, Mary Parker and C2C Project Director Alice Sessions all said a key challenge to developing more online modules (such as those developed for ACC's Fundamentals of Biology) is their labor intensity. Parker explains the challenge for instructors:

> *[Lectora] was wonderful but very time consuming to build these modules. That is our biggest drag on our progress. I delegated different tasks. There are three who are building their modules. They're working many more hours. Buy-in is there, but you can only do so much. (9/26/2013)*

Fonken views were similar, saying,

> *I contacted a couple of Lectora and they confirmed for a 1-hour module it takes 120 hours. That's what's been difficult—keeping up with the class. Right now we're a week and a half ahead of the students. If you want to put in videos, concept checks, etc. It's a lot of work. That's one of the biggest wishes I had. That they put in money for tech support. Our money was for equip and hiring tech support and admin support we don't have that available. (9/26/2013))*

Beyond technology problems, the main challenges cited in relation to the expansion of the technology-enabled curriculum related to scaling up and doing so quickly to meet the need. Eva Rios-Lleverino of Capital IDEA explained the challenge this way:

> *I think it has a lot of potential. The need for the students is there. Many students want to go to the healthcare. Six-hundred and fifty students at Capital IDEA, 75% are pursuing healthcare. When ACC opens their new campus—Math Emporium—it will have 600 students. They can be teaching 600 students at one time. They also want to replicate at West campus and at North. We'd like to see Capitol Idea at the Highland campus because it's so central. (9/25/13)*

A second challenge down the road may be that, despite Fonken's enthusiasm for the role of Capital IDEA's Career Navigators, they only support fraction of the students in the health sciences pathway. For example, in fall of 2013 Capital IDEA was working with 13% of the 460 students taking Fundamentals of Biology. If the support from Capital IDEA proves to have an

additive effect on the success rates for Fundamentals of Biology, then an additional challenge will be to find ways to expand those services.

> *Of the students that Capital IDEA works with, Fonken says that, "Right now the Capital IDEA folks think maybe at best half of their students are getting through that kind of stuff. We want to see that number going way up." (9/26/2013)*

Anita Thomas, an Anatomy Instructor talked about another potential future challenge for expanding the program to other, more advanced courses: "Each semester, getting the students to understand that they should be learning before class. The advanced courses have so much more content than 1308. They have to go through this before class. . . . Also, getting them to talk in class is important to their success; to share what their problems and questions are".

Looking ahead: What to watch

Looking ahead it will be important to see whether the great enthusiasm for the course redesign will be translated into improved passing rates for all the courses and greater matriculation into health science careers.

Meg Fleming, Bio Department Chair, was optimistic about the transfer of successful practices from one course to another:

> *[What's already happening] is more effective learning and retention of the material. This spring, I taught A&P and had a number of students from redesigned BIOL 1308 (Fundamentals of Biology). The retention of the material was remarkable in those students. [11/13/14]*

Beyond this, some have their eyes on self-pacing, allowing students, particularly veterans, to use their prior learning to proceed more quickly through the materials:

> *The future promise is in modularizing these courses. Rick and I are military brats. We're so tied in to helping our veterans. We had vets coming who had been medics in Afghanistan and Iraq. They knew physiology, not at a research depth, but in practice. They would say, "I saw that happen." I would like us to be able to help those students complete the modules at a faster rate. I don't know how we could structure awarding the LEA if they completed the course in 3 weeks. That is something for the administration to figure out. But our president, our provost, and VP for instruction – all are really interested in modularization and self-pacing for students. (11/14/14)*

There is precedent at ACC for the kind of self-paced modules Fleming discussed. Currently, developmental math classes have been shifted on-line. In a large open space outfitted with dozens of computer terminals, students complete developmental math modules on their own. Instructors mill about, and students flip a sign at their desks if they have a question and would like an instructor's attention.

When asked whether there are points in the Health Sciences pathway that need work, Alice Sessions said the Anatomy pass rates are not as high as instructors want them to be. She pointed out that so far they have only had only taught the redesigned course for one semester, and their experience with Fundamentals of Biology (BIOL 1308) was that it took three cycles of teaching the course and making adjustments before the full extent of the improvements became clear (11/13/14).

Finally, both the C2C Director, Alice Sessions and Instructional Designer, Virgil McCullough, indicated that one of the things they need to do as they move ahead is to gather more data on what happens in the cases when students do fail.

Finally, some faculty members commented that at times they were not clear about the differences between the redesigned courses and the traditional models, and so were unable to counsel students effectively about their choice. Two students expressed a similar frustration; they want to know they are registering for a redesigned course.

References

Aspen Institute: Workforce Strategies Initiative (2010). *Courses to employment: Sectoral approaches to community college/non-profit partnerships: Initial education and employment outcome findings for students enrolled in healthcare career training 2003-2009; Capital IDEA and Austin Community College Partnership*. Wash. DC: Aspen Institute.

VI. Activities Under the Auspices of the Grant

Summary of this section

C2C funds have been used for

- Purchasing faculty time to redesign of the Fundamentals of Biology (BIOL 1308) course in a blended model to use on-line modules and collaborative hands-on tasks in the classroom;
- Paying for the creation of a science lab on the Eastview Campus so that Fundamentals of Biology (BIOL 1308) could be taught there, reaching more under-served students;
- Hiring an instructional designer during Year 2 of the C2C Grant with funding from the grant;
- Purchasing faculty time to work with the Instructional Designer to redesign the Anatomy course (BIOL 2304 and its lab BIOL 2101);
- Purchasing equipment for the phlebotomy program run by ACC's Workforce Development Program;
- Paying a portion of the salaries of two career navigators to provide support to students at the Eastview campus;
- Hiring tutors for assistance of Anatomy students.

In the remainder of the grant period Dean Fonken intends to expand the use of the redesigned courses to other campuses—5 campuses for Fundamentals of Biology and 3-4 campuses for Anatomy (BIOL 2304), although it is not currently intended to be used by all faculty, with the belief that not all faculty are well suited to the change in pedagogical style.

The C2C Funds have begun being used to expand the organization's capacity to prepare low-income and trade affected workers for high need health care and bio-tech jobs.

> *The goal of this program is to get more students more quickly in the health professions program. Right now, the prerequisites are the biggest stumbling block they have. So, we're changing the curriculum—the way it's taught: The emphasis is on student centered mastery learning. This is a huge paradigm shift not just for us as teachers but for them as students… The results of the quizzes help us know where they want extra help. – Alice Sessions, C2C Project Coordinator, (9/26/13)*

The funds have been used in three main areas to build this capacity:

1) Use of grant funds -- Creation of the Bio-Innovation Lab at the Eastview Campus a campus in proximity to target student populations

The first and most tangible change was the outfitting of a biology job on a campus where there had been none. David Fonken, Dean of Math and Science for ACC explained the change:

> *At the Eastview campus that you visited, we had a science lab, and we had a nursing program but we were never able to provide the prerequisites for those programs on that campus. We lacked the equipment, basically. And so one of the things that the grant did was allow us to buy the equipment to teach Human Anatomy, Human Physiology, Introduction to Anatomy and Physiology, and also equipped the lab for the Intro to Biology. So that means that we're able to serve more students and we're able to serve them in the environment where they will belong to the health professions. (9/27/13)*

The design of these labs, including the purchase of technology, was carried out by a team of instructors and one technology assistant, given their charge by Fonken.

2) Use of grant funds -- Redesign of the curriculum and curricular materials for Fundamentals of Biology

Fundamentals of Biology (BIOL 1308) is a prerequisite course created to replace another prerequisite course that had been keeping students from matriculating into health science programs that lead to higher paying jobs. C2C funds bought time for a half dozen faculty members and one technology assistant to redesign this course by creating a) on-line modules that students would complete at home; and b) small group hands-on activities to be completed in class.

The rationale for design is that of the "flipped classroom" –-that the presentation of content is best done outside of class time, so that the class time can be used for higher order tasks, collaborative work, and more individualized instruction by the teacher.

In Fundamentals of Biology, the design team created modules using a development tool called *Lectora***.** Students were intended to complete these modules before class—although some reported that a minority of students preferred completing them after class. In our interviews during the first year instructors seemed not to take issue with this, although when we returned in the third year of the grant we found that they were doing more to encourage students to do the modules before coming to class.

The on-line modules created for Fundamentals of Biology course (BIOL 1308) combine readings and graphic presentations with periodic quizzes that confirmed comprehension before the next material is presented. The modules that we viewed seemed to take nothing for granted, assuming virtually no prior knowledge. The modules also seemed to build from concrete to abstract—introducing formulas or scientific ways of describing phenomena only after students understood what these meant in concrete, real-life terms. In this way, they used a "building block approach" –providing a cognitive map for how things fit together. Completing these modules was an interactive, self-correcting alternative to a textbook that provided instructors data on what students grasped and what they were struggling with before class.

Once in class, instructors gave short lectures, led discussions, completed problem sets with students, and had students do hands-on small group assignments. There were distributed to desk groups of 4 students in plastic bins that contained materials for a problem that they were to solve. An example that we saw included three sets of cards—one with definitions, one with graphics,

and the last with a brief description. Students were to work in groups to match one definition with a corresponding graphic and its description.

In classes, we noted a few themes. There was a great deal of attention to the affective aspects of learning such as building confidence, being supportive and calming anxiety. Complementing this, teachers seemed to be in the habit of enlisting students in helping other students and having them encourage one another.

For assessment, the team also chose to purchase software by *Qualtrix*® for on-line testing. As Dean Fofi explains, it is he who sends it out via email, but it is up to the individual instructor to decide whether to have students complete the quiz in class or at home. (9/26/13)

Meg Flemming, ACC Biology Department Chair, highlighted the significance of these changes being made on the Eastview Campus:

> *I wish there was not a poor side of town, but the East Side has traditionally been lower income and poorer schools. We're already seeing a change—students who have been going through the phlebotomy and CNA program. We just launched it last month.*

In our visit during Year 1, while we found much support for the *idea* of these changes among students, faculty, and administrators, we also heard reports of there being "glitches" and stress on the faculty involved in the creation of the materials. As we'll discuss further in the next section related to the needs that led them to hire an instructional designer, in Year 3 participants—now experiencing more success—were even more candid about the problems during the initial rollout.

3) Use of Grant Funds –Hiring of an instructional designer during Year 2 of the C2C Grant

By all accounts, the greatest bottleneck in the initial roll-out of the Austin's first redesigned course, BIOL 1308, was the time required for the community college instructors to learn how to use the software to create the on-line modules. Here is how the C2C Coordinator described the initial roll out, looking back from the vantage point of the successes in Year 3:

> *This was the first time teaching the redesigned course, and as such, there were many glitches and obstacles to overcome; modules were delivered late, notes were incomplete and activities were untested. Student evaluations reflected this. They said things like, "The course seemed poorly planned, especially in the early weeks of the semester", "The new course was hectic at first" and "Some of the students struggled with the modules." By the end of the semester, we had worked out the majority of the problems. As a result 74% of the students passed the course, compared to 76% of the general population of BIOL 1308 students. However, we all worked hard over the winter break to revise and reorganize the course. We moved the modules around, tested and revised the activities and standardized the grading rubric. (11/15/14).*

While the fall rollout was rocky and student evaluations reflected their dissatisfaction, by spring they had reworked many of the modules and student feedback and teacher satisfaction improved

(Alice Sessions, 2/10/15). While the faculty, who receive tenure after 3 years on the job, were reportedly not stressed for fear of losing their jobs, they did say that the demands on their time to create the modules were stressful.

It was this context that led the Dean, David Fonken, to shift some grant money to create the position of the Instructional Designer, filled by Virgil McCullough.

For his part, McCullough said that much of the problem in the initial phase was the choice of *Lectora* for use by faculty who did not have backgrounds in web design.

> *The designers chose a very complex tool*—Lectora. *It is not intuitive, not what our instructional designer had any knowledge of. It was taking hours and hours of people's time. Things were late. Things were not done. (11/22/14)*

One question this raises is whether future efforts could more successfully use faculty in the process of design if they could find a design tool that was more user friendly for people without design training.

While faculty and administration spoke of the need for someone who could become an expert in the *Lectora* software used to create the modules, McCullough—whose masters degree is in Instructional Design—also emphasizes the organization of content into clusters and sequences that are most easily "ingested" (as he puts it).

While the hiring of an instructional designer dedicated to the redesign of the courses specified in the C2C grant has helped, that designer, Virgil McCullough, said that even with his work there intensive time commitment from faculty was not completely relieved and that there was—from his vantage point—still a need to shift money from faculty equipment to IT support. (11/22/14)

According to the C2C Grant Coordinator, Alice Sessions, the Dean Fonken has offered to arrange to find ways to fund his position after grant funds run out in March, 2016 (email 5/18/15).

4) Use of grant funds -- Redesign of the curriculum and curricular materials for Human Anatomy (BIOL 2304).

The hiring of the instructional designer was an important part of expanding the redesign of courses to Human Anatomy (BIOL 2304) for spring of 2014, and the plans to do the same for Human Physiology in the fall of 2014, and Introduction to Anatomy & Physiology in spring of 2015. This redesign is being conducted through a collaboration of innovation minded faculty members tapped by Project Lead Rick Fofi and the Instructional Designer, Virgil McCullough.

In the bigger picture, what this means is that ACC is in the process of creating a series of courses that all orient students to the new way of learning involving on-line modules outside of class and hands on activities within class—a process that began before C2C with the redesign of the statistics course in the Statways Program, with funding from the Carnegie Foundation. (Mary Parker, 11/14/14)

When asked what differences she was seeing afforded by the redesign of Anatomy (BIOL 2304), Thomas said that,

> *With the old design, the students come in without reading. Having taught the course once now, having the students [arrive with familiarity to the topic] is making the biggest difference—to have time available to have discussions and to do classroom activities. (11-12-14)*

All LEH hours that instructors get for planning related to the BIL courses are paid by the C2C grant. The actual teaching and grading time is paid for by ACC at standard faculty rates. (Alice Sessions, 2/18/15)

5) Use of grant funds—Purchase of equipment for the phlebotomy program run by ACC's Workforce Development Program

Certification in phlebotomy is a relatively quick way for a student to boost their earning potential above minimum wage levels with jobs starting at around $13.00 per hour. Earning a phlebotomy certification helps students to make ends meet while they continue their education in a health sciences program.

When the C2C grant application was written ACC's existing phlebotomy program was open only to students in the Medical Laboratory Technology (MLT) Program, so the C2C grant application was written to include a plan to create another non-credit phlebotomy program within Workforce Development.[2] C2C grant funds were used to purchase specialized beds and equipment so that students could practice taking blood samples.

6) Use of grant funds -- Funding salaries for Career Navigators to provide support on the Eastview Campus

The C2C funds are also providing a percentage of the salaries of two Career Navigators (a multi-faceted support role) from Capital IDEA, a community based organization that has long collaborated with ACC. (Eva Rios-Lleverino, 9-25-13)

7) Use of grant funds --Hiring Capital Idea to give supplemental support to BIOL 1308 Students

Because Capital Idea had some C2C funds remaining in their budget, Capital Idea used this funding to hire a career navigator to provide extra support to students in Fundamentals of Biology (BIOL 1308) who were not enrolled in the full Capital Idea Program. This career navigator, Pam Thomas, emailed and/or met with 8 students regularly in the BIOL 1308 classes in fall of 2014 (email Alice Sessions, 7-14-15). Sessions characterized the nature of this support as "mentoring," which she distinguished from the support given to those enrolled in the full program in that it did not include financial assistance.

[2] In 2014, the Medical Laboratory Technology program changed their program requirements to open their phlebotomy program to non-MLT students.

One way that Career Navigators build self-efficacy is in helping students think past the immediate certificate or credential to consider that as a stepping-stone to the next one. Shoreline community college machinist program is designed so that students earn different certifications throughout their coursework, allowing them to stop out of the program to get work to support them and then return when they are ready to earn a new credential. Students at Austin Community College who wish to pursue a career in health sciences often start with a program that grants them a phlebotomy certificate that takes weeks rather than months, and allows them to increase their income beyond a minimum wage job. A credential as a Certified Nurse's Assistant serves a similar purpose. Career Navigators can help students first, know of this option, and second, help students think of it as only the beginning of their studies in health sciences.

This same support was offered to veterans taking the course in spring of 2015, but none of the veterans responded so the support was dropped. Unfortunately, all three of those veterans dropped the course, raising the question of whether they might have succeeded with the support offered (Alice Sessions, email 7/14/15).

8) Use of grant funds – Hiring tutors for assistance of students in redesigned courses

Tutors for both the redesigned Fundamentals of Biology course and redesigned Anatomy (BIOL 2304) were hired using grant funds. Tutors were chosen from those who had already completed the class and earned an "A" grade.

9) Use of grant funds—Plans for the remainder of the grant period

Along with the refinement of the curriculum materials of the Anatomy (BIOL 2304) course, and the redesign of Human Physiology[3], and Anatomy and Physiology, Alice sessions said that in the remainder of the grant period they intend to expand the use of the redesigned courses to other campuses—5 campuses for Fundamentals of Biology and 3-4 campuses for Anatomy (11/13/15). That said, she does not believe that the redesign should be used by all faculty:

> *…I don't believe it should go college-wide. It takes a certain kind of teacher and be willing to tolerate the fundamental chaos that happens within these learning activities—I mean chaos with a purpose. (11/13/15)*

To aid instructors in the "chaos with a purpose" Sessions has begun enlisting tutors in as instructional aids before and during class time, and said that she is waiting for permission from the grant director at the fiscal agent, Northern Virginia Community College to allow them to go to five campuses using tutors.

Regarding this expansion of the redesign to other sections, Instructor Anita Thomas, who is part of the team redesigning the Anatomy (BIOL 2304) course said that, "It's not hard to get adjuncts to do it. There has been so much enthusiasm." (11/12/14).

[3] Although Sessions said that they hope to redesign the Physiology course, this was not part of the original promise for the use of grant funds.

Dean Fonken was optimistic that this extension of the program would move from grant funding to institutional dollars:

> *It won't take a huge amount of funding because the curriculum will already be developed. The cost would be developing the labs. This would be less expensive than at Eastview; those would be institutional funds. But future redesign will be less expensive because we already have the curriculum. The big cost would be equipping the innovation lab itself. I'm reasonably confident that the institution will support this. (9-27-13)*

Administrative Structure and its relationship to program changes

At the center of the redesign—Dean of Math & Sciences

The impetus for the use of C2C funds for curricular change seems to be most closely tied to decisions made by the Dean of Math and Sciences, David Fonken.

Once the grant had been won, Fonken delegated the details of development to Instructor, David Fofi, who worked with a design team of highly motivated faculty members and one Tech Support staff person.

Once the design team had begun their work, Fonken hired Alice Sessions as C2C grant coordinator.

Above the Math and Science Departments, Fonken and biology department chair Meg Flemming reported support from the Office of the President. While generously giving us credit for the funds supplied, Meg Flemming said,

> *You have paid for computers, software, and release time for faculty. Senior leadership of the college is thrilled by it. We presented a status report to the president 3-4 weeks ago. All of the administrators were leaning back, but in 3-4 minutes all were leaning forward. The quality of what's being put together is just great. I'm so impressed with what's being done. It's huge. (9/27/14)*

Support from the President's Office

Fonken reported similar support from the president of ACC and those in administrative positions offices between Fonken and the college president:

> *The president is very supportive [of continuing to extend these sorts of changes]. We had a meeting with him in late August… We showed him the software. He's behind us, I think. My boss, the vice president for instruction is behind us too. The next layer is on board too. You met Enrique Solis. He's Mike's boss, the next layer between him and the president. I think they're all kind of in line for this.*

> *As long as we keep producing good results we're going to get good support… We want more and better prepared students into the healthcare pipeline. (9/27/13)*

While support from the top seems to have mattered, the manner of support also seems to have mattered. Eva Rios-Lleverino, Director of Operations at Capital IDEA, says

> *I didn't realize how much change can make things so positive. The leadership of ACC changed a few years ago. The deans have been very welcoming in working with us, instead of them saying, "Oh, here they come wanting to tell us how to do it." We have been able to work very well with them. (9/25/13)*

Rios-Lleverino went on to say that, while Capital IDEA was not directly involved in the curriculum redesign, they were appropriately consulted on areas of their expertise related to student support: when to provide the courses, childcare needs, and more. They continued to be consulted for their input.

Support at the Department level

At the Department level, both Fonken and C2C Coordinator, Alice Sessions say there has been good faculty support in the Biology department, following the enthusiasm of its Chair Meg Flemming (9/26/13).

One administrative structure that may keep a bias towards innovation at the department level is the policy that the chair must rotate to a new person every three years. Meg Flemming's opinion was that this kept anyone from being entrenched and brought new ways of seeing things to the position.

Faculty support seems to have buoyed by training done on the modules the Saturday before each semester. One faculty member who teaches Fundamentals of Biology course (BIOL 1308) but was not involved in developing its learning modules indicated that despite being a "traditional, stand at the front teacher," she has made the transition to the new methods. She has been supported by one day of professional development before each semester and a weekly check-in meeting (9-25-13). In the future, she thinks new people could be brought into the fold by asking them to sit in on classes in which the redesign is used, a practice that is already done when new faculty are hired.

Challenge for the future – Avoiding burnout, winning over more faculty

Considering what seems to be a strong consensus in favor of the flipped, hybrid model that the C2C funds have supported, the challenge ahead will be sustaining it. While Design Team Leader, Rick Fofi, is said to have put together a team of dedicated and detail oriented faculty, some reported signs of burnout (Meg Flemming, 9-27-13).

According to Fonken and Fofi, in our visit what was needed to avoid burn-out was to free up C2C funds so that more are dedicated to faculty release time for developing the modules so that less work was done after hours and off the clock. In our Year 3 visit, there was greater release

time, although faculty still said that the demands exceeded the Learning Equivalent Hours that they were given, but this strain seemed to be offset somewhat by the professionalism they felt in their collaboration.

Additionally, in Year 1 there was some concern expressed about the future of the redesign when less innovation-oriented faculty members were asked to teach courses that utilize the redesign, but by Year 3, we only heard reports of instructors—including adjunct faculty--requesting to teach the newly redesigned courses.

What support services and other services were offered?

With the redesign is being completed, Capital IDEA and ACC's Continuing Education Department are both collaborators in ACC's health sciences track. Their contributions are detailed in other sections of this report.

Career Navigators are involved with students as soon as they are accepted into the program. A Career Navigator for Capital IDEA gives an overview of the kinds of supports they provide. One of the challenges they help with is helping students to get vaccinations, with many not having access to their pediatric immunization records. Students receive reimbursement if they cannot pay.

Theresa Soto explains the supports from Capital IDEA's career navigators and the six months that it often takes for students to have all the required vaccinations:

> *I have weekly meetings called "Career Sponsorship Support Sessions. Those are on campus at ACC. We did degree mapping because registration started this week. For the next class they'll be taking, they want them funneled to those specific classes. I have individual sessions with people having personal issues. It gets intensive. It's like therapy. If they need to figure something out then we brainstorm.*
>
> *I'm always on them: "Registration is next week. Have you filled out your forms and paperwork?" Letting them know that I won't let them fall through the cracks. They have a lot of support from their families. We pay for tuition and childcare. If they are eligible for Pell grants, they use that for living expenses. They do crafty things like that. If I see that they're struggling I ask them, "Have you applied for food stamps?" (10-7-2013)*

Support for some students also comes through the Continuing Education Department which has raised money to expand the phlebotomy program and build relationships with healthcare providers. This is done so students can move quickly into their entry-level positions while doing pre-requisite courses like BIOL 1308.

With regard to easing students' path into the health sciences, of Nancy Laudenslager, of ACC's Workforce Development program, said that the program itself, combined with entre to these entry level positions would help keep students on the health sciences track:

> *This grant is going to encourage them because they can work in the field so they don't have to take a job in McDonalds. They can get mentors and encouragement. They'll have a better sense of what they want to do. (9/26/13)*

Within the program itself, students commented on the way alignment of the teaching in the different sections (taught by a number of faculty members) multiply the number of people who they can go to for help:

> *All of the professors are available. I think there are about 5-6 sections. They all offer the same things so if my professor isn't available, I can go to the other one. Instead of having 1 instructor I have 5 or 6. (Student, 10/28/13)*

Challenges with support services offered by ACC

While students in the healthcare track have access to supports offered by the wider college, there are challenges. According to Math instructor, Mary Parker:

> *One third of our 156 students come through Capital IDEA—they do a lot. The other 2/3 just come off the street. There are not special services beyond the usual ACC services offered for them. Childcare, for example--We don't have that. (10/27/13)*

In some cases the problem may be that the services are offered in ways that don't meet the needs of students. Rick Fofi, explains

> *ACC is great resources for tutoring, including Saturday and Sunday. Of 158 students maybe 10 use that. It's matter of getting here. They have families, and—it is early yet—for any course we don't see too many until they realize exams are coming. If people take advantage of the tutoring they are likely to pass. (9/26/13)*

When asked if ACC provides online tutoring, Parker said that it is available, but was just beginning and was not being used by students much.

In the case of advisement, we heard from two students that the ACC counselors seemed to be unfamiliar with the redesign of the program and the advantages it offered:

> *I don't have a counselor or case manager. I found the counselors in the Nursing Department to not be very helpful. They actually told me to not take the 1308. They said, "Why don't you just study and take the Anatomy?" If I have any questions I just ask my professor. She has been incredible. (9/25/13)*

To remedy some of these challenges both administrators and teachers told us that they hoped that Capital IDEA's career navigator services could be expanded them to serve more of its students, particularly those in developmental courses. David Fonken says the data he has seen suggest the greater initial investment required in career navigators pays off in the long term:

This career navigator thing--If you have a developmental ed student, we act like you just throw them in a developmental math class, and hope that something good happens. But in fact, the numbers say that most of the time bad things happen. If you look at students in elementary algebra and you throw them in with standard support and you look at them 3 years later, maybe 1 in 6 will have progressed and have credit for a college math class… That's a terrible number. That means in a class of 25 students you're helping maybe 4 or 5 students, and just helping them to a degree, to get through their college math.

So, what Capital IDEA does, it has this framework of support. They recruit them first. They, honestly, make them jump through a lot of hoops to demonstrate some commitment. They're not difficult, but they have to show up, show an interest and then sustain that. They provide wrap-around support services which appear to be generous, and in some ways they are. If they don't show up they call them, and if a disaster happens they help them out with a rent payment, find child support or do whatever it takes to keep them in school…

But if you look at what they do from the broader perspective of competitors—on a cost per completer basis, they're way cheaper than we are. That requires an institutional change in mindset. If we look at what the outcomes are, we could benefit significantly from a career navigator model, from putting students through a series of exercises that let them demonstrate their commitment and then providing them wrap around services towards a very specific goal. Not something nebulous but, "Hey, I'm working towards a degree in nursing or I'm going into medical lab technology," where there's a clear outcome with financial benefit that serves the community and serves their families. (9/25/13)

Sustainability, extension and dissemination of programs after the C2C Grant

Sustaining the current redesigned courses

Beginning with Dean of Mathematics and Science, David Fonken, and down the organizational pyramid, there was widespread optimism about the sustainability of the instructional changes after the C2C grant funds run out. Here's how Fonken viewed the prospects for sustaining and extending the programs begun under C2C:

I don't see any challenges in sustaining the thing. We will have the curriculum. It will require maintenance but maintenance is a smaller activity than redesign. Well have brought the model to our Eastview campus and replicated here at the Highland campus. So what's the next barrier? How hard is it to take it Cypress Creak, or Round Rock? It's almost cookie cutter at that point. There will be, of course, some adjustment by those faculties. We have a critical mass from those campuses… It's not a huge group but 6 or 8 or 10—if you think of that as the nucleus of the group that teaches these courses, you have a critical mass of people. Once you have a group of people saying the right things—"Here's how you do it; I can help you do it…" (11/14/14)

Anita Thomas, who teaches Anatomy (BIOL 2304) sounded similarly optimistic, echoing the belief that support for the redesign will be spread by the initial group of instructors who have experienced success with it:

> *I think it is here to stay. Those of us who have been baptized –it's going to be picked up by other faculty. Once the grant is gone, we would need our software, and release time would help… (11/12/14)*

Extending the redesigning to new courses after the C2C Grant

Beyond sustaining what's been done, the department head, Meg Flemming expressed aspirations for extending their work even further by redesigning Physiology Course and Microbiology, which were not included in C2C Grant (11/14/14). If this happened, then all of the health science prerequisite courses would have been redesigned. Dean Fonken, for his part, expressed his interest in continuing the process of redesign.

> *In the next redesign [of additional courses] there will be some challenges. It will take some release time. We enjoy strong support from administration. Maybe I'm being Pollyanna but this thing seems to be working. The key was getting a curriculum that makes a difference. (11-13-14)*

Disseminating the materials and knowledge nationally

Administrative leaders responsible for the redesign—Fonken, Sessions, and Flemming—all told us that they intend on making the materials they have created available to other colleges teaching the health science pre-requisites. On the receiving end, it would seem that other colleges who teach these courses would benefit from receiving these modules insofar as their health science courses teach the roughly the same content.

In their SGA, the Department of Labor says explicitly that they are "interested in encouraging the development of accessible online learning strategies that can effectively serve TAA-eligible workers and other adults." They go on to say, "All eligible workers and other adults successful applicants must allow broad access for others to use and enhance project products and offerings, including authorizing for-profit derivative uses of the courses and associated learning materials by licensing newly developed materials produced with grant funds." (p. 3-4).

The grant also stipulates that any materials created through the grant must be licensed under a Creative Commons license—a license that makes those materials freely available, even to those who wish to use or adapt the materials for profit. While the Creative Commons license is intended to widen the use of materials created by the grant, in requiring this, it creates a Catch-22: If the product has to be made available for free, how can a college earn the money to pay for the staffing, computers, and supplies needed to actively promote the product? Note here the difference between "making available" and "promoting" on-line curricular products--plenty of great ideas are *available* on Federal websites without anyone knowing that they are even there due to lack of *promotion*.

When I asked David Fonken how he imagined this being carried out once the grant money is gone he said that one possibility was for staff involved in creating and/or implementing the redesigned courses could sell their services as consultants while making the materials available for free (11/13/13).

Still, there are other issues to figure out. Bio Department Chair, Meg Fleming discussed some of the issues that she was thinking about:

> *Interviewer: How do you feel about a neighbor stealing it?*
>
> *Fleming: I'm happy. The way I think about the redesign material is that ACC didn't pay for it. Our tax dollars paid for it but it needs to be packaged in a way so that it will help keep its integrity to a certain extent. Each college will tweak it; each of us here tweaks it. But if you change it too much, you'll hear, "It's not working for us."*
>
> *I would like to find a way to put it out in a more professional package. I think Rick is into that idea too. Rather than just putting it on a flash drive and saying "Here you go." That would mean, finding the initial money to do that. We'd have to sell it. Well, I don't know that we could do that, and stay true to the grant's concept. So I'm wandering I don't really know how to do it. Any ideas guys? (11/14/14)*

In response to her question, we explained that one option was that the Department of Labor planned to ask colleges who had won TAACCCT grants to post any materials they created on the MERLOT website – an acronym for Multimedia Educational for Learning and Online Teaching—run by the California State University system.

Other ideas were for dissemination at conferences and conventions and the Biology Forum that they attend monthly.

VI. Assessment of students

Summary of this section:

The assessment of students regarding the prerequisites for healthcare fields differ depending on whether the students enter ACC's healthcare prerequisites through Capital IDEA or not.

Assessment for student entering pre-requisites via Capital IDEA

- A five step testing and counseling process that is focused on building and assuring a student's commitment to succeeding on the healthcare/bio-tech track;

- In the latter part of the C2C grant, Capital Idea began a system in which entering students are classified as being low, medium or high support, with services provided accordingly.

Assessment for students not entering pre-requisite courses via Capital IDEA

- Academic assessments are done within courses, and students must pass an exam on high school biology content to be admitted to the Anatomy course.

- Assessments in the redesigned courses are both formative and summative, with frequent low-stakes quizzes and regularly scheduled exams with higher values.

- Within the newly redesigned courses, the online modules allow immediate formative feedback: students know when they have or have not mastered materials and instructors can access those data to inform their decisions about the next day's in-class instruction. Having these modules also gives students the flexibility to work whenever they can (as long as they have Internet access).

- C2C administrators were frank about wishing that all their students could have the kinds of personal, holistic and supportive screening that is given to those entering via Capital IDEA.

Capital IDEA's Assessment of new students proves to be a wise investment in human resources

Capital Idea's initial assessment – a 5-step process

Students who come to do the pre-requisites for the various healthcare/bio-tech programs via Capital IDEA complete a five-step process for entrance. (Eva Rios-Lleverino, 09/17/13, Sonia Alexander-Okafor, 11/13/14)

1. Orientation.
    - Orientations are held in the community (rather than on campus) three times per year.
2. Testing and sign up
    - Following orientations, students come to campus for a test and sign up session. There they take the TABE (Test of Adult Basic Education) and SAGE (Student Assessment of Growth & Excellence) tests.
3. Career Guidance meeting
    i. The student meets with a Career Navigator from Capital Idea. The data from this meeting are used to produce a list of job possibilities based on students' aptitudes, allowing the Career Navigator to say, "These are your top 3 possibilities." The Navigator then counsels the person about what they would have to do if they want to pursue those fields.
4. Final Commitment Interview
    i. The Final Commitment Interview is a 30-minute conversation with either the Executive Director or Director of Operations.
5. Student is assigned a Career Navigator
    i. If accepted after the Final Commitment Interview, a student is assigned a Career Navigator.

Based on this intake process, students are either assigned to begin work in the C2C program or assigned to a College Prep Academy career navigator who guides them through a 12-week program to "shore them up" before returning to the regular program. In all, Capital Idea has nine navigators. (Pam Thomas, 11/13/15).

Interestingly, this multi-step process seems to be more about making sure the students are ready to commit to working with Capital IDEA rather than Capital IDEA screening out students based

on a lack of aptitude. Eva Rios-Lleverino, Director of Operations, explains what she's looking for when she conducts the Final Commitment Interviews:

> *First, I'm looking for a story of something that they've done and been able to follow through on, even if it is a GED.*
>
> *Sometimes we don't get any of that and we still decide to take a risk. I say, "We're going to take a risk." Second, we ask them for a commitment to give back to their community. I don't say "No," it's more about "Not yet." Let's say they just got a full time job offer… Sometimes it's about paying attention to why they are making that decision… We work with them as individuals.*
>
> *Once and a while I have someone who might not make a good fit. Maybe once per year [I turn someone down]. That's the beauty of all those steps—it's more of a self-selection process. They know. (09/27/13)*

David Fonken, Dean of Math and Science at ACC, views this process not only as an assessment but as a treatment because it seems to build students' commitment and not just measure it:

> *…What Capital IDEA does, it has this framework of support. They recruit them first. They, honestly, make them jump through a lot of hoops to demonstrate some commitment. They're not difficult, but they have to show up, show an interest and them sustain that. (11/13/13)*

<u>Capital Idea's on-going assessment through regular contact differentiated for high, medium and low needs for support</u>

Capital idea's initial assessment is followed up with support services that serve as both formative assessment and intervention. In a change to how services are provided since the C2C grant began, services are now allocated based on student need so that students are coded--red, yellow, and green-- based on the perception of whether they have a high, medium, or low need for services. Theresa Soto, Career Navigator for Capital Idea, said that of her caseload 10% were classified as needing high support, 80% needing medium support, and 10% low support. (11/13/14).

Pam Thomas, Supervisor of Career Navigators, describes the work of the navigator's this way:

> *They have between 80-126 students. They do the same case management as an academic counselor but they also do check-ins. We're different from an academic counselor in that the students have to see us on a weekly, bi-weekly or monthly basis, depending on whether they are high, medium or low support. And we reach out to them more than they reach out to us. We have a relationship with our students. When it's going bad they will tell us. Our community connections go deep so we have resources in the community, so that that crisis can be averted. They don't have to drop out. They don't have to worry about studying. We provide 100% childcare. We provide a voucher. [The childcare provider] can be a relative. The only requirement is that another student in the program*

> *cannot be your childcare. And whoever the sitter is has to get a national background check. (11/13/14)*

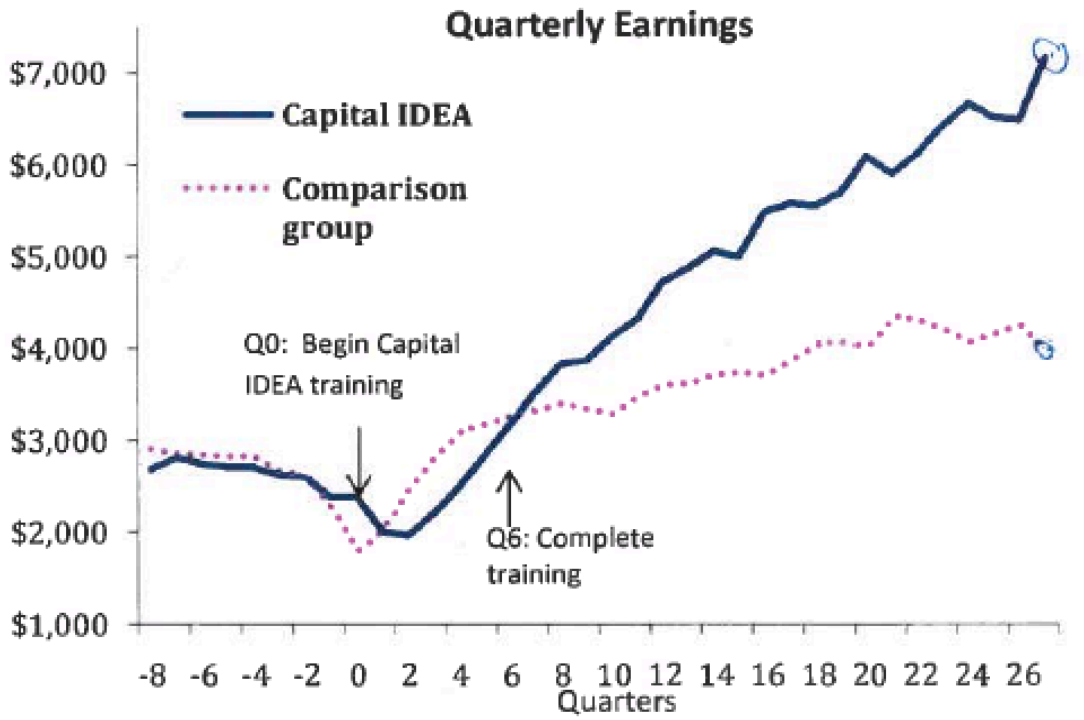
At times, data collected by the college will lead ACC personnel to contact Capital Idea that a students seems to be struggling so Capital Idea can check in with the student. (Felix Villareal, 11/12/14)

David Fonken argues that the data will show this more labor intensive approach ultimately achieves results in a more cost-effective manner:

> *They provide wrap around support services which appear to be generous and in some ways they are. If they don't show up they call them, and if a disaster happens they help them out with a rent payment, find child support or do whatever it takes to keep them in school. But if you look at what they do from the broader perspective of competitors—on a cost per completer basis, they're way cheaper than we are. That requires an institutional change in mindset. If we look at what the outcomes are, we could benefit significantly from a career navigator model, from putting students through a series of exercises that let them demonstrate their commitment and then providing them wrap-around services towards a very specific goal. (9/25/13)*

Research by the Ray Marshall Center on Capital IDEA bears out Fonken's assertion that—in the long run—CI's return on investment means they are a wise investment for taxpayers. The Marshall Center's research found that "over the first 10 years, each dollar invested in Capital IDEA training returns $1.65 to taxpayers, which translates to an annual return rate of 9% per year. Over 20 years, each dollar invested in Capital IDEA returns $5.01 to taxpayers—an annual return rate of 17% per year." (Smith, King, and Schroeder, 2011; Smith & King, 2011)

In the third year of the grant, Fonken got some of what he wanted regarding wrap around services for ACC students who are not enrolled in Capital Idea. When Capital Idea found extra money in their budget they offered to provide extra support for ACC students who were taking the redesigned Fundamentals of Biology (BIOL 1308) course. As mentioned in the previous chapter, this support involved mentoring, but did not include the financial support given to the students fully enrolled in Capital Idea.



Note: Capital IDEA participation begins at Quarter 0. Participant earnings are compared to comparison group earnings from the previous eight quarters to ensure a quality matched comparison.

Assessment for ACC Students not involved with Capital IDEA

Things look different for students who are not entering the health care pre-requisites through Capital IDEA. Students who are not entering BIOL 1308 via Capital IDEA are not matriculating into any particular program but rather signing up to take a course. While they may have been advised to take the course by an ACC college advisor, the college's advising is a much more general, all purpose guiding for the students. C2C Project Coordinator, Alice Session says,

> *The College has no formal guidance system to help students through the college. We are seeing the positive impact of the support services from Capital IDEA on the student success and look forward to making assessments and specialized supportive advising a major part of the next phase of our work. (4/22/14)*

Once they begin taking the BIOL 1308 course, students' progress is monitored through test scores and a pre-and post-course assessment. All students who wish to take Human Anatomy, the next course in the sequence of pre-requisites for the health science and biotech program, must pass an assessment test of high school biology skills. This is taken by about 85% of the students.

Differences in Assessment Paradigms between Capital IDEA and the wider ACC

With this screening test, we again see the difference in the paradigm of "assessment" used by the wider college versus the less traditional model used by Capital IDEA. Where the high school biology test is meant to screen out those who might not be ready for the Anatomy course purely on the basis of academic knowledge, Capital IDEA's "assessment" includes academic tests but also a discernment process about whether they're ready to commit to begin a sequence of courses—ready both psychologically and in relation to the situation of their family, job and transportation, and so on.

Whereas the college's assessment is summative in that it is meant to judge if students are ready to take the course one way or the other, Capital IDEA's process is formative in that it actually is intended to build students commitment *through* the process of assessment.

Positive effects of BIOL 1308 on rates of students passing into the Anatomy course

Interestingly, BIOL 1308 is now being used to temper this approach. During the first week of BIOL 1308 students take a pre-test which consists of an old version of the Anatomy assessment test. At the end of the course they take the same test again. The assessment becomes more formative and useful to both students and instructors.

Regarding the data on passing rates over time, Alice Sessions says this:

> *Before 2008 [when there was no BIOL 1308]--we had only about a third of the students achieve over 70% on the assessment test to register for Anatomy. We added the BIOL 1308 in fall 2008 and not only have the assessment test scores risen by more than 20%, but the pass rate of the students in Anatomy have also greatly increased. We don't have data yet to see what will happen with the BIOL 1308 redesign, but will have preliminary data this summer. (4/22/13)*

As of September 2015, Austin did not have data from the Ray Marshall Center on pass rates for students in the Anatomy course which will allow us to see whether those rates were higher for students who took the redesigned course than those who took the traditional one—one crucial metric for the success of the C2C funded program.

On-line formative assessment within courses allows flexibility for students with demanding schedules

On-line modules allow students immediate feedback about whether they're understanding the material. Instructional Designer, Virgil McCullough tells us that there are times when the module is designed so that students can't proceed until they have the correct response, but at other times they may. "It takes good instructors who know what the right corrective response will be," he says (11/12/14).

In Anatomy, students also interact with the material by adding their own notes to an outline provided before coming to class. These notes are intended to help the student understand where that week's module lies in the broader scheme of the material.

The new format used in the redesigned courses is hoped to have positive results in student achievement, particularly for students with the most demanding home lives. Laura Suarez, biology instructor explains it this way,

> *It allows students flexibility—the feedback I've been receiving is that they can get the module night or day. With a classroom you either get it or not. Some work night jobs… At their night jobs they can get to the modules done. (9/25/13)*

Rick Fofi, in the same discussion, added this,

> *The traditional way, I can know the ones who can't make it--the ones with children. ACC is staunch about no children allowed in class. This allows them to take it over and over again. (9/25/13)*

Here again, we see the paradigm shift towards more formative assessment. Students see, immediately, whether or not they have mastered the material. If they have not they can continue to work on it according to their own schedule.

Online formative assessment informs what content instructors emphasize in class

For the teachers' part, the on-line modules provide immediate feedback that allows them to select which problem sets to have which students complete. Here the more immediate feedback allows differentiation so not all students need to be working on the same activities.
When we asked Flo Oxely, Bio 1308 Instructor, whether she uses data from the modules to inform what she does in class she told us,

> *I do and I think that every other instructor does as well. Having had a couple semesters to work on this stuff, I've identified where they may have trouble. Today we were working on cellular respiration and I took an awful long time walking them through that. There are places where they're not going to get it, then you give them the hands on stuff. They might not be getting mitosis, then you have them make the chocolate doughnut model. Then you line them up—pro-phase, ana-phase. They can see the progression. That works better than flashing them on the screen. (11/13/15)*

Modules for BIOL 1308 include quizzes designed to aid the student in assessing their own understanding of the material and to practice for the unit test. While these quizzes are graded, the point values are kept low enough so that students' focus is lesson the grade and more on learning what they need to work on. There are 23 quizzes at 5 points each, for a total of 115 points out of the 900 that can be earned in the course. Students have 1 week to complete the quiz, allowing them some flexibility to complete it according to their own schedule (Source: Syllabus BIOL 1308)

Rick Fofi, Instructor and Team Leader for the design team, explained that he wants even more flexibility for students, "Eventually, I want it to be so they don't have to come to class except when they need it. Currently it is required." (9/25/13)

"Poll Everywhere" allows formative Assessment in class (Don't turn off your cell phones!)

Another type of formative assessment that is done in class is the use of a website called "Poll Everywhere" which allows faculty to post questions on a screen and have students choose their answers by texting a particular number from their cell phones. In focus group interviews one student said that even though students' names are not identified on screen and students are often encouraged to collaborate with the students in their table-group, she enjoyed the subtle competition of seeing if she was among those students who identified the correct answer.

For their part, teachers can use data from Poll Everywhere to make on the spot decisions about what do delve into. Anita Thomas, Anatomy instructor, describes her practice this way:

> *Teachers can see what percentage chose the correct answer. This gives me an idea what I still need to explain. I can take them through each of these options to think critically about why that's the not correct answer. I can teach how to eliminate answers. It's a total teamwork. (11/12/14)*

As one more dimension of learning, this same student reported that she took a screen shot of the correct answer on her phone, so that she could review those in her free time. (2/13/14).

Summative assessment – a mixture of low stakes and high stakes quizzes/exams

Summative assessment in BIOL 1308 can best be described as plentiful. There's a great deal of graded assessment—some carry few points, others carry many.

Table 11 – Assessments used in BIOL 1308/Biology Fundamentals

BIOL 1308 Assessments	Points
17 graded class activities @ 10pts each	170 pts.
23 quizzes @ 5 pts. Each	115 pts.
23 objectives @ 5pts each	115 pts.
5 unit tests @ 100 pts. Each	500 pts.
TOTAL	900 pts.

"Class activities" refer to the hands on, small group work done following a module to reinforce the key (and more difficult) concepts of the module. If students are absent they may download the activity from Blackboard and hand it in. (BIOL 1308 Syllabus)

The quizzes for each module are discussed above in the section on formative assessment. As mentioned, these are quizzes are frequent and have low point totals, to keep the emphasis on students' self-assessment. (BIOL 1308 Syllabus)

Unit tests consist of 30 multiple-choice questions worth 2 points each and a short answer section worth 40 points that may include fill-in-the-blank questions, sets of matching questions, sketching and labeling, and reading comprehension questions on a short science article. These are paper tests that you complete in class using a pen or pencil. Calculators will be provided if needed. If a student receives a 70% or less they may make corrections during the following week for up to 4 points of additional credit.

Finally, extra credit is given for students who complete the checklist of work that should be completed for each unit as a way of incentivizing organization and time management. Two points can be earned for each of the five units.

In the Anatomy course, assessment is also a mixture of low-stakes and high stakes assessment. The lower stakes assessment is done through graded quizzes on both lectures and labs. Both of these are done on-line, out of class. The quizzes are timed and the system shuts down after time has expired. Initially these were done in class, but the instructors decided that they were taking too much time away from instruction. Students take 13 quizzes and may drop their 3 lowest scores. (Anita Thomas, 11/12/14)

Students also take exams that are considered higher stakes, with greater weight in their final grade. They take 5 unit tests, a lecture tests and a lab test (each lecture 12 % of total and each lecture test is 5%). At the end of the course there is a comprehensive final exam.

<u>A student's suggestion on the timing of tests</u>

One suggestion that came out of a student focus group—raised by one student but supported by two others—was to change the day when tests were held. They said that they have their tests on Tuesdays, but the Thursday before the test they move on to new material. Students see this timing as problematic:

> *Student #1: I think it's good to have the test early in the week because I need the weekend to study, but today we did Respiration and that is not going to be on next week's test, and honestly, I did not do the module because a) I'd rather use that time to study; and b) I don't want to be cramming new information into my head.*
>
> *Female student #2: And you feel lost in class because you didn't do that module.*
>
> *Female student #1: We did Respiration in class today and none of the people in my group had not done the module for this very reason.*
>
> *Female student #3: I think it's class wide.*

One way that this might be remedied would be to teach the material that would be on the test up until Thursday and then test it on Tuesday, so that there were no intervening days with material that would not be on the next test.

Continuous improvement afforded by plenty of data

Besides facilitating improvement of performance of individual students and individual teachers, the collection of data for each module and each question within those modules allows for the continuous improvement of those. So, for example, the instructional designer tells us that one professor, Thomas Samuel, aspires to collect granular data on each student so that he can target his instruction to each individual when they come in for face-to-face sessions, "sort of like advertising." (11/13/14)

References

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VIII. Contributions from Partners Most Critical to Success of the Grant

Summary of this section

- **Statways:** The Statway Program uses flipped classroom model of on-line modules at home followed by hands-on, collaborative activities in the classroom. In this way, the Statway program provided a ready-made template for the redesign of BIOL 1308 and the other pre-requisites that will be redone with C2C funding, and currently provides congruence in teaching style for those students taking both courses.
- **Capital idea:** The staff and leadership at Capital IDEA provide the support services that help low-income adults–those who have traditionally not been successful in higher education--to succeed and find living wage careers.
- **Workforce Development**: Workforce Development provides non-credit courses to help students get jobs paying greater than minimum wage, ideally so that they can pursue further credentials.

Capital Idea: Intensive case management for a sub-group of ACC's students

The ACC's health sciences pathway and the support services associated with it are designed to provide educational and job training opportunities as well as intensive student support services to low income adults in the Austin area. The educational program is provided by ACC and the student support services and case management are provided by Capital IDEA.

Capital IDEA offers thorough and comprehensive case management and support services as well as some remedial programming for learners who are not ready for college-level reading or mathematics. Capital IDEA brings to the partnership with ACC the ability to help low income adults find employment by building the "soft skills" (communication, timeliness, interview skills, etc.) needed to find, acquire, and keep jobs as well as to advance to higher paying jobs. The program is also designed to allow Capital IDEA to focus on the self-esteem and confidence to allow them to be successful in the job search, interview, and hiring processes. This is a very challenging aspect of the program design because no two Capital DEA clients are alike; as with most first generation adult college students, these clients have a wide variety of personal challenges which vary as their life circumstances change, and they need student services which are tailored to meet their constantly evolving needs.

ACC is well prepared to serve low-income adults who have multiple challenges to overcome in order to be successful in higher education and the workforce. Like most community colleges, ACC has special services for first generation college students, support for those from low income families, tutoring services, special advising for adult learners, and a community-orientation which leads to a knowledge of what area employers are looking for in applicants. Additionally,

as outlined below, the instructional strategies employed in this program were designed for people who have never been successful in college either because they have never tried or they were unsuccessful in previous attempts in higher education.

The positive relationship between ACC and Capital IDEA is reflected in the comments of Dean David Fonken:

> *Capital IDEA has a lot of great things that they do with their case management program that, I think, if we adopted them here at the college, it would help us considerably with development education. Any engagement I can have with Capital IDEA or folks doing similar work, I'd promote that... (9/27/13)*

The instructional model - - which includes online modules, flipped classroom, data- driven instruction, and differentiation to meet learners' needs - - seems to be strongly supported by both cooperating organizations. The partners are committed to the construct asserted by Malcolm Knowles in the *Theory of Andragogy* (1984) that adult learners should be put in charge of their own learning. Further, Capital IDEA supports ACC by preparing program participants for a student-centered learning environment which allows participants to become students with the flexibility they need to learn new concepts and to apply the material in real-life work settings.

First choice for a second chance

K. Patricia Cross said the community college is the first choice for those seeking a second chance. The partnership between Capital IDEA and Austin Community College is an ideal example of providing a second chance to part of our society that has historically been under-served by higher education.

The intensive case management services provided by Capital IDEA separate this program from other efforts to serve low-income adults. These so-called wrap-around services are critical to help the target population enter, persist, and succeed in the program. Capital IDEA helps these students address non-academic issues related to finances, transportation, childcare, etc. Equally important to these non-academic services are "quasi-academic" services that concern issues such as attendance, class participation, persistence, and student behavior. The current program is designed to "mix" these services that occur both prior to and during training/education activities.

An example of the support services provided by Capital IDEA comes from ACC Instructor Mary Parker who spoke of Capital IDEA students who enter the Statway Program: "The Capital IDEA folks were putting a lot of students in Statway." When asked if Capital IDEA-based students demonstrated more persistence, Parker commented:

> *Yes, not better prepared but they persist. They don't just drop out when something goes wrong. They don't come in better, but they are propped up better. And they're also better motivated. They jumped through a lot of hoops to get in.*

ACC Biology Department Chair Meg Flemming summed up the partnership and its value to low-income adults and communities:

Capital IDEA has been a huge partner. Capital IDEA has the capacity to bring students to college readiness, but they don't have the ability to bring them to science readiness. We do that. It's a great team.

I wish there was not a poor side of town, but the east side has traditionally been lower income and poorer schools. We're already seeing a change there: students who have been going through the phlebotomy and CNA programs that we just launched it last month. To me, what we're doing is the future of education: modularization and the flipped classroom. (9/27/13)

Capital Idea's role in student recruitment

Capital IDEA allows Austin Community College to reach a diverse population of low-income adult learners, with a greater percentage of women than men, and Latinos represented in much greater percentages than other groups.

There was general agreement among representative from both partnering organizations over the need to increase recruitment of male participants. In discussion about this imbalance, it was noted that community college enrollment (as well as enrollment at all types of higher education institutions and in both credit and non-credit programming) is higher for female students. One interesting point discussed at ACC was that faculty members felt the predominance of women is related to Capital IDEA's efforts at attracting single mothers and young women who are in need of extra support. One faculty member suggested that men tend to look for education/training programs that can lead to larger and more immediate monetary rewards; additionally, men, are less interested in the wrap-around services which play such a big role in the C2C Program.

Capital Idea Student Demographics 2013 www.capitalidea.org/about -- accessed 7/20/15	
Race/Ethnicity	47% Hispanic/Latino
	25% African American
	21% White/Anglo
	4% Asian
	3% Other
Gender	76% female
	24% male
Age	Age 18-34: 36%
	Age 25-34: 40%
	Age 35-44: 17%
	Age 44+: 7%
Family household	No children 42%
	Single parent 31%
	Two parents 27%

Finding ways to resolve the enrollment imbalance problem is a challenge for Austin Community College and its partners. Addressing this issue (i.e., attracting more males to the program) could allow deeper changes to local communities. ACC and its partners are working to build/promote so-called "stepping stone programs" that would recruit more men and allow them to support their families while continuing with education and workforce training programs. Working together to create more effective marketing, the partnering organizations can play a major role in recruitment of more male participants.

Statways: A redesigned statistics course that paved the way for the courses redesigned through the C2C Grant

The Statways Program provided an example of the possibilities of using a flipped classroom model to foster greater success among students in prerequisite courses for the health science. Insofar as the courses redesigned in the C2C program used similar models, it also created congruence for students who take it as part of their health sciences preparation sequence.

David Fonken, Dean of Math and Sciences at ACC had these comments on the success of the combination of Capital IDEA services and the Statway Program:

> *Statway is the first program I have seen that is successful, sustainable, and cost effective. What the Statway folks do is to require a two-semester commitment from students. They take students at that same level—people who are ready for elementary algebra- and put them through a developmental course which has some elements of pre-statistical reasoning in it, and they put them through a college level stat class with a 1-semester lab course on the side. (9/27/13)*

Along with the individual effects of such partners as Capital Ideas, there are also the possibility of the additive (or multiplicative) effects when Capital Idea is combined with one of ACC's other partners. For example, David Fonken, told us of providing Statways students with the supports of Capital Idea:

> *We have a cohort now that's doing the Statway course that is all Capital IDEA students. With all the scaffolding that Capital IDEA supplies I think we'll see numbers much higher than 50%. We'll find out at the end of the year. (9/27/13)*

Workforce Development: Non-credit courses that help students get a job to support themselves while pursuing for-credit credentials

The Workforce Development Division of ACC's Continuing Education Program provides students with non-credit courses and training that allow people to attain a job and income to sustain themselves, and ideally, allow them to pursue higher credentials.

Just as Workforce Development helps Capital Idea by supporting their students in getting jobs, Capital Idea helps its students in Workforce Development to succeed by providing them resources otherwise unavailable to them:

> *What I can tell you about Capital Idea is that if a student doesn't have the resources CI will get them. They are fantastic at that. If they didn't have a computer they would make sure they would get them. If they need bus passes--whatever they need I'm confident they provide that. They provide money for childcare if they need it. They're very extensive. They have a small clientele—they're very choosy. (Nancy Laudenslager, Director of Workforce Development, 11/12/14)*

Figure 2

Summary of Program Design & Services to Support the Partnership

Educational Services

Individualized Services	Pre-College Level Courses
Basic Skills with occupational context	Study Skills Preparation
Tutoring	Study Groups
For-credit certificate programs	Non-credit soft skills and job skills

Student Support Services

Case Management	Personal Support Services
Enrollment Assistance	Childcare
Transportation	Peer-Support Groups
Motivation and Self-Esteem Support	Time Management
Computer & Technical Skills	Communication Skills

Lab Technicians: Support for the redesigned BIOL 1308 paid by ACC (rather than grant funds)

In Year 3 of the grant, one change that had been made was the inclusion of BIOL 1308 in the work of the Lab Technicians who prepare materials for lab courses. It is a position that pre-existed the C2C grant, and funding for the position comes from the college rather than any grant funds. Insofar as BIOL 1308 is not technically a lab course supported by special lab fees, in the long term this may raise some issues. Here's what one Lab Tech told us about the situation:

> *[The redesign of BIOL 1308] had effected us a lot. The lab techs have been involved in creating the hands on modules--not the online modules… 1308 was primarily lecture class and now it's more of a lab course. We're the ones with the ACC credit cards. We do all that stuff. We really didn't have to support 1308 [prior to the redesign]. Now it requires support. It has added to our workload—not tremendously. As it gets introduced to each campus they say, "This isn't in my job description because it's not a lab class." (11/14/14)*

From the sounds of this, the Lab Technicians are playing an important role in easing the load on faculty in preparing the materials for the in-class activities. It remains an open question whether using their services for a non-lab course will build resistance or become an accepted anomaly to the system.

During Year 3 of the Grant, ACC began the search for another grant to continue the redesign of courses. Beyond the three courses that will be redesigned through the C2C grant (Concepts in Biology, Anatomy, and Anatomy & Physiology), ACC hopes to complete similar redesigns for Physiology and Microbiology, the remaining core courses that all students must take for entry into any four-year health sciences degree. (Rick Fofi, 2/10/15)

Placement: "These Students Want Jobs"

Students come to this program with many needs, but one primary goal: they need a job. The Partnership between ACC and Capital IDEA creates the collaboration to enhance the participants' chances of being placed in jobs that pay a living wage. This is done through the combination of the academic/training skills provided by ACC and the non-academic supports offered by Capital IDEA. While community colleges have historically served people who struggle to enter the workforce, it is the wrap-around services provided by Capital IDEA that seem to be an essential element in helping the program participants to find jobs with a livable wage. In other words, placement is another area in which collaboration is essential. This is reflected in the comments of Eva Rios-Lleverino:

> *In the Certified Nurse's Aide program, there are non-paid internships and once they take the state exam Theresa is responsible for placements. For the CNAs, they end up in assisted living and hospitals. That's why Seaton Family Hospital is involved. Seaton has been involved from the beginning. They start working for them as an intern and then they can see them, so they just move them up. They also were looking into phlebotomy for those who don't want to get into the CNA. It's the same process.*
>
> *Seaton Family Hospitals and Capital IDEA. Great collaboration. It didn't start that way, but then we came together. At first we went in circles. But then, once we had the modules I saw the pay off. (9/25/13)*

Job placement is also a priority for ACC's Workforce Development Center. According to Director Nancy Laudenslager, the Center participates in the partnership with Capital IDEA to help place participants in jobs which provide both a livable wage and the opportunity for advancement:

> *The placement rate for the CNA field is around 100%. If participants complete the program they get a job. In two years they're making $12.00 or 12.50 per hour. [The salary] kinda caps there though. But if they get acute care skills, then they have an option of working in a hospital, and they have the opportunity to get into other programs like Medication Aid training.* (9/26/13)

Capital Idea's Program Management: "A Cohesive Fit"

The partnership between Austin Community College and Capital IDEA helps the program to meet the needs of both the low-income adults and employers in the greater Austin region. The cooperative example created by these two partners provides a great model for other community colleges and non-profit agencies.

ACC has a very "cohesive fit" with Capital IDEA. The two partners not only respect what each organization does, they u*nderstand the mission and objectives* of each organization. For example, several college officials acknowledged that the non-profit organization has valuable expertise and experience in providing the wrap-around support services that are so important to

the success of students in the program. They also know this type of service is part of Capital IDEA's mission in the community.

According to Meg Flemming, Chair of the Biology Department, the faculty members at ACC share some of the core values of Capital IDEA. When asked whether the faculty members are motivated by a desire to help those who are less fortunate or to help the community college fulfill its mission, she responded:

> *Probably all of the above. They're here because they want to teach. If you are paying attention to trends, the flipped classroom is showing huge results. People are very excited. Flipping the classroom makes each learner responsible for his/her own learning. Takes out spoons--I won't spoon-feed you but I'll give you the spoon. (9/27/13)*

Within Capital Idea, there are nine navigators, each with between 80-126 students. Pam Thomas, who supervises the navigators, explains their work:

> *They do the same case management as an academic counselor but they also do check-ins. We're different from an academic counselor in that the students have to see us on a weekly, bi-weekly or monthly basis, depending on whether we have assessed them as needing low, medium, or high support. We reach out to them more than they reach out to us. We have a relationship with our students. When it's going bad they will tell us. Our community connections go deep so we have resources in the community, so that that crisis can be averted, they don't have to drop out. They don't have to worry about studying. We provide 100% funding for childcare. That is a voucher. The childcare provider can be a relative. The only requirement is that another student in the program cannot be your childcare. And whoever the sitter is, has to get a national background check. (11/13/14)*

Two navigators have special roles focusing on special populations. One focuses particularly on intake for the C2C grant's focus on IT training, determining whether they are already prepared to be successful in that program. The other specialized navigator—titled the "College Prep Navigator"—takes those individuals who do not seem ready for the program and works with them in an intensive 12-week preparation program before they join the others. (Pam Thomas, Capital Idea Program Manager, 11/13/14)

In the latter half of the C2C Grant, Capital Idea used its own funds to provide special mentoring to students in the C2C program who were not otherwise enrolled in the full Capital Idea program in what Capital Idea's Pam Thomas referred to as a "Pilot Program." For those students who volunteer to receive Capital Idea mentoring they receive the same kinds of support services while taking the pre-requisite and co-requisite courses except that they do not receive financial support (e.g. childcare stipends) and they receive less support in soft skill training as they move into placements. Mentoring for non-Capital Idea students is strictly voluntary. Capital Idea makes presentations in their classes and students sign up as they wish. Contact with those students occurs every 2 weeks, either by email or by phone.

Officials at ACC have worked to ensure that the Workforce Development Center, which is within the Continuing Education Division, is an important part of the partnership. Nancy Laudenslager indicates that the involvement of Capital IDEA and career navigators has been helpful for students who need assistance in overcoming a lack of job skills and the barriers to job placement:

> *The challenge for us is to get the word out there. We now work with Capital IDEA and Workforce Solutions. In the past, Capital IDEA focused on the degree programs. This past year they're sponsoring more people in our programs.* (11/12/14)

Leveraging of Resources: A Partnership to do more and to do better

Again, the foundation of the collaboration between community colleges and private not-for-profit organizations is that through teamwork and positive associations, they can enlarge their capacity to meet their mission of open access, workforce development, and serving both individual and society. A positive relationship between a community college and a community-based nonprofit can allow each institution to serve more people and reach more of those who are traditionally under-served in society.

This relationship is reflected in the comments of Dean David Fonken who spoke of the success of the partnership with Capital IDEA in preparing low-income adults for workforce training and the evolving change in culture at ACC:

> *It has helped the culture to evolve. We've had a longstanding relationship with Capital IDEA. For a number of years we've helped them out with their College Prep Academy. That's where they help students to get ready for college. We provide the Curriculum and faculty, and they provide the scaffolding and that sort of thing. This is the next step—beyond college prep. Now we're looking at—"What do they do when they get to us?" I sat down with Steve one day and looked at this gap. They were very successful in getting people ready for college. The students who got into the programs like nursing were very successful. But in between—in the pre-requisite courses, they weren't so successful. We decided that the grant would be the perfect way to address that.*
>
> *So I would say that it [the grant] definitely helped our culture of collaboration with non-profits and community programs. I would like to see it keep developing. I think Capital IDEA has a lot of good approaches that I'd like to see happening. Capital IDEA has a lot of great things that they do with their case management program that I think, if we adopted them here at the college, it would help us considerably with development education. Any entanglement I can have with Capital IDEA or folks doing similar work, I'd promote that.*
>
> *What Capital IDEA does, it has this framework of support. They recruit them first. They, honestly, make them jump through a lot of hoops to demonstrate some commitment. They're not difficult, but they have to show up, show an interest and then sustain it. They provide wrap around support services which appear to be generous and in some ways they are. If they don't show up they call them, and if a disaster happens they help them*

out with a rent payment, find child support or do whatever it takes to keep them in school. But if you look at what they do from the broader perspective of completer: on a cost per completer basis, they are way cheaper than we are. That requires an institutional change in mindset. (9/25/13)

Workforce Development

Workforce Development is part of the Continuing Education Department of ACC. As such, it offers courses that are not for college credit. The contribution made by Workforce Development is in creating courses and programs that allow students pursuing for-credit programs to get a higher paying job to sustain them as they pursue their studies. One advantage that they have over the for-credit programs in doing so is that they have greater flexibility in creating courses and in scheduling them insofar as they need not go through the approval processes required by the college and the state. Nancy Laudenslager, Director of Workforce Development describes this difference this way:

We start and stop programs all the time. If a company needs phlebotomists, we can set it up. The only reasons we follow the fall, spring, summer schedule, is that that's the way the college divides it up. But in terms of where we offer it, when we offer it, we have a lot of flexibility. That was why they came to us for phlebotomy. They said, "We are at our limit. These are our slot times…" We said, "How can we make this work? We're a bit of contortionists. (11/12/14)

Workforce Development, for its part, works closely with Workforce Solutions, a state job referral agency. Where Workforce Development creates programs to prepare students for jobs sectors where there is a demand, Workforce Solutions helps students connect with those jobs. If a job is on Workforce Solutions "high demand list" then they will send students to Workforce Development with a voucher to pay for their coursework there. Goodwill also refers students and sends them with vouchers, sometimes requesting that an entirely new course be created (e.g. apartment maintenance). (Nancy Laudenslager, 11/12/14)

Commitment to Program Sustainability: A Focus on Solving Real-Life Problems

In discussing the sustainability of the program in Austin into the future, concern was expressed over whether Capital IDEA will be able to find the additional funding necessary to keep up with the wrap-around services as Austin CC works to expand their instructional model to new academic departments. Several people felt ACC was ready to move forward in the partnership with Capital IDEA by adding new academic departments and also moving into new geographic areas in the ACC service region.

For example, Dean David Fonken spoke about expanding the partnership with Capital IDEA in the future:

We're talking to employers, but mostly through Capital IDEA. We are strengthened by their focus on jobs. They primarily support students who are interested in a few carefully selected jobs. We benefit from that directly. I would like to see Capital IDEA expanded greatly.

> *Interviewer: How do you imagine proceeding in expanding [the program]?*
>
> *I've got [people asking to be involved] here. Bio-tech is probably the next partner… Beyond that, the sky's the limit. We're thinking about this as the model for other partnerships. (9/25/13)*

The idea of expanding the partnership between Capital IDEA and ACC seems to be a commonly held goal. ACC would like to see Capital IDEA in an expanded role. Our interviews showed that administrators and instructors at ACC respect and appreciate the role Capital IDEA has played in the partnership. Collaboration that is larger in scope and more innovative should be discussed while the success of the current partnership is being assessed. David Fonken, for example, expressed that when examining cost per program completer, he believes Capital IDEA is less expensive per completer than ACC. He would like to see the college investigate more alliances with nonprofits.

Additionally, since their courses must be self-sustaining, Workforce Development administrator Diane Laudenslager anticipates no problems in sustaining the courses in the healthcare track. (11/14/14)

References

Knowles, M.S. & Associates. (1984). *Andragogy in action: Applying modern principles of adult learning*. San Francisco: Jossey-Bass

IX: Factors Contributing to the Partners' Involvement

Summary of this section

Internal Partner: Faculty involved in the redesign of courses

- Faculty continue to be involved in the redesign working with the newly hired instructional designer;
- While faculty receive course release time ("Lecture Equivalent Hours") the work is said to typically exceed the compensation;
- There is a strong collaborative spirit among the redesign teams with an emphasis on "playing to people's strengths";
- Leaders of the redesign are deliberately accepting and encouraging variation in the implementation of the redesigned courses, again, attempting to "play to people's strengths";
- One question we, as evaluators, had is how, in the long-term, the advantages of standardization between course sections will play out in relation to the desire for flexibility and bottom-up innovation.
- A persistent concern is the conflict between the desire for flexibility and a "bottom-up" approach to innovation and the obvious advantages of standardization between course sections of redesigned courses.

Internal Partner: Workforce Development

- Workforce Development, as part of ACC's Department of Continuing Education, provides not-for-credit courses that prepare students quickly for the next step in employment, helping them earn more than minimum wage, and providing the opportunity to pursue higher credentials through ACC. They are sustained through tuition dollars, so meeting the needs of students in the healthcare pipeline is a mutually beneficial enterprise.

External Partner: Capital Idea

- Each entity involved in the partnership understands and respects the mission of the other organization. Everyone at Austin Community College seems to respect Capital IDEA's mission of helping working adults out of poverty and into living wage careers. Likewise, those at Capital IDEA understand and appreciate the mission of the community college generally and Austin Community College in particular. They recognize that their missions complement one another.
- Leaders, case managers, instructors, and others at both organizations share a commitment to addressing the real-life problems of people in the Austin area through an increase in services through the partnership.

Internal Partner Contributions: Faculty involved in the redesign of courses

Faculty continue to be involved in the redesign working with the newly hired instructional designer

Even with the hiring of an instructional designer in the second year of the grant, the faculty continues to play an integral role in the redesign of courses. For the Anatomy course, all instructors meet as a group on Fridays to discuss various aspects of the redesign.

While faculty receive course release time ("Lecture Equivalent Hours") the work typically exceeds a normal load

Faculty members, the instructional designer, and administrators, consistently indicated that while the grant has helped to provide release time for faculty to do redesign work, involvement in the redesign still created a greater workload than teaching the college's traditional teaching load. That said, the faculty involved were still very enthusiastic about their participation and there was no shortage of full-time or part-time faculty interested in being involved.

There is a strong collaborative spirit among the redesign teams, with an emphasis on "playing to people's strengths"

When asked about the success of the redesigned courses, and the collaborative spirit found throughout the process, Dean of Mathematics and Sciences, David Fonken gave credit to Rick Fofi, the faculty member who leads the redesign of both Fundamentals of Biology (BIOL 1308) and Anatomy (BIOL 2304): "A lot of it [the credit] falls on Rick Fofi's leadership. He has done a skillful job of picking people with passion and expertise. He's done a great job of dividing people up--working from people's strengths." (11/13/15)

When we asked Fofi about the charge he had been given, it was clear that Fonken, for his part, had put a great deal of confidence in him and resisted micromanaging. As Fofi recalls,

> *David [Fonken] said, "We got this grant -- make it happen." I was the unofficial leader and director until they got Alice Sessions [C2C Director]. I had to pick the team, develop the courses; manage the team, make the big decisions, make sure we met the goals. (11/13/15)*

After Alice Sessions was hired as grant director, Fonken said he delineated responsibility so Fofi focused entirely on his team of faculty developers while Sessions took care of all the operational and financial details of the grant. Fonken said his involvement, after getting the grant, was facilitating regular communication between Fofi, Meg Flemming, the Biology Department Head, and himself. (11/13/15)

Leaders of the redesign are deliberately accepting and encouraging variation in the implementation of the redesigned courses, again, attempting to "play to people's strengths"

In the third year of the grant, with two of the redesigned courses being implemented, something analogous to Fofi's ability to "play to people's strengths" seemed to have become part of the wider ethos of implementation. Whether or not this is directly related to Fofi's style can't be said. When programs are "rolled out" from the first adopters to the later ones, some organizations become rigid, insisting on "fidelity" to the initial design, but Alice Sessions described something more fluid and organic happening deliberately at ACC:

> *…Over the course of the year, we accumulated enough materials so we could begin to individualize the sections to play to the teachers' strengths—some teachers like the PowerPoint's. I like the guided notes.... There are often two or three activities for a class—so teachers can pick and choose. Then there's the cross fertilization—"I tried this, it didn't really work well,"--that type of thing. (11-13-14)*

Along these same lines, Sessions said that after the BIOL 1308 had been taught once, the grading system was changed so that of the 1000 points 170 of those were not associated with a particular activity "allowing for greater individuality" among instructors. She said, "That means the teachers can [use their discretion]… That has the faculty playing to their strengths." (11/13/14)

In sum, there seems to be a strong theme of faculty empowerment, beginning with the initial charge to from the Dean to the Team Leader, and later from the design team to the faculty implementing the redesigned courses.

One question we had is how, in the long-term the advantages of standardization between course sections will play out in relation to the desire for flexibility and bottom-up innovation. While those involved in the redesign are deliberate about wanting to allow flexibility so that teachers can adapt the course according to their strengths and predilections, there are also areas where standardization seemed to have value. For example, to maximize flexibility for students, office hours of all instructors of a course are open to all students who are taking that course, regardless of whether the student is enrolled in a particular section of the course. This show of collaboration—one that too rarely happens in higher education—requires that faculty have some standardization in content of what they are teaching and how they explain it. Another example of the press for standardization is in the desire to have data comparing redesigned course sections to non-redesigned sections. While a range of variation in how the redesigned courses are taught is acceptable, some extremes might create issues in comparison. Examples like these are not meant to denigrate the admirable desire to keep the redesigned courses flexible and open to the innovation of individual instructors, they are meant to point out the inevitable tension that such efforts will encounter. How this tension will be managed is something to watch moving forward.

Internal Partner: Workforce Development

To recap, Workforce Development is part of the Continuing Education Department of ACC. As such, it offers courses that are not for college credit. Laudenslager also makes the point that they are not trying to compete with the for-credit programs.

> *[The person who comes to us] is not someone who is looking for a degree. This is shorter term. [Our courses] are all competency based. As many programs as possible—all the healthcare programs, they all have industry certifications. So while we don't teach to the test, we make sure that everything that is in the test is included in the curriculum so that they have an opportunity to pass the national exam. (11/14/14)*

External Partner Contributions: Capital Idea

The mission and objectives of each partnering organization *are understood* by all participating organizations.

Officials at Austin Community College have a history of working with Capital IDEA, and they fully understand the nonprofit organization's mission and objectives in participating in the partnership. Likewise, leaders at Capital IDEA have a strong understanding of the mission of community colleges in general and ACC in particular. By understanding each other's mission and objectives for this partnership, these two organizations are able to avoid partnership pitfalls such as turf wars and focus on their mutual interest in providing training to help low income adults attain sustainable jobs with a living wage.

The mission and objectives of Capital IDEA and Austin Community College *are important* to both organizations.

It is not enough to know and understand the mission of each partner institution; it is equally important to believe the other institutions' missions are important. For this reason, community colleges and nonprofits like Capital IDEA are natural partners. Their missions complement each other, and the people who work at one institution respect and appreciate what the other institution accomplishes. This mutual "mission respect" allows ACC and Capital IDEA to promote their institutional commitment to provide education and training services to low-income adults.

Capital IDEA and Austin Community College share the desire to do more, to do better, and to reduce the costs of doing more and better through collaboration.

Administrators, instructional leaders, and case managers at both ACC and Capital IDEA expressed a sincere interest in helping the less fortunate, and many who were interviewed acknowledged that they were convinced that the results would be better with the other partner fully involved. It is important to note that there seemed to be a clear understanding that this partnership is not a "zero sum game" where one entity gains only at the other's expense. Avoiding this all-too-common mentality allows this partnership to move forward without jealousy, suspicion, and mistrust.

Alice Sessions, C2C Director, explains one way that Capital Idea benefits from its relationship with the college: "As a private organization they're always looking for money. We can get them success stories. We're validating the work that they do." (11/13/15)

Looking from the other vantage point, Pam Thomas, Program Manager at Capital Idea, offers this example of how Capital Idea recently was able to help the College to raise money:

> *Thomas: I'll tell you why it works: because we are a community-based organization and we have the flexibility to do some things that ACC can't do because they are a public college. I'll give you a great example. We got two bond packages passed for ACC. In part it was due to Capital Idea's relationship with the community. We could go out and do public endorsements because I'm not an employee and so I could talk about how ACC is being supportive. So, in this last campaign—we had long days because all we did was let people know about ACC… We only advocate for issues--not a person who is running for office. Our advocacy was for issues 1, 2, and 3. What we tell the voter, if the candidate you like is for Issue 1, 2, or 3—*
>
> *Interviewer: But ACC couldn't do that.*
>
> *Thomas: Nope. And they didn't ask us. We knew they needed it. It just worked for everyone. It's not that we wouldn't do if they asked. We want to see that they do well. (11/13/14)*

Leaders in both organizations have a sincere belief that new and better services will result from the partnership.

Both partners know – from experience – how difficult it is to reach the target population. By working together and recognizing that participation in the partnership can further each organization's mission and goals, ACC and Capital IDEA increase the chance of breaking the cycle of poverty by connecting low income residents with the support services of Capital IDEA, the workforce training of ACC, and a network which prepares them to be productive workers who meet the needs or area employers.

Partners have been able to avoid institutional opposition to change through communication within and across organizations

Every organization has a level of inertia to overcome in achieving change. Educational institutions are particularly known for their resistance to change. Capital IDEA and ACC have demonstrated, however, the importance of overcoming resistance through communication about the partnership both within each organization and, significantly, across the two partnering entities. Both organizations promote the partnership and publicly discuss the advantages of a community college and a nonprofit working together to provide workforce training for low-income adults.

This collaboration involves partnering organizations with a focus on solving real-life problems in the community.

Capital IDEA and ACC appear to share a belief that participation in this partnership will benefit the community--and people--both institutions serve. Leaders and front-line personnel of both organizations know there are long-standing regional workforce development needs in the Austin

region, and they appear to believe those requirements can successfully be addressed by this partnership.

Appendix D: Logic Model

Logic Model Assignment
1. Logic Model for BIOL 1308 Redesign with Innovation Lab
2. Logic Model for Statway MATD 0365 Developmental Mathematics Course

Austin Community College
Austin, Texas

Prepared by Alice Sessions, Project Director
with input from Rick Fofi, Biology Faculty Team Leader and Mary Parker, Math Faculty Leader

June 17, 2013
Revised after ATD discussion July 8, 2013

1. Austin Community College's Logic Model for the Biology Innovation Lab and BIOL 1308 Biology Fundamentals Course

Step 1: Describe the Resigned BIOL 1308 Biology Fundamentals Course with Innovation Lab

Input	Activity	Output	Outcome
Biology faculty Staff Capital IDEA staff	Convene faculty and staff team. ↓ Review common course objectives (CCO) for BIOL 1308. ↓ Determine modules to achieve CCO ↓ Build modules. ↓ Identify space and accommodations for innovation lab. ↓ Develop supporting materials for use in innovation lab ↓ Develop assessments for modules. ↓ Recruit students. ↓ Train faculty and innovation lab staff. ↓ Teach the course. ↓ Review and revise.	All modules are complete at start of course. All modules are taught and assessed in each section. 5 sections of 1308 are at least 85% full. At least 85% of the target 50 Capital IDEA students are enrolled. At least 85% of the students starting BIOL 1309 finish with a grade of A, B or C. At least 90% of completers enroll in BIOL 2404 or BIOL 2304/2101 in spring or summer 2014.	*Short-term* At least 90% of 1308 completers finish BIOL 2404 or BIOL 2304/2101 in spring or summer 2014 with a grade of A, B or C. *Medium-term* At least 75% of certificate-seeking students are accepted into a health program in 2014 At least 75% AAS students taking redesign 1308 finish BIOL 2305/2102 and 2420 in 2014. *Long-term* Increase by 25% the number of students working in healthcare by 2015. Increase by 30% annual earnings of certificate and AAS graduates.

Assumptions: The Biology prerequisites for health sciences programs act as a barrier to student success. Although the BIOL 1308 course, begun in 2008 has improved completion rates, nearly thirty percent of students entering the course never complete it. The mastery-learning approach of the course redesign with the supportive, student-centered innovation lab will improve student completion rates of the prerequisite courses.

Step 2: Identify the Formative and Summative Evaluation Questions

Formative evaluation questions on BIOL 1308 redesign with innovation lab

Formative Evaluation Question	Potential Benefits to answering question	Feasibility of obtaining data	Time and Resources required
Is there integration between the classroom and innovation lab?	Integration is an essential part of our model for improving student success	Feasible. Use online student surveys and assessment results for each module of 150 students taking the course.	30 min/student for survey 6-8 hr. for Director /teaching team to design and upload survey. 3-4 hr. for Director for assessment results 3-4 hr. for analysis by teaching team. Innovation lab computers with survey loaded
Is the innovation lab fully staffed by faculty or tutors?	Professional support for collaborative assignments in lab are important for student success.	Feasible. Faculty to hold office hours in the innovation lab. Tutors hired to work at other times the lab is open.	0-2 hrs./week for teaching team members 2-3 hours to develop schedule 3-4 hrs. to hire tutors 1-2 hrs./week for teaching leader to monitor lab.

Final (Summative) Evaluation Questions on BIOL 1308 Redesign with Innovation Lab

Summative Evaluation Question	Potential Benefits to answering question	Feasibility of obtaining data	Time and Resources required
Do more students complete the course with an A, B or C compared to those taking non-redesign course?	Determine whether the redesign increases student completion and success rates.	Feasible. ACC has database of all grades in all courses. Compare 160 redesign students with up to 448 regular BIOL 1308 students in Fall 2013.	Done Jan. 2014 when data available. 3-4 hr. for Director to compile data. 3-4 hr. for teaching team to analyze data 10-15 hr. for teaching team to make revisions.
Do more students taking redesign course get accepted into health sciences programs?	An important grant goal is to get more students credentialed in health sciences. Getting them into programs is the first step.	Feasible. Develop tacking and advising system with help from Capital IDEA partners for all students in redesign course.	Fall 2013: Develop tracking and advising system. Director, teaching leader, Capital IDEA Career Navigator. 10 - 15 hr. needed Fall 2013: Train teaching team faculty. 3-4 hr. workshop. Spring 2014: Implement tracking and advising system. None. Part of teaching duties. Director: 1-2 hr./week to collect and analyze data.
Do more students taking redesign program get jobs upon becoming certified in a health sciences field?	An important grant goal is to get more students working in their chosen field.	Feasible. Expand tracking system to include students after graduation. Maintain contact by email, twitter, etc.	Develop post-graduate tracking system. 10-20 hr. needed by Director, health sciences chairs, Capital IDEA. Train staff in spring 2015.

A. Evaluation Questions	B. Expected Outcomes	C. Tasks	D. Personnel	E. Timing	F. Data Source	G. Analysis	H. Reporting
Do more students complete the course with an A, B or C compared to those taking non-redesign course?	Increased completion rate with passing grade in redesign course with innovation lab.	1a. Obtain student data from ACC database. 1b. Analyze data between redesign and non-redesign sections.	Director with help from ACC IR staff and Evaluator	January 2014 for fall cohort. June 2014 for spring cohort.	ACC Database	Compare percent students getting A, B, C or DFW in redesign sections with those in non-redesign sections.	To ACC grant partners To NOVA partners
Do more students taking redesign course get accepted into health sciences programs?	Increased acceptance into health sciences programs by students in redesign sections.	2a. Develop tracking & advising system. 2b. Train faculty and staff 2c. Implement system. 2d. Track acceptance rates.	Director /Capital IDEA /Evaluator Capital IDEA Director /teaching team Director /Evaluator	Fall 2013 Late fall 2013 Spring 2014 Summer/Fall 2014	ACC database, student self-reporting, program chairs	Compare the redesign students being accepted to those in comparable programs from non-redesign.	To ACC grant partners To NOVA partners
Do more students taking redesign program get jobs upon becoming certified in a health sciences field?	More graduates entering workforce from redesign sections.	3a. Expand tracking system to include students after graduation. 3b. Maintain contact by email, twitter, etc.	Director /Capital IDEA /Evaluator Director /Evaluator	Spring/Summer 2014 Summer/Fall 2015	ACC graduation database, student self-reporting, program chairs	Compare the redesign students completing programs to those in comparable programs from non-redesign.	To ACC grant partners To NOVA partners

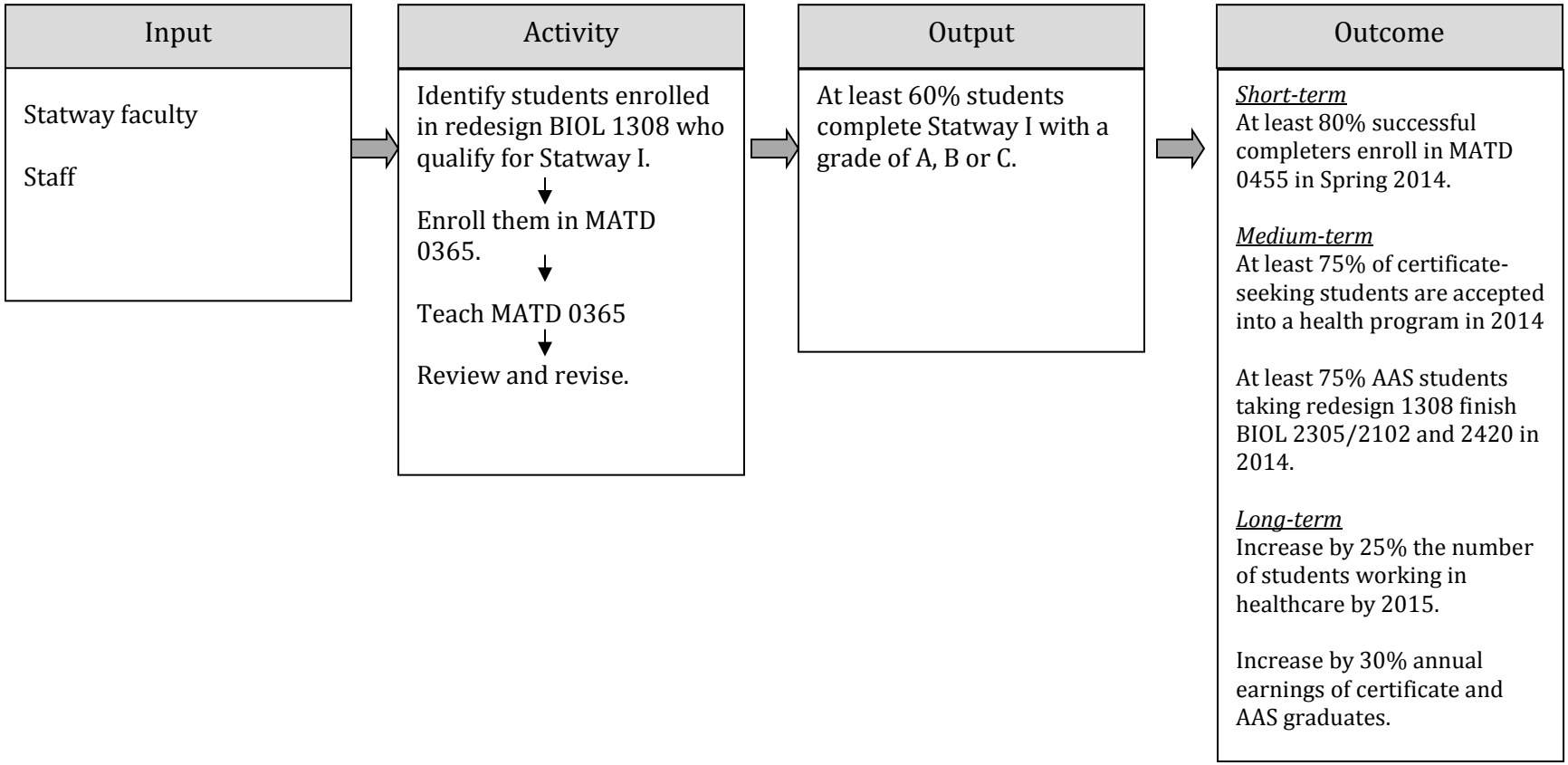
Step 3: Evaluation Plan for BIOL 1308 Redesign with Innovation Lab

ACC Evaluation Plan for BIOL 1308 Redesign with Innovation Lab

Year	Semester	Target Date	Task #	Task	Data Team	Other personnel	Date completed
2014	Spring	March	1a	Obtain student data from ACC database.	Director and Evaluator	IT staff	
2014	Spring	May	1b	Analyze data between redesign and non-redesign sections.	Director and Evaluator	IT staff	
2013	Fall	Dec	2a	Develop tracking & advising system.	Director and Capital IDEA	Faculty	
2014	Spring	January	2b	Train faculty and staff	Capital IDEA	Faculty	
2014	Spring	Feb	2c	Implement system.	Faculty and Director		
2014	Summer and Fall	October	2d	Track acceptance rates.	Director and Evaluator	Faculty	
2014	Summer	August	3a	Expand tracking system to include students after graduation.	Director, Capital IDEA and health sciences program chairs.	Faculty	
2015	Summer/Fall	Dec	3b	Maintain contact by email & twitter	Director, Capital IDEA	Faculty	

2. Austin Community College's Logic Model for Developmental Mathematics Statway Course, MATD 0365 Mathematics for Statistics I

MATD 0365 and MATD 0455, the two Statway courses, were developed through a grant from the Carnegie Foundation for the Advancement of Teaching. This innovative sequence of courses, taken concurrently with the Biology prerequisite courses, is designed for students who are not ready for college-level mathematics and take them through credit-level college Statistics, a prerequisite for health sciences programs. These Statway courses in conjunction with the innovative Biology courses increases the number of students successfully completing their prerequisites in the shortest time.



Assumptions: ACC data indicate that less than one third of students pass developmental math the first time they take it. As the number of repeats increases, the number of students dropping out also increases. The Statway course was developed with a grant from the Carnegie Foundation; ACC was a partner. When it was piloted in Fall 2012, more than fifty percent of the students passed and proceeded to the second Statway course. Student input was positive. It is expected that this course will improve the rate at which students complete their health sciences credentials and go into the workforce. These 2 Statway courses provide students with college-level statistics needed for many health programs.

Step 2: Identify the Formative and Summative Evaluation Questions

Formative evaluation questions on Statway MATD 0365

Formative Evaluation Question	Potential Benefits to answering question	Feasibility of obtaining data	Time and Resources required
Are the students learning the math skills necessary for success in health sciences?	Math skills are an essential component for workforce success in health sciences. Students need to pass developmental math before being accepted in a program.	Feasible. Use ACC database to determine grades of students in Statway compared to other developmental math courses.	4-6 hr. for Director and Evaluator to compile data. 4-6 hr. for Math faculty to analyze data. 10-15 hr. for Math faculty to revise course
Are more students passing the Statway courses than MATH 1342?	One of the grant goals is to increase the rate at which students obtain jobs in their chosen profession.	Feasible Use ACC database to determine completion rates of students in Statway compared to other developmental math courses.	4-6 hr. for Director and Evaluator to compile data. 4-6 hr. for Math faculty to analyze data. 10-15 hr. for Math faculty to revise course

Final (Summative) Evaluation Questions on Statway MATD 0365

Summative Evaluation Question	Potential Benefits to answering question	Feasibility of obtaining data	Time and Resources required
Do more students complete the course with an A, B or C compared to those taking non-Statway course?	Determine whether the Statway course increases student completion and success rates.	Feasible. ACC has database of all grades in all courses. Compare Statway students with the standard dev. math. students in Fall 2013.	Done Jan. 2014 when data available. 3-4 hr. for Director to compile data. 3-4 hr. for math faculty to analyze data 10-15 hr. for math faculty to make revisions.
Do more students who have taken the first Statway course, complete the second math course with a grade of A, B or C?	Data shows that the more successful students are at the dev. Math courses, the more quickly they graduate.	Feasible Use the ACC database to compare completion rates of students in the two courses	Summer 2014: Collect data on student completion rates and grades in the 2 dev. Math courses, compared to students in comparable dev. Math courses.

A. Evaluation Questions	B. Expected Outcomes	C. Tasks	D. Personnel	E. Timing	F. Data Source	G. Analysis	H. Reporting
Do more students complete the course with an A, B or C compared to those taking non-Statway course?	More students will pass MATD 0365 compared to those in traditional dev. Math courses.	1a. Obtain student completion and grade data from ACC database. 1b. Analyze the results.	Director /Evaluator	Spring 2014	ACC database	Director, Evaluator, Math faculty	To ACC grant partners To NOVA partners
Do more students who have taken the first Statway course, complete the second math course with a grade of A, B or C?	More students completing the first Statway course will complete the second dev. Math course with a grade of A, B or C compared to traditional dev. Math courses.	2a. Obtain student completion and grade data from ACC database. 2b. Analyze the results.	Director /Evaluator	Summer 2014	ACC database	Director, Evaluator, Math faculty	To ACC grant partners To NOVA partners

Step 3: ACC Evaluation Plan for Statway MATD 0325 Class

Year	Semester	Target Date	Task #	Task	Data Team	Other personnel	Date completed
2014	Spring	March	1a	Obtain student completion and grade data from ACC database.	Director and Evaluator	IT staff	
2014	Spring	May	1b	Analyze the results.	Director and Evaluator	Faculty	
2014	Summer	June	2a	Obtain student completion and grade data from ACC database.	Director and Evaluator	Faculty	
2014	Summer	August	2b	Analyze the results.	Director and Evaluator	Faculty	

Chapter 2: Los Angeles Trade and Technical College
Credentials to Careers Program

ABSTRACT

In general, during the life of the C2C grant, LATTC has made a specific and sustained investment in the following:

1) Developing an overarching strategic outlook about career pathways – that is providing comprehensive student support services in student friendly and community friendly ways.

2) Using C2C as a demonstration project to actualize aspects of the overall model (PACTS framework) using lessons learned along the way to build career pathways in other programs.

3) Using the idea of a program coordinator/career navigator as a lynch pin for coordinating services at the student level, coordinating the development and implementation of services at the faculty and staff level , coordinating community resources (employers in this case) and working with the colleges leadership to align their strategic outlook with what is actually happening on the group. The C2C Program Coordinator at LATTC acts as an intermediary between all levels of the organization. This is a unique position in many respects, someone who works with the president, VP and Dean, faculty, community agencies, employers, institutional resources, and students.

Since the site visit in the fall of 2013 LATTC has continued to expand their partnerships and formalize the processes for establishing and maintaining these important professional resources. The LATTC Employer Advisory Council involves local employers in establishing and reviewing learning outcome goals. It also includes employers in program development and increases communication between those who will hire LATTC students and those who will teach and prepare the students for employment.

One of the challenges C2C staff at LATTC faced was the lengthy process of regional and state approval of the new Biomanufacturing/biotechnology program. As of the Dec 2014 site visit, the LATTC Curriculum committee, Los Angeles Community College District Board of Trustees, and Los Angeles Orange County Regional Consortia have approved the new Biotechnology/Biomanufacturing Certificate/AS Degree program and they began offering courses to students in Fall 2014, which is now part of the Applied Science Pathway.

The Applied Science Pathway includes Biotechnology/Biomanufacturing, Chemical Technology Program, and Process Plant Technology programs. Biotechnology/Biomanufacturing students can earn a certificate (33 units), or a two-year Associate of Science (AS) Degree (60 units). With completion of either of these programs, students will be prepared to work as science technicians, or continue towards transfer into a bachelor's program. LATTC outlines their Applied Science Pathway as designed for the technician-in-training with the academic background and work experience to complete a certificate program within one or two years, work immediately, and advance with on-the-job experience. Students who earn a certification and enter the workforce

can apply these credits to the AS Degree in the three areas within Applied Sciences or to other bachelor degrees at 4-year institutions.

Faculty have continued the development of new materials for the Pathways program. For example, Biotechnology modules were being developed to be included into LATTC's online platform Moodle as a lab component to supplement the classroom curriculum. These early modules were designed to be ready for Spring 2015 semester, with the entire set of online curriculum developed and ready for use by Fall 2015. Training in the use of this teaching modality began in Fall 2014. Similarly, based on student and faculty experience in the Summer 2014 Boot camp sessions with contextualized math, future book camps will include an English component contextualized to Science.

Chapter 2 Executive Summary

Project Background and Purpose

The NOVA's Credentials to Careers (C2C) USDOL-TAACCCT Project, a consortium among seven community colleges along with their strategic partners, is designed to address changes in the economic and employment outlook, specifically in the science, technology, engineering and mathematics (STEM) related areas. Representing diverse programs, needs and geographic areas of the country, seven leading community colleges, along with their strategic partners from business and non-profit sectors as well as the Aspen Institute and Achieving the Dream, the consortium was purposefully assembled to meet contemporary employment challenges for unemployed and displaced workers. With the collaboration of the strategic partners and the cumulative knowledge and experience of the consortium members, the aim is to leverage[4] resources, skills and experience to help the target population increase attainment of credentials and ultimately employment. To attain this goal, the consortiums efforts are strategically aligned with five innovative core design elements:

1. Evidenced-Based Design
2. Stacked and Latticed Credentials
3. Online and Technology-Enable Learning
4. Transferability and Articulation
5. Strategic Alignment

Overview of LATTC's Work

The broader program evaluation—of which this Final Report is part--has two linked elements:

1) Participant outcomes and impacts -- The degree to which the program's activities impacted employment outcomes for grant participants evaluated with non-experimental cohort comparison design.
2) Program implementation – "to understand the particular features of these programs so lessons learned and promising practices identified can be disseminated to the broader field and contribute the sustainability of the effort".

This report involves the second of these two elements and uses qualitative methods and includes individual interviews and focus groups of students, teachers, career navigators, community partners, and administrators; as well as observations of class sessions and analysis of artifacts such as curricula.

In general, during the life of the C2C grant, LATTC has made a specific and sustained investment in the following:

[4] Here, and throughout this report, reference to "leveraging of resources" should not be confused with co-mingling of funds.

1) Developing an overarching strategic outlook about career pathways – that is providing comprehensive student support services in student friendly and community friendly ways.

2) Using C2C as a demonstration project to actualize aspects of the overall model (PACTS framework) using lessons learned along the way to build career pathways in other programs.

3) Using the idea of a program coordinator/career navigator as a lynch pin for coordinating services at the student level, coordinating the development and implementation of services at the faculty and staff level, coordinating community resources (employers in this case) and working with the colleges leadership to align their strategic outlook with what is actually happening on the group. The C2C Program Coordinator at LATTC acts as an intermediary between all levels of the organization. This is a unique position in many respects, someone who works with the president, VP and Dean, faculty, community agencies, employers, institutional resources, and students.

Contributions of Partners

Since the site visit in the fall of 2013 LATTC has continued to expand their partnerships and formalize the processes for establishing and maintaining these important professional resources (see the LATTC Industry Partner Interest Form and Hosting Employer's Internship Forms in the Appendix). Currently, additional industry partners include AMVAC Chemical Corporation and Huy Fong Foods. It was evident that Christie Dam joining the C2C team as the Project Coordinator made a notable difference in the programs' ability to more fully capitalize on the strong start of the program. Christie Dam was hired as the project coordinator in February of 2014 to work with both on campus student service departments and external community partners to provide career navigation services and case management. In this capacity she has continued to identify new employers in the LATTC service region as potential industry partners to discuss potential internships, job-shadowing and future employment opportunities.

Members of the EAC work with science and math faculty members from LATTC as well as the Project Coordinator to develop curriculum and program core competencies. They also work with college officials in program management and student placement. They are expected to provide opportunities for job shadowing and internships, application and interviewing tips/practice and, ultimately, employment. Furthermore, employers are engaged in the learning process and mentoring program participants as well as student visits to manufacturing sites and guest lectures by various industry representatives.

Employers have many reasons to participate in the design of the program. For example, employers benefit from being involved in (a) the interviewing process for hiring new workers; they help to get program participants ready for the hiring process; (b) establishing the need for stackable credentials which allow people in the program to be able to work toward an associate degree or certification; (c) offering input on the program's core competencies and student learning outcomes; and (d) serving as guest speakers during Program Orientation and classes.

This model follows others at LATTC using competency models for career pathways and stackable credentials to help students move along career pathways. According to LATTC, these

models offer stackable certificates and associate's degrees. While these programs are tailored to specific needs, they have several common components: the first certificate in the stack is a fundamentals certificate which focuses on industry-wide and specific-sector competencies; the second certificate addresses occupation level knowledge and skills; the AA/AS degree is the third point in the stack. This design provides options for individuals to pursue multiple career paths and multiple credentials.

AMVAC Chemical Corporation, Huy Fong Foods (Sriracha), Grifols Biologicals, provide industry site visits and tours of their facilities to LATTC's Applied Science students. Similarly, these partners have also visited the LATTC campus, provided students opportunities to learn more about career opportunities as guest lectures in several classes. Site visits provide an opportunity for students to see the curriculum in action as well as network and find out about possible job opportunities and career options within the Applied Sciences field.

Curriculum

One of the challenges C2C staff at LATTC faced was the lengthy process of regional and state approval of the new Biomanufacturing/biotechnology program. As of the Dec 2014 site visit, the LATTC Curriculum committee, Los Angeles Community College District Board of Trustees, and Los Angeles Orange County Regional Consortia have approved the new Biotechnology/Biomanufacturing Certificate/AA Degree program and they began offering courses to students in Fall 2014, which is now part of the Applied Science Pathway.

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Faculty have continued the development of new materials for the Pathways program. For example Biotechnology modules were being developed to be included into LATTC's online platform Moodle as a lab component to supplement the classroom curriculum. These early modules were designed to be ready for Spring 2015 semester, with the entire set of online curriculum developed and ready for use by Fall 2015. Training in the use of this teaching modality began in Fall 2014. Similarly, based on student and faculty experience in the Summer 2014 Boot camp sessions future book camps will include an English component contextualized to Science.

During our first site visit we had the opportunity to sit in on several classes in session and interview faculty members. We observed Introduction to Biology with Dr. Gee that included a lecture and an applied lab as well as Chemistry 51 with Dr. Diaz. We also conducted two focus

group interviews with members from the first cohort of Biomanufacturing students. In our second site visit we observed several other classes including Biotech 10 (evening class with students having worked a full day), Chem Tech 111 and 132.

In general, we observed well-planned lectures with instructors who asked good Socratic questions that kept the student actively engaged. It was evident that the instructors had developed a positive rapport with the students, had established high expectation in terms of classroom participation. Lecture materials referenced prior knowledge and the instructors used this to draw the students into problem solving and linking prior knowledge to new learning. During both site visits we observed that lectures were followed by hands on applied lab work that was directly related to the lecture materials. Instructors moved throughout the lab assessing students and continued to asked Socratic questions that invited students to thinking and problem solving in greater depth rather than direct, lower level question would have accomplished.

Particularly on our second site visit we observed examples of interactive student-centered forms of instruction. We observed effective use of Socratic questioning and other strategies that invited students to be active in deliberate agents in their own learning. For example in an intro chemistry class the instructor, who is a veteran of the biotech industry, routinely answered questions about what the correct answer was with further questions. We observed the entire lecture and all answers to the sample problems students were working out were solved by the students themselves. There was not one instance where the instructor gave in and provided answers to the students. This is noteworthy as it demonstrates clear links to what employers have expressed as a key need, that is - student who can problem pose and problem solve. This kind of Socratic strategy seems central to fostering the kinds of skills students will need in the knowledge economy.

Faculty interviews revealed that the key C2C faculty have continued to be fully engaged in refining curriculum and developing new curriculum based in part on our team's earlier evaluation reports as well as their own ongoing informal formative evaluation. The Applied Science Pathway faculty has made serious adjustments and refinements to the program. For example, the separate workshops offered in the first year of the Boot Camp intended to build some of the soft skills identified by employers were integrated into the program itself rather than as decontextualized separate activities.

Our focus group interviews and classroom observations during both site visits revealed that the students felt a great sense of connection to the program, to each other and the faculty. Students expressed that they appreciated the hands-on and applied aspect of the program, the use of guest speakers from Biomanufacturing, visits to the various industry partners and opportunities to learn to develop better communication skills. For example, students talked about a guest lecturer from Grifols Biologicals shortly before our site visit that involved lectures, lab activities, opportunities to do mock interviews followed by a plant tour of Grifols.

<u>Curriculum Strengths</u>

1. Curriculum authentically linked to the employer needs in Biomanufacturing
2. Consistent with the C2C curricular outlook. This curriculum is specifically designed to build

participants competencies beyond the technical skills needed, being comprehensive and interdisciplinary
3. Authentic hands-on learning labs
4. Effective use of Socratic questioning during lectures and labs
5. Evidence of positive impact on students self-perceptions and commitment

Activities Under the Auspices of the Grant

The hiring of the Project Coordinator Christie Dam in the winter of 2014 unleashed the energy that the program's faculty and administrators had put into the project to that point. The new Project Coordinators moved forward working a number of activities under the auspices of the grant:

1. Working with the various stakeholders to update curriculum
2. Develop new pathways within the Applied Science Pathway program
3. Purchase equipment
4. Strengthen existing industry partnerships and foster new partnerships
5. Build stronger relationships with the colleges extensive student support services
6. Marketing
7. Recruiting
8. Coordinating and communicating these and other activities between program faculty and the department's and the college's leadership team.

Assessment of Student

LATTC has an assessment center where students are screened for placement in the appropriate level of coursework. The primary tool for assessing students prior to being enrolled in the program is the Test of Adult Basic Education (TABE). This is considered a pre-placement test designed to measure students' general strengths and identifies their current skill level in English and Mathematics. LATTC also uses the Accuplacer and English as a Second Language (ESL) Placement tests as screening and placement tools. Pre-assessments are part of the Biomanufacturing student orientation, which includes the TABE assessment**.** The Bridges to Success Dept., which provides case management, assessment, enrollment, support and logistics services for C2C students also plays a role in student assessment.

<u>Summary C2C Student Assessment Tools:</u>

- Test of Adult Basic Education (TABE)
- Accuplacer
- English as a Second Language (ESL) Placement Test
- Student Surveys
- Expand and improve prior learning assessments

Factors Contributing to the Partners' Involvement

Leaders of the C2C Grant Project at Los Angeles Trade-Tech College realize that by working collaboratively with businesses and industries within the 882 square mile Los Angeles Community College District, they can fulfill their institutional mission. Officials at LATTC have a history of working with area employers, and they fully understand their success depends on partnerships and collaboration.

At the same time, employers benefit by having access to employees that the companies (e.g., Grifols and Baxter) will need in the next few years. These employees will have both the academic skills and the soft skills the companies indicated they would seek in new employees, including the "soft skills" related to interviewing skills, teamwork, and communication.

Additionally, by understanding each other's objectives, area employers and LATTC appear to value their mutual objectives and missions. They also recognize how each mission can complement the other. For Los Angeles Trade-Tech College, the mission is to provide affordable, accessible, and quality educational opportunities and workforce training to meet individual and community needs to allow people and businesses to be successful. For the employers, the goal is to have well-trained employees who can help the businesses compete in a global marketplace. The mutual "mission respect" found between those who train and those who hire employees is vital to this collaboration, and it enhances the relationship.

Finally, it is important to note the importance of involving area employers in this partnership from the beginning. This collaboration involved partnering with community-based business and industry that provide jobs to program participants. Including businesses in the collaboration from the earliest stages of program management and curriculum development to job placement procedures makes the enterprise effective and prosperous.

Key Contributions from Partnership Most Critical to the Success of the Grant include:

The partnership between LATTC and local employers is good for the local community's economy. Continued partnership development through fostering relationships with new employers and strengthening of existing relationships. It's noteworthy that while the department and the leadership of the college itself supports the strategic focus on developing and maintaining partnerships, the individuals like Christie Dam that coordinates these efforts are the lynch pins to the success of these kinds of collaboration with industry. Continued meetings and collaboration with Girfols Biologicals and other industry partners keeps the program on the leading edge. The LATTC Employer Advisory Council involves local employers in establishing and reviewing learning outcome goals. It also includes employers in program development and increases communication between those who will hire LATTC students and those who will teach and prepare the students for employment. Advisory committee meetings have included:

- Grifols Biologicals
- Think Earth Environmental Education Foundation
- Tesoro Corporation
- Student Empowerment Academy

- LA County Sanitation Department
- City of Los Angeles Environmental Engineering Association
- City of Los Angeles Environmental Learning Center
- Gavina Gourmet Coffee
- Baxter Healthcare Corporation
- Conoco Phillips Unit Trainer
- American Chemical Society, and
- LATTC faculty, staff, students, & administration including the College President.

LATTC held a Grand Opening of the Vernon-Central/LATTC Worksource Center located right here on our community college campus that was attended by Los Angeles Mayor Eric Garcetti. This level of collaboration and commitment from the industry partners and the local community at large is impressive and a clear indicator of contributions from the partners that are critical of the success of the grant.

V. Contributions of Partners

Summary of this section

This section of the Final Evaluation Report provides an examination of the partnership between Los Angeles Trade-Tech College and the employers who participate in the Credentials to Careers Partnership, including Grifols, Inc. and Baxter Bioscience, two major employers in the LATTC Service Region.

Program Design

Los Angeles Trade-Tech College (LATTC) has a long and well-established association with employers within its service region. LATTC has a strong working relationship with major employers in the metropolitan Los Angeles area. Initially they developed an Employment Advisory Committee (EAC) for their Chemistry Technology and Process Technology programs. Later, in 2014, they developed an EAC for the wider Applied Science Pathway.

Representatives of business and industry in the LATTC service region, like Grifols USA, Inc. and Baxter International, have been involved in designing the program and establishing the program curriculum for the LATTC Credentials to Careers Program. Grifols USA produces protein therapies and products for hospitals, pharmacies, and health care professionals; the company employs over 11,000 people worldwide. Baxter International produces products for health care professionals and has over 60,000 employees around the world.

Since the site visit in the fall of 2013 LATTC has continued to expand their partnerships and formalize the processes for establishing and maintaining these important professional resources (see the LATTC Industry Partner Interest Form and Hosting Employer's Internship Form in the Appendix). Currently additional industry partners include AMVAC Chemical Corporation and Huy Fong Foods. It was evident that Christie Dam joining the C2C team as the Project Coordinator made a notable difference in the programs ability to more fully capitalize on the strong start of the program. Christie Dam was hired as the project coordinator in February of 2014 to with both on campus student service departments and external community partners to provide career navigation services and case management. In this capacity she has continued to identify new employers in the LATTC service region as potential industry partners to discuss potential internships, job-shadowing and future employment opportunities.

Members of the EAC work with science and math faculty members from LATTC as well as the Project Coordinator to develop curriculum and program core competencies. They also work with college officials in program management and student placement. They are expected to provide opportunities for job shadowing and internships, application and interviewing tips/practice and, ultimately, employment. Furthermore, employers are engaged in the learning process and mentoring program participants as well as student visits to manufacturing sites and guest lectures by various industry representatives.

Employers have many reasons to participate in the design of the program. For example, employers benefit from being involved in (a) the interviewing process for hiring new workers;

they help to get program participants ready for the hiring process; (b) establishing the need for stackable credentials which allow people in the program to be able to work toward an associate degree or certification; (c) offering input on the program's core competencies and student learning outcomes; and (d) serving as guest speakers during Program Orientation and classes. This model follows others at LATTC use competency models for career pathways and stackable credentials to help students move along career pathways. According to LATTC, these models offer stackable certificates and associate's degrees. While these programs are tailored to specific needs, they have several common components: the first certificate in the stack is a fundamentals certificate which focuses on industry-wide and specific-sector competencies; the second certificate addresses occupation level knowledge and skills; the AA/AS degree is the third point in the stack. This design provides options for individuals to pursue multiple career paths and multiple credentials.

Curriculum Development

The Curriculum Development process used the following pathway. Business and industry representatives were active in several steps in the process:

1. New Course Development
2. Curriculum approval by regional business and industry
3. College curriculum course approval
4. College curriculum approval of AS degree
5. Supply and equipment budget
6. Regional approval of AS degree
7. State approval of AS degree

For example, Grifols Biologicals, Inc. worked closely with LATTC to develop the core requirements and to review the curriculum developed by LTTCC faculty and administrators. The core competencies represent the student learning outcomes upon which the curriculum is developed. The core competencies requested by Grifols and other employers included:

- Chemistry:
    a) Chemical Composition
    b) Molecular Weights
    c) Molarity, Molality, Normality of Solutions
    d) International System of Units (SI)
    e) Concept of Solubility

- Business:
    a) Preparing a Resume
    b) Interviewing Skills
    c) Teamwork

- Microbiology:
    a) Microorganisms
    b) Cleaning/Sanitizing
    c) Environmental Monitoring

- Math:
    a) Metric system
    b) Rounding Rule/Significant Figures
    c) Formulas/Calculations

- English:
    a) Writing Skills/Documentation
    b) Comprehension

- Related Topics:
    a) FDA/GMP Regulations
    b) Validation
    c) Building and Facilities
    d) Utilities – Water for Injection
    e) Protein Purification
    f) Purchasing/Raw Materials Control/Supply Chain Management

Additionally, the industry partners have played a major role in the direct development of the program curriculum. Officials from Grifols, Inc. collaborated with LATTC administrators and faculty members to develop the curriculum for the Associate of Science Degree in Bio manufacturing. The academic curriculum includes 53 total units in the following categories:

- 10 units in Biology, including General Microbiology;
- 5 units in Chemistry, including Fundamentals of Chemistry;
- 8 units of Bio manufacturing;
- 12 units in Process Plant Technology, including Process Management and Control Fundamentals; and Introduction to Process Plant Safety; Process Plant Equipment; Regulations and Policies;
- 18 elective units.

All program participants have the opportunity to participate in this short-term "Boot Camp" which can help students to pursue an industry-recognized Certificate, transfer to a four-year institution after receiving an AS Degree, or enroll in the Applied Science Pathway. The Boot Camp includes:

- Boot Camp 1st week Math refresher
- Boot Camp 2nd week Math refresher & College Navigation/Career Readiness/Life Skills
- 5-WEEK SUMMER COURSES
    - Biology 3 : Introduction to Biology (UC/CSU transferrable)
    - Process Plant Technology 104: Introduction to Process Plant Safety

Finally, based on the request of Grifols, Inc. and Baxter Bioscience, two major employers in the LATTC Service Region, the curriculum includes a soft skills program to assist students in preparing for employment interviews and the rigors of the employment process. An employment

preparation course, CT 141, may be added to the curriculum or incorporated into other existing courses in an "across the curriculum" manner.

Partners Continued Involvement in the Living Curriculum

AMVAC Chemical Corporation, Huy Fong Foods (Sriracha), Grifols Biologicals, provide industry site visits and tours of their facilities to LATTC's Applied Science students. Similarly these partners have also visited the LATTC campus, provided students opportunities to learn more about career opportunities as well as guest lectures in several classes. Site visits provide an opportunity for students to see he curriculum in action as well as network and find out about possible job opportunities and career options within the Applied Sciences field.

Student Recruitment

Based on input from community-based employers such as Grifols and Baxter Bioscience, LATTC has worked to expand the marketing of the program to increase the number and quality of program applicants. More inner city work force affiliates, including Work Source Centers, the Chamber of Commerce, and Veterans' Offices have been invited to assist in recruitment of applicants for the program.

Once potential program participants reach the LATTC Campus, the Bridges to Success Center makes them feel welcome by offering case management style support services such as assessment, enrollment support, and logistic services for TAA Applicants. The Bridges to Success Center is an impressive and effective initiative to make potential students who may be new to college or first-generation college students feel comfortable.

Recruiting candidates who are in the greatest need for job training and can be successful in the rigorous academic program is a major challenge. Put another way, filling all available slots in future cohorts with those who can "most benefit" from the training should be a goal of the project. The employment demands anticipated at Grifols, Baxter, Huy Fong Foods and AMVAC Chemical among other employers makes it essential that people with the potential to complete the training be identified, recruited, and supported through the enrollment process. This will begin with expanded recruitment and marketing efforts to reach more potential program participants

The first cohort of students in the LATTC Program had 9 students. The cohort had 6 males and 3 females; six of the students are Hispanic and 2 are Black. Seven of the nine students are part-time students. Five of the students are incumbent works, and six of the students have basic skills deficiencies. The average age of participants in the LATTC Program is 28, younger than the average student in the seven C2C Programs around the nation. At the time of our second site visit in Dec of 2014 LATTC had exceeded their student recruitment goals, offering a second summer boot camp session that served 40 additional students. We did not obtain student demographics on these students.

One strategy for recruitment and retention of students that LATTC discussed was offering a free boot camp that included a math refresher and life skill workshops. LATTC personnel believed

that this program feature assisted with student recruitment. In addition they expressed that the summer boot camp also helped students with little or no background with the college experience to better understand what they were committing themselves to as well as opportunities to gain greater understanding of the career option in the applied sciences fields. In the fall of 2014 after completing the summer boot camp, LATTC enrolled their first group of students in the Applied Science pathways including the first Biotechnology course the college has ever offered .

Program Management

The training program at LATTC had only been in place a short time when the site visit for this program evaluation was conducted in late October of 2013. At the time of the site visit, only nine students were enrolled in the training, and these students were fairly new to the program. Therefore, the data for this preliminary evaluation were limited. As of the second site visit in Dec of 2014 LATTC had reached their recruitment goal and were offering a second summer boot camp to 40 additional students.

According to those interviewed, the current partnership between LATTC and area employers is a model of community college-private sector partnership. LATTC is a community-based college with a strong ability to coordinate its services and academic programs with the needs and future plans of community agencies and private sector businesses and industries. This effort appears to be a part of LATTC's general effort to participate in the general renewal of the community surrounding the college.

Based on their previous experience, the employers who have participated in the program management and curriculum development of the Credentials to Careers Program have expressed the need to build soft skills into the program curriculum. These employers told LATTC officials that previous applicants for employment lacked skills/knowledge in three areas:

- Confidence in expressing knowledge of concepts related to process technology;
- Critical thinking;
- Dress and appearance for interviews.

Finally, as previously mentioned, LATTC has an active Employer Advisory Committee that includes local businesses and industries in establishing and reviewing the learning outcome goals for the program. The Advisory Council also incorporates employers in program development and increases communication between those who will hire LATTC students and those who will prepare the students for employment. Officials from LATTC have acknowledged that EAC members have played an important role in both curriculum development and pedagogical suggestions for the program.

Placement

Since this is a preliminary report, data on job placement for the first cohort of C2C Program graduates are not complete. At the time of the site visit, the first cohort of nine students was taking classes. Nevertheless, it was noted that LATTC faculty were concerned about, and actively involved in, preparing students for jobs in the community. Employment, and the things

students needed to do to prepare for work, was emphasized during classroom sessions. Even though LATTC was in the development of the degree phase, they were working with Grifols, Baxter, and companies; faculty members know these employers and what their expectations are for LATTC grads.

It is significant to note that according to meetings held in July of 2013 with officials from LATTC, Grifols anticipates hiring 70 to 80 entry-level specialist positions by the end of the year. Further, with the addition of a new 94,000 square foot facility, they will be hiring around 75 people in manufacturing technician positions, with the possibility of promotion to management positions. In the long-term, they hope to hire up to800 new people over the next 3-4 years, with about 50% of the new positions in manufacturing technician positions. Grifols is working with Pasadena City College in addition to LATTC to prep to meet their hiring needs.

Grifols prefer to hire people who have earned an Associate's Degree because these workers are better prepared. Grifols requested that the curriculum for the AS Degree focus more on manufacturing rather than Biology. The participation of Grifols at the earliest time in the program development process will pay dividends for program graduates when they are seeking job placement.

The *2014-15 Economic Forecast and Industry Outlook* of the Los Angeles County Economic and Development Corporation, indicates that employment in fields of scientific and technical services is now a leading industry in Southern California. The professional, scientific, and technical services industry is the 5th largest in LA County, and it had a growth rate of 3.7% in 2013. There are anticipated gains of 8,800 jobs in 2014 and over 9,000 jobs in 2015 (source: http://college.lattc.edu/asp/employment-outlook-career-opportunities/). Accordingly, the LATTC Applied Science Pathway is designed to meet this need by preparing students for entry-level technician positions in biomedical, research, and industrial laboratory areas as chemical technicians, process technicians, and science technicians.

Earnings for bio manufacturing technicians vary depending on experience, education, geographical location, and area of specialty. According to nationwide data collected for 2012, the average annual salary for biological technicians in nonsupervisory positions was $39,750 (source: *www.bls.gov/ooh*). In Los Angeles, the average mean wages for science technicians was $42,290. LATTC ranks 14th nationally for highest paid graduates on the College Salary Report from Pascale.

Commitment to Program Sustainability

LATTC officials are gathering assessment data from students who have completed the Summer Bridge Academy as well as a Bio Tech Boot Camp Rating Sheet. The purpose of gathering these data is to improve the program for future cohorts. There is also constant evaluation of the program through conversations with businesses and companies who serve as potential employers of program graduates.

VI. Curriculum: How was the particular curriculum selected, used, or created?

Summary of findings in this section

The LATTC's Biomanufacturing curriculum has a multidisciplinary and interdisciplinary focus which includes soft-skills, science, mathematics and a workplace/industry focus (see figure 1). It is also student centered, designed to foster active engagement in learning and student ownership, and most importantly teaching students to be able to think on their feet and solve problems. This curriculum falls within the larger curricular outlook of LATTC's Pathways to Academic, Career and Transfer Success (PACTS) model, an approach that emphasizes stackable credentials, and is built on the foundation of students developing self-efficacy. Developed through a collaborative partnerships with industry representatives to identify core competencies and student learning outcomes, the Associate of Science Degree in Biomanufacturing can be completed in four semesters plus the two-week Biomanufacturing Bridge Academy.

Curriculum Strengths

1. Authentically linked to the employer needs in Biomanufacturing
2. Consistent with the C2C curricular outlook
3. Authentic hands-on learning labs
4. Effective use of Socratic questioning during lectures and labs
5. Evidence of positive impact on students self-perceptions and commitment

Area for Continued Growth

Consider the integration of strategies for providing formative feedback to students that will help them more clearly identify their learning goals, assess and monitor their progress towards their goals, and reflect on and refine the learning and studying strategies that are most effective. As of the second site visit in Dec of 2014 we continue to think that this is a natural area for growth considering the focus on wrap around services and the focus on building self-efficacy in the PACTS model (see Appendix F). Renee Madyun's use of Socratic questioning is an example of the kind of informal formative assessment techniques that can be very effective at fostering self-efficacy and engagement and promoting the depth of processing necessary for long-term memory.

Background of Curriculum Selection, Development and Use

Background: How USDOL and NOVA Central Conceptualize Curriculum

In order to effectively evaluate the programs curriculum selection, development and use, it will be helpful to provide a brief background on how the USDOL conceptualized curriculum in the SGA as well as how NOVA Central framed their proposal in response to this solicitation. According the USDOL SGA, one of the overall goals of the grant was to prompt programs to

introduce "innovative and effective methods for curriculum development and delivery" that were responsive to specific workforce needs, and promote improved learning, retention, and employment outcomes. Similarly the USDOL framed curriculum as a means of engaging employers in targeted industry to help identify skills and competencies that would be incorporated into programs' curriculum. In addition, the USDOL emphasized the importance of how applicants would incorporate these curricular innovations into the standard offerings of the institution. The USDOL integrates curriculum development throughout the SGA where it can be seen as an important means of supporting, strategic alignment, sustainability, program implementation as well as encouraging greater contribution and engagement from partners, employers and industry.

The NOVA proposal was congruent with how curriculum was conceptualized in the USDOL SGA. Here curriculum is framed as one of the central tools to fostering innovation and successful outcomes. For example the proposal states, "The aim is to increase attainment of credentials through innovative and effective methods of teaching and learning through curriculum redesign and technology that ultimately lead to successfully preparing trade-impacted workers for fast-growing STEM occupational clusters." Taken together, curriculum for the C2C consortium emphasizes:

1) Innovation
   a) Introduce innovative and effective methods for curriculum development and delivery

2) Fostering Outcomes
   a) Learning
   b) Retention
   c) Employment

3) Authenticity
   a) Engaging employers and other stakeholders
   b) Increasing responsiveness to specific workforce needs

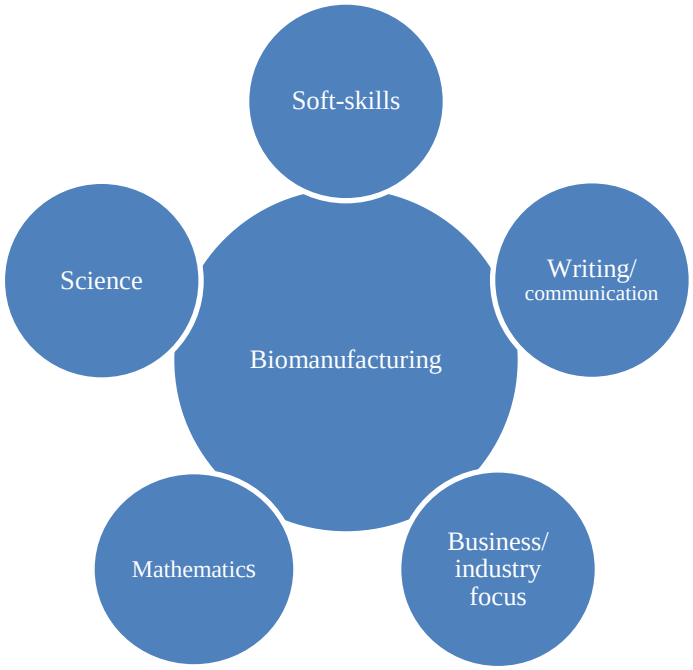
4) Sustainability
   a) Building organizational capacity by incorporating curricular innovations into the standard offerings of the institution

LATTC's Curriculum Background and Overview

The LATTC's Biomanufacturing curriculum has a multidisciplinary and interdisciplinary focus which includes soft-skills, science, mathematics and a workplace/industry focus (see figure 1). Emphasized across the program is a student centered approach which is designed to foster active engagement in learning and student ownership of their developing knowledge and skillsets. This particular emphasis was purposefully developed into the program based on feedback from workforce partners who emphasized the importance of workers who can problem solve and think on their feet. Based on interviews with program faculty and review of curricular materials, it was also evident that the curriculum was designed to be goal focused – what was described as a natural process of aligning identified needs of students with appropriate services and instruction

and providing instruction that is integrated, applied and hands-on. Faculty also emphasized the importance of students/faculty dialog and the importance of questioning as a means for student academic achievement.

Figure 1: LATTC's Biomanufacturing Interdisciplinary Curriculum



The Biomanufacturing curriculum falls within the larger curricular outlook of LATTC's Pathways to Academic, Career and Transfer Success (PACTS) model. PACTS is a career pathways model that emphasizes stackable credentials, and is built on the foundation of students developing self-efficacy, greater academic and career readiness and awareness, career goal setting and learning to navigate and utilize college and community resources. It is evident that the curriculum is consistent with USDOL goals of "innovative and effective methods for curriculum development and delivery". The LATTC curriculum is carefully designed to be innovative, focused on employment outcomes, is authentic and well designed to be sustainable with the college larger strategic outlook for student success. The Biomanufacturing program is considered by the college leaders as a demonstration project that falls under the PACTS model and is linked to the goal of students being employed at the end of the program. It was expressed by the leadership team that new directions can start with a few people and it was clear from our visit that there are a number of motivated and committed people working in the C2C Biomanufacturing program.

One of the overarching curricular features that was present across the review of materials provided was a clear and strong emphasis on career pathways and stackable credentials (see Appendix D-H). Minutes from meeting with industry partners, college wide strategic documents, C2C specific strategic models, among other documents all expressed a coherent focus on providing comprehensive, wrap around services to students.

One of the more recent evolutions of the C2C program at LATCC has been the expansion of wraparound student support services. The program coordinator, Christie Dam, provides overarching career navigation for students in the applied sciences pathway as well as the coordination of services with employers, inner city workforce affiliates and support of program faculty. The growth and expansion of student support services LATTC has included housing, veteran affairs and even American Indian specific services. In this way the C2C students in the Applied Science Pathway have access to a full pallet of services designed to help them persist, complete and obtain employment. Another important evolution of the C2C efforts has been that continued and strengthening relationships with biotech employers in the area. Here it's clear that bringing on a new program coordinator was critical to the expanding and leveraging of these resources.

LATTC's Curricular Details

One of the challenges C2C staff at LATTC faced was the lengthy process of regional and state approval of the new Biomanufacturing/biotechnology program. As of the Dec 2014 site visit the LATTC Curriculum committee, Los Angeles Community College District Board of Trustees, and Los Angeles Orange County Regional Consortia have approved the new Biotechnology/Biomanufacturing Certificate/AS Degree program and they began offering courses to students in Fall 2014, which is now part of the Applied Science Pathway.

The Applied Science Pathway includes Biotechnology/Biomanufacturing, Chemical Technology Program and Process Plant Technology programs. Biotechnology/Biomanufacturing students can earn a certificate (33 units), or a two-year Associate of Science (AS) Degree (60 units). With completion of either of these programs, students will be prepared to work as science technicians, or continue towards transfer into a bachelor's program. In the Chemical Technology Program, students can earn a certificate after 47 units or an AS Degree with 60 units successfully completed. Lastly, the Process Plant Technology Program offers students the option of receiving a certificate with 45 units or an AS Degree with 60 units of study. LATTC outlines their Applied Science Pathway as designed for the technician-in training with the academic background and work experience to complete a certificate program within one or two years, work immediately, and advance with on-the-job experience. Students who earn a certification and enter the workforce can apply these credits to the AS Degree in the three areas within Applied Sciences or to other bachelor degrees at 4-year institutions.

LATTC's curriculum was developed through collaborative partnerships with industry representatives which included Baxter Bioscience and Grifols Biologicals, Inc. Key industry partners worked closely with LATTC faculty and administrators to identify core competencies, student learning outcomes and develop and review curriculum. The result of this collaboration is a comprehensive curriculum for an Associate of Science Degree in Biomanufacturing. The program is designed to allow students to complete the 53 units (outlined below) in two calendar years; four semesters plus the Biomanufacturing Bridge Academy (2 weeks).

Associate of Science Degree in Biomanufacturing

- 10 units in Biology, including General Microbiology;
- 5 units in Chemistry, including Fundamentals of Chemistry;
- 8 units of Bio manufacturing;
- 12 units in Process Plant Technology, including Process Management and Control Fundamentals; and Introduction to Process Plant Safety; Process Plant Equipment; Regulations and Policies;
- 18 elective units.

One of the key aspects of the curriculum is the "boot camp" approach where students are brought into an intense training setting where they interact with peers and faculty through interdisciplinary content and applied and hands-on learning opportunities. The Boot Camp includes:

- Week one: Math refresher
- Week two: Math refresher & College Navigation/Career Readiness/Life Skills
- 5-Week Summer Courses
    - Biology 3 : Introduction to Biology (UC/CSU transferrable)
    - Process Plant Technology 104: Introduction to Process Plant Safety

A comprehensive boot camp curriculum was provided for our review that highlighted a well thought out plan of study, a balance of lectures and hands-on lab experiences as well as industry guest speakers. Also of note were the use of applied labs in topics such as cheese production that allow students to see lecture and course readings and topics in action. The PowerPoint presentations that were included were very well done, providing concise structure to the lectures and lab experiences in addition to building in informal formative questioning in the presentations. It was evident that serious professional thought went into the development of these materials.

A number of other curricular materials were provided as well that document the other components of the program. While these were consistent with the quality and detail of the boot camp materials, there were fewer of them that made it harder to assess the full scope of the Associates degree program. This was not surprising given the project management plan that indicates that curriculum was still being developed and approved during the time period of our site visit.

Faculty members have continued the development of new materials for the Pathways program. For example Biotechnology modules were being developed to be included into LATTC's online platform Moodle as a lab component to supplement the classroom curriculum. These early modules were designed to be ready for the Spring 2015 semester, with the entire set of online curriculum developed and ready for use by Fall 2015. Training in the use of this teaching modality began in Fall 2014. Similarly, based on student and faculty experience in the Summer 2014 Boot camp sessions, future boot camps will include an English component added that will be contextualized to Science.

Curriculum in Action

During our first site visit we had the opportunity to sit in on several classes in session and interview faculty members. We observed Introduction to Biology with Dr. Gee, which included a lecture and an applied lab, as well as Chemistry 51 with Dr. Diaz. We also conducted two focus group interviews with members from the first cohort of Biomanufacturing students. In our second site visit we observed several other classes including Biotech 10 (evening class with students having worked a full day), Chem Tech 111 and 132.

In general, we observed well-planned lectures with instructors who asked good Socratic questions that kept the student actively engaged. It was evident that the instructors had developed a positive rapport with the students, had established high expectation in terms of classroom participation. Lecture materials referenced prior knowledge and the instructors used this to draw the students into problem solving and linking prior knowledge to new learning. During both site visits we observed that lectures were followed by hands on applied lab work that was directly related to the lecture materials. Instructors moved throughout the lab assessing students and continued to asked Socratic questions that invited students to thinking and problem solving in greater depth than direct, lower level question would have accomplished.

Particularly on our second site visit we observed examples of interactive student-centered forms of instruction. We felt it was evident the level of engagement between instructors and students was a part of the culture of the program. Sidebar conversations during our visits to classrooms over the two-day visit with students and faculty indicated that what we were seeing was not staged for our benefit. We observed effective use of Socratic questioning and other strategies that invited students to be active in deliberate agents in their own learning. For example in an intro chemistry class the instructor, who is a veteran of the biotech industry, routinely answered questions about what the correct answer was with further questions. This is noteworthy as it demonstrates clear links to what employers have expressed as a key need, that is - student who can problem pose and problem solve. This kind of Socratic strategy seems central to fostering the kinds of skills students will need in the knowledge economy. We also observed students demonstrating the use of new equipment purchased through the C2C grant (See Appendix K) and again observe students engaged in authentic hands-on learning where the underline constructs they were learning in chemistry were being put into practice in a lab setting. While we did not measure student motivation and engagement directly, our anecdotal observations indicated that students were highly engaged and motivated and displayed high levels of self-efficacy. Student interviews suggested they had clear goals and saw the program as supporting their goals.

Faculty interviews revealed that the key C2C faculty have continued to be fully engaged in refining curriculum and developing new curriculum based in part on our team's earlier evaluation reports as well as their own ongoing informal formative evaluation. The Applied Science Pathway faculty have made serious adjustments and refinements to the program. For example, the separate workshops offered in the first year the Boot Camp, intended to build some of the soft skills identified by employers, were integrated into the program itself rather than as decontextualized separate activities.

Our focus group interviews and classroom observations during both site visits revealed that the

students felt a great sense of connection to the program, to each other and the faculty. Students expressed that they appreciated the hands-on and applied aspect of the program, the use of guest speakers from Biomanufacturing, visits to the various industry partners and opportunities to learn to develop better communication skills. For example, students talked about a guest lecturer from Grifols Biologicals shortly before our site visit that involved lectures, lab activities, opportunities to do mock interviews, followed by a plant tour of Grifols.

Students also talked about the support they felt from their peers and the faculty. During our first visit no career navigator had yet been assigned to the project so support had been informally provided by faculty and other grant team members. At that time it was evident that the commitment of these faculty members was key to the programs successful start. As discussed elsewhere in this report, hiring Christie Dam as the Project Coordinator was a significant milestone in the development of the Applied Sciences Pathway program as she has been able to leverage the college's various capacities for supporting students. It was evident from our visit that the level of student, faculty and employer support was notably improved and very effective.

During both site visits, students talked about their larger goals beyond the Associates degree and their desire to capitalize on the career pathways model and continue to a Bachelor's degree. Most importantly, students talked about the importance of a tangible job after completing the program. One student in particular said that he appreciated the program and enjoyed being a part of it, but if there wasn't a job on the other side, he'd "drop it right there". This highlights just how important a clear employment goal is to these students. Students talked about their appreciation for the faculties careful and thoughtful explanation of difficult concepts, their patients, the level of organization and support as well as the degree to which the different activities we coordinated.

Curriculum Strengths

1. Curriculum authentically linked to the employer needs in Biomanufacturing
2. Consistent with the C2C curricular outlook. This curriculum is specifically designed to build participants competencies beyond the technical skills needed, being comprehensive and interdisciplinary
3. Authentic hands-on learning labs
4. Effective use of Socratic questioning during lectures and labs
5. Evidence of positive impact on students self-perceptions and commitment
6. Comprehensive wrap-around services
    a. Worksource Center
    b. Financial aid
    c. Bridges to Success
    d. Pathway counselor
    e. Pathway faculty
    f. Assessment
    g. Institutional Effectiveness
    h. Academic Connections/tutoring

Area for Continued Growth

Consider the integration of strategies for providing formative feedback to students that will help them more clearly identify their learning goals, assess and monitor their progress towards their goals, and reflect on and refine the learning and studying strategies that are most effective. As of the second site visit in Dec of 2014 we continue to think that this is a natural area for growth considering the focus on wrap around services and the focus on building self-efficacy in the PACTS model (see Appendix F). Renee Madyun's use of Socratic questioning is an example of the kind of informal formative assessment techniques that can be very effective at fostering self-efficacy and engagement and promoting the depth of processing necessary for long-term memory.

VII. Activities Under the Auspices of the Grant

Summary of this section

The hiring of the Project Coordinator unleashed the energy that the program's faculty and administrators had put into the project as of February of 2014. The new Project Coordinator moved forward working with the various stakeholders to update curriculum, develop new pathways within the Applied Science Pathway program, purchase equipment, strengthen existing industry partnerships and foster new partnerships, build stronger relationships with the colleges extensive student support services, market, recruit and coordinate and communicate these and other activities between program faculty and the department's and the college's leadership team.

Because of the relatively finite nature of LATTC's Biotechnology/Biomanufacturing program, the use of grant funds is fairly straightforward. Like the other C2C colleges, LATTC does leverage existing college and partner resources to accomplish its goals, however it is the grant dollars in large measure that has allowed them to develop the new curriculum and offer a newly approved program to students.

During our first site visit it was a challenge to develop a clear sense of how grant dollars where being utilized to support the goals of the project as the program was just getting under way. The case manager/career navigator had not been hired as of our November 2013 visit and other resources had not been identified and put into place. Again, as discussed else where the hiring of Christie Dam in this role has helped LATTC better coordinate the activities under the auspices of the grant.

Focus group interviews with the leadership team suggested a clear strategic commitment to the program, with the team seeing it as an important means of demonstrating the potential of this approach to meeting the needs of their students and the community. At the time of the first site visit, it appeared that there may have been a certain amount of caution on making concrete plans and moving the program forward due to this self-imposed pressure for the program to perform well, as well as the lack of a program coordinator to pull the thread of the leadership team's strategic vision together into purposeful action. At the time of our site visit we were able to find evidence of grant funds used to supporting the development and approval of the new curriculum, establishing the boot camp summer programs. However the case manager/ career navigator was yet to be hired as of Nov 2013.

However, as of the second visit in the fall of 2014 the new Project Coordinator was in place, having been hired February of 2014, and there was notable advancement of the projects strategic vision. The hiring of the Project Coordinator unleashed the energy that the program's faculty and administrators had put into the project as of February of 2014. The new Project Coordinators moved forward working with the various stakeholders to update curriculum, develop new pathways within the Applied Science Pathway program, purchase equipment, strengthen existing industry partnerships and foster new partnerships, build stronger relationships with the college's extensive student support services, market, recruit and coordinate and communicate these and other activities between program faculty and the department's and the college's leadership team.

VIII. Assessment of students

Summary C2C Student Assessment Tools:

- Test of Adult Basic Education (TABE).
- Accuplacer
- English as a Second Language (ESL) Placement Test
- Student Surveys
- Expand and improve prior learning assessments

The Assessment and Screening of Students

LATTC has an assessment center where students are screened for placement in the appropriate level of coursework. The primary tool for assessing students prior to being enrolled in the program is the Test of Adult Basic Education (TABE). This is considered a pre-placement test designed to measure students' general strengths and identifies their current skill level in English and Mathematics. LATTC also uses the Accuplacer and English as a Second Language (ESL) Placement tests as screening and placement tools. Pre-assessments are part of the Biomanufacturing student orientation that includes the TABE assessment**.** The Bridges to Success Dept., which provides case management, assessment, enrollment, support and logistics services for C2C students also plays a role in student assessment.

Related to assessment is an interest within the program to expand and improve prior learning assessment and work to mitigate institutional barriers to student PLA. While not always consider as part of student assessment the Biomanufacturing faculty also survey students to gain feedback about aspects of the program that are going well and those that may need refinement (see Appendix I: Biotechnology "Boot Camp" student survey)

Suggestions for Future Growth

While the assessment tools used to place students appear to be more than appropriate, increasingly the field of assessment has highlighted the importance of ongoing formative assessments to improve learning. Formative assessments are those that assist students in clarifying their learning and performance goals, assessing their progress towards those goals, facilitates their own self-monitoring on their way to those goals as well as fostering the refinement and strengthening of the learning strategies they identify as the most effective. LATTC may want to consider how the principals of formative assessment and the power these have to promote students as active and deliberate agents in their own learning may strengthen their program and meet their goal of fostering self-efficacy.

IX. Factors Contributing to the Partners' Involvement

Summary of this section

This section examines the factors affecting the partners involved in the Credentials to Careers Program at Los Angeles Trade-Tech College. The discussion focuses on how the mission of LATTC is supported through partnerships and collaborations with private sector businesses and industries. Additionally, the contributions to the collaboration that are most critical to each partner are discussed.

Leaders of the C2C Grant Project at Los Angeles Trade-Tech College realize that by working collaboratively with businesses and industries within the 882 square mile Los Angeles Community College District, they can fulfill their institutional mission. Officials at LATTC have a history of working with area employers, and they fully understand their success depends on partnerships and collaboration.

At the same time, employers benefit by having access to employees that the companies (e.g., Grifols and Baxter) will need in the next few years. These employees will have both the academic skills and the soft skills the companies indicated they would seek in new employees, including the "soft skills" related to interviewing skills, teamwork, and communication.

Los Angeles Trade-Tech College Mission Statement

We provide our students and community with high-quality academic, technical, and professional educational opportunities that:

- Meet their career development and academic goals;
- Foster a climate of life-long learning;
- Prepare our students to participate effectively in our society; and
- **Generate economic development with our educational, governmental, community and business partners.**

Additionally, by understanding each other's objectives, area employers and LATTC appear to value their mutual objectives and missions. They also recognize how each mission can complement the other. For Los Angeles Trade-Tech College, the mission is to provide affordable, accessible, and quality educational opportunities and workforce training to meet individual and community needs to allow people and businesses to be successful. For the employers, the goal is to have well-trained employees who can help the businesses compete in a global marketplace. The mutual "mission respect" found between those who train and those who hire employees is vital to this collaboration, and it enhances the relationship.

Finally, it is important to note the importance of involving area employers in this partnership from the beginning. This collaboration involved partnering with community-based business and industry that provide jobs to program participants. Including businesses in the collaboration from the earliest stages of program management and curriculum development to job placement procedures makes the enterprise effective and prosperous.

X. Contributions from Partners Most Critical to the Success of the Grant

Summary of this section

- The training will produce the employees the companies' project will be needed in the next few years.
- The employees will have both the academic skills and the soft skills the companies indicated they would seek in new employees, including proficiency related to interviewing, teamwork, and communication.
- There would be a group of potential applicants who would be familiar with the companies, their work cultures, and their expectations.
- The partnership between LATTC and local employers is good for the local community's economy.
- More people within the community will either hold, or be prepared to earn, an Associate's Degree, helping to meet state and local government goals of increased college graduation rates.
- The LATTC Employer Advisory Council involves local employers in establishing and reviewing learning outcome goals. It also includes employers in program development and increases communication between those who will hire LATTC students and those who will teach and prepare the students for employment.
- Creating and fostering a pipeline of qualified candidates trained with the required knowledge and skills needed in industry.

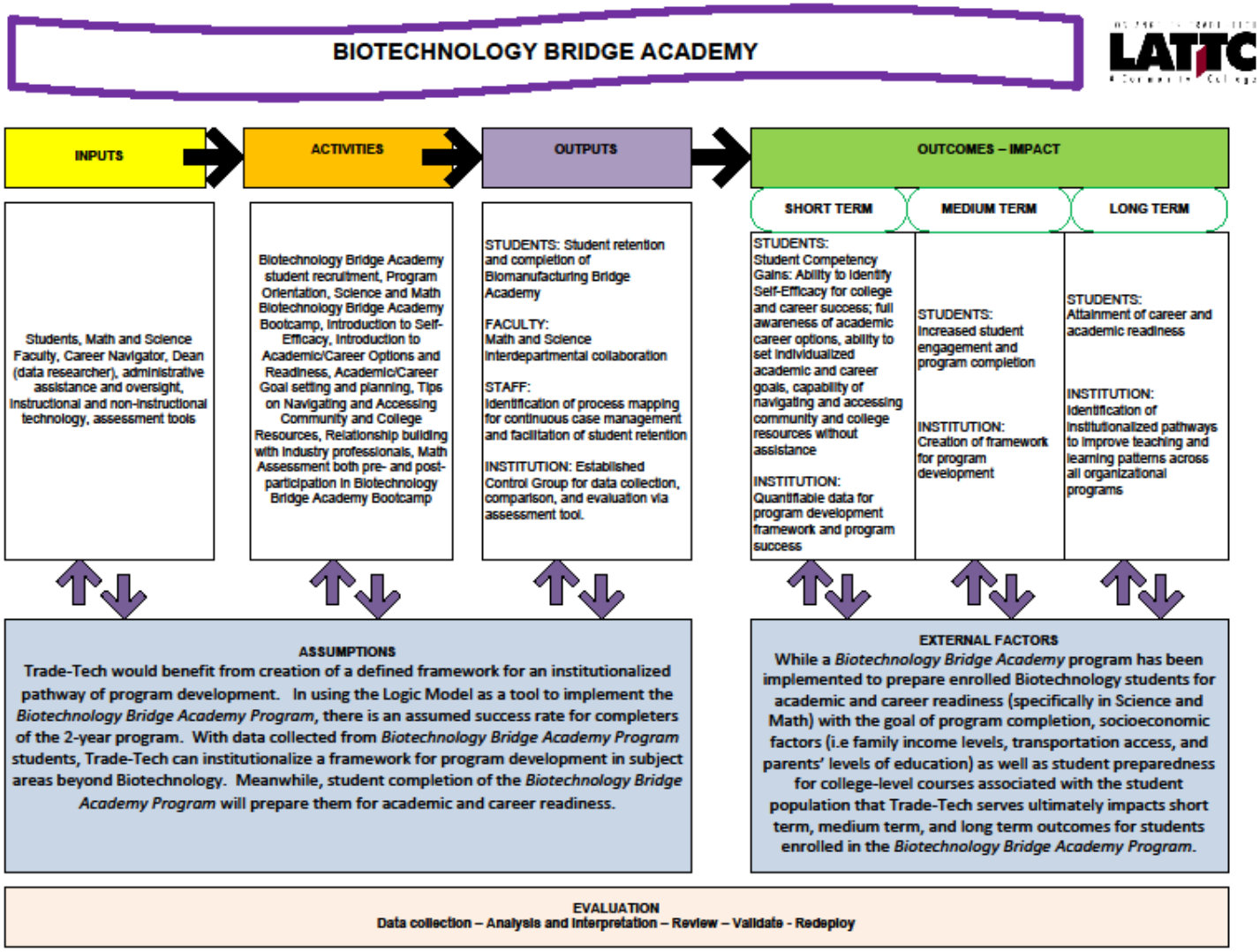
In the fall of 2014, LATTC held an advisory committee meeting to introduce industry partners to the Applied Science Pathway and newly developed program of Biotechnology (with an emphasis in Biomanufacturing) with 22 participants including industry partner representatives from Grifols Biologicals, Think Earth Environmental Education Foundation, Tesoro Corporation, Student Empowerment Academy, LA County Sanitation Department, City of Los Angeles Environmental Engineering Association, City of Los Angeles Environmental Learning Center, Gavina Gourmet Coffee, Baxter Healthcare Corporation, Conoco Phillips Unit Trainer, American Chemical Society, and LATTC faculty, staff, students, & administration including the College President.

Also in the fall of 2014, LATTC held a Grand Opening of the Vernon-Central/LATTC Worksource Center located on the community college campus. Los Angeles Mayor Eric Garcetti was present for the ribbon cutting ceremony. This level of collaboration and commitment from the industry partners and the local community at large is impressive and a clear indicator of contributions from the partners that are critical of the success of the grant.

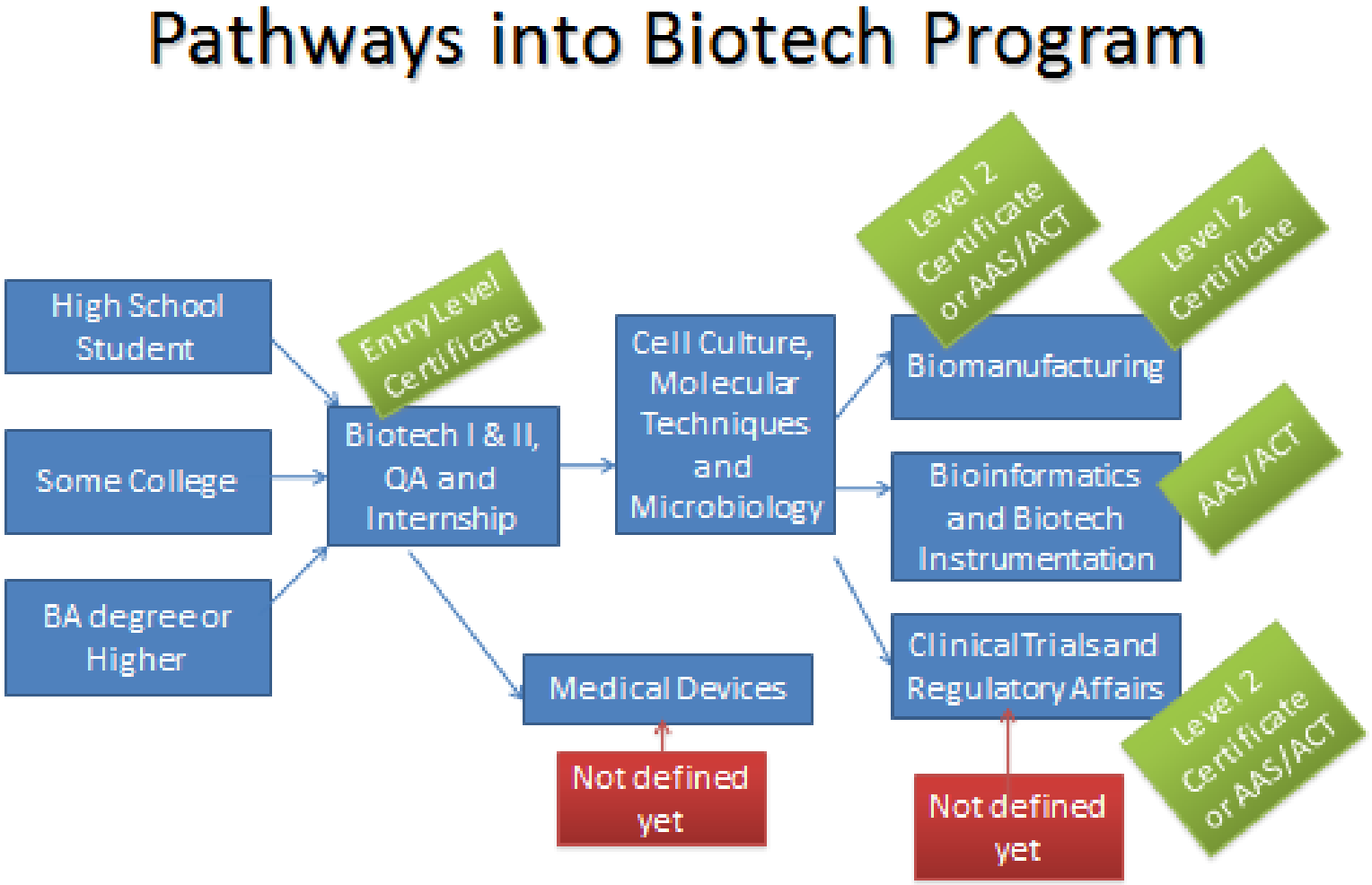
Key Contributions from Partnership Most Critical to the Success of the Grant include:

- The training will produce the employees who the industry partners expect will be needed in the next few years.
    - Program completers will have had opportunities for work-based learning and will be familiar with the organizational culture and be work-ready immediately upon program completion.
    - The collaborative development of curriculum and learning opportunities helps to stimulate the local workforce and strengthen our community's economic development
- The employees will have both the academic skills and the soft skills the companies indicated they would seek in new employees, including proficiency related to interviewing, teamwork, and communication.
- There would be a group of potential applicants who would be familiar with the companies, their work cultures, and their expectations. Potential employees would be more prepared to contribute on their first day on the job. There would also be lower turnover rates and lower costs to the company related to hiring and training new employees.
- The partnership between LATTC and local employers is good for the local community's economy. Continued partnership development through fostering relationships with new employers and strengthening of existing relationships. It is noteworthy that while the department and the leadership of the college itself supports the strategic focus on developing and maintaining partnerships, the individuals like Christie Dam that coordinates these efforts are the lynch pins to the success of these kinds of collaboration with industry.
    - Continued meetings and collaboration with Girfols Biologicals and other industry partners keeps the program on the leading edge.
- More people within the community will either hold, or be prepared to earn, an Associate's Degree, helping to meet state and local government goals of increased college graduation rates.
- The LATTC Employer Advisory Council involves local employers in establishing and reviewing learning outcome goals. It also includes employers in program development and increases communication between those who will hire LATTC students and those who will teach and prepare the students for employment.
- Creating and fostering a pipeline of qualified candidates trained with the required knowledge and skills needed in industry.

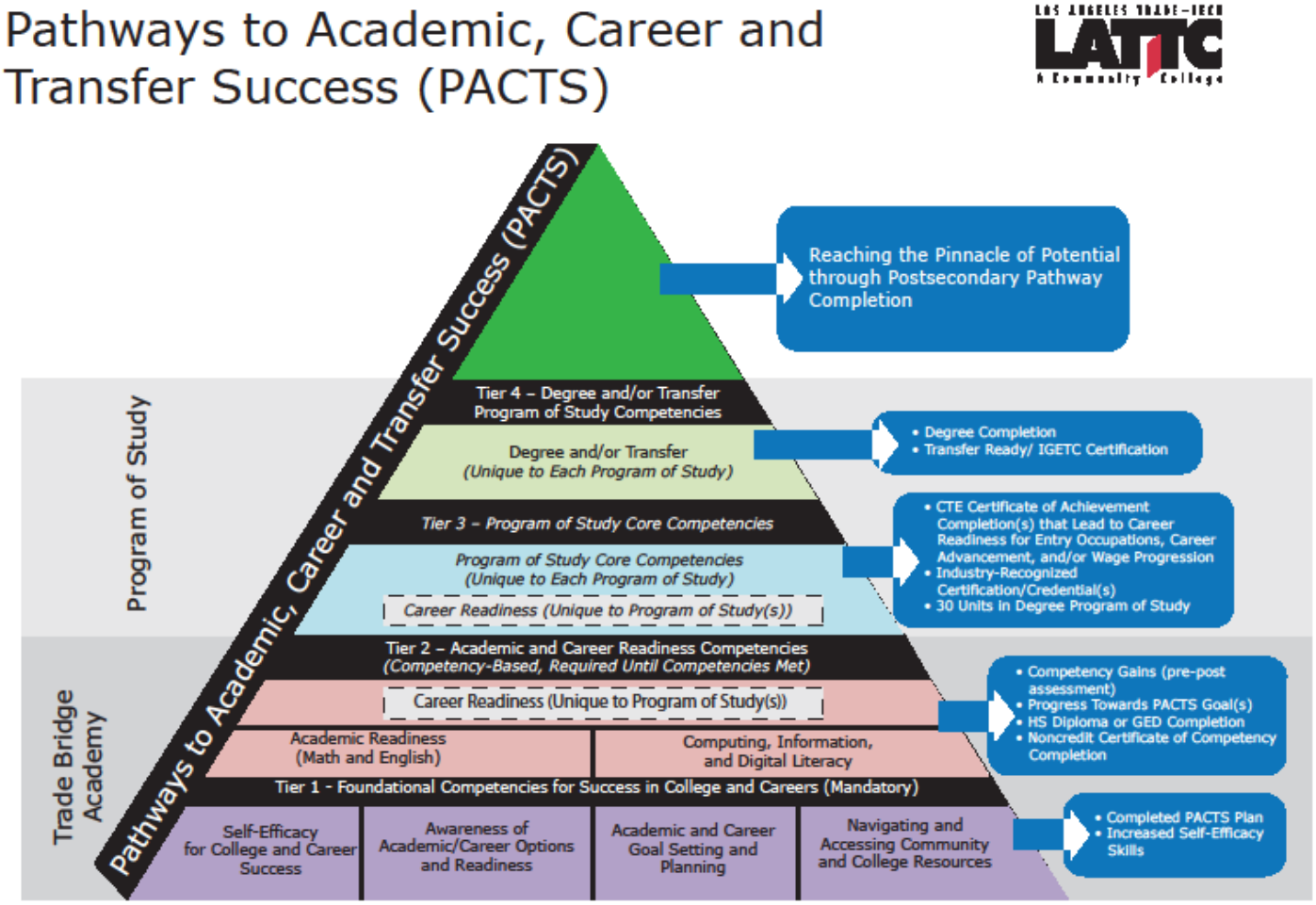
Appendix D: Biomanufacturing Bridge Academy Logic Model



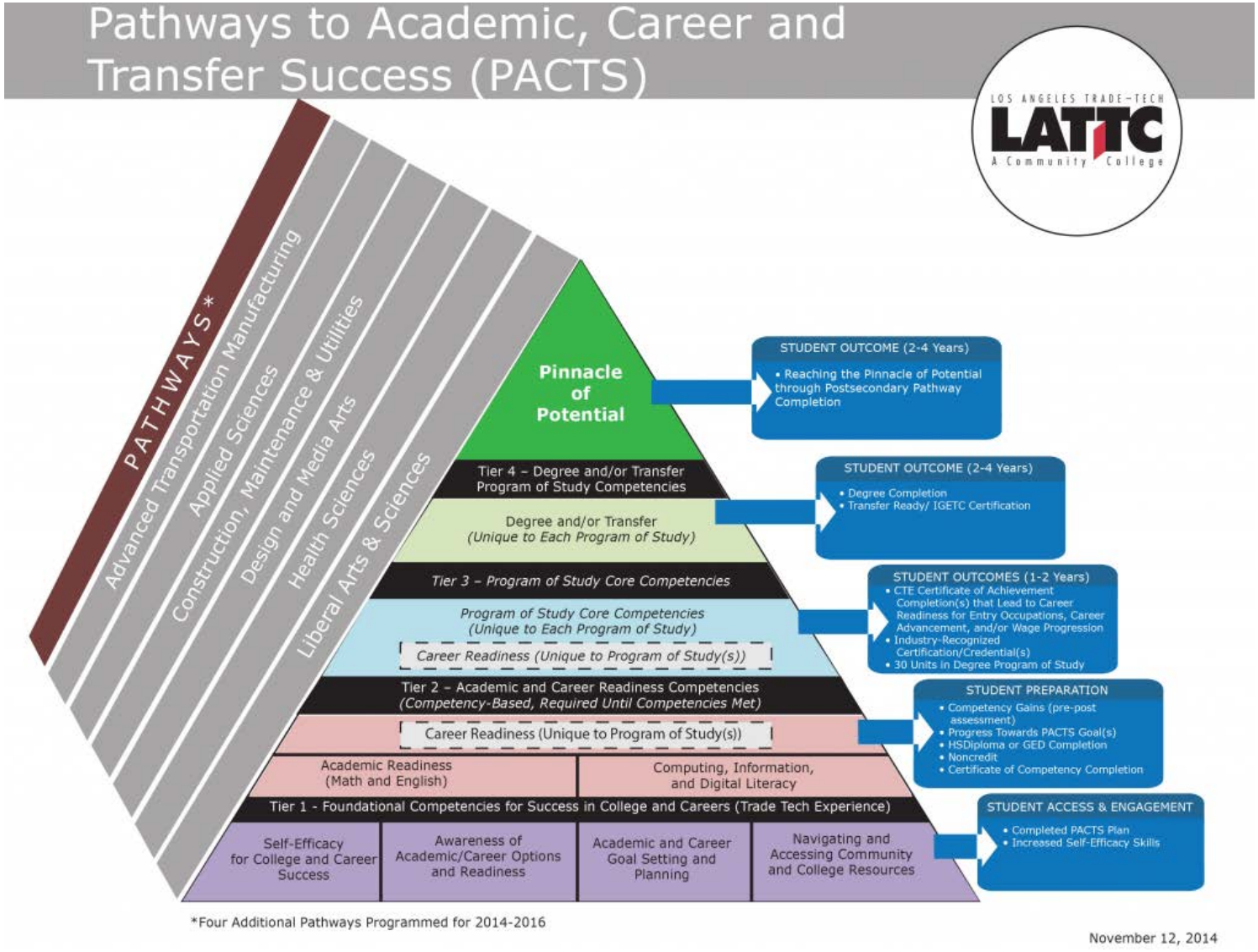
Appendix E: Pathways into BioTech Program



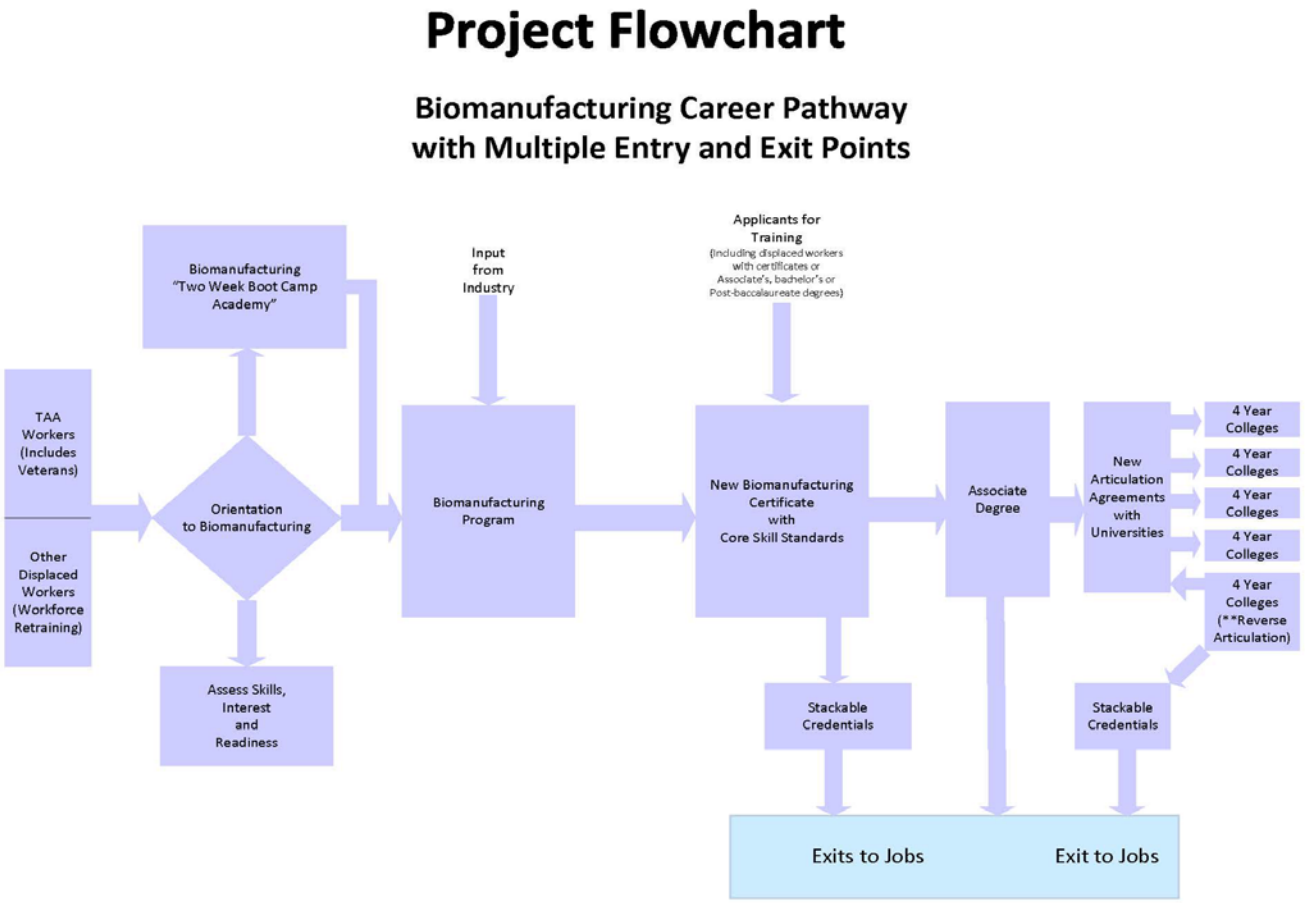
Appendix F: Former PACTS Framework



Appendix F(a): Current PACTS Framework



Appendix G: Project Flowchart



Legend: Reverse Articulation Agreement (degreed students come to two-year college for hard skill training).

Appendix H: Grifols Biological Meeting Minutes

Meeting held at Grifols Biologicals, Inc. - July 2013

Attendees: Martin Diaz, Chemistry Instructor, Vincent Jackson, Administrative Dean, Willie Zuniga, President & CEO, Karen Glenn, Project Administrator

Suggestion by Willie: Need to expand our marketing base to obtain good and interesting applicants - use other work source center along with Wilshire work Source, Chamber of Commerce, campus Veteran's office and other inner city workforce affiliates.

- Grifols looking to hire 70 to 80 entry-level specialists for the fall term Grifols prefers students have AA degrees because based on history, students are better prepared.
- Certificate is nice, but AA is better.
- Focus more on the manufacturing than the biology.
- Will promote to supervisory level with AA DEGREES.
- Grifols does not provide internships.

Need to build into curriculum a soft skills preparation piece to prepare students for interviews later on for interviews with Grifols and Baxter Healthcare. Renee has met with Angela and Martin to include in second year course as part of two-year degree program. Employment prep. course - CT 141

Areas of concern from prior students who interview:

- Confidence in expression knowledge of concept relating to process tech.
- Critical thinking
- Dress and appearance form interviews.

Career Navigator person will also be a coach/motivator and lead person to provide support services for students.

Grifols, Inc.:

- South Alhambra near Cal State LA off 710 north - Valley exit.
- Plasma-derived protein therapies for patients who have rare genetic diseases and potentially life- threatening infections.
- Building new 94,000 square foot building - hiring 75 people in manufacturing technician positions with a few management positions Demolition of one facility built in 1940's
- 800 hires in the next three to four years. Over 50% of the hires will be in manufacturing technician positions.
- Salaries range from $33K to $45K
- Working with Cerritos, LATTC, Worksource Centers, and Pasadena City College.
- Turnover at Grifols is about 7%.
- New hires to really understand Grifols process takes about 12 months.

Baxter Bioscience - Baxter Healthcare Corp.

4502 Colorado Blvd. LA 90039

- Develops, manufactures, and markets products that save and sustains lives of people with chronic and acute medical conditions such as hemophilia, immune disorders, infectious diseases, kidney diseases and trauma.

Gilead: San Dimas

- Manufacturing packaging and labeling of antiviral products, as well as the distribution of Gilead products sent through the USA and the Pacific Rim. Experiencing layoffs at this time.

Student need to know these basic competencies:
Basic algebra measurements conversions, units for Chemistry 51 for the Fall Math 112 and 115 use of calculators. SOP - Standard office Procedures.
Meeting adjourned.

Appendix I: Biotechnology "Boot Camp" Rating Sheet

LOS ANGELES TRADE-TECHNICAL COLLEGE
Biotechnology "Boot Camp" Rating Sheet

Two-week Boot Camp: **Start date: August 5, 2013** **End date: August 16, 2013**

Students, please take a few minutes to complete the brief survey in order to determine what activities went well and what areas we need to improve. PLEASE DO NOT INCLUDE YOUR NAME ON THE SURVEY.

(**0 or 1 = Poor; 2 or 3 = Fair; 4 or 5 = Awesome**)

0 1 2 3 4 5 1. Biotechnology Overview Session – July 17, 2013

Week One: 8/5 to 8/8

0 1 2 3 4 5 2. Math Skills overview

0 1 2 3 4 5 3. Trade Bridge Academy Orientation

0 1 2 3 4 5 4. Career Awareness/Career Options/Career Exploration workshop.

0 1 2 3 4 5 5. Navigation and Accessing Community & College Resources

PROVIDE ADDITIONAL COMMENTS:

Strengths:

Areas to Improve:

Comments/Suggestions

Thank you for completing this survey.

Appendix J: LATTC Member Check

LATTC Member Check

TO: Vincent Jackson
FROM: Steve Myran, Mitch Williams
RE: A request for input on our general impressions from our site visit to LA
DATE: 3/11/2014

This member check is designed to provide some very broad strokes of what we think we saw and heard on our visit in case you care to give us any comments or feedback. Please provide us feedback about the accuracy of any of the information provided.

C2C Program Highlights

1) Institutional focus on building the capacity in the area of workforce development and to serve displaced and under employed workers

    a) C2C does not appear to be a side project, instead it is seen by the administration of the college as a spearhead to promote a number of strategic reforms

        i) Bridges to success center – wrap around services for students
        ii) Biotechnology is part of the colleges strategic master plan
        iii) Various pathway models

2) Supporting student learning

    a) Boot camp
    b) Math anxiety
    c) Opportunities to meet representatives from various biotech employers
    d) Hands-on and team learning opportunities
    e) Tours of biotech companies
    f) “soft skills” development

3) Well-developed curriculum

    a) Curriculum development included feedback from the biotech field
    b) Curriculum includes a full range of opportunities to beyond biotech topics to assure student success. For example:

        i) Math anxiety workshops
        ii) Teamwork building
        iii) Interviewing skills
        iv) Resume writing
        v)

4) Dedicated and talented science faculty

    a) Martin Diaz and Angela Gee – curriculum development and instruction

        i) Student interview and classroom observation both highlighted hands-on engaging learning opportunities for students. Instructors created a climate of inquiry and success.
        ii) Learning opportunities are well aligned with many aspects of learning sciences principles

Appendix L: LATTC Industry Partner Form

APPLIED SCIENCE PATHWAY FACT SHEET

APPLIED SCIENCE PATHWAY: At Los Angeles Trade-Technical College, we offer an Applied Science Pathway for individuals interested in pursuing a career in the process of discovering, developing, manufacturing, or regulating quality of new products within the local Southern California region. Our Applied Science Pathway includes 3 different Programs of Study:

- Biomanufacturing
- Chemical Technology
- Process Plant Technology

GROWTH IN STEM-RELATED JOBS: According to the U.S. Department of Commerce's report (July 2011), over the past 10 years, Science Technology Engineering and Math (STEM) jobs have grown 10 times faster than non-STEM jobs. The Department of Labor's Bureau and Labor Statistics' "Occupational Outlook Handbook" stated that employment of biological technicians is expected to grow by 10% from 2012 to 2022. Based on data from the Department of Labor and State Workforce Commission, 41% of STEM employers anticipate increased hiring in the next 2 years, and there is a projected growth of 26% for long-term employment projections (through 2018) in Los Angeles. LATTC's Applied Science Pathway is designed to prepare students for entry-level technician positions in biomedical, research, and industrial laboratory areas as chemical technicians, process technicians, and science technicians.

HOW A PARTNERSHIP SUPPORTS OUR COMMUNITY:

- You would have a pipeline of qualified candidates trained with the required knowledge and skills needed within your organization. Program completers who have been given the opportunity to have work-based learning opportunities would also be familiar with your organization's culture and be work-ready immediately upon program completion.
- With a partnership between you and Los Angeles Trade-Technical College, we can together stimulate the local workforce and strengthen our community's economic development
- Our community members would be trained to obtain either an industry-recognized Certificate or Associate Degree leading to long-term employment opportunities within the local community resulting in low turn-over rates for your company.
- Our partnership provides continuous new talent for your candidate pool

HERE'S HOW YOU CAN HELP DEVELOP OUR FUTURE WORKFORCE AND OUR COMMUNITY:

- Join our Advisory Council to review the goals and objectives of our program so that you can serve as a communication link between the college and our community
- Participate in our program development by informing our college staff of changes and trends in the economy and local workforce
- Become our partner so that together we can develop a skilled and trained workforce to meet your organization's needs by providing work-based learning opportunities
- Offer supervised work-based learning for a program participant

PLEASE JOIN US IN DEVELOPING OUR COMMUNITY'S LOCAL WORKFORCE FOR FUTURE CAREERS IN STEM-RELATED JOBS

LOS ANGELES TRADE-TECH LATTC A Community College

Contact Information

Christie Dam, ISA – Project Coordinator
400 West Washington Blvd., Los Angeles, CA 90015
Mariposa Hall, MA-106C
213.763.7075 - dammc@lattc.edu

PARTNERSHIP INTEREST FORM

COMPANY INFORMATION:

COMPANY NAME:

rams (please complete attached *Internship Form*)

Appendix M: Hosting Employer's Internship Form

Thank you for your interest in hosting an intern! The internship is work-based learning experience for our Applied Science Pathway students, giving them the opportunity to simultaneously apply the skills they learn in the classroom to a professional workplace, adding value and gaining confidence. The goal of the internship is twofold:

1. Provide motivated, administrative talent to our business partners
2. Give Trainees the opportunity to apply what they've learned to a professional environment and gain critical experience and confidence to be competitive in the job market

Our goal is to ensure a fulfilling experience for the intern and internship host. In order to do this, we consider the culture and scope of work of each internship provider alongside the trainees' skills, work styles and career goals. For us to make the best possible placement for you and your organization, please provide as much information as possible.

LOGISTICS

Name: _____ Title: _____

Company: _____ E-mail: _____ Phone: _____

Company Address: _____City: _____ Zip Code: _____

Internship Job Title:_____ Internship Supervisor: _____

Does your company require a background check? (circle one) Yes No

Does your company require a drug test? (circle one) Yes No

Does your company require a TB test? (circle one) Yes No

Will your intern need to attend a company orientation? Yes No If yes, how far in advance of the internship? _____

Does your company require U.S. citizenship? (circle one) Yes No

Paid Internship rate: _____

Length of internship:_____

Expected Start date:_____

Expected End date:_____

To whom should the intern report on the first day and where should s/he find that person? _____
_____

CULTURE

On a scale of 1 – 5, please choose the numerical value that best answers the following questions about company culture. "1" represents "none/not at all" while "5" represents "a lot/very."

1) **How much supervision will the intern have in their day-to-day workload?** 1 2 3 4 5
2) **How repetitive will the intern's work load be from day to day?** 1 2 3 4 5
3) **How much creativity, free thought or critical thinking will be required?** 1 2 3 4 5
4) **How much customer service and interaction with critical stakeholders will there be?** 1 2 3 4 5
5) **Is there anything else we should know about your company culture? Please explain:** _____

_____

SCOPE OF WORK

In the section below please:

- Provide a percentage estimate of ***time to be spent*** in each of the task categories
- Check off all ***tasks to be done*** in each category

Laboratory related Tasks _____%

____ Handling lab instruments and tools
____ Working with computer simulated programs
____ Performing measurements
____ Assisting with preparing lab reports
____ Working with chemicals

Communications/Personal Contact tasks ____%

____ Contact with other departments/management (information, requests, etc.)
____ Customer Service
____ Bilingual (Spanish ____ , French ____ , Other _____)
____ Other (please explain) _____

Computer based Tasks _____%

____ Word Processing/Typing
____ Database maintenance (updates, entries, deletions, etc.)
____ Database queries (purchase orders, inventory, accounts, etc.)
____ Internet/On-line Research
____ Microsoft Office Suite (please list:_____)

Administrative Assisted Tasks _____%

____ Photocopy
____ Filing
____ Facsimile
____ Other (please specify)_____

Special Projects _____%

Please describe: _____

Employee Shadowing _____%

Position:_____

Could this internship become long term employment? ***(please mark)*** ___Highly possible ___ Possibly ___ Unlikely

Thank you again for your interest in hosting an intern!
Internships will take place as long as agreed upon with the college
With questions, please call: Christie Dam (213) 763.7075 or email DamMC@lattc.edu
Please return this form to Christie Dam at DamMC@lattc.edu

Chapter 3: Mott Community College
Credentials to Careers Program

ABSTRACT

The Mott C2C project is designed around the Workforce Education Center's earlier experiences responding to the decline of the auto industry in the Flint, Michigan area and the devastating impact this had on the local and statewide economies. Through this work they made a number of steps forward that significantly shaped the nature of the C2C project. These included:

1. The creation of a mission statement expressing in concise terms the Workforce Education Center's (WEC's) purpose within the broader mission of MCC;[5]
2. Braided funding provided for programs and services;
3. The use of a "screening-in" process that takes people where they are and finds the best fit for them;
4. Intensive case management – an inclusive form of case management that includes the full range of services and advising this population needs;
5. Career pathways that have multiple entry and exit points connecting non-credit and for-credit programs to help students set proximal goals that sustain them both economically and motivationally (a development that began before C2C with a prior externally funded program called Breaking Through);
6. Stronger and more authentic links to the labor market and expanding students opportunities for more hands-on clinical experiences;
7. The use of individuals in business and industry as adjunct instructors, bringing a greater level of authenticity to students' learning experiences.

Taken together, Mott has identified leveraging resources, establishing and strengthening partnerships, identifying the authentic and contextual needs of both employers and underemployed and unemployed individuals as key strategies to a comprehensive means of improving the economic outlook for this region of Michigan.

[5] As a part of the C2C deliberations, the WEC staff developed this mission statement for further institutional consideration: *It is the mission of the Workforce Development Center to (1) empower individuals to get good jobs and advance in their career pathways, and (2) partner with employers to match their workforce skill needs with qualified candidates.*

Chapter 3 Executive Summary

Mott Community College (MCC) is a comprehensive community college with an enrollment of over 12,000 students. The college is located in Flint, Michigan and serves the Genesee County region. The college serves a very diverse urban, suburban, and rural population with an economy centered on manufacturing and health-related industries. The economy of the region served by MCC has endured a severe downturn during the past two decades due to the closure of major automotive manufacturing plants and the long-term economic crisis in Michigan. As a result, the region has experienced a high unemployment rate and is striving toward economic recovery and revitalization. MCC is playing a significant role in this recovery and revitalization process through a variety of economic and workforce development, career education, displaced worker, literacy skills enhancement, job training, corporate services, and employment assistance initiatives of which the Credentials to Careers (C2C) program is one.

The MCC C2C program sees itself as a "breaking through" college that will add value to the overall C2C consortium through its work in the area of navigating the space between non-credit and credit courses/training. This model is strategically designed to address critical issues that adult learners face navigating the complex array of agencies, services and resources they need to successfully transition from low skill work or unemployment to better paying skilled work.

MCC's C2C program, which focuses on preparing displaced and unemployed adults for STEM-related healthcare careers, is led and managed by MCC's Workforce Education Center (WEC[6]). The center operates out of an off-campus site in a close partnership with Michigan Works, the State of Michigan's workforce development agency. The WEC is MCC's workforce development arm, providing non-credit and short-term job skills training to job seekers and partnering with employers and other community organizations to create a highly-skilled workforce that matches the region's workforce needs. The C2C program, focusing on helping displaced and unemployed workers find meaningful employment, carries out WEC's mission in a very direct way. In addition, the C2C program affords the staff an opportunity to develop best practices in serving this constituency that can be replicated in other similar settings.

Through this work they made a number of steps forward that significantly shaped the nature of the C2C project. These included:

8. The creation of a mission statement expressing in concise terms the Workforce Education Center's (WEC's) purpose within the broader mission of MCC;[7]
9. Braided funding to meet the holistic needs of low income and displaced workers;

[6] WEC. WCD, and Workforce and Career Development Division are all names that refer to the same entity. Different names have been used over the years. In this documents we use WEC because that seems to be the name currently in use.

[7] As a part of the C2C deliberations, the WEC staff developed this mission statement for further institutional consideration: *It is the mission of the Workforce Development Center to (1) empower individuals to get good jobs and advance in their career pathways, and (2) partner with employers to match their workforce skill needs with qualified candidates.*

10. The use of a "screening-in" process that takes people where they are and finds the best fit for them;
11. Intensive case management – an inclusive form of case management that includes the full range of services and advising this population needs;
12. Career pathways that have multiple entry and exit points connecting non-credit and for-credit programs to help students set proximal goals that sustain them both economically and motivationally (a development that began before C2C with a prior externally funded program called Breaking Through);
13. Stronger and more authentic links to the labor market and expanding students opportunities for more hands-on clinical experiences;
14. The use of individuals in business and industry as adjunct instructors, bringing a greater level of authenticity to students' learning experiences.

Taken together, Mott has identified leveraging resources, establishing and strengthening partnerships, identifying the authentic and contextual needs of both employers and underemployed and unemployed individuals as key strategies to a comprehensive means of improving the economic outlook for this region of Michigan.

Overview of Findings:

The evaluative comments below relate to the desired outcomes of the TAACCCT-funded program at MCC, with a focus on the evaluation of MCC's capacity to deliver STEM education and career training programs for displaced and unemployed adults, the creation of replicable best practices and strategies, and serve as a catalyst for innovation and economic growth in Flint and the Genesee County region.

The evaluative comments also relate to focus during the C2C project at MCC on the five core elements of TAACCCT-funded projects: evidence-based design, stacked credentials, online and technology-enabled learning, transferability and articulation, and strategic alignment.

In general, the C2C program has engendered program and system innovations and improvements in a number of areas: streamlining enrollment management including the "screening-in" process, creating a case management or career navigation system, accelerating the remedial skill development process, improving student performance tracking system and data-informed decision-making, expanding faculty professional development, developing of a braided funding strategy, strengthening of the guided career pathways approach, engaging employers and a wide range of community partners, expanding wraparound services, and moving toward a "one college" system that integrates institutional processes for both non-credit and credit students.

Curriculum

The curriculum at Mott is consistent with how USDOL's TAACCCT SGA and NOVA's proposal conceptualize curriculum as an important means of supporting and encouraging innovation, fostering outcomes, engaging in authentic collaboration and being responsive to employer needs and building organizational capacity to strengthen and expand programs.

Mott's healthcare career pathways curriculum evolved over a number of years of working with unemployed and displaced workers and provides robust structures to support this population's needs. The curriculum of the C2C program encompasses these major innovative features:

- A "screening in" process of assessment, orientation, and career guidance for entering students;
- An accelerated and intensive literacy and workplace skills program;
- An embedding of student support services into the instructional programs;
- An effort to create stacked credentials through a link between the non-credit C2C, program and the career-focused certificate and associate degree programs of MCC.

The screening-in process and the accelerated and intensive literacy and workplace skills programs are best practices that other community colleges could replicate.

A comprehensive student focused curriculum

One of our more notable observations about the curriculum was that it was comprehensive and student focused. In many respects the comprehensive career pathways they've developed represents a robust curriculum that is well designed to address the fuller range of student needs. As the Mott team indicated, this work represents a paradigm shift for them, with a host of student-focused resources within the college and outside the college functioning in concert under the direction of Workforce Development. The group emphasized that this type of approach requires "seeing the student differently, as a complete individual… a philosophy of seeing people as people", and "seeing the work as a facilitator vs. a machine ".

Similar to several of the other consortium colleges, Mott's curriculum is an innovative way of blending elements of student services and support and soft skills with professional skills, knowledge and dispositions. The program recognizes that industry skills and knowledge are not sufficient for students to be successful. In many respects this represents some interesting boundary crossing between what are traditionally thought of as curricular and non-curricular activities; that is teaching and content on one-side and student support services on the other. The work at Mott, funded by C2C blurs these traditional lines and provides students with a potentially more dynamic and effective way of fostering growth and success. With this in mind we encourage Mott to:

1. Continue developing and refining comprehensive student focused curricula
2. Continued development of adaptive models of workforce development
3. Explore ways of enhancing the instructional climate

Use of grant funds

Sophisticated use of "braided funding"—generating and interlocking funds from multiple sources to finance various programs—allows the WEC to leverage its limited funds to produce greater results than when one funding source is targeted on a single program. WEC programs leverage funds from the college itself, federal financial aid (Pell Title 4A "clock hour" grants), Michigan Department of Education, regional businesses, governmental and foundation grants, and student fees.

The braided funding strategy involves a certain amount of risk since some funding sources, such as federal and foundation grants, are unpredictable. However, it may be the most sustainable strategy since the reality is that non-credit and workforce education funding will depend on an entrepreneurial spirit on the part of leaders for the foreseeable future.

Taken together, the overall use of grant funds is strategically designed to build a self-sustaining regional infrastructure to serve students. Specifically, grant funds are used for the following:

- Career Coach/Navigator salaries
- Case Management Training
- Short term training
- Expanding experiential learning opportunities for internships
- Subsidizing paid internship experiences to extend the duration of internships

Assessment of Students

Mott's health career pathways program utilizes a comprehensive assessment and screening process that is designed to "screen-in" students to the right program and is consistent with the theme of being responsive to employer and student needs.

Wide Variety of Assessment Tools Including:

1. WorkKeys
2. Healthcare Career Seeker Inventory (HCSI)
3. JobFit Assessment

Mott maintains a comprehensive set of student data through their Efforts to Outcome (ETO) system which provides a systematic way of making data informed decisions. This approach helps the organization to assess which of the strategies were most effective and which need to be improved. Workforce Development uses the system for wide variety of problem solving and action.

Contributions of community partners

The WEC has developed partnerships that benefit the C2C program including employers, Michigan Works, family service organizations, local governmental agencies, and other educational institutions. A critical partnership with Michigan Works involves shared staffing and student services. Partnerships with regional employers provide for practical advice for program developers, experiential learning opportunities for students, job placements for graduates of the program, labor market information on which to make decisions on program directions, and professional development opportunities for the C2C program faculty and staff.

The network of the C2C partnerships include both community entities and MCC departments. Key stakeholders include employers; non-profit community agencies; MCC faculty and administrators; local, state, and federal governmental agencies, and other educational organizations. Among the community partners that are advancing MCC's C2C initiative are the following:

- Michigan Works! (Genesee and Shiawassee counties)
- McLaren Regional Medical Center
- Specialty Pharmacy
- Greater Flint Health Consortium
- Flint STRIVE (community-based organization providing job preparation services)
- Genesee Regional Chamber of Commerce
- Metro Housing Partnership
- Charles Stewart Mott Foundation
- Michigan Campus Compact
- Michigan Department of Education
- Michigan Department of Commerce (through Michigan State University)
- Genesee County government (employment services)
- Shiawassee County government (employment services)

Community partners are contributing to C2C in a number of ways as outlined below:

1. Braided funding: Braiding multiple sources of funding can be merged to create a more comprehensive workforce development programs or service.

2. Shared staffing: MCC employees and Michigan Works! employees share receptionist, intake, orientation, testing, and other duties.

3. Student recruitment: Many of the community governmental and non-profit agencies cooperate in recruiting students for the C2C initiative.

4. Internships and other forms of experiential learning: A number of employers provide internships and other forms of experiential learning for C2C students. Michigan Works! refers to this opportunity for students as the "earn and learn" component.

5. Changes in MCC and WEC Division procedures and practices: The WEC Division is working with the MCC leadership to create a single admissions, orientation, and financial aid process

6. Changes in MCC and WEC Division curriculum: The WEC Division leadership and staff have increased the focus on continuous assessment of changing labor market demands and adjusting the curriculum in the direction of high demand fields. Ultimately, this ongoing attention to changing workforce requirements will impact all career education programs of the college.

7. Changes in teaching methods: Expanding internships and other direct learning experiences will impact other WEC Division programs as well.

8. Professional development of MCC and WEC Division faculty and staff: Improved opportunities for faculty and staff professional development.

9. Blurring of boundaries between MCC/WEC Division and its community partners: As the community partners cooperate on student recruitment, program development, student services, job placement, etc., the boundaries between the organizations involved blur.

10. Clarifying the mission of MCC's WEC Division: At the time of this evaluation, the leadership of the WEC Division was considering a revised mission statement which included an emphasis on community partnerships:

    > *It is the mission of the Workforce and Career Development Division to (1) empower individuals to get good jobs and advance in their career pathways and (2) partner with employers to match their workforce skill needs with qualified employees.*

11. Creating an alignment between the C2C initiative and MCC's strategic directions: C2C and other forms of community-based programming are contributing to a strategic shift in the orientation and strategic directions of Mott Community College as a whole. Opportunities to institutionalize or scale up innovations being introduced by the WEC Division include:
    a. Emphasis on strategic community networking
    b. Emphasis on MCC faculty and staff engagement in the community
    c. Understanding where students are coming from; what their life circumstances are
    d. Focus on career and educational pathways
    e. Focus on social equity: helping students overcome barriers to career and educational success caused by poverty and low income, economic and housing isolation, and other forms of racial and ethnic inequalities.

Factors contributing to the involvement of community partners

We identified six factors that contribute to the involvement of community partners in the C2C initiative:

1. Shared mission: MCC and the community partners all share a mission that relates to the success of individuals, businesses, and communities in the Flint/Genesee region.

2. Opportunity to transform the workforce and career education system in the community: By creating community partnerships in Flint, a "surge force" can achieve momentum toward reform that no one institution, including the community college, can do alone.

3. Social equity: Community partnerships such as that developed for the C2C initiative can help to create opportunities for disenfranchised groups to enter the American economic mainstream.

4. Adjusting to the "new normal" of current and projecting financial limitations for educational and other community-based institutions: By sharing resources and supporting the braided funding strategy of the WEC Division and the C2C initiative, the partners can maximize the

impact in terms of student learning outcomes of the limited dollars available.

5. Rapidly changing skill requirements of the workforce: The C2C network of partners seeks to prepare student for a career pathway that leads to job security in the high demand occupational fields of the future.

6. Shared interest in the economic recovery of the Flint/Genesee region: All partners seek to contribute to the economic recovery and growth of the region.

Contributions from partners post critical to success of the grant

As we examined the contributions from the partnerships that were most critical to the success of the grant we noted a clear willingness among the various stakeholders to do things differently. The "new normal" with the rapidly changing skill requirements of the workforce has created an environment where the creative collaboration and leveraging of scarce resources is necessary to meet the complex needs of the displaced and unemployed workers in this region of Michigan. In this environment the contributions that are currently most critical to the success of the grant appear to fall in the following categories:

1. Blurring of boundaries between the various partnerships with all the stakeholders taking more active roles in curriculum development, the identification of needs, and other functions;
2. Creating stronger strategic alignments between organizations that make boundary crossing possible;
3. The collaborative development of the healthcare career pathways and the comprehensive student focused curriculum;
4. Applied and authentic learning opportunities both in the classroom and during internships

Strategic Alignment: C2C, WEC, and MCC "One College" Systems

At a meeting of C2C evaluators with key MCC and WEC executives, a commitment was indicated to college-wide innovations such as comprehensive screening in for all students at the point of entry, stacked credentials programs where WEC program graduates "ladder" to MCC certificate and associate degree programs, and cooperation at key intersection points for students where advising and career navigation services are needed. Already, progress is underway to create a common application and admissions process for both credit and non-credit students, and the transcript process is being updated. Further evidence of strategic alignment at the college level are the workshops being held by WEC leaders with division deans to coordinate programs, services, and processes. As well, the inclusion of WEC and C2C goals in MCC's 2013-2018 strategic goals speaks to movement to "one college" systems:

- Ensure that MCC programs and services are directly related to the current and emerging labor market needs of our region.
- Continue to partner with local, regional, and state entities to ensure our students are prepared to meet the needs of the workplace.

- Participate in coordinated leadership with local, regional, and state efforts to attract and retain jobs.
- Maintain a leadership role in the community by engaging community partners to better meet area educational needs.

Next steps / Possibilities for growth

We also found that several other areas that are not yet as evolved as the above and represent tremendous opportunities to push the potential of the C2C grant effort and related work to the next level. These have to do with how the partners can build on the success thus far and push the instructional side of the career pathways curriculum. These include:

1. Encourage greater professional development in teaching and the principles of adult learning;
2. Expand the outlook and use of student data into more formative methods. While there has been progress in this area since Year 1, it remains an area for continued growth.
3. Continue to build the successful procedures and practices associate with this boundary crossing into the normative structure of the different organizations to foster sustainability.

Table 2 – Interview and Observation Participants and Topics

Name	Position	Topics
Robert Matthews (Yr. 1, Yr. 3)	Executive Dean	Interviews with program management team members, grant director on a comprehensive set of topics including: 1. Partnerships 2. Student services 3. Assessment 4. Career pathways
Dartanyon Jamerson (Yr. 3)	Project Director - Healthcare	
Scott Jenkins (Yr. 1)	VP - Student & Administrative Services	
Lorie Dumond (Yr. 1, Yr. 3)	Administrative Support Specialist	
Moses Bingham (Yr. 1, Yr. 3)	Program Assistant	
Jamar Baker	Job Development Specialist	Interviews with program management team members, grant director on a comprehensive set of topics including: 1. Partnerships 2. Student services 3. Assessment Career pathways
Craig Coney (Yr. 1)	Interim President and CEO (Michigan Works)	
Gail Bowman (Yr. 1)	Coordinator, Workforce & Career Development	Observations of intake enrollment assessments, observation of a job development specialist Interviews regarding, partnerships, student service, assessment, and career pathways
Janet Westhoff (Yr. 1)	Faculty - Coordinator, Nursing - Health	
Aron Gerics (Yr. 1)	Facilitator/Trainer	
Judith Banta (Yr. 1)	Job Coach	
Karla Lawrence (Yr. 3)	Career Navigator, case management	Case management
Kathleen LaVallier (Yr. 3)	Jobs development	Jobs development
Staff (Yr. 1)	McLaren Regional Medical Center	Worksite visit (regarding the worksite's needs for training)
Staff (Yr. 1)	Area nursing home	Worksite visit (regarding the worksite's needs for training)
Students (Yr. 1)	Pharmacy Tech & Nursing Students	Observation of classroom lecture/discussion Post observation focus group interview

V. Curriculum: How was the particular curriculum selected, used, or created?

Summary of findings in this section

The curriculum at Mott is consistent with how USDOL's TAACCCT SGA and NOVA's proposal conceptualize curriculum as an important means of supporting and encouraging innovation, fostering outcomes, engaging in authentic collaboration and being responsive to employer needs and building organizational capacity to strengthen and expand programs.

Mott's healthcare career pathways curriculum evolved over a number of years of working with unemployed and displaced workers and provides robust structures to support student needs. The student-centered can comprehensive approach can be seen as having six primary components:

1. Screening-in and relationship building
2. Self-assessment and goal setting
3. Literacy (developmental education)
4. Healthcare programs
5. Soft skills and job seeking skills
6. Life skills and work/life balance

One of the more notable themes that we identified was the fluid and integrated way that curriculum is used strategically to help meet student needs. The work the Mott team has done in developing the curriculum represents a paradigm shift, with a host of student-focused resources within the college and outside the college functioning in concert under the direction of Workforce Development. We suggest three areas of continued growth which include:

1. Continue developing and refining comprehensive student focused curricula
2. Continued development of adaptive models of workforce development
3. Explore ways of enhancing the instructional climate

Background of Curriculum Selection, Development and Use

Background: How USDOL and "NOVA Central" conceptualize curriculum

In order to effectively evaluate the program's curriculum selection, development and use, it will be helpful to provide a brief background on how the USDOL conceptualized curriculum in the SGA as well as how NOVA Central—the fiscal agent and leader for the C2C Consortium--framed their proposal in response to this solicitation. According the USDOL SGA, one of the overall goals of the grant was to prompt programs to introduce "innovative and effective methods for curriculum development and delivery" that were responsive to specific workforce needs, and promote improved learning, retention, and employment outcomes. Similarly the USDOL framed curriculum as a means of engaging employers in targeted industries to help identify skills and competencies that would be incorporated into programs' curriculum. In addition, the USDOL emphasized the importance of how applicants would incorporate these curricular innovations into the standard offerings of the institution. The USDOL integrates curriculum development throughout the SGA where it can be seen as an important means of supporting, strategic alignment, sustainability, program

implementation as well as encouraging greater contribution and engagement from partners, employers and industry.

The NOVA proposal was congruent with how curriculum was conceptualized in the USDOL SGA. Here curriculum is framed as one of the central tools to fostering innovation and successful outcomes. For example the proposal states, "The aim is to increase attainment of credentials through innovative and effective methods of teaching and learning through curriculum redesign and technology that ultimately lead to successfully preparing trade-impacted workers for fast-growing STEM occupational clusters." Taken together, curriculum for the C2C consortium emphasizes:

5) Innovation
    a) Introduce innovative and effective methods for curriculum development and delivery

6) Fostering Outcomes
    a) Learning
    b) Retention
    c) Employment

7) Authenticity
    a) Engaging employers and other stakeholders
    b) Increasing responsiveness to specific workforce needs

8) Sustainability
    a) Building organizational capacity by incorporating curricular innovations into the standard offerings of the institution

Mott's Curriculum -- Background

According to Robert Mathews, the Executive Dean of Workforce Development at Mott Community College, The Mott C2C project is designed based on their earlier experiences working with unemployed and displaced workers. As part of a Courses to Employment demonstration project with the Aspen Institute in 2008, they gained a number of key insights that significantly shape the nature of the C2C curriculum. During our interviews with Mott staff, particularly with Robert Mathews, it was evident that they have taken a student centered approach to understanding the curricular needs of this student population and sought to design programs to meet these needs. While C2C grant funds have not been used specifically for curriculum development, like a number of the other consortium members, Mott has identified those curricular features that are consistent with the way USDOL and NOVA conceptualize curriculum and leverages these to meet the goals of the grant.

Overview of Mott's Career Pathways Curriculum

The core content of the curriculum is based on industry standards and driven by the credentials. But unlike much of the standards based curriculum common in today's educational climate, the larger curriculum doesn't stop here. Moving well beyond a simple list of content to be covered and resources students will use, the Mott career pathways curriculum is student-centered and comprehensive.

Features of the Student Centered Career Pathways Curriculum

1. Intensive student assessment
2. "Screening-in" – meeting students where they are and identifying the most needed and appropriate resources
3. Individual Serice Strategy (ISS) using a range of assessments and other student information to develop student action plans.
4. Self-paced, online skill building resources
5. Monthly "Empowerment Events"
6. Intensive case management (wrap-around services)
    a. Academic Case Management Model
    b. "One-stop" enrollment management process
7. Career pathways that have multiple entry and exit points help students set proximal goals
8. Leveraging existing stacked credential programs
9. Non-credit to credit pathways
10. Stronger, more authentic links to the labor market
11. Expanding opportunities for more hands-on clinical experiences.
12. Instructors from business and industry who bring a greater level of authenticity to the classroom
13. Articulation agreements
14. Prior learning assessments

Taken together this comprehensive approach can be seen as having six primary components:

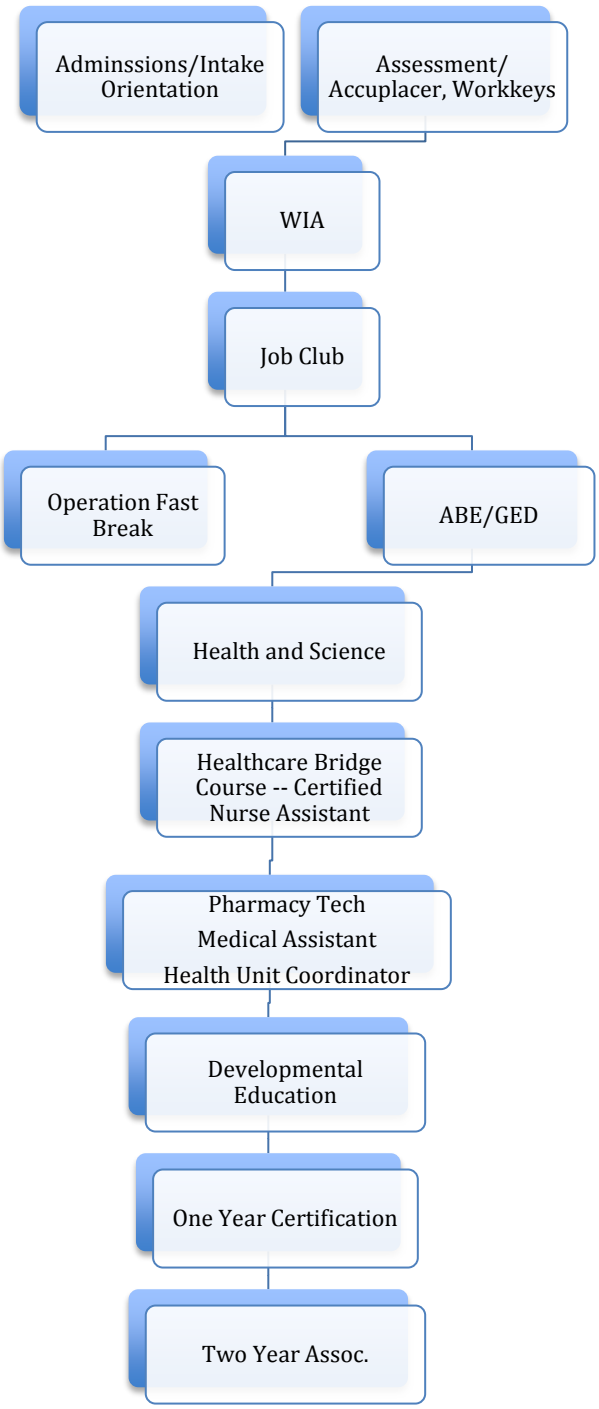
1) Screening-in and relationship building
2) Self assessment and goal setting
3) Literacy (developmental education)
4) Healthcare programs
5) Soft Skills and job seeking skills
6) Life skills and work/life balance

<u>Stackable credentials through non-credit on ramps to for-credit programs</u>

In recent years, before the beginning of the C2C grant, the WEC of MCC participated in the national "Breaking Through" initiative of the Jobs of the Future organization that centered on guided career pathways and stackable credentials. Based on that foundation, the WEC has expanded these innovations within the C2C program. This has involved building bridges between (1) "on ramp" programs such as ABE, GED, ESL, and developmental education and the programs of the WEC, (2) the bridges between non-credit WEC programming and the credit-granting career education programs of MCC, and (3) MCC's career education and workforce development programming to employment. Guiding career pathways work has also included the development of stackable credentials that offer staged employment opportunities through the completion of non-credit program completion followed by certificate and associate degree program completion. Related innovations are the development of more highly structured workforce education programs, stronger

wraparound services, the expanded use of student performance data and the monitoring of student progress, and expanded employer interfaces.

Figure 1 -- Mott Community College Career Pathways: Healthcare Model



Accelerated basic literacy and workplace skills training

Another success factor of the C2C program is the way students learn basic literacy and workplace skills through intensive and accelerated remedial literacy training and open entry/open exit ABE/GED training prior to entering a specific job skills program. What this means is that each student group enters the program as a cohort and those who need remedial instruction get involved in an individualized and accelerated developmental education program. Once they demonstrate a set level of competency, they can enter a specific job skills development program.

Through this accelerated process, displaced and unemployed adults are less likely to experience the discouragement and frustration, and often program withdrawal, that occurs when remediation stretches over a long period of time. These adults are impatient to learn employable skills and secure a job and yet need to develop a set of basic literacy and workplace skills to do so. An accelerated and intensive program of remediation is a workable solution.

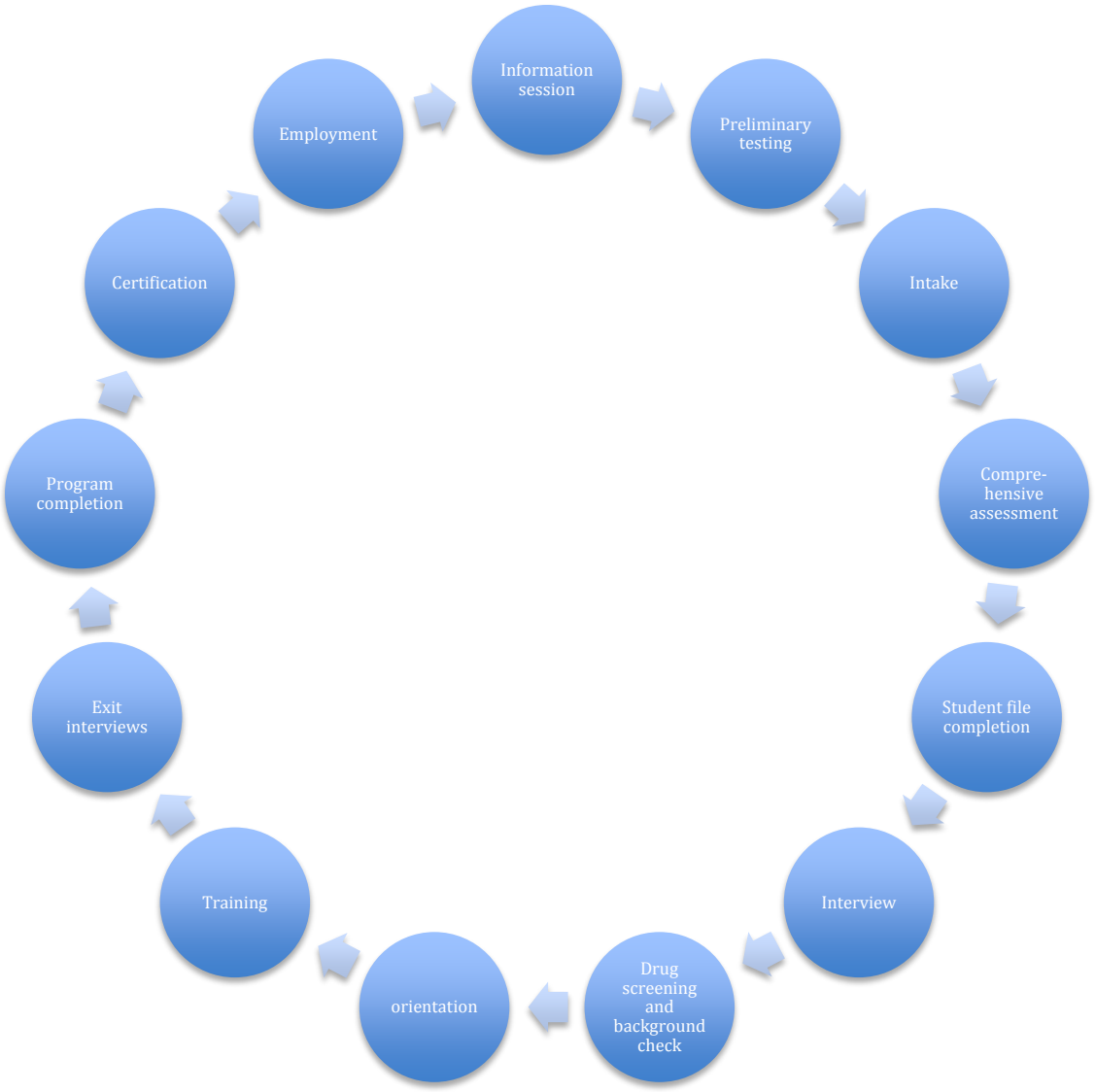
A comprehensive student focused curriculum

What we find particularly interesting regarding the career pathways curriculum is that the Mott team developed this approach primarily from a student services perspective and the specific feature of the curriculum grew out of their experience in this area and a desire to better meet the needs of this population. One of the more notable themes that we identified was the fluid and integrated way that curriculum is used strategically to help meet student needs. Traditionally curriculum is often seen merely as the content that is to be taught and separate from other factors that influence student success such as admissions, student services, and student assessment. While the Mott staff have not articulated this directly, in many respects the comprehensive career pathways they've developed represents a robust curriculum that is well designed to address the fuller range of student needs. Similar to other colleges in the consortium, the USDOL grant was a good match as it served as a mechanism for Mott to continue developing this more student-centered approach.

As stated above, the Mott team didn't specifically develop the career pathways model as a curriculum per se, but in practice the overall model functions quite well as such. However, this shouldn't suggest that the design isn't intentional. In the development of this program, the Mott team was consistent with the USDOL and C2C conception of curriculum as fostering innovation, student outcomes, authenticity, and sustainability. Similarly, it is consistent with curriculum development theory that sees curriculum as part of an ongoing and iterative process of developing new materials and procedures, trying them out, assessing their results and revising and improving the next iteration; a continuous cycle of improvement.

As the team indicated in one of the focus group interviews, this work represents a paradigm shift, with a host of student-focused resources within the college and outside the college functioning in concert under the direction of Workforce Development. They acknowledged, that "there isn't a comprehensive umbrella yet, but little by little there is the integration of the related services." Similarly, the group emphasized that this type of approach requires "seeing the student differently, as a complete individual… a philosophy of seeing people as people", and "seeing the work as a facilitator vs. a machine ". The two graphics below highlight the comprehensive nature of the healthcare career process and model and demonstrate the holistic approach used at Mott.

Figure 2 -- Healthcare Careers Process



Curriculum in action

During our site visit we had the opportunity to sit in on several classes in session and interview faculty members and the director of the nursing program. We also conducted a focus group interview with a group of students from the Pharmacy Tech program. In general we observed fairly traditional instructional practices, with students sitting at tables listening to the instructor, taking notes and asking and answering questions. We also observed students in self-paced learning computer labs with a staff member who was there to help them where needed. These observations suggested that the curriculum was clearly defined and students knew what was expected of them and were able to be proactive learners.

During our focus group interview with the students we learned that even though the semester had just started, students felt a growing connection to the program and to each other and the faculty. Students expressed that they responded well to the use of real world examples and that instructors were engaging and developed personal relationships with them that demonstrated genuine concern and support.

Suggestions for Future Growth

Continue developing and refining comprehensive student focused curricula

Similar to several of the other consortium colleges, Mott's curriculum is an innovative way of blending elements of student services and support and soft skills with professional skills, knowledge and dispositions. The program recognizes that industry skills and knowledge are not sufficient for students to be successful. In many respects this represent some interesting boundary crossing between what are traditionally thought of as curricular and non-curricular activities; that is teaching and content on one side and student support services on the other.

The work at Mott, funded by C2C blurs these traditional lines and provides students with a potentially more dynamic and effective way of fostering growth and success. We encourage Mott to continue developing curriculum along these lines and to specifically articulate career pathways as the curriculum.

Continue development of adaptive models of workforce development

One of the themes that was identified in Mott's curriculum was what we might call adaptiveness; that is the ability of the organization to make modification to the curriculum based on changing and refined student, employee, employer and marketplace needs. Our interviews with the Mott team members revealed that almost to a person, they were well connected to the local employers and had routine contact and interactions with them. As a group they were cognizant of the evolving employment climate and were able to be responsive to these changes. Similarly, as Robert Mathews described, "One of the gaps we learned to fill was to focus a little more on the intensive case management, we might be thought of as academic case management, which is different than the typical social services case management approach – a more full range of support which includes family, work/life balance, transportation, among other factors". This type of adaptation and flexibility appears to play a critical role in the project and we encourage the group to continue refining and developing this approach.

Explore ways of enhancing the instructional climate

While the instructional climate for the career pathways classrooms we observed were more than adequate by most standards, we see opportunities to enhance the teaching strategies in ways that would help support the program's overall student-centered approach. Our focus group interviews with the Mott team revealed that this is an area they have identified as an area for growth. What is particularly interesting here is that the boundary defining nature of the student-centered approach they are using is well suited for and supportive of changes and enhancement in the instructional

climate. Given the philosophic outlook among the Mott team of “seeing the student differently, as a complete individual, developing a more robust instructional climate is a natural fit.

VI. Contributions of Partners

Summary of key contributions of partners described in this section

This section provides an examination of the partnerships between Mott Community College's Workforce and Career Development (WEC) Division (also known as the Workforce Development Center) and the network of community partners engaged in achieving the objectives of MCC's Credentials to Careers initiative (TAACCCT program funded by the U.S. Department of Labor). This section focuses on the specific strategies used by the division to leverage the resources of this network to empower unemployed persons to secure good jobs and achieve financial independence. As well, this networking effort seeks to create sustainable workforce development partnerships that can impact economic development and the quality of life in the Flint/Genesee region.

Introduction: Flint Michigan and Mott's C2C's program's role in its revival

Flint, Michigan is the birthplace of General Motors. Until the 1970s, The Flint/Genesee County region was an automotive manufacturing powerhouse with 80,000 persons employed in General Motors assembly plants and related businesses. Since the closing of the assembly plants, Flint has been in a downward spiral of shuttered factories, dwindling population (losing one-half of its population from a high of 200,000 to the present 100,000), a high rate of poverty (one-third of the population is below poverty levels), a high unemployment rate (15 percent), urban decay, and rampant crime and violence (in 2012, Flint led the nation in homicide rates and was rated by the FBI as one of the two most violent cities in the nation). Flint is currently under a state-mandated emergency manager and risks joining Detroit as a city declaring bankruptcy.

On the other hand, there are some hopeful signs of resurgence led by a non-profit partnership known as Uptown Developments. A new medical school is under development, new medical centers are emerging, General Motors is reinvesting in Flint through a new facility that will employ 600 persons, and empty retail shorefronts are starting to refill.

In this milieu of despair and vision, Mott Community College (MCC) is a beacon of hope for those individuals who face barriers to educational and career success such as low income, limited literacy skills, and low job skills. Through the Credentials to Careers (C2C) initiative, MCC's Workforce and Career Development (WEC) Division is creating community partnerships that will (1) enhance services to current cohorts of unemployed and disenfranchised students and (2) become a sustainable network that advances the talent and workforce development dimensions of the region's economic development strategy. Thus, the C2C initiative is contributing to both individual and community development and to both the short-term and long-term benefit of the community.

C2C project is designed around the Workforce Education Center's earlier experiences responding to the decline of the auto industry in the Flint, Michigan area and the devastating impact this had on the local and statewide economies. They learned early on that they could not wait for unemployed and displaced workers to come to the community college; instead they had to proactively partner with a

host of private and public entities to better service the community's needs. In 2008 they were a part of a demonstration project along with the Aspen Institute on a Courses to Employment grant that helped them further shape how they could best respond to the employment needs of the community. Through this work they gained a number of key insights that significantly shaped the nature of the C2C project. These included:

1. The potential of braided funding to better meet the holistic needs of low income and displaced workers. They found that when they sought out ways to leverage various financial resources they were able to "braid" these resources together in a way that they were better able to support the full range of services this vulnerable population needed.

2. The use of a "screening-in" process that takes people where they are and finds the best fit for them. This takes more time and resources but they have found that it can mitigate individuals "stopping-out" of their programs. This approach emphasizes
    a. The importance of building trusting and supportive relationships
    b. Intensive student assessment is used to help identify the most appropriate academic placements.
    c. A host of self-paced skill building resources are available to students.

3. Intensive case management – moving beyond the traditional way that academic advising and social services tend to be bifurcated. Here Mott has developed a more inclusive form of case management that includes the full range of services and advising this population needs.

4. Career pathways that have multiple entry and exit points that help students set proximal goals that sustain them both economically and motivationally.

5. Making stronger and more authentic links to the labor market and expanding students opportunities for more hands-on clinical experiences.

6. Engaging individuals in business and industry as adjunct instructors, bringing a greater level of authenticity to students' learning experiences.

Given this background, the MCC C2C program sees itself as a "breaking through" college that will add value to the overall C2C consortium through its work in the area of navigating the space between non-credit and credit courses/training; specifically through their noncredit-to-credit healthcare training pathways model. This model is strategically designed to address critical issues that adult learners face navigating the complex array of agencies, services and resources they need to successfully transition from low skill work or unemployment to better paying skilled work. In this way an Academic Case Management model is used at MCC that is designed to enhance students' retention and achievement rates. The major project activities that support this work include:

1. The development of and/or enhancing of articulation processes and agreements
2. Use of online learning technologies
    a. Intensive remediation programs to reduce the time to the first credential and employment
    b. Teaching workplace soft skills

    c. Integrating the Basic Skills Model
3. Leveraging partnership with Genesee/Shiawassee County Michigan Works (the Workforce Investment Board), Diplomat Specialty Pharmacy and the McLaren Regional Medical Center to identify targeted credentials, pre-screening requirements and industry training requirements.
4. Healthcare career pathways
5. "one-stop" enrollment management processes
6. Academic Case Management Model
7. Deliver credentials within a career pathway in the following areas:
    a. Pharmacy Technician
    b. Medical Administrative Specialist
    c. Medical Assistant

A key success factor for the C2C program is WEC's strong partnerships with Michigan Works, employers, and other community agencies. The WEC partnership with the Flint-based Michigan Works center has actually blurred the lines between the two organizations in terms of shared services, processes, and staff. For example, WEC and Michigan Works: MCC and Michigan Works employees work side-by-side in areas such as entry and assessment. Michigan Works support is folded into WEC's braided funding approach. WEC involves employers at all stages of the progression of workforce education programs—from student selection and intake, guidance through the program of choice, internships, program completion, and employment.

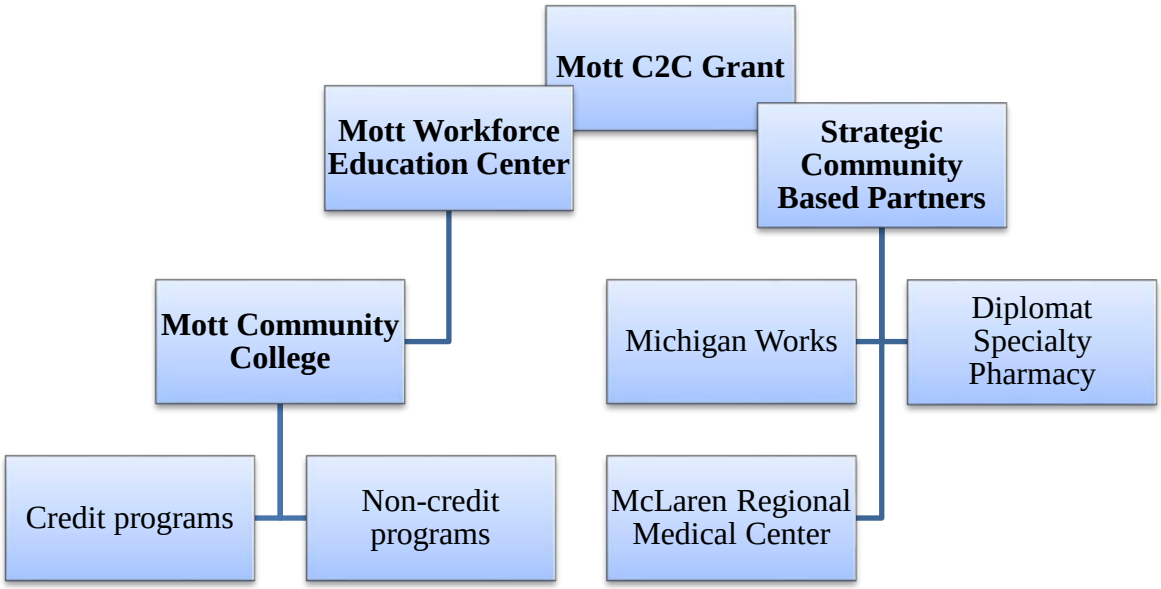
Other partnerships include the public schools, the State of Michigan (for example, No Worker Left Behind funding), Greater Flint Health Consortium, Flint STRIVE (supportive services for adults), Flint healthcare career pathways project, The Workforce Intelligence Network (WIN), and family services agencies. A good example of community engagement of MCC and WEC executives is the leadership role they have played in addressing the literacy skills crisis in Flint and Genesee County through the formation and sponsorship of the 17-organization Flint and Genesee Literacy and Basic Skills Network.

Taken together, Mott has identified the following key strategies: leveraging resources, establishing and strengthening partnerships, identifying the authentic and contextual needs of both employers and underemployed and unemployed individuals as key strategies to a comprehensive means of improving the economic outlook for this region of Michigan.

Contributions of community partners

The network of the C2C partnerships include both community entities and MCC departments. Key stakeholders include employers; non-profit community agencies; MCC faculty and administrators;

Figure 3 -- Mott Local C2C Organization Map



local, state, and federal governmental agencies, and other educational organizations. Among the community partners that are advancing MCC's C2C initiative are the following:

- Michigan Works! (Genesee and Shiawassee counties)
- McLaren Regional Medical Center
- Specialty Pharmacy
- Greater Flint Health Consortium
- Flint STRIVE (community-based organization providing job preparation services)
- Genesee Regional Chamber of Commerce
- Metro Housing Partnership
- Charles Stewart Mott Foundation
- Michigan Campus Compact
- Michigan Department of Education
- Michigan Department of Commerce (through Michigan State University)
- Genesee County government (employment services)
- Shiawassee County government (employment services)

Community partners are contributing to C2C in a number of ways as outlined below:

1. Braided funding: MCC's WEC Division receives funding from many local, state, and federal funding sources, braiding these dollars together so that funding from two or more sources can be merged to create a specific workforce development program or service. This is achieved by very aggressively seeking varied funding sources and then creatively braiding the funds secured to maximize impact.

2. Shared staffing: The WEC Division has created a shared staffing structure with the local Michigan Works! agency. MCC employees and Michigan Works! employees share receptionist, intake, orientation, testing, and other duties.

3. Student recruitment: Many of the community governmental and non-profit agencies cooperate in recruiting students for the C2C initiative.

4. Internships and other forms of experiential learning: A number of employers provide internships and other forms of experiential learning for C2C students. Michigan Works! refers to this opportunity for students as the "earn and learn" component.

5. Changes in MCC and WEC Division procedures and practices: The WEC Division is working with the MCC leadership to create a single admissions, orientation, and financial aid process so that C2C and other WEC students flow naturally into continuing learning toward an associate degree or other higher education credential. Other internal procedures and practices also change as the unique needs of the C2C students are considered.

6. Changes in MCC and WEC Division curriculum: The C2C initiative requires a close connection to the changing local and regional labor market. The WEC Division leadership and staff have increased the focus on continuous assessment of changing labor market demands and adjusting the curriculum in the direction of high demand fields. Ultimately, this ongoing attention to changing workforce requirements will impact all career education programs of the college.

7. Changes in teaching methods: The C2C initiative requires more emphasis on experiential or work-based learning that in turn requires strong partnerships with regional employers. Expanding internships and other direct learning experiences will impact other WEC Division programs as well. The WDC Division has learned how to create internship opportunities and enable persons with limited transportation options to participate.

8. Professional development of MCC and WEC Division faculty and staff: Changes in institutional processes, curriculum, and teaching methods are providing opportunities for faculty and staff professional development.

9. Blurring of boundaries between MCC/WEC Division and its community partners: As the community partners cooperate on student recruitment, program development, student services, job placement, etc., the boundaries between the organizations involved blur. Students in a medical administrative specialist class indicated their appreciation of the

MCC/WEC Division partnership with Michigan Works! since negotiating the "maze" by themselves had been frustrating and required great persistence.

10. Clarifying the mission of MCC's WEC Division: At the time of this evaluation, the leadership of the WEC Division was considering a revised mission statement which included an emphasis on community partnerships: *It is the mission of the Workforce and Career Development Division to (1) empower individuals to get good jobs and advance in their career pathways and (2) partner with employers to match their workforce skill needs with qualified employees.*

11. Creating an alignment between the C2C initiative and MCC's strategic directions: C2C and other forms of community-based programming are contributing to a strategic shift in the orientation and strategic directions of Mott Community College as a whole. Opportunities to institutionalize or scale up innovations being introduced by the WEC Division include:
    a. Emphasis on strategic community networking
    b. Emphasis on MCC faculty and staff engagement in the community
    c. Understanding where students are coming from; what their life circumstances are
    d. Focus on career and educational pathways
    e. Focus on social equity: helping students overcome barriers to career and educational success caused by poverty and low income, economic and housing isolation, and other forms of racial and ethnic inequalities.

VII. Activities Under the Auspices of the Grant

Summary of this section

Mott's C2C program represents a complex interlacing, or "braiding" of funding and services that are strategically linked to the goals of the grant. The use of strategically leveraged funds increases the range and quality of services needed to scaffold and support the holistic needs of this student population.

Specifically, C2C Funds Support:

- Career Coach/Navigator salaries
- Case Management Training
- Leveraging Funds for short term training and/or subsidized employment and supportive services
- Expanding experiential learning opportunities for internships
- Subsidizing paid internship experiences to extend the duration of the internship

Career Navigation/Case Management

Some displaced and unemployed adults find even the community college setting, much less a university environment, too intimidating to navigate on their own. Others hold a negative stereotype about government job training programs as only for the uneducated. The WEC has addressed these problems through the C2C program by introduced the concept of "career navigators," a position funded by C2C funds. The persons in this position serve as student mentors and advocates from the point of student entry to remediation to retention to employment. At other organizations and colleges, the persons in this position may be referred to as client service representatives, job coaches, intake specialists, or job development specialists.

At MCC, the career navigator provides individualized services to a cohort of TAACCCP students and, in so doing, becomes a part of the instructional team by partnering with the faculty members involved. The career navigator may provide group sessions for the cohort on topics such as career planning, study skills, time management, and resume writing. Finally, the career navigator serves as a direct link between the student and potential employers and internship sites, thus working to close the gap between and students' workplace readiness and actual employment.

Braided Funding

Sophisticated use of "braided funding"—generating and interlocking funds from multiple sources to finance various programs—allows the WEC to leverage limited funds to produce greater results than is possible when one funding source is targeted on a single program. WEC programs leverage funds from the college itself, federal financial aid (Pell Title 4A "clock hour" grants), Michigan Department of Education, regional businesses, governmental and foundation grants, and student fees.

The braided funding strategy involves a certain amount of risk since some funding sources, such as federal and foundation grants, are unpredictable. On the other hand, diversification means also gives stability in that if one funding stream ends, there will presumably others that remain. In this way, it may be the most sustainable strategy since the reality is that non-credit and workforce education funding will depend on an entrepreneurial spirit on the part of leaders for the foreseeable future. Here the use of strategically leveraged funds increases the range and quality of services needed to scaffold and support the holistic needs of this student population.

Overview of grant related activities

Taken together, the overall use of grant funds is strategically designed to build a self-sustaining regional infrastructure to serve students. Specifically, the use of grant funds are used for the following:

- Career Coach/Navigator
- Case Management Training
- Short term training
- Subsidizing supportive services
- Expanding experiential learning opportunities for internships

VIII. Assessment of students

Summary C2C Student Assessment Tools:

Mott's health career pathways program utilizes a comprehensive assessment and screening process that is designed to "screen-in" students to the right program and is consistent with the theme of being responsive to employer and student needs.

Wide Variety of Assessment Tools Including:

1. WorkKeys
2. Healthcare Career Seeker Inventory (HCSI)
3. JobFit Assessment

Mott maintains a comprehensive set of student data through their Efforts to Outcome (ETO) system which provides a systematic way of making data informed decisions. This approach helps the organization to assess which strategies were most effective and which need to be improved. Workforce Development uses the system for wide variety of problem solving and action.

The Assessment and Screening of Students

Mott's health career pathways program utilizes a comprehensive assessment and screening process that is designed to "screen-in" students to the right program. The Work Keys Service Center provides a job analysis profile, skills assessment and instructional services utilizing a range of assessments. Consistent with the theme of being responsive to employer needs, the WorkKeys assessment system works with employers to determine the skill requirements of various jobs, determine the current skills of employees/students and use this information to help educators/trainers target their instruction to help students fill these gaps.

Assessment tools

1. Applicant interview
2. Applicant Evaluation Form
3. Criminal Background Authorization
4. WorkKeys
    a. Mathematics
    b. Reading
    c. Observation
    d. Location
5. Healthcare Career Seeker Inventory (HCSI)
6. JobFit Assessment
7. Panel interview

Data-informed decision-making

In addition to screening, Mott also collects and maintains assessments and other student data to assist in sound data-informed decision making. To support this effort they use Efforts to Outcome (ETO) software to track student data which include:

- Demographics
- Expenses
- Student employment placements
- Funding resources
- Grant obligations
- Case management notes

This approach helps the organization to assess which strategies were most effective, which were not and build on the lessons learned from each iteration of data collection and analysis. In this way, decisions are made informed by systematically collected information. As Gail Bowman pointed out, Workforce Development uses the system for wide variety of problem solving and action including:

- Annual reporting to the Vice President
- Leadership team review of aggregated data
- Individuals in various student support roles reviewing student profiles to help them make good decisions
- Used systematically for managing the grants and the organization
- Sharing outcomes and progress
- Only supporting training that the economy will support

While the Mott team has increasingly learned to rely on this system along with the collection and interpretation of other sources of data, as Gail Bowman emphasized, "we don't want to become slaves to these metrics; we want to leverage this information and work smarter and more effectively to meet student's needs". We observed the use of data among the intake staff, the various student services personnel and the administrative staff. This ranged from seemingly simple issues such as if issuing a gas card to a student was warranted to decisions about programing. Consistent with the student-centered outlook at Mott, several staff members expressed that their approach to data-informed decision making evolved from a focus on how they can better serve students.

During the period of the C2C program, this screening-in process has deepened through obtaining more data on the background and needs of individual displaced and unemployed workers and through developing effective responses to those needs upon program entry. The C2C faculty and staff have gained greater appreciation that the individuals served by the C2C program tend to have been "beaten up" by life and the lack of resources. Although they have a wide range of educational backgrounds, they tend to be high school dropouts, are single parents, have low test scores, lack dependable transportation, need clothing, lack dependable childcare services, lack study skills, have little by way of support, and suffer from low self-esteem. These individuals need a job *now;* they are impatient to get a good, sustainable job in order to support their families. They want stability in their life; they are worn out from the chaos caused by all of the uncertainties and barriers in their lives. Their challenges are so immediate that it is very hard for them to think about career progression, earning a certificate or associate degree, or other long-term life goals. And yet, amazingly, these

students exhibit true "grit" and persistence in seeking a good job and a more stable life. By going beyond superficial acquaintanceship to really know each individual student and his/her needs, the C2C faculty and staff is better prepared to design effective practices to respond to those needs while celebrating their grit and treating them with the dignity and respect that they deserve.

The C2C staff has developed the following insights regarding the entry needs of displaced and unemployed adults that must be met during the screening in process and beyond in order to empower them to benefit from other aspects of the WEC/Michigan Works wraparound services concept:

- In general, these students need the gift of a caring, nurturing, attentive faculty and staff. A culture of caring concern is the WEC's "secret sauce."
- The students need "small successes." "I actually passed that test!"
- The students benefit from working with a cohort of students with common experiences as a mutual support group.
- The students benefit from a very structured schedule and structured classroom methods including required attendance and make-up arrangements.
- The time courses are offered is important to these students (in synch with their childcare and other responsibilities—no early morning classes)
- While not funded by C2C funds, students working with wraparound services benefit from assistance such as gas cards, bus cards, books, business clothing, and access to computers, tutoring services, etc.
- The students prefer to be referred to as students rather than as clients.
- The students need to visualize clear career pathways—how does what each class contribute to my goal of getting a good job?
- The students benefit from experiential learning—they welcome any exposure to their chosen career field such an internship, corporate visit, classroom visit by an employer, and participating in a mock interview.
- The students are very curious and anxious about job opportunities—they want to know who the employers are, what jobs are available, how they can get help to find a job, and what their chances are of finding a job upon program completion.

Note here, that while "Assessment" in educational programs typically refers only to the assessment of students, Mott's process has been to use it for students, but also as a tool for assessing how they can continually improve their own processes.

IX. Factors Contributing to the Involvement of Community Partners

Summary of this Section

This section outlines six factors that contribute to the involvement of community partners in the C2C initiative: shared mission, opportunity to transform the workforce and career education system in the community, social equity, adjusting to the "new normal of limited financial resources, rapidly changing knowledge and skill requirements of the workforce, and shared interest in the economic recovery of the Flint/Genesee region.

Factor One—Shared mission

MCC and the community partners all share a mission that relates to the success of individuals, businesses, and communities in the Flint/Genesee region. In addition, the partners are committed to a specific mission of empowering individuals who have at-risk factors for career and educational success such as low income, limited literacy skills, and limited job skills to get good jobs and advance in their careers.

Factor Two--Opportunity to transform the workforce and career education system in the community

The educational system in nearly every urban center, including Flint, has failed to prepare students for the demands of the global economy and the technology-centered economy. By creating community partnerships in Flint, a "surge force" can achieve momentum toward reform that no one institution, including the community college, can do alone.

Factor Three—Social equity

Racial and ethnic minorities in Flint and elsewhere continue to experience persistent and entrenched inequities in terms of wealth, income, economic opportunity, residential isolation, and discrimination. Community partnerships such as those developed for the C2C initiative can help to create opportunities for disenfranchised groups to enter the American economic mainstream.

Factor Four—Adjusting to the "new normal" of current and projected financial limitations for educational and other community-based institutions

By sharing resources and supporting the braided funding strategy of the WEC Division and the C2C initiative, the partners can maximize the impact in terms of student learning outcomes of the limited dollars available.

Factor Five—Rapidly changing skill requirements of the workforce

All of the partners recognize that the Flint/Genesee region must respond to the escalating knowledge and skill requirements of the workforce and the technology-centered economy. The C2C network of

partners seeks to prepare students for a career pathway that leads to job security in the high demand occupational fields of the future.

Factor Six—Shared interest in the economic recovery of the Flint/Genesee region

All partners seek to contribute to the economic recovery and growth of the region.

X. Contributions from Partners Most Critical to Success of the Grant

Summary of Findings from this Section

- A willingness to do things differently than they have in the past;
- Creative collaboration around leveraging scarce resources;
- Blurring of boundaries between the various partnerships with all the stakeholders taking more active roles;
- The creation of stronger strategic alignments between organizations that make boundary crossing possible;
- The collaborative development of the healthcare career pathways and the comprehensive student focused curriculum;
- Applied and authentic learning opportunities both in the classroom and during internships.

We also found that several other areas that have tremendous opportunities to push the potential of the C2C grant effort and related work to the next level. These include:

- Encourage greater professional development in teaching and the principles of adult learning;
- Expand the outlook and use of student data into more formative methods;
- Continue to build the successful procedures and practices associate with this boundary crossing into the normative structure of the different organizations to foster sustainability.

As we examined the contributions from the partnerships that were most critical to the success of the grant we noted a clear willingness among the various stakeholders to do things differently. The "new normal" with the rapidly changing skill requirements of the workforce has created an environment where the creative collaboration and leveraging of scarce resources is necessary to meet the complex needs of the displaced and unemployed workers in this region of Michigan. In this environment the contributions that are currently most critical to the success of the grant appear to fall in the following categories:

1. Blurring of boundaries between the various partnerships with all the stakeholders taking more active roles in:
    i. Curriculum development
    ii. Identification of needs
    iii. Student assessment
    iv. Internships and other learning experiences
    v. Student support services
    vi. Job seeking and placement
2. Creating stronger strategic alignments between organizations that make boundary crossing possible;
3. The collaborative development of the healthcare career pathways and the comprehensive student focused curriculum;

4. Applied and authentic learning opportunities both in the classroom and during internships.

We also found that several other areas that are not as evolved as the above represent tremendous opportunities to push the potential of the C2C grant effort and related work to the next level. These have to do with how the partners can build on the success thus far and push the instructional side of the career pathways curriculum.

1. Encourage greater professional development in teaching and the principles of adult learning;
2. Expand the outlook and use of student data into more formative methods:
    a. Strengthen data feedback loops with instructors that help inform on the relationship between instructional practices and student success
    b. Extend the data capacity to student and encourage them to use their own data to set goals, monitor their progress towards those goals and adjust their learning behaviors accordingly
3. Continue to build the successful procedures and practices associate with this boundary crossing into the normative structure of the different organizations to foster sustainability.

Appendix D: Mott Logic Model Recommendations

Name of C2C Institution:	Mott Community College
Authorized C2C Project Director:	Robert Matthews

Top-Recommended Option for Logic Model Focus

Title of Project/Sub-Project: Increase Participant Success by in-depth **case management services** for the target population that is hard to serve.

Project Summary Description	**Briefly describe what is different or unique about this area of focus that makes it a potential promising practice**	**Briefly describe how/if this project relates to C2C's overarching model of college partnerships with community-based workforce organizations and employers**	**Identify which of the 6 C2C initiative's core elements is most closely associated with this project (see list below)**
Develop in-depth case management advising process • Career Coach/Navigator funding • Case Management Training • Leveraging Funds for short term training and/or subsidized employment and supportive services • Labor Market knowledge • Community Partner for holistic social services	Develop comprehensive Individual Service Strategy (ISS) with an educational and/or employment portfolio. • ISS is based on an analysis of the assessments, surveys, questions, work and educational history, personal preferences, and interviews as the action plan for the individual services required for the participant to accomplish for educational and employment goals. • One on One Communication plan • Monthly	Healthcare students will be assigned a Career Coach/Navigator from beginning to one year after employment. • Delivered Services will be motivate, support and empower the participant, build rapport, monitor and document services and outcomes, and provide referrals to community partners. • Update the ISS, education and career plan monthly or as needed adjusting the participant's goals to accommodate the life's challenges	4. Plug regional program or service gaps 5. Strengthen participant support services to align systems

	Empowerment Events: Case Mgmt. • ETO & OSMIS system entries: Case Mg Technology • Monthly Action items for Career Coach/Navigators to meet for information, education, staff support and participant struggles • Formal Case Management Advising Processes	(remember "hard to serve"). • Keep managing and advising the participant of the planning, preparing and training mindset to accomplish goals. • Attend Career Coach/Navigator meetings to discuss case management difficulties • Network with other Case Management units, Workforce staff and employers to discuss job matching & placement either subsidized or unsubsidized for work experience.	

Alternative Option for Logic Model Focus

Name of C2C Institution:	Mott Community College

Title of Project/Sub-Project: Enhance healthcare career pathway by enhancing stackable credentials

Project Summary Description	**Briefly describe what is different or unique about this area of focus that makes it a potential promising practice**	**Briefly describe how/if this project relates to C2C's overarching model of college partnerships with community-based workforce organizations and employers**	**Identify which of the 6 C2C initiative's core elements is most closely associated with this project (see list below)**
• Lack of employable skills; foundational skills, life skills, workplace competencies, and job-specific skills • Minimal technology skills • Lack of high school diploma, ABE, GED, and ESL • Insufficient/inefficient access to technology • Prior job eliminated assembly or general labor/non-skilled positions • No coordinated effort to honor competencies/articulate credit among community colleges • Difficult to articulate credit and non credit programs within institutions due to faculty contracts	• Business demand for new, skilled healthcare workers • MCC is working together with employers, workforce boards and other stakeholders • TAA grant • New technologies • Existing Prior Learning Agreement/Articulation Agreement/MOU between consortium colleges, financial aid for students (Pell, Vrap, etc.) Company Tuition Reimbursement • Education / healthcare coordination on required credentials / skill sets • MCC has ETO a single database to track participants from intake to training and employment • Work groups to develop online components and/or courses in basic/foundation skills using Career Ready 101	• Improved curricula aligned with healthcare employers needs • Online courses/course components in healthcare outside of the classroom • Prior learning assessments available at all member institutions, to place students into stacked/latticed system • All students with an educational plan tailored to meet their individual learning gaps and participating company hiring requirements • Increased knowledge sharing and collaboration	2. Build or Enhance stackable "stepping stone" credentials 4. Plug regional program or service gaps

	(WorkKeys/ACT) • Leveraged funds from Mott Foundation, Michigan Economic and Development Corporation (MEDC), and other grant funded programs • Michigan Works! Programs • National Certifications (C.N.A., Pharmacy Technician, Home Health Aid, Medical Administrative Assistant, NCRC, etc.) • Existing Community College Programs (Pathways) • Existing stacked credential programs at consortium schools	across consortium colleges	

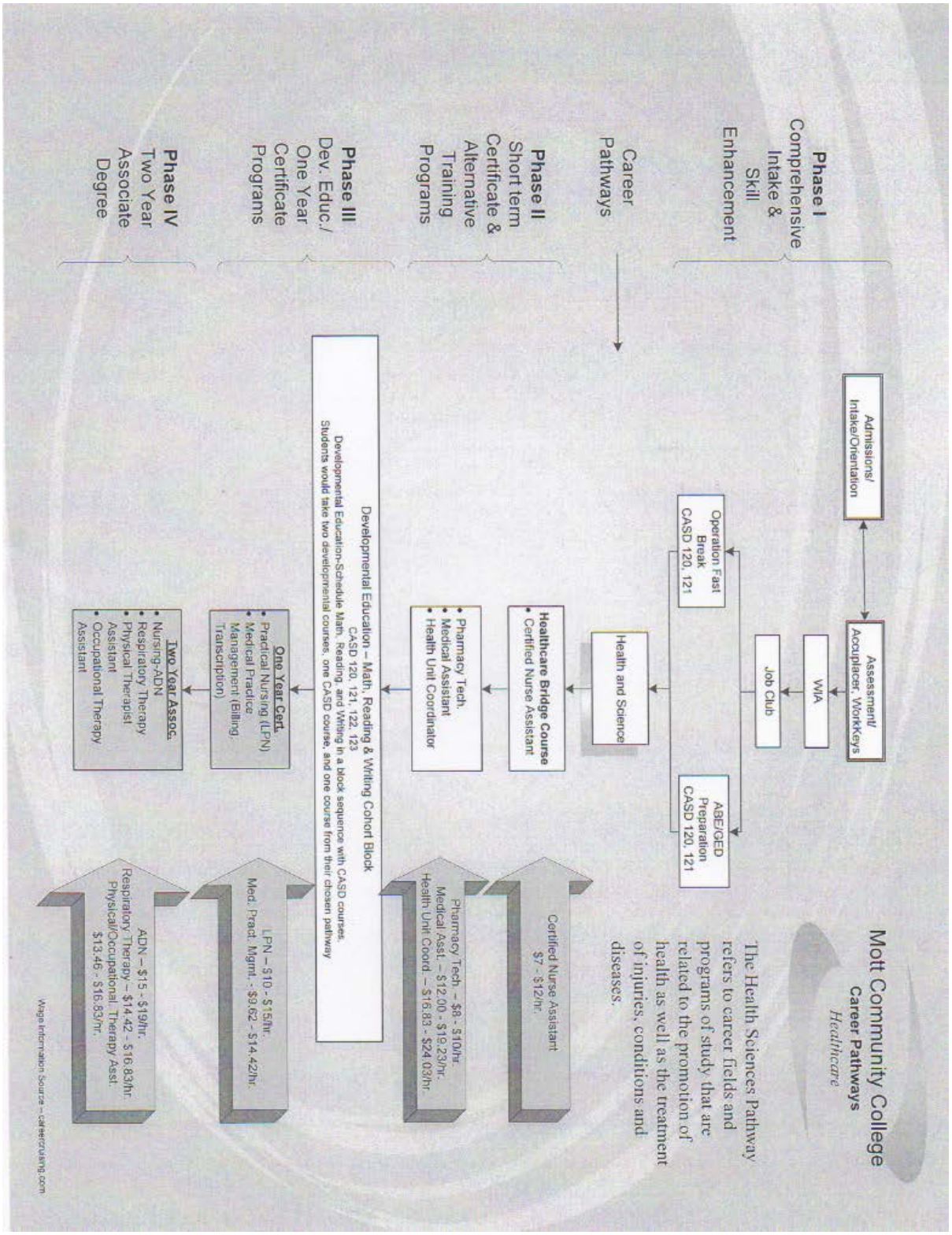
Appendix E: C2C Site Visit Preparation Matrix

Dept. of Labor (USDOL) Program Implementation Evaluation Questions	Artifacts?	Observations?	Interviews of college personnel?	Interviews of Non-profit and/or community partners	Interviews of Industry partners?
1) Curriculum: How was the particular curriculum selected, used, or created?	Curricula and student work (though these were not created with C2C funds so spend less time on this).		Student focus group.		
2) Program design and structures. How were programs and program designs improved or expanded using grant funds? What delivery methods, program administrative structures, support services and other services were offered?	Program literature	Observations of intake enrollment assessments, observation of a job development specialist, classroom participation.	Project personnel, front-end counselors, job development specialists, student focus group, focus group with coach navigator team		
3) Assessments: Were their in-depth assessments used to select participants? What assessment tools and process were used, how were they used and who conducted them?	Print out of Work Keys assessment, and "Healthcare Career Inventory," intake file folder. Interest form that they initially fill out to help them to direct them to information sessions on different programs.	Observations of front end-counselors doing intake interviews.	Project personnel, front-end counselors,		
3) Recruitment, -- Students are recruited through the Workforce Development Agency. They also draw from multiple non-profits.	Materials for recruitment		Student focus group, interview of front-end counselors.		

4) Training,		Observations in classrooms in the two healthcare settings.	student focus group, job development specialists, coach navigator team focus group	Worksite visit (regarding the worksite's needs for training)	Worksite visit (regarding the worksite's needs for training)
5) Placement,		Observations of Information Sessions for particular career interests.	student focus group, Interview of staff who are involved in supportive services; (job development specialists, coach navigator team focus group)	Worksite visit	Worksite visit (regarding the worksite's needs for training)
6) Program management,			Interviews with program management team members, grant director		
7) Leveraging of resources,			Interviews with program management team members, grant director		
8) Commitment to program sustainability			Interviews with program management team members, grant director		
9) Factors that contributed to partners' involvement or lack of involvement in the program,			Interviews with program management team members, grant director		
10) Contributions from partners that were most critical to the success of the grant program, C2C Funding was given to support expanding some of our experiential learning opportunities for internships at the conclusion. Another source of funding gave money to provide incentives to employers		Observations at sites where the C2C funds will be used to develop experiential learning internships.	Interviews with program management team members, grant director	Workforce Board at Michigan Works	

11) Contributions from partners who had less of an impact.		Observations at sites where the C2C funds will be used to develop experiential learning internships.	Interviews with program management team members, grant director		

Appendix F: Healthcare Career Pathways Model



Chapter 4: Muskegon Community College
Credentials to Careers Program

ABSTRACT

Within the larger consortium, the Muskegon C2C project is a response to changes in the economic backbone of this region of the country and the associated need for skilled workers who can navigate between design and fabrication. Traditionally machining and industrial design were taught in separate programs, however as the nature of manufacturing has changed there is a greater need for workers who are cross-trained in these two areas. Muskegon Community College (MCC) responded to this need by collaboratively developing a combination computer – aided design (CAD) and computer numerical control (CNC) career pathway that ranges from an 8-week academy to an Associate's Degree in CAD/CNC. The project is enhanced through strategic alignments with community partners including employers, K-12 school districts, universities, governmental agencies and non-profit community organizations.

Among the most critical contributions from the various partners is the manufacturers' role in the development and design of the CAD/CNC program. In many respects, this contribution more than others has the potential to have the most direct impact on the vulnerable population the program is designed to serve. The direct pipeline between the current manufacturing needs and the providers of this training provide a level of congruence with actual jobs not always found in the development of academic programs. Supporting the core CAD/CNC curriculum, the student supportive services that are available provide additional resources that will ensure greater student retention and success.

Chapter 4 Executive Summary

Project Background and Purpose

The NOVA's Credentials to Careers (C2C) USDOL-TAACCCT Project, a consortium among seven community colleges along with their strategic partners, is designed to address changes in the economic and employment outlook, specifically in the science, technology, engineering and mathematics (STEM) related areas. Representing diverse programs, needs and geographic areas of the country, seven leading community colleges, along with their strategic partners from business and non-profit sectors as well as the Aspen Institute and Achieving the Dream, the consortium was purposefully assembled to meet contemporary employment challenges for unemployed and displaced workers. With the collaboration of the strategic partners and the cumulative knowledge and experience of the consortium members, the aim is to leverage[8] resources, skills and experience to help the target population increase attainment of credentials and ultimately employment. To attain this goal, the consortiums efforts are strategically aligned with five innovative core design elements:

6. Evidenced-Based Design
7. Stacked and Latticed Credentials
8. Online and Technology-Enable Learning
9. Transferability and Articulation
10. Strategic Alignment

Within the larger consortium The Muskegon C2C project is centered on a computer –aided design (CAD) and computer numerical control (CNC) Associate Degree program. Traditionally machining and industrial design were taught in separate programs, however as the nature of manufacturing has changed there is a greater need for workers who are cross-trained in these two areas. This program came about as the result of ongoing partnerships with Muskegon area manufacturers who have expressed the need for workers with this combination of skills. Muskegon Community College (MCC) is also partnering with Michigan Works as the local workforce development agency. The program is also structured around a comprehensive philosophy of student support services designed to assure that adult learners successfully make the transition from lower paid work or unemployment to high skilled, high paying careers.

Muskegon's C2C Background

Muskegon Community College's C2C program provides a career pathway in advanced manufacturing for workers cross-trained in computer –aided design (CAD) and computer numerical control (CNC). This focus came about as the result from an ongoing collaboration with several area employers including Anderson Global and Alcoa Howmet. As Dan Rinsema-Sybenga, Dean of Workforce and Talent Development, pointed out, local manufacturers are

[8] Here, and throughout this report, reference to "leveraging of resources" should not be confused with co-mingling of funds.

currently unable to fill positions because many workers, who may have come out of low-skill jobs before the recession, lack the high tech skills in machining that are needed. Today employees need working knowledge of engineering and design principles as well as computer programming, skills most experienced traditional line workers do not possess. This project is specifically designed to fill this gap with CNC emphasizing more of the programming skills and CAD focused more on design and engineering tasks.

Overview of Findings:

Changes since Year One

- Development of the hybrid CAD and CNC program
- Recruitment of over 60 students for the hybrid program
- Incorporation of flipped classroom and on-line features in the hybrid program (simulator training for "classroom" or content component of program)
- Selection of a paraprofessional to assist students in the CAD/CNC lab setting
- Creation of career advocate position
- Building of employer partnerships
- Enhanced job placement of program graduates
- Partnerships with regional high school vocational education programs

The successes and the challenges at the end of Year Three

- Successes: What is Working
  - ✓ Improved marketing—website, social media, press releases, word of mouth, brochures, and community presentations
  - ✓ Work of the career advocate: individual intake sessions with students, case management with each student, job placement, communication with program faculty
  - ✓ Paraprofessional providing individual support to students in CAD/CNC lab
  - ✓ New "on-ramps" to CAD/CNC program such as College Prep 101 and employability skills training by Michigan Works!
  - ✓ First step on career ladder: accelerated CAD/CNC academy
  - ✓ Tuition assistance (albeit not provided by the C2C grant)

- Challenges: Areas for Continued Improvement
  - ✓ Further integration of general education classes (Math, English, Business Communications)
  - ✓ Transfer of CAD/CNC program into four-year programs (for example, Ferris State University)
  - ✓ Faster pace of curricular change (frustration of employers of pace of change in educational programs
  - ✓ Timing of classes to accommodate course schedule to other life responsibilities of students
  - ✓ Pell grants: concern about using up Pell grant funds prior to program completion
  - ✓ Further work on stackable credentials

- ✓ Further work on career and college pathways
- ✓ Further work on embedding student support services into occupational programs
- ✓ Further work on wraparound services and case management for individual students
- ✓ Expansion of experiential learning

Sustainability: C2C impact on future of MCC

- Program-level sustainable elements of C2C program
  - ✓ Lab redesign
  - ✓ Simulation lab software upgrade
  - ✓ CAD/CNC equipment upgrade
  - ✓ Faculty cross-training
  - ✓ Capstone course for CAD/CNC students
  - ✓ Bridge program—accelerated 8-week academy
- Institutional-level sustainable elements of C2C program
  - ✓ Sustainable community partnerships
  - ✓ Link of C2C innovations to MCC's Achieving the Dream initiative
  - ✓ Flipped classroom approaches in other programs (for example, nursing)
  - ✓ Evidence-based program design

Contributions of Partners

C2C's strategic alignment with community partners includes employers, K-12 school districts, early colleges and charter schools, universities, governmental agencies such as Michigan Works!, and non-profit community organizations. This alignment is built on the foundation of partnerships that MCC has developed with individuals, businesses, and communities over many years. A unique dimension of the C2C partnerships is that the CAD/CNC program was redesigned in cooperation with specific employers to meet their urgent needs for skilled workers. Among the community partners that are advancing the CAD/CNC program are:

- Employers, including Anderson Global and Alcoa Howmet
- Michigan Works! (Muskegon-Oceana)
- West Michigan Strategic Alliance (strategic regional economic development consortium of business and educational leaders)
- K-12 school districts, including the development of 2+2+2 programs, STEM faculty professional development programs (such as math summit for math faculty), and data sharing
- Universities (articulation agreements for the CAD/CNC program)
- Local, state, and national governmental agencies
- Community-based non-profit organizations

Most critical contributions of community partners: Year One to Year Three

- Recruitment of students for the CAD/CNC program (Michigan Works)
- Tuition reimbursement by employers

- Provision of internships and part-time work experiences for students by employers
- Shared employer/MCC faculty/staff curriculum planning
- Employer-led program advisory committees
- Job placement of graduates by employers

Factors which limit community partnerships

- Concerns about bureaucracy—state and federal regulations
- The pace of curricular change at MCC is slower than the pace of change in business
- Time constraints for business leaders—difficulty in attending MCC advisory meetings

Curriculum

The curriculum for CAD/CNC program at MCC came about as the result from ongoing feedback from local manufacturers in the Muskegon area who were calling for skilled workers who could navigate between design and fabrication. Responding to this feedback MCC developed 4 program options that fall on a career pathways continuum that range from an 8 week academy to an Associate's Degree in CAD/CNC. Both the USDOL and NOVA have conceptualized curriculum as an action arm of the grants efforts; serving as a means of innovating, fostering outcomes, emphasizing authenticity and ensuring sustainability. MCC's CAD/CNC curriculum effectively does each of these. This curriculum represents an innovative way of addressing gaps in current training models.

CAD/CNC Career Pathways

1. CAD/CNC Accelerated Academy
2. CAD/CNC Advanced Accelerated Academy
3. CAD/CNC Certificate program
4. CAD/CNC Associate Degree

Supporting the core CAD/CNC curriculum, the student supportive services that are available provide additional resources that will ensure greater student retention and success. Providing an additional layer to the curriculum, Michigan Works provided a range of instruction on the "soft skills" identified by area employers as lacking among many workers.

In action, the program emphasizes hands-on experiential learning with opportunities for formative feedback which enhances learning and student motivation. Similarly we observed examples of the flipped classroom concept used very effectively.

Use of Grant Funds

The overall use of grant funds is strategically designed to develop a new program that meets the needs of area employers. Specifically, grant funds support the following:

1. The purchase of new CNC simulators (Essentially the computer portion of CNC milling machine students will learn to use on the shop floor).
2. The purchase of new CNC Mini Mills

3. Master3DGage Coordinate Measuring Machine Arm (Requested specifically by one of the employer partners, Alcoa Howmet, which needs workers trained in highly precise measuring)
4. Providing the salary of the Grant/Project Coordinator position

Because of the relatively compact nature of the Muskegon C2C program, the use of grant funds is similarly straightforward. Like the other C2C colleges, Muskegon does leverage existing college and partner resources to accomplish its goals, however it is the grant dollars in large measure that have allowed them to develop the new curriculum, purchase the equipment needed to support the program, and staff the program appropriately to ensure they meet their stated goals.

Taken together, the overall use of grant funds is strategically designed to develop a new program that meets the needs of area employers. Once established this program will be self-sustaining as a standard offering in the selection of various career pathways within the college.

Assessment of Students

The Muskegon CAD/CNC program uses a variety of student screening assessments to appropriately match students to the program as well as learning assessments to guide students through the program and ensure mastery of the requisite skills and knowledge. These screen and assessment tools include:

1) WorkKeys assessment
   a) Job skill assessments
   b) Job analysis
   c) Skill training

2) Computer Adaptive Placement Assessment and Support System (**COMPASS)**
   a) Reading
   b) Writing
   c) Mathematics.

3) Tooling U
   a) CNC programing
   b) CNC mill operator
   c) CNC lathe operator

Factors Contributing to the Involvement of Community Partners

Six factors that contribute to the involvement of community partners in the C2C initiative were identified:

1. Shared interest in the economic stability and growth of the Muskegon region: All partners seek to contribute to the economic stability and growth of the region.

2. Rapidly changing skill requirements of the workforce: All of the partners recognize that the Muskegon region must respond to the escalating knowledge and skill requirements of the workforce and the technology-centered economy. The C2C network of partners seeks to prepare student for a career pathway that leads to job security in the high demand occupational fields of the future.
3. Shared mission: MCC and the community partners all share a mission that relates to the success of individuals, businesses, and communities in the Muskegon region.
4. Opportunity to transform the workforce and career education system in the community: While manufacturing has come back in Muskegon the low-skill/high wage jobs are gone for good. Currently there are not enough skilled workers to meet the demands of industry creating an urgency to meet those demands lest businesses move elsewhere. By creating community partnerships in Muskegon, a "surge force" can achieve momentum toward reform that no one institution, including the community college, can do alone.
5. Social equity: Community partnerships such as those developed for the C2C initiative can help to create opportunities for disenfranchised groups to enter the American economic mainstream.
6. Adjusting to the "new normal" of current and projecting financial limitations for educational and other community-based institutions: By sharing resources and supporting the redesign of the CAD/CNC program and the C2C initiative, the partners can maximize the impact in terms of student learning outcomes of the limited dollars available.

Contributions from Partners Most Critical to Success of the Grant

Among the most critical contributions from the various partners is the manufacturer's role in the development and design of the CAD/CNC program. In many respects, this contribution more than others has the potential to have the most direct impact on the vulnerable population the program is designed to serve. The direct pipeline between the current manufacturing needs and the providers of this training provide a level of congruence with actual jobs not always found in the development of academic programs.

Related to this important contribution is how this collaboration has influenced the development and refinement of the curriculum. This dynamic program provides students with hands-on experiential learning opportunities and internships that can lead to students entering this high paying career pathway.

Lastly, the collaboration among the different stakeholders creates an opportunity to build on C2C successes and lessons learned and seek to integrated these with current institutional-level strategic directions: The redesign of MCC's CAD/CNC program is integral to institutional-level strategies to influence and transform instruction and student services. These future shaping strategies include:

1. Strategic alignment with community partners including employers, K-12 school districts, early colleges and charter schools, universities, and governmental agencies.
2. Updating of the MCC's strategic plan
3. Individualized student wraparound case management

4. Evidence-based design
5. Institutionalization of innovations such as flipped classrooms, stacked credentials, experiential learning, and technology-enabled programming;
6. Linking the accreditation process (Higher Learning Commission of the North Central Association of Colleges and Schools), MCC's Achieving the Dream program, and the C2C initiative to become a holistic strategic institutional development pathway.

Table 2 – Interview and Observation Participants and Topics

Name	Position	Topics
Dan Rinsema-Sybenga **(Yr. 1& 3)**	Dean Of Workforce And Talent Development	Comprehensive set of topics including: 5. Partnerships 6. Student services 7. Curriculum
Valarie Shelby **(Yr. 1& 3)**	Grant coordinator CAD/CNC program	
Tom Martin **(Yr. 1& 3)**	Engineering and Design Technology Department Chair	
Tom Groner **(Yr. 1& 3)**	Instructor, Machine Technology	
Al Wahr **(Yr. 3)**	Instructor	
Valarie Shelby and MCC staff **(Yr. 1& 3)**	Student Success Center staff	Services available to students
Name	**Position**	**Topics**
Michigan Works staff **(Yr. 1& 3)**	Michigan Works staff	Partnership, recruiting, curriculum and instruction (soft skills)
Students **(Yr. 1& 3)**	CAD/CNC students	Experiences in the program
Observations		
Observed	**Topics**	
Student Success Center staff **(Yr. 1& 3)**	Observations of supportive services available to students	
Students & CAD/CNC faculty **(Yr. 1& 3)**	Classroom/instructional observations	

V. Contributions of Partners

Summary of this Section

This section provides an examination of the partnerships between Muskegon Community College (Michigan) and community organizations that are engaged in or supporting MCC's C2C initiative that focuses on the redesign of the CAD/CNC program featuring innovations such as a flipped classroom model[9], technology-enabled learning, stacked credentials, individualized student wraparound case management, experiential learning, and mastery learning. It is expected that the redesign of the CAD/CNC program will lead to similar redesign projects in MCC's other career education programs.

Muskegon Community College Overview

While a number of the consortium members are involved in somewhat larger and more complex partnerships across multiple agencies and collaborators, Muskegon Community College's C2C program is comparatively straightforward. In collaboration with several area employers including Anderson Global and Alcoa Howmet, MCC identified the need in advanced manufacturing for workers cross-trained in computer–aided design (CAD) and computer numerical control (CNC). The program is designed to assist workers in developing skills, knowledge and employment opportunities in advanced manufacturing. As Dan Rinsema-Sybenga, Dean of Workforce and Talent Development, pointed out, local manufactures are currently unable to fill positions because many workers, who may have come out of low-skill jobs before the recession, lack the high tech skills in machining needed today. Today workers need working knowledge of engineering and design principles as well as computer programming, skills most experienced traditional line workers do not possess.

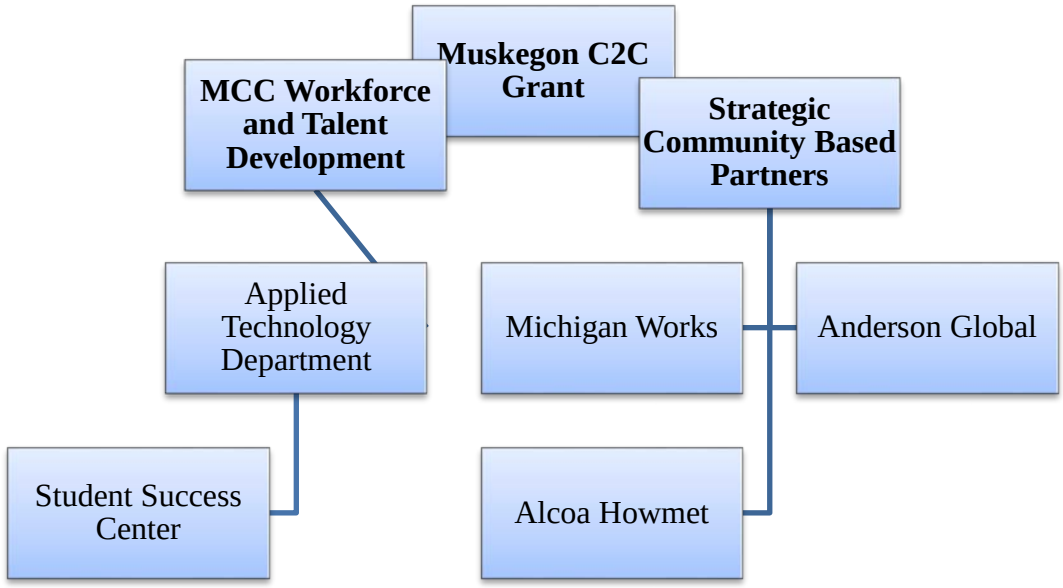
In order to meet these employers identified needs the Muskegon C2C project offers an Associate Degree in CAD/CNC. In order to ensure the successful transition from lower paid work or unemployment to high skilled, high paying careers, the program also features comprehensive student support services designed specifically for this population of adult learner. Michigan Works, one of MCC's community partners, plays an important role in providing these wrap around services by offering workshops in employer identified soft skills.

MCC's Goals for the grant are to increase the programing capacity by 40 students over the three years of the grant in order to meet the area employers' needs. To achieve this goal, MCC is developing and refining curriculum that provides cross-training in CAD and CNC and better

[9] Regarding "the flipped classroom:" Instead of the traditional model of students gaining content in class through lectures and then applying that content on their own as homework, in a "flipped classroom" the content delivery happens as homework—in this case through on-line materials--and application of this content done in class/lab time, where there can be greater help from the instructor and greater dialogue with peers.

incorporates metrology into its machining programs. As Dan Rinsema-Sybenga said, "Companies are looking for cross-trained candidates to fit into new, more technology-driven positions. This is all part of the evolution of the workforce." Similarly, Bob Becklin, an apprenticeship coordinator at Anderson Global said that the Accelerated Academy in CAD/CNC would be helpful to those looking to become apprentices and eventually become journeymen earning $26 per hour.

Figure 1 -- Muskegon C2C Organization Map



Contributions of Community Partners

Contributions of the community partners to the C2C initiative

C2C's strategic alignment with community partners includes employers, K-12 school districts, early colleges and charter schools, universities, governmental agencies such as Michigan Works! and non-profit community organizations. This alignment is built on the foundation of partnerships that MCC has developed with individuals, businesses, and communities over many years. A unique dimension of the C2C partnerships is that the CAD/CNC program was redesigned in cooperation with specific employers to meet their urgent needs for skilled workers. Among the community partners that are advancing the CAD/CNC program are:

- Employers, including Anderson Global and Alcoa Howmet
- Michigan Works! (Muskegon-Oceana)
- West Michigan Strategic Alliance (strategic regional economic development consortium of business and educational leaders)

- K-12 school districts, including the development of 2+2+2 programs[10], STEM faculty professional development programs (such as math summit for math faculty), and data sharing
- Universities (articulation agreements for the CAD/CNC program)
- Local, state, and national governmental agencies
- Community-based non-profit organizations

External and internal partners are contributing to the C2C initiative in a number of ways as outlined below:

1. Curriculum development: Local businesses facing a shortage of CAD/CNC technicians participated in the redesign of MCC's program.

2. Experiential learning: A component of the redesigned CAD/CNC program is student internships at local businesses.

3. Marketing and student recruitment: A number of businesses and other community organizations have assisting in recruiting students for the program

4. Internal partner cooperation: MCC faculty and staff members have cooperated in developing the new CAD/CNC program, laboratory redesign, requisition and installation of laboratory technology and equipment, cross-training of faculty, and student recruitment.

5. Articulation with secondary schools and universities: MCC has made it an institutional priority to articulate the redesigned CAD/CNC program and other career education programs with regional secondary schools and universities.

6. Shared funding: MCC cooperates with Michigan Works, employers, and other community organizations to share CAD/CNC and other program costs as a means of maximizing the benefit of the limited funds available.

7. Integration with institutional-level strategic directions: The redesign of MCC's CAD/CNC program is integral to institutional-level strategies to transform instruction and student services. These future shaping strategies include:

    a. As outlined above, strategic alignment with community partners including employers, K-12 school districts, early colleges and charter schools, universities, and governmental agencies such as Michigan Works.

    b. Update of MCC's strategic plan

    c. Individualized student wraparound case management

[10] A 2+2+2 program involves students being admitted in their junior year to begin a focus on a particular area, then doing two more years in that area as an Associates Degree, before completing two more years at a 4-year college.

d. Evidence-based design (such as an upgraded data base and dashboard, increased emphasis on institutional effectiveness and research, and president-sponsored faculty and staff dialogue on institutional transformation)

e. Institutionalization of innovations such as flipped classrooms, stacked credentials, experiential learning, and technology-enabled programming

f. Linking the accreditation process (Higher Learning Commission of the North Central Association of Colleges and Schools), MCC's Achieving the Dream program, and the C2C initiative to become a holistic strategic institutional development pathway.

VI. Curriculum: How was the particular curriculum selected, used, or created?

Summary of findings in this section

The curriculum for the CAD/CNC program at MCC came about as the result from ongoing feedback from local manufacturers in the Muskegon area who were calling for skilled workers who could navigate between design and fabrication. Responding to this feedback MCC developed four program options that fall on a career pathways continuum that range from an 8-week academy to an Associate's Degree in CAD/CNC.

CAD/CNC Career Pathways

1. CAD/CNC Accelerated Academy
2. CAD/CNC Advanced Accelerated Academy
3. CAD/CNC Certificate program
4. CAD/CNC Associate Degree

Supporting the core CAD/CNC curriculum, the student supportive services that are available provide additional resources that will ensure greater student retention and success. Providing an additional layer to the curriculum, Michigan Works provided a range of instruction on the "soft skills" identified by area employers as lacking among many workers.

In action, the program emphasizes hands-on, experiential learning with opportunities for formative feedback, which enhances learning and student motivation. Similarly we observed effective uses of the flipped classroom concept used very effectively.

Room for growth

Students also talked about "soft skills Fridays" with the instructors from Michigan Works. While the students were supportive of the basic idea of this soft-skill instruction, they felt that after a full week of applied, hands-on learning, the delivery of instruction had sometimes felt condescending. They were very cautious to express this concern as they did see the value and importance of the class, but emphasized they would have like to have seen this type of content more integrated into the program as opposed to a largely separate class.

Background of Curriculum Selection, Development and Use

Background: How USDOL and NOVA central conceptualize curriculum

In order to effectively evaluate the programs curriculum selection, development and use, it will be helpful to provide a brief background on how the USDOL conceptualized curriculum in the SGA as well as how NOVA Central framed their proposal in response to this solicitation. According the USDOL SGA, one of the overall goals of the grant was to prompt programs to introduce "innovative and effective methods for curriculum development and delivery" that were responsive to specific workforce needs, and promote improved learning, retention, and

employment outcomes. Similarly, the USDOL framed curriculum as a means of engaging employers in targeted industry to help identify skills and competencies that would be incorporated into programs' curriculum. In addition, the USDOL emphasized the importance of how applicants would incorporate these curricular innovations into the standard offerings of the institution. The USDOL integrates curriculum development throughout the SGA where it can be seen as an important means of supporting strategic alignment, sustainability, and program implementation, as well as encouraging greater contribution and engagement from partners, employers and industry.

The NOVA proposal was congruent with how curriculum was conceptualized in the USDOL SGA. Here curriculum is framed as one of the central tools to fostering innovation and successful outcomes. For example the proposal states, "The aim is to increase attainment of credentials through innovative and effective methods of teaching and learning through curriculum redesign and technology that ultimately lead to successfully preparing trade-impacted workers for fast-growing STEM occupational clusters." Taken together, curriculum for the C2C consortium emphasizes:

9) Innovation
    a) Introduce innovative and effective methods for curriculum development and delivery

10) Fostering Outcomes
    a) Learning
    b) Retention
    c) Employment

11) Authenticity
    a) Engaging employers and other stakeholders
    b) Increasing responsiveness to specific workforce needs

12) Sustainability
    a) Building organizational capacity by incorporating curricular innovations into the standard offerings of the institution

How MCC advances the USDOL/NOVA curricular outlook

Both the USDOL and NOVA have conceptualized curriculum as an action arm of the grant's efforts; serving as a means of innovating, fostering outcomes, emphasizing authenticity and ensuring sustainability. MCC's CAD/CNC curriculum effectively does each of these. This curriculum represents an innovative way of addressing gaps in current training models.

Muskegon's curriculum background

The curriculum for CAD/CNC program at MCC came about as the result of ongoing feedback from local manufacturers in the Muskegon area who were calling for skilled workers who could navigate between design and fabrication. According to Tom Goner, a key Machine Technology instructor at MCC, an advisory council for the program was established which provided a means

for local manufacturers to provide insights and feedback about the development of the program. Similarly, as Tom Martin, Chair of the Applied Technology department pointed out, the employers indicated that they were looking for skilled workers who can design, build, and measure.

MCC's CAD/CNC curriculum

Responding to this feedback MCC developed four program options that fall on a career pathways continuum that range from an 8 week academy to an Associate's Degree in CAD/CNC (see list below). This pathway begins with a CAD/CNC Accelerated Academy, which helps students move quickly into entry level jobs in the field and ends with an Associate's Degree that will aid students in obtaining high skill, high paying manufacturing jobs. MCC describes the 8-week program as a "jump start into the 2-year Associates Degree program". Similarly this first step on the career pathway provides the first of a number of stackable credentials.

CAD/CNC Career Pathways

1. CAD/CNC Accelerated Academy - An 8-week course that expedites entry level skills to prepare students for next classes in the certificate or degree program.
2. CAD/CNC Advanced Accelerated Academy - An 8-week course, 6 credit hours, to move one that much closer to one's educational goal.
3. CAD/CNC Certificate program - A one year program for CAD/CNC skills and careers.
4. CAD/CNC Associate Degree - A two year program for advanced skills and careers.

Table 3 --CAD/CNC Career Pathways

Career Pathway Step	Program	Course
Step 1: Launch Your Career	**Accelerated Academy:** An 8-week intensive course in entry level CAD and machining skills to jump start your education and job search preparation.	3-credit hours in basic CAD software 3-credit hours in basic machining
Step 2: Expand Your Skills	**Advanced Accelerated Academy**: An 8-week course in 3d and parametric design using Solidworks®, numerical control machining and off-line programming.	3-credit hours in 200 level CAD 3-credit hours in 200 level machining
	One-Year Certificate Program (30 hours)	General Education Requirements (3 cr. hrs.) CAD & Design Requirements (9 credit hrs.) Machine Technology Requirements (15 cr. Hrs.) Technical-Related Requirements (3 cr hrs.)
Step 3: Complete Your Degree	**CAD/CNC Associates degree (62 hours)** A 2-year program in advanced computer aided design skills (CAD) combined with computer numerical control (CNC) programming and machining skills.	General Education Requirements (23 cr hrs.) CAD Requirements (12 cr hrs.) Machine Technology Requirements (15 cr hrs.) Technical-Related Requirements (6 cr hrs.) Electives (6 cr hrs. min)

MCC's student support services

Consistent with the C2C consortiums' emphasis on wrap around student services, MCC's CAD/CNC program offers students a similar array of services well designed to meet the unique needs of this program's population. MCC has recently updated how they provide student advising and support through a restructuring that brought together different student support entities of the college under a unified structure. This restructuring is part of a college wide strategic Student Success Completion Agenda, which uses language and strategies that are congruent with the C2C consortium's work. We observed this in action as students came into the Center and were quickly directed to someone who could help them. Given this improved ability to provide wrap around student services at the college level, MCC's C2C program is able to leverage these resources for their students. In addition the project provides an additional layer of case management through a grant-supported position.

Our interview with the CAD/CNC students indicated a strong sense of feeling supported by the program. Student specifically talked about how Valarie Shelby, the grant coordinator, helped them navigate all of the issues they had getting enrolled and settled into the program. While they did talk about assistance they received from the college's support services, they felt most supported the C2C faculty and staff. They also expressed their gratitude for how available the instructors where to students. As Valarie pointed out during one of the focus group interviews, "we have to be mindful of all the components needed to assure student success" and this outlook was evident across the program.

Providing an additional layer to the curriculum, Michigan Works provided a range of instruction on the "soft skills" identified by area employers as lacking among many workers. These sessions are designed to help employees deal with personal problems, interactive effectively with others and adapt to challenges. What some students called "soft skills Fridays" included instruction and experiences in the following areas:

1. problem solving
2. presentation skills
3. oral and written communication
4. organization
5. attitude adjustment
6. team building
7. conflict resolution abilities
8. interpersonal communication skills--how to deal with personal problems, interact with others and adapt to challenges, etc.

Curriculum in action

In assessing the curriculum in action, we were able to observe students and instructors in action in a number of different classrooms, interview a number of instructors, and hear about the student experience in a student focus group interview. We observed both fairly traditional instructional practices and very dynamic problem based learning. In the traditional classroom we

observed the instructor doing the vast majority of the talking and students being largely passive, and in the problem based learning environment we saw students actively engaged in applied learning; working both individually and collaboratively and receiving guided support from the instructor.

We also saw examples of what is currently being described as the flipped classroom where students worked in a computer lab mastering course content and then went into the lab to utilize those skills in practice. In our interview with the teaching faculty it was evident that this kind of hands-on applied and experiential learning was central to their instructional outlooks. We found it interesting that this outlook was not shaped by courses or professional development experience in teaching or adult learning, but developed from experience helping non-traditional students master difficult concepts and skills.

The focus group interview with the students reveal that students appreciated the compressed time frame for the program and were eager to have marketable skills. They also expressed their appreciation for the timely feedback from instructors– particularly in the machine shop where they felt they were able to master difficult skills and concepts due to the fast iterations of mistakes, feedback, adjustments and improved skills and knowledge they experienced. Students also talked about “soft skills Fridays” with the instructors from Michigan Works. Students also talked about “soft skills Fridays” with the instructors from Michigan Works. While the students were supportive of the basic idea of this soft-skill instruction, they felt that after a full week of applied, hands-on learning, the delivery of instruction had sometimes felt condescending. They were very cautious to express this concern as they did see the value and importance of the class, but emphasized they would have like to have seen this type of content more integrated into the program as opposed to a largely separate class.

VII. Use of Grant Funds

Summary of this section

The overall use of grant funds is strategically designed to develop a new program that meets the needs of area employers. Specifically, grant funds support the follow:

1. Thirteen new CNC simulators (Essentially the computer portion of CNC milling machine students will learn to use on the shop floor.
2. 2 CNC Mini Mills
3. Master3DGage Coordinate Measuring Machine Arm (Requested specifically by one of the employer partners, Alcoa Howmet, which needs workers trained in highly precise measuring)
4. Grant/Project Coordinator position

Because of the relatively compact nature of the Muskegon C2C program, the use of grant funds is similarly straightforward. Like the other C2C colleges, Muskegon does leverage existing college and partner resources to accomplish its goals, however it is the grant dollars in large measure that has allowed them to develop the new curriculum, purchase the equipment needed to support the program and staff the program appropriately to ensure they meet their stated goals.

Taken together, the overall use of grant funds is strategically designed to develop a new program that meets the needs of area employers. Once established, this program will be self-sustaining as a standard offering in the selection of various career pathways within the college. Specifically, grant funds have been used for the following:

1. Thirteen new CNC simulators (Essentially the computer portion of CNC milling machine students will learn to use on the shop floor)

2. Two CNC Mini Mills

3. Master3DGage Coordinate Measuring Machine Arm (Requested specifically by one of the employer partners, Alcoa Howmet, which needs workers trained in highly precise measuring)

4. Grant/Project Coordinator position

VIII. Assessment of students

Summary C2C Student Assessment Tools:

The Muskegon CAD/CNC program uses a variety of screening and assessments tools which include:

1) Work Keys assessment
   a) Job skill assessments
   b) Job analysis
   c) Skill training
2) Computer Adaptive Placement Assessment and Support System (**COMPASS)**
   a) Reading
   b) Writing
   c) Mathematics.
3) Tooling U
   a) CNC programing
   b) CNC mill operator
   c) CNC lathe operator

The Assessment and Screening of Students

The Muskegon CAD/CNC program uses a variety of student screening assessments to appropriately match students to the program and learning assessments to guide students through the program and ensure mastery of the requisite skills and knowledge.

Michigan Works provides the WorkKeys assessment, a product from ACT, which has three main components:

1. Job skill assessments (designed to measure foundational and personal skills as they apply to the workplace)
2. Job analysis (pinpoints or estimates skill benchmarks for specific job positions that individuals must meet through testing)
3. Skill training (helps individuals boost their scores)

New students at MCC must also take the Computer Adaptive Placement Assessment and Support System **(**COMPASS) test, which is used as a placement test in reading, writing, and mathematics.

During the program itself, students utilize Tooling U, an online teaching and assessment tool. Tooling U which offers courses and assessment in:

- CNC programing
- CNC mill operator
- CNC lathe operator

IX. Factors Contributing to the Involvement of Community Partners

Summary of this Section

This section outlines six factors that seem to contribute to the involvement of community partners in the C2C initiative: rapidly changing knowledge and skill requirements of the workforce, shared interest in the economic recovery of the Muskegon region shared mission, opportunity to transform the workforce and career education system in the community, social equity, and adjusting to the "new normal" of limited financial resources.

Factor one—Rapidly changing skill requirements of the workforce: All of the partners recognize that the Muskegon region must respond to the escalating knowledge and skill requirements of the workforce and the technology-centered economy. The C2C network of partners seeks to prepare student for a career pathway that leads to job security in the high demand occupational fields of the future.

Factor two—Shared interest in the economic stability and growth of the Muskegon region: All partners seek to contribute to the economic stability and growth of the region.

Factor three—Shared mission: MCC and the community partners all share a mission that relates to the success of individuals, businesses, and communities in the Muskegon region. In addition, the partners are committed to a specific mission of empowering individuals who have at-risk factors for career and educational success such as low income, limited literacy skills, and limited job skills to get good jobs and advance in their careers.

Factor four--Opportunity to transform the workforce and career education system in the community: The educational system in nearly every city, including Muskegon, is struggling to prepare students for the demands of the global economy and the technology-centered economy. While manufacturing has come back in Muskegon the low-skill/high wage jobs are gone for good. Currently there are not enough skilled workers to meet the demands of industry creating a urgency to meet those demands lest businesses move elsewhere. By creating community partnerships in Muskegon, a "surge force" can achieve momentum toward reform that no one institution, including the community college, can do alone.

Factor five—Social equity: Racial and ethnic minorities in Muskegon and elsewhere continue to experience persistent and entrenched inequities in terms of wealth, income, economic opportunity, residential isolation, and discrimination. Community partnerships such as that developed for the C2C initiative can help to create opportunities for disenfranchised groups to enter the American economic mainstream.

Factor six—Adjusting to the "new normal" of current and projecting financial limitations for educational and other community-based institutions: By sharing resources and supporting the

redesign of the CAD/CNC program and the C2C initiative, the partners can maximize the impact in terms of student learning outcomes of the limited dollars available.

X. Contributions from Partners Most Critical to Success of the Grant

Summary of Findings from this Section

We suggest that there are three key contributions from the partnerships that are most critical to the success of the grant and to the sustainability of the lessons learned.

1. Manufacturing partners' role in the development and design of the CAD/CNC program.
2. Partners' contribution is in the development and refinement of the CAD/CNC curriculum including the core content and industry soft skills
3. Partners contribution to opportunities to integrate C2C successes and lessons learned the institutional level strategic directions

Contributions of the Community Partners to the C2C Initiative

Among the most critical contributions from the various partners is the manufacturer's role in the development and design of the CAD/CNC program. In many respects, this contribution, more than others, has the potential to have the most direct impact on the vulnerable population the program is designed to serve. The direct pipeline between the current manufacturing needs and the providers of this training provide a level of congruence with actual jobs not always found in the development of academic programs.

Related to this important contribution is how this collaboration has influenced the development and refinement of the curriculum. This dynamic program provides students with hands-on experiential learning opportunities and internships, which can lead to students entering this high paying career pathway.

Lastly, the collaboration among the different stakeholders creates an opportunity to build on C2C successes and lessons learned and seek to integrate these with current institutional-level strategic directions: The redesign of MCC's CAD/CNC program is integral to institutional-level strategies to influence and transform instruction and student services. These future shaping strategies include:

1. Strategic alignment with community partners including employers, K-12 school districts, early colleges and charter schools, universities, and governmental agencies;
2. Updating of the MCC's strategic plan;
3. Individualized student wraparound case management;
4. Evidence-based design;
5. Institutionalization of innovations such as flipped classrooms, stacked credentials, experiential learning, and technology-enabled programming;
6. Linking the accreditation process (Higher Learning Commission of the North Central Association of Colleges and Schools), MCC's Achieving the Dream program, and the C2C initiative to become a holistic strategic institutional development pathway

Appendix D: Muskegon Logic Model

Logic Model Assignment

Logic Model to Combine and Redesign CAD/CNC Programs to Include Innovative Technology

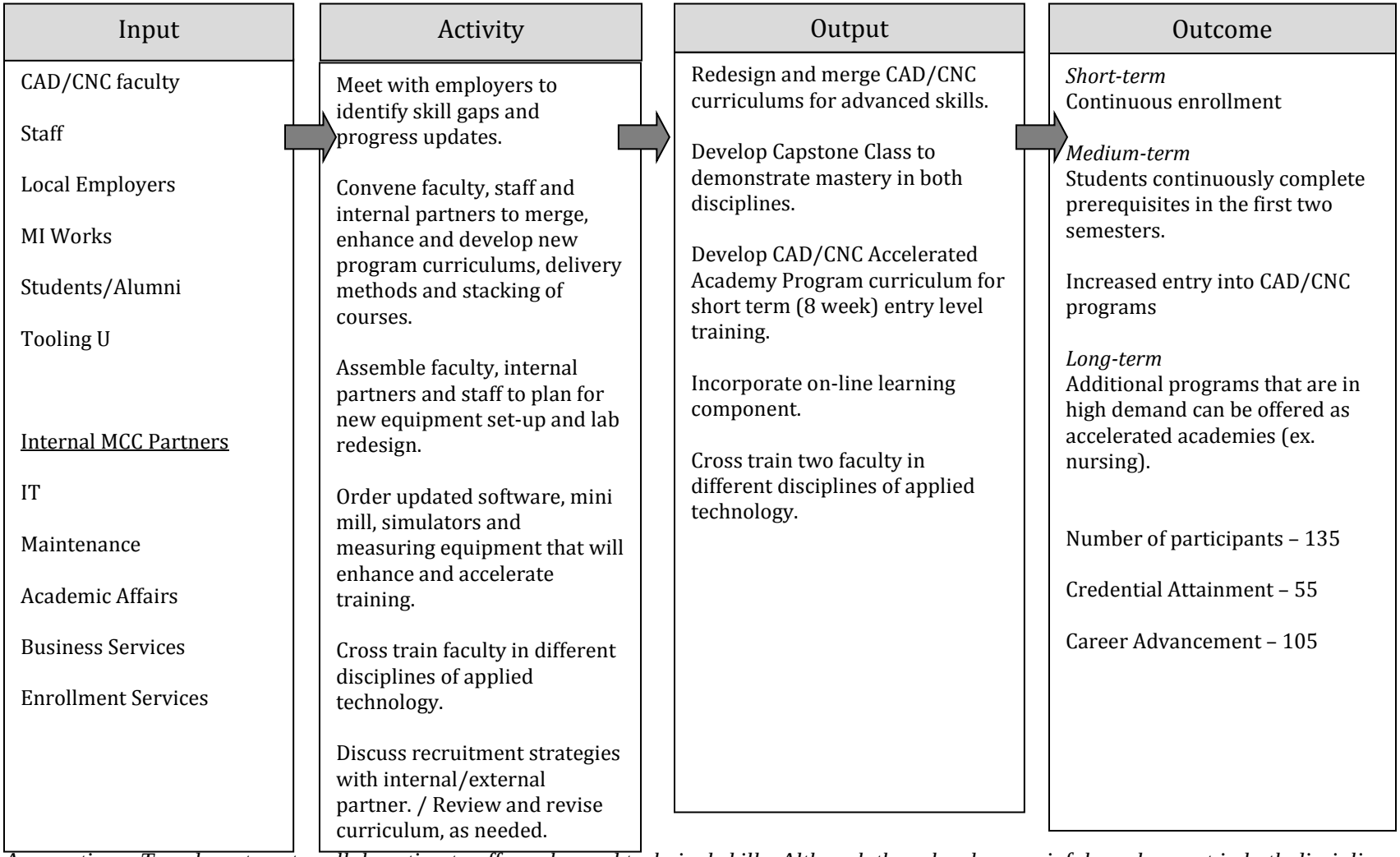
Logic Model
Muskegon Community College
Muskegon, Michigan

Prepared by Val Shelby - Grant Coordinator with input from
Dan Rinsema-Sybenga - Project Director, Tom Martin - CAD faculty, Tom Groner - CNC faculty

July 10, 2013

Muskegon Community College's Logic Model to Combine and Redesign CAD/CNC Programs to Include Innovative Technology

Step 1: Describe how to combine and redesign CAD/CNC programs to include innovative technology



Assumptions: Two departments collaborating to offer enhanced technical skills. Although there has been gainful employment in both disciplines, employers are requesting they are offered together.

Step 2: Identify the Formative and Summative Evaluation Questions

Formative evaluation questions to combine and redesign CAD/CNC programs to include innovative technology

Formative Evaluation Question	Potential Benefits to answering question	Feasibility of obtaining data	Time and Resources required
Does the integration of software allow for the transfer of data points?	We create a closed loop CAD, CNC, CMM database.	Feasible. CMM inspected part matches the initial CAD Design.	15 hours – CAD Instruction 15 hours – CNC & CMM Training
Is there enhanced collaboration between CAD and CNC?	Integration is an essential part of our model for improving student success.	Feasible. CMM inspected part matches the initial CAD Design.	15 hours – CMM Instruction 15 hours – Simulator Training

Final (Summative) evaluation questions to combine and redesign CAD/CNC programs to include innovative technology

Summative Evaluation Question	Potential Benefits to answering question	Feasibility of obtaining data	Time and Resources required
Do students complete a quality part from start to finish utilizing CAD, CNC and CMM Technology?	Determine if this program redesign provides the knowledge needed to design, produce and inspect quality parts.	Feasible. Student performance is determined by instructor and recorded in database.	30 hours – CNC/CMM Training 30 hours – CMM Simulator Training
Are programs joining together to provide designing, machining and quality skills that will prepare students for in-demand occupations?	Students get the training needed to be qualified for employment.	Feasible. MCC database	20 hours – Develop tracking system.
Are job openings currently available that can't be filled due to lack of skills in applied technology?	Close the skills gap by training students using enhanced technology. Provide employers qualified applicants to quickly fill open positions.	Feasible. Employer survey Wage record data MCC reporting	

Step 3: Evaluation plan to combine and redesign CAD/CNC programs to include innovative technology

A. Evaluation Questions	B. Expected Outcomes	C. Tasks	D. Personnel	E. Timing	F. Data Source	G. Analysis	H. Reporting
Do students complete a quality part from start to finish utilizing CAD, CNC and CMM Technology?	Students obtain the knowledge needed to design, produce and inspect quality parts.	1a. Obtain student data from MCC database.	Director, applied technology faculty and grant coordinator.	Fall 2013 or winter 2013	MCC database	Does the part meet the fit, form and function of the original designs?	To MCC grant partners To NOVA partners
Are programs joining together to provide designing, machining and quality skills that will prepare students for in-demand occupations?	Students gain skills needed to enter the workforce.	2a. Train faculty on new equipment. 2b. Track skills attainment.	Director, applied technology faculty and grant coordinator.	Fall 2013 or winter 2013	MCC database	Are students acquiring the skills needed to become employed?	To MCC grant partners To NOVA partners
Are employers unable to fill current job openings due to the skills gap in applied technology?	Employers hire qualified candidates.	3a. Maintain contact with students. 3b. Track entered employment rate.	Director, applied technology faculty and grant coordinator.	Fall 2013 or winter 2013	MCC database, student self-reporting, employer reporting	How many current / recent students are employed in the applied technology field?	To MCC grant partners To NOVA partners

MCC Evaluation Plan to combine and redesign CAD/CNC programs to include innovative technology

Year	Semester	Target Date	Task #	Task	Data Team	Other Personnel	Date Completed
2013	Fall	September	1a	Obtain student data from MCC database.	Director and Grant Coordinator	IT staff	
2013	Summer	July	2a	New equipment training.	Faculty		
2013	Winter	December	2b	Track skills attainment.	Faculty and Grant Coordinator	IT staff	
2013	Fall	September	3a	Maintain contact with students.	Grant Coordinator	IT staff	
2013	Winter	December	3b	Track entered employment rate.	Grant Coordinator		

Appendix E: C2C Site Visit Schedule

	Day 1	Day 2	Day 3
8:00 – 9:00	**Breakfast**	**Breakfast**	
9:00 – 10:00	**Evaluator and key project personnel meeting**: Informal meeting to clarify the goals of the visit and to ask and answer questions - Dan, Val, Tom, Tom	**Meeting with institutional research and evaluation staff/faculty**: identify and discuss data fields for the impacts phase of the evaluation. Conference call participation with Frank Skinner - Eduardo, Mike, Val	**Observe Coach/Navigator meeting** - Val
10:00 – 11:00	**Pres & VP** Ascertain buy-in from top - Dr Nesbary, Teresa **10:30 – Classroom Observation**		**Q&A with Coach/Navigator team** - Val
11:00 – 12:00	**Classroom Observation**: capture researcher field notes and other observations - CAD, Steve Abel	**Training/classroom observation** - MT, Al Wahr	**Evaluator debriefing**: capture researcher field notes and other observations
12:00 – 1:00	**12:30 - Lunch with program faculty** - Tom, Tom, Al, Steve	**12:30 - Lunch focus group with program Students** - Students	**Training/classroom observation**
1:00 – 2:00	**Evaluator debriefing**	**Focus Group interview with program management staff** - Val, MI Works	**Lunch and site visit debriefing with program project lead**
2:00 – 3:00	**Discussion on 5 core elements and best practice potential with Key project personnel** - Val, Dan	**Evaluator debriefing**: capture researcher field notes and other observations	
3:00 – 4:00	**Evaluator and key project personnel day 1 debriefing**: discuss artifacts collected, ask questions about observations, etc.	**Tour of other programs not visited**	
4:00 – 5:00		**Interview Program director.** - Dan	

Chapter 5: Northern Virginia Community College
Credentials to Careers Program

ABSTRACT

NOVA's IT Pathways program's stakholders include Northern Virginia Community College, Adult Career Pathways, *SkillSource* Group, Inc., Training Futures (Northern Virginia Family Services), NOVA's Workforce Development Division and Multivision, an employer and training site. Shaped by a well articulated strategic vision, this project represents a complex set of interlacing services and curricula specifically designed to help participants navigate the multifaceted and full range of factors they face endeavoring to improve their work and economic conditions.

Shaped by this strategic outlook, the synergy among the partners are key drivers to establishing the organizational capacity to sustain the effort and help build these features into the normative structures of the college. In sum, the key contribution we wish to highlight is the vision of these mutual beneficial relationships of the partners to create the synergisms of the IT Pathway. Providing the strategic backbone for this effort, the programs overarching curriculum was selected because it represented key features of NOVA's strategic outlook and could be leveraged[11] to move more quickly to scale and sustainable impact on a new geographic region. The NOVA curriculum is focused on IT career pathways that provide structured, wrap-around support services, foster greater learning through problem-based and authentic learning and help develop a variety of the "soft" skills and dispositions needed to be successful job seekers and employees.

While the strategic partnerships are NOVA's particular strength, we also make recommendations about how these partnerships can continue to be made more user-friendly for both incoming and returning students, as well as the partners themselves, whose knowledge of each others' programs allows them to refer students to others' organizations.

[11] Here, and throughout this report, reference to "leveraging of resources" should not be confused with co-mingling of funds.

Chapter 5 Executive Summary

Project Background and Purpose

The NOVA's Credentials to Careers (C2C) USDOL-TAACCCT Project, a consortium among seven community colleges, along with their strategic partners, is designed to address changes in the economic and employment outlook, specifically in the science, technology, engineering and mathematics (STEM) related areas. Representing diverse programs, needs and geographic areas of the country, seven leading community colleges, along with their strategic partners from business and non-profit sectors, as well as the Aspen Institute and Achieving the Dream, the consortium was purposefully assembled to meet contemporary employment challenges for unemployed and displaced workers, and all other adults. With the collaboration of the strategic partners and the cumulative knowledge and experience of the consortium members, the aim is to leverage resources, skills and experience to help the target population increase attainment of credentials and ultimately employment. To attain this goal, the consortium's efforts are strategically aligned with five innovative core design elements:

11. Evidenced-Based Design
12. Stacked and Latticed Credentials
13. Online and Technology-Enable Learning
14. Transferability and Articulation
15. Strategic Alignment

Within the larger consortium, NOVA Local C2C program is a stakeholder group made up of Northern Virginia Community College and their **strategic community and business partners.** The program is designed to provide education and training programs that lead to credentials and a career in IT related fields for TAA impacted workers and all other adult workers. In order to meet the unique needs of this population within the geographic employment outlook, a IT career pathways approach is taken where students have access to multiple onramps and exits that best meet their backgrounds, interests and employment needs.

The stakeholder group is made up of Northern Virginia Community College, Adult Career Pathways, *SkillSource* Group, Inc., Training Futures (Northern Virginia Family Services), NOVA's Workforce Development Division of Multivision. Together the local consortium can leverage a wide range of skills, knowledge and experience to address the regional workforce development needs in the IT and STEM related sectors.

Research Question and Evaluation Methods

This report is outlined according to the Department of Labor's Guidelines for the Program Implementation section of the evaluation for TAACCCT grants (p. 34).

1) Curriculum selection, use, and development
2) Use of grant funding to improve the programs and program design
3) Assessment and screen of participants abilities, skills and interests
4) Contributions of the partners in terms of:

a) program design,
b) curriculum development (also see #1)
c) recruitment,
d) training,
e) placement,
f) program management,
g) leveraging of resources, and
h) commitment to program sustainability

5) Factors contributing to partners' involvement or lack of involvement in the program
6) Contributions from partners that were most critical to the success of the grant program

This report focuses on the implementation of the programs in order "to understand the particular features of these programs so lessons learned and promising practices identified can be disseminated to the broader field and contribute the sustainability of the effort." It is an analysis of data from the Sept.-Dec. 2013 of the grant implementation. The report uses qualitative methods that include individual interviews and focus groups of students, teachers, career navigators, community partners, and administrators, as well as observations of class sessions and analysis of artifacts such as curricula.

Overview of findings:

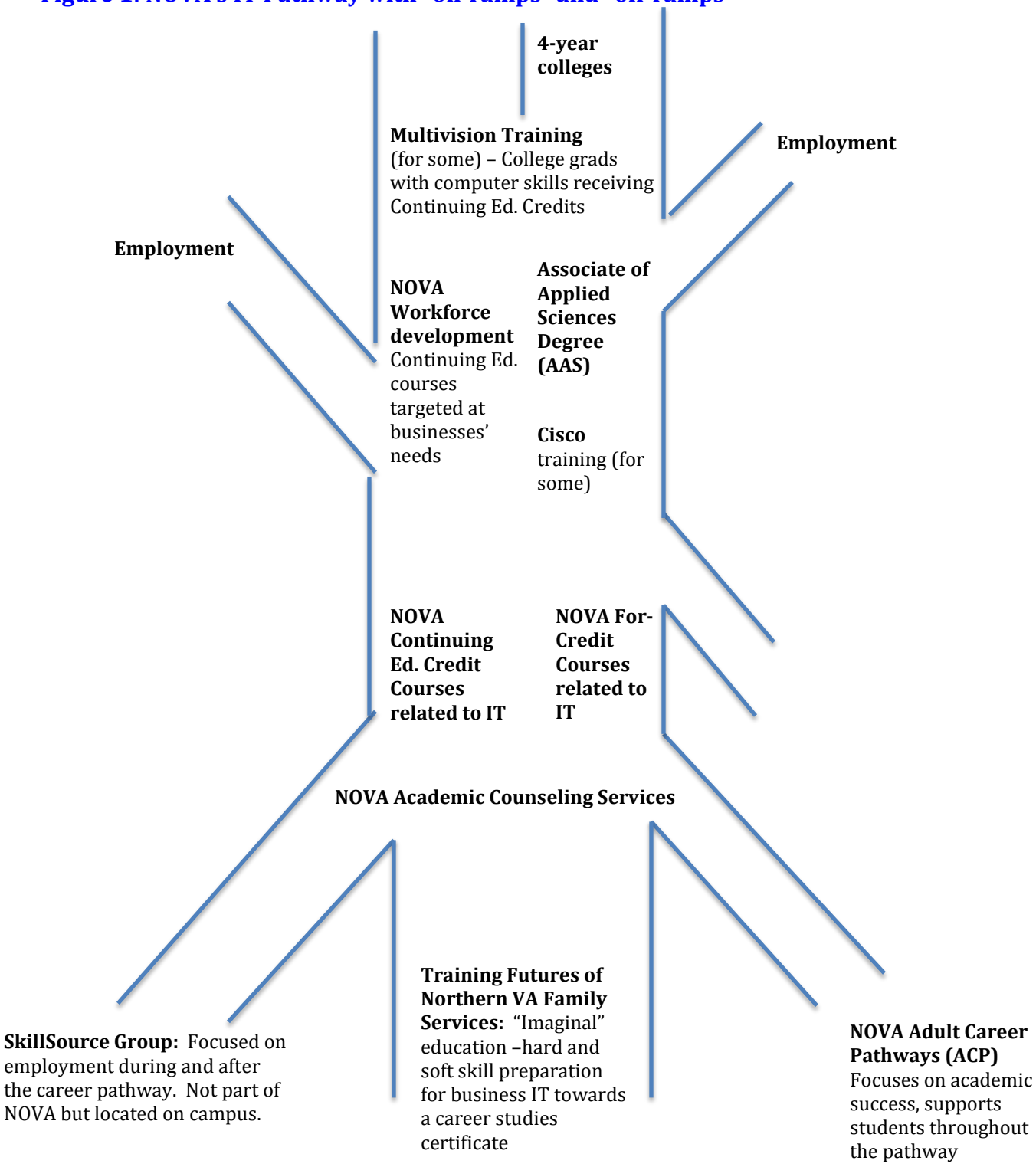
Strategic Partnerships

NOVA's IT pathway involves a variety of partners that include both non-profit student support, and development agencies and for-profit job training sites. There are multiple "on-ramps" to NOVA's IT pathway. Students can begin their program through one of the intensive student support agencies – SkillSource Group, Training Futures, or Adult Career Pathways—or they may simply begin enrolling in NOVA for credit courses.

C2C represents a complex interlacing of services strategically linked under the auspices of the grant. Taken together, the various partnerships provide a comprehensive set of services strategically linked to meet participants' needs. Specifically, these contributions are well designed to help participants navigate the complex and full range of factors they face endeavoring to improve their work and economic conditions. These include:

- Recruitment and support of students who may be disengaged from other academic organizations;
- On-going support and mentoring;
- Focus on long term academic and career success through stackable credentials, career pathways, articulation agreements and CEU options;
- Data driven – a focus on key outcomes;
- Integration of a workforce development division within the community college campus

Figure 1: NOVA's IT Pathway with "on-ramps" and "off-ramps"



- Addressing barriers through wrap around services to help participants navigate the range of support services they need as they transition from low paying, low skill work to higher paying skilled work;
- Focus on high demand IT related jobs and career pathways;
- Meeting the needs of a range of unemployed or underemployed workers.

Contributions from Partners Most Critical to Success of the Grant

The interaction and cooperation among the various partners is creatively designed to meet the overall programs goals, such that the whole is greater than the sum of the parts. A key contribution of NOVA's IT Pathway is the college's creative use of a wide variety of resources—particularly non-cash resources—to create synergisms between multiple partners for the benefit of students in need of employment. The over-arching approach to collaboration among these partners that should be recognized as perhaps the "contribution" with the greatest impact.

NOVA has used the following to leverage the services of its partners:

- C2C funds contracts with organizations which pay salaries to their employees;
- Operating costs until the partner can sustain them themselves;
- Allowing an organization to locate on NOVA's campus, allowing closer integration with the college;
- Academic credit for students from NOVA;
- A steady stream of recruits provided by NOVA's Workforce Development.

In sum, the key contribution we wish to highlight is the vision of these mutual beneficial relationships that brought together these partners to create the synergisms of the Manassas IT Pathway.

Key contributions of key partners appear below for each partner:

Adult Career Pathways

- Recruitment of students who are disengaged from other academic organizations;
- On-going support throughout a student's career – 87% retention rate (ACP Dashboard);
- Focus on their academic success by achieving stackable credentials (whereas other agencies focus on job placement);
- Data driven – a focus on key outcomes (See Appendix E: ACP Dashboard);

SkillSource

- Integration of a workforce development agency within the community college campus
- Providing the training for entry level jobs that are known to be in-demand, so that students can support themselves throughout their community college career;
- Having ease of entry—there are no entrance requirements so that any student who wants to take a course many do so;

- Close attention to which jobs are in demand, afforded by on-going contact with over 600 businesses;
- Doing all this with particular attention to helping students find work in IT related jobs, and when necessary, to referring clients to short term training so that they can do that work (Seema Jain, Vice President of Operations, 9/12/13).

Training Futures

- Providing a "way in" for students seeking careers in business and IT for who may have given up or may have never believed that they were "college material;"
- Addressing barriers to being successful in the office environment through their unique *Imaginal Learning* model (described in more detail below);
- High success rates in terms of retention, employment, and continuation with other stacked and latticed credentials supported through intensive "wrap around support" from its Career Navigators.
- Co-enrollment partner with NOVA providing eligible clients an opportunity to earn credit towards the Business IT career studies certificate.

Workforce Development and their partnership with Multivision

- Workforce development provides Continuing Education Units (CEUs) and certifications to its trainees, including those students who enter the training program at Multivision.
- Students in Workforce Development courses receive CEUs that can lead to various latticed and stackable certifications. Those who complete the Multivision training receive CEU credits along with certification from a program that is highly regarded by other employers. Some students move directly into employment at Multivision. The knowledge Multivision trainees receive is knowledge on the leading edge of what is needed by industry.
- Multivision receives a dependable pool of trainees who come with some IT experience who are partly incentivized by receiving CEUs and a certification provided by NOVA. As trainees, they can be hired, or not, depending on their performance with no obligation from Multivision.

Recommendation regarding key partnerships

In our Year 1 visit, we expressed concerns at NOVA about the complexity of their network of organizations and whether they could do more to help incoming students know what services were offered by what organizations. We thought that communicating a clear overview of services available between NOVA and its partners would also benefit the partners themselves when a other stakeholders understand their program and can refer appropriate candidates.

In our Year 3 visit, NOVA had taken steps toward making their programs more user friendly, creating an overview chart, and having a representative from Adult Career Pathways (ACP) visit classes and provide students a quick spoken overview of services available. In addition, the partners that make up NOVA's IT Pathway said that they felt like the grant had already helped them to

establish better knowledge and communication with the partners at the other organizations, and that this was helping in many intangible ways.

In this way NOVA is taking steps in the right direction, but long-term this still seems like an area where there is potential for further growth. When we emailed to ask Christina Hubbard, Coordinator of Counseling Services at ACP, regarding whether she thought it was for ACP to continue to be the body that informs students about the big picture of the various organizations that make up the NOVA network through classroom visits, she wrote, "No, probably not." Explaining, she cited the enormity of NOVA's student body: 78,000 for-credit students and 24,000 workforce development/continuing education students. "We simply don't have the resources to do that across all disciplines. Additionally, we reached out to numerous classes with inconsistent yield from those efforts," she said.

Ms. Hubbard, nonetheless, did see ways that that ACP could continue to develop its capacity in this area:

> Instead, I think our better approach is to continue building a name for ACP within the college by informing students, staff, and faculty about these programs in ways that push a larger dialogue about opportunities. So, for example, ACP's plans for the upcoming year include starting to attend campus-based student services staff meetings in order to connect with campus peers who are connecting with the greater population on a daily basis. We are also planning to have our advisors develop specialty areas… in order to have them connect with the faculty cluster from a specific content area which will provide more visibility to these programs and opportunities for faculty as well. Then, hopefully, we'd be able to better count on faculty and staff to support these efforts, make more referrals to our affiliates, and also reach a far greater yield of students. (Email, 3/14/16)

Further, Ms. Hubbard also saw ways that the classroom visits might still be appropriate for certain sub-groups:

> …We know that there are certain populations that might benefit more from our programs. So, for example, I could see us continuing classroom presentations in strategically selected classes like evening early childhood classes. This student population tends to meet our demographic and can benefit from some additional targeted outreach. (Email, 3/14/16)

These ideas for development strike us as good ones and the use of ACP to carry out this task seemed like it should continue, but for the long term it seems the task of helping students who *don't* enter NOVA's programs through a program like ACP to see the big picture of the affiliated services, it would be best if it was also taken up NOVA counseling services. Essentially, what we're suggesting is that this information should be disseminated at all entry points—whether a student gets that start coming through the "main door" of NOVA, or through Training Futures, ACP, or some other affiliated organization.

Looking even further down the line, we at Myran and Associates believe that ideally, the process of educating students about the services available and referring them when appropriate, would also be connected to initial assessments of *all entering NOVA students*-- not necessarily assessment tests of

academic skills, but more holistic assessments of a student's prior learning experience; their financial, social and familial supports; their short-term and long-term goals. While ACP does do assessments of students, including a Prior Learning Assessment, this assessment is only given to the subset of NOVA students who are applying to be part of an ACP cohort. This would, of course, also require the counseling services to do more to remain in contact with the various community-based partners, and to educate the partners about each other, so that when a student came to them first, rather than to the college, they would be able to make the appropriate referral.

Christina Hubbard explains the challenges to accomplishing such sweeping changes:

> It's a problem of size and roles of our community training partners. When we look at our co-enrollment programs, the historical precedent has been that the community training provider was the one who managed all recruitment for their programs and the college's role was simply to facilitate college enrollment for credit once the partner had identified who they accepted. Thus, there was little reason for the college advisors to know about the program – they weren't recruiting for the partner. It would be similar to asking the college advisors to know which high schools in the area offer dual enrollment; they simply don't have a reason to know about all of the places NOVA has a footprint. (Email, 3/14/16)

Clearly, there are challenges here, and we suggest that this area is one for NOVA's long-term growth, rather than one that is ripe for a quick fix.

In the short term, one thing that NOVA has done on a limited basis that can be done campus wide with relatively easily is to create a clear brochure mapping the relationships of NOVA's various partners and providing a paragraph describing the services offered by each partner, and getting stacks of these to every college counselor and every community based organizations.

Curriculum

Because NOVA's IT Pathway that is supported by the C2C grant is actually not limited to the course offerings of NOVA, but also includes a number of organizations both within NOVA and outside of it, when we speak of the "curriculum" at NOVA we are actually speaking about the combined curricula of this network of organizations.

This said, this curriculum writ large is built around the ways that the USDOL's TAACCCT SGA and NOVA's proposal conceptualize curriculum as an important means of:

1. Supporting and encouraging innovation
2. Fostering outcomes
3. Engaging in authentic collaboration and being responsive to employer needs
4. Building organizational capacity to strengthen and expand programs

The varied programs that fall under the C2C grant at NOVA use a wide range of assessment and screening instruments to place and monitor student progress. These fall into three main categories; English language learners, adult literacy, career interests and aptitude.

NOVA utilized Training Futures, SkillSource, Adult Career Pathways and the Multivision

partnership as key partners in the project because they represented key curricular features of NOVA's strategic outlook and could be leveraged to move more quickly to scale and sustainable impact on a new geographic region—the Manassas campus region that lies within NOVA's service region. The NOVA curriculum is focused on IT career pathways that provide structured, wrap-around support services, foster greater learning through problem-based and authentic learning and help develop a variety of the "soft" skills and dispositions needed to be successful job seekers and employees.

Curriculum Strengths

1. Authentically linked to employer needs
2. Specifically designed to build participants full range of competencies
3. Authentic, problem based learning
4. Wrap-around support networks and case management
5. Learning life, literacy and work skills in an integrated fashion
6. Transformational experiences for students

Area of Curriculum to Consider for Further Growth

1. Examine those aspects of the NOVA program that are currently seen as non-curricular and consider how expanding this outlook may help them strengthen their overall curriculum.
2. Capture curricular innovations in consumable forms
3. Continue to build the empirical support behind *imaginal* learning.
4. Continue to build and refine adaptive and flexible workforce development curriculum
5. Create more on-line courses and hybrid courses to meet the needs of those with challenging schedules or those who are geographically remote, including those doing military service

Table 2 – Interviews, Focus groups and Observations or Tours

Affiliation	Position	Name	Interview?	Focus Group?	Observation or tour?
C2C Grant Administrators	Grant Director	Deborah Rosen		Yr. 1	
	Local Project Mgr. (Year 1 & 4)	Judith James	Yr. 1	Yr. 1	Yr. 1
	Local Project Mgr. (Year 2 & 3)	Susan Baker	Yr. 3	Yr. 3	
	Data Coordinator	Frank Skinner		Yr. 1, Yr. 3	
	C2C Monthly Meeting	[Multiple stakeholders]			Yr. 3
Training Futures	Lead Instructor	Suzy Mead	Yr. 3	Yr. 1	
	Director, Workforce Development Services	Sharon LeGrande	Yr. 3	Yr. 1	
	Student Trainees	[Names omitted]	Yr. 3	Yr. 1	
	Instructor	Sarah Swain		Yr. 3	
	Instructor	Latoya Robinson		Yr. 3	(Cont.)
NOVA-College Pathways Initiatives	Director	Kerin Hilker-Balkisson		Yr. 1	
	Data Manager	Jennifer Pocai		Yr. 1	
	Coordinator, Counseling Services	Christina Hubbard		Yr. 3	
	Cyber Security Class	N/A			Yr. 3
	NOVA-contact and IT Coach	Erika Coddington	Yr. 1, Yr. 3		
Workforce development	Special Projects Director	Jim Fabian		Yr. 1, Yr. 3	
	Director of the Design and Group	Esther Perantoni		Yr. 1	
SkillSource Group, Inc.	Community Relations Supervisor / Employment & Training	Myra Mobley		Yr. 1	
	President and CEO	David Hunn		Yr. 1	
	Vice President of Operations	Seema Jain		Yr. 1, Yr. 3	
	Manager, Manassas Skillsource Center (Beginning Yr. 3)	Karla Quninoz		Yr. 3	
Multivision	Chief Operating Officer	Ashwin Bharath	Yr. 1		Yr. 1
	Lead Recruiter	David Gaines	Yr. 1		

V. Contributions of Partners

Summary of key contributions of partners described in this section:

Adult Career Pathways

- Recruitment of students who are disengaged from other academic organizations;
- On-going support throughout a student's career – 87% retention rate (ACP Dashboard);
- Focus on their academic success by achieving stackable credentials (whereas other agencies focus on job placement);
- Data driven – a focus on key outcomes (See Appendix E: ACP Dashboard);
- Leveraging funds for tuition assistance.

SkillSource

- Integration of a workforce development agency within the community college campus;
- Connects clients with training for entry level jobs that are known to be in-demand, so that students can support themselves throughout their community college career;
- Providing ease of entry for trainees, insofar as there are no entrance requirements. Any student who wants to take a course many do so;
- Close attention to which jobs are in demand afforded by on-going contact with over 600 businesses;
- Doing all this with particular attention to helping students find work in IT related jobs, and when and helps them to access non-credit training so that they can do that work.

Training Futures

- Providing a "way in" for students seeking careers in business and IT for who may have given up or may have never believed that they were "college material;"
- Addressing barriers to being successful in the office environment through their unique "Imaginal Learning" model (described in more detail below);
- High success rates in terms of retention, employment, and continuation with other stacked and latticed credentials supported through intensive "wrap around support" from its Career Navigators.

Workforce Development and their partnership with Multivision

- Workforce development provides Continuing Education Units (CEUs) and certifications to its trainees, including those students who enter the training program at Multivision.

Workforce Development and their partnership with Multivision (Cont.)

- Students in Workforce Development courses receive CEUs that can lead to various latticed and stackable certifications. Those who complete the Multivision training receive CEU credits along with certification from a program that is highly regarded by other employers. Some students move directly into employment at Multivision. The knowledge Multivision trainees receive is knowledge on the leading edge of what is needed by industry.
- Multivision receives a pool of trainees who come with some IT experience who are partly incentivized by receiving CEUs and a certification provided by NOVA. As trainees, they can be hired, or not, depending on their performance with no obligation from Multivision.

NOVA Local Consortium

NOVA Local C2C program is a regional consortium made up of Northern Virginia Community College and their **strategic community and business partners**. The program is designed to provide education and training programs that lead to credentials and a career in IT and STEM related fields for TAA impacted workers, unemployed or underemployed, low-wage, dislocated, military or veteran, and all other adults.

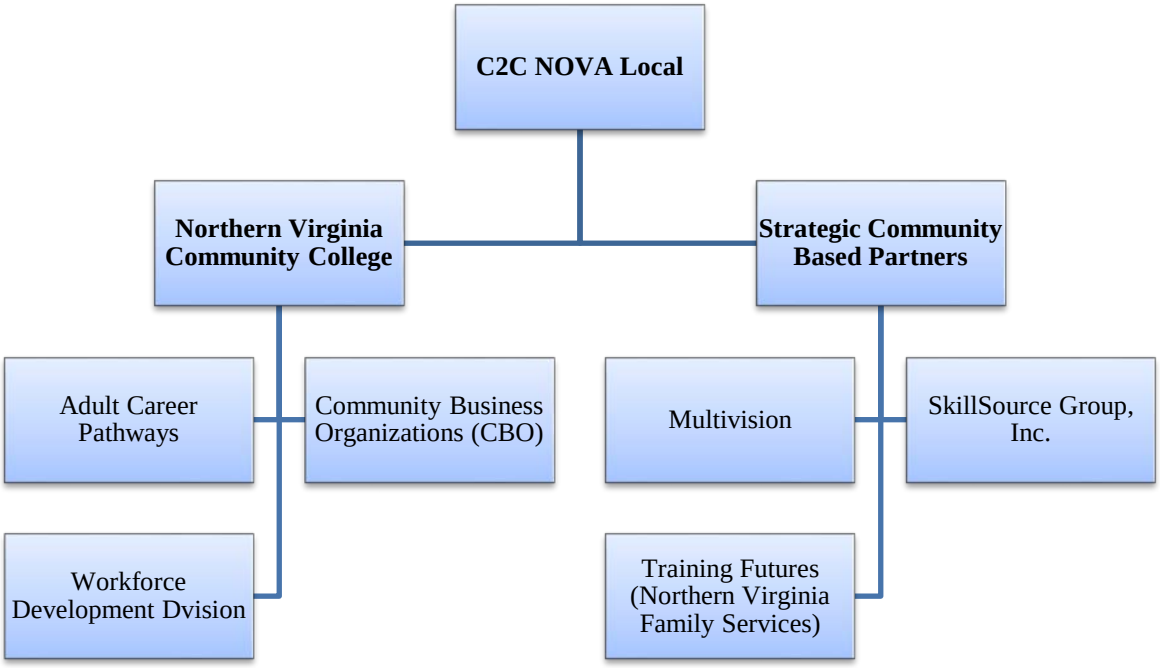
The consortium is made up of Northern Virginia Community College, Adult Career Pathways, *SkillSource* Group, Inc., Training Futures (Northern Virginia Family Services), and Workforce Development Division of Multivision (See NOVA Organizational Map below). Together the local consortium can leverage a wide range of skills, knowledge and experience to address the regional workforce development needs in the IT and STEM related sectors. These leveraged resources include:

1. A full range of "wrap-around" advising and support services:
    a. Financial aid
    b. Career counseling, planning and goal setting
    c. College registration
    d. Problem solving skills
    e. Application and resume writing
    f. Interviewing skills
    g. Job search and placement assistance
    h. Personal development
    i. Professional "soft" skills

2. Stacked and Latticed Credentials, Transferability and Articulation
    a. College credit options (students can earn up to 21 college credits)
    b. Career Studies Certificate from NOVA
    c. Industry-desired certifications

3. Workforce Development and Education
    a. Technical, administrative and computer skills
    b. Hands-on internships
    c. Real-world, hands-on training strategies
    d. Post training mentoring

Figure 2 -- NOVA Local C2C Organization Map



Credentials to Careers: NOVA's Technology Gateway Partnership
http://www.nvcc.edu/c2c/about.html

Overview of the partners their roles and contributions

There are multiple "on-ramps" to NOVA's IT pathway. Students can begin their program by through one of the intensive student support agencies--SkillSource Group, Training Futures, or Adult Career Pathways—or they may simply begin enrolling on NOVA for credit courses.

Here's an overview of the services that each of those agencies provide (in alphabetical order):

1. Adult Careers Pathways (ACP) – (Part of NOVA)

Central focus

Jennifer Pocai, Program/Data Manager of ACP summed up their work this way: "ACP is about academic counseling, assisting in success in college… We're providing the academics and coaching. Things to keep them on track academically… Our goal is for students to stay on track to

complete the credentials. We're looking at the biggest picture—if this job is miserable, it's a temporary situation. What's next?" (9/12/13)

Key contributions of ACP to NOVA's IT Career Pathway

- Recruitment of students who are disengaged from other academic organizations
- On-going support throughout a student's career – 87% retention rate (See Appendix F: ACP Dashboard)
- Focus on students' academic success by achieving stackable credentials (whereas other agencies focus on job placement)
- Data driven – a focus on key outcomes (See Appendix F: ACP Dashboard)
- Leveraging funds for tuition assistance

(Emails Kerin Hilker-Balkissoon, Director of NOVA Career Pathway, 5/13/14).

Recruitment:

ACP maintains relationships with community organizations and actively seeks out students who are disengaged from academic institutions. A unique aspect of their work is bringing student services out into the community. Hilker-Balkissoon, explains it this way: "We're going to them. It's very different than the traditional student services. We're meeting in Starbucks..." (9/12/13)

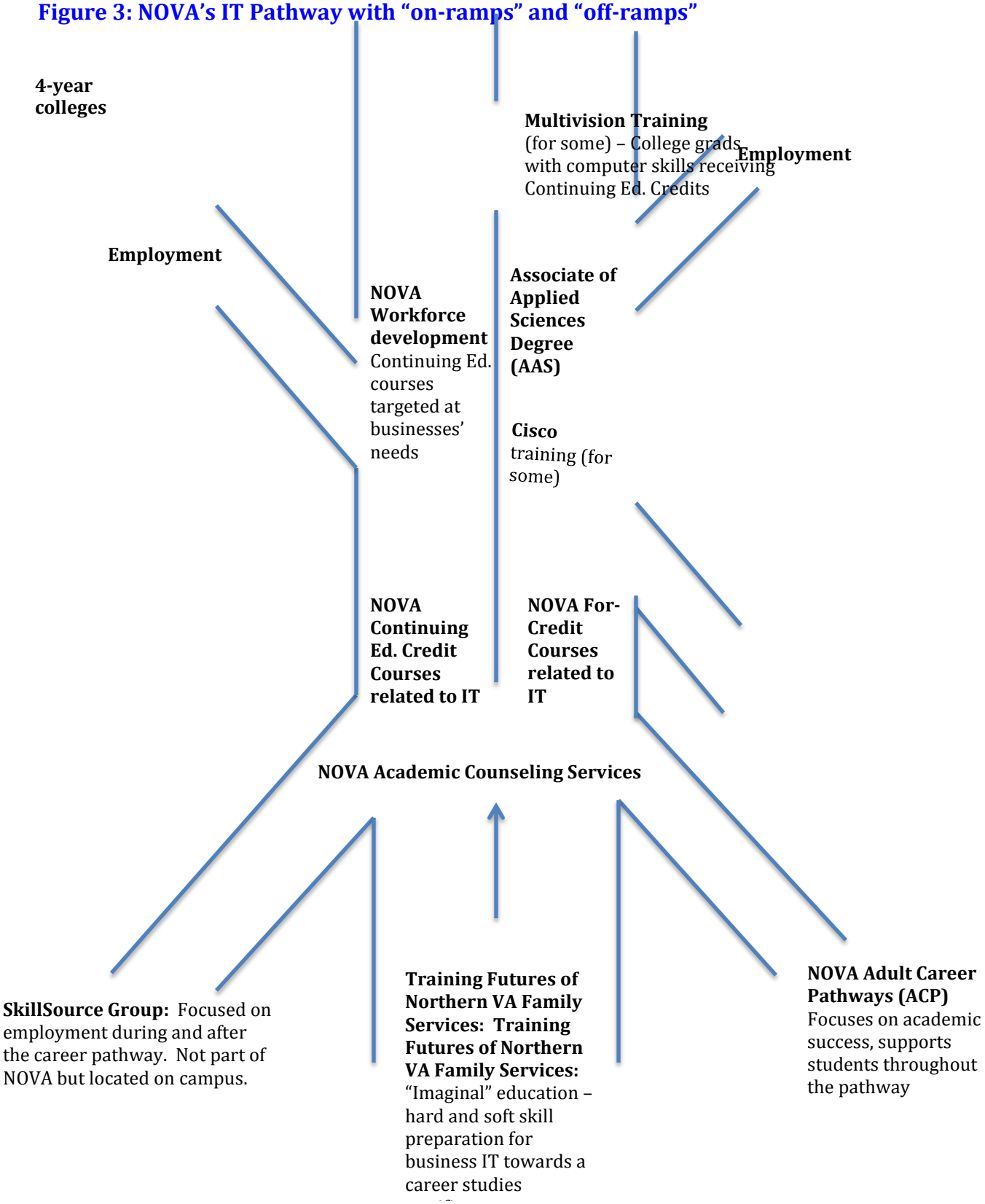
The goal of reaching into the community is to reach students who might not otherwise connect with NOVA. Hilker-Balkissoon describes their process as "drilling down into the [community based] organizations and identifying pockets of students who were completely disengaged from education."

On-going Support of students by ACP

ACP's role in C2C is to provide support and counseling to students who are interested in the IT Career Pathway. Jennifer Pocai explained that a key part of the support they give students is to help to achieve stackable credentials so that they can find employment as they build their knowledge (9/12/13).

To this end, they assign a Career Navigator to work with students throughout their academic careers at NOVA. As with recruitment, ACP distinguishes itself from traditional college counseling such as that provided by NOVA itself, by conducting these support sessions in the community.

Figure 3: NOVA's IT Pathway with "on-ramps" and "off-ramps"



During the course of the C2C Grant ACP also took on the role of sending staff to NOVA classes to give students an overview of the services provided by the various partners. In our Year 3 site visit we observed ACP representatives providing information about the job market, focusing particularly on IT careers.

Collaboration with other student support agencies

A student's work with ACP does not preclude them working with other student development organizations such as Training Futures. ACP reaches over multiple stages of the student's career, so the career navigator from ACP would stay with a student across multiple programs, from their enrollment in Training Futures into their career as a NOVA student.

Similarly, many students who come to ACP are referred by other agencies.

Performance data

ACP's work is focused on annual goals tracked on a dashboard available to the public. (See Appendix F). Their goals concern the following:

- Service volume
- Number of key relationships
- Activation – percentage of students participating in a program
- Initial course and/or program completion
- Retention and persistence
- Credential earned
- Tuition Resources leveraged

Leveraging Tuition support for students

ACP leverages $400,000 annually in third-party tuition funding to help its participants (ACP Dashboard 2012-2013)

Program Sustainability

Part of the original agreement brokered by NOVA President, Dr. Robert Templin, with ACP and other community partners was during the grant term they would establish ways to sustain their work after the grant money was gone (Bill Browning, formerly Special Assistant to the President, 5/9/14). Kerin Hilker-Balkissoon, Director of Career Pathways at NOVA describes ACP's plans for sustainability as follows:

> *We are actively engaged in sustainability planning for Adult Career Pathways' C2C work both at Manassas and across the college. Currently, we have already secured a commitment for college funding to maintain our C2C Success Advisor position beyond the grant period. We also have a proposal pending with our college's executive administration to develop an office of Experiential Learning at NOVA. This new department, if launched, would include support for the C2C Career and Internship Counselor position currently*

funded by C2C. As such, both full-time positions have active sustainability plans and are likely to continue beyond the end of the grant period.

[Regarding the two part-time positions funded by the grant], our Grant Project Manager position is funded through multiple grant projects, and the focus of this position is to ensure compliance with these grants. As such, the continuation of this role would be contingent upon continued external funding, which we expect to decrease as elements of our program become fully institutionalized... [Regarding] our part-time Access Counselor position it is too soon to make a request for non-recurring funding for the 2016 fiscal year, but in the next budget cycle we intend to present data that demonstrates the increased college transition and financial aid revenue generated by the position provides a worthwhile investment. (email, 5/13/14)

2. SkillSource Group (SSG) – (Not part of NOVA, funded by Federal workforce development)

Central focus

Where NOVA's Adult Career Pathways focus is on the student's academic success, the SkillSource Group (SSG) is focused on helping students get jobs during their tenure at NOVA and beyond it. David Hunn, President and CEO put it this way:

Not only are we here to enhance training but we want to be a resource for students. We're a conduit between job seekers and business. (David Hunn, President and CEO, 9/12/13).

Their website describes their services this way:

When job seekers or business owners visit a SkillSource One-Stop Employment Center, they're greeted by professional staff who can assist them with free *employment and training services. We not only provide computer, Internet, and copier facilities, but trained staff can help access other resources such as skills assessment testing, career training, job placement, personalized counseling, and interview and resume preparation.*
(http://www.myskillsource.org/ accessed 5/13/14)

SkillSource is one of many programs across the country funded by the federal Workforce Investment Act (WIA). When we asked David Hunn, how their design was similar and different from Workforce Development offices nationally he gave this explanation:

The fact that we're on a college campus I think is unique… I think that it's fairly rare, even in Virginia... How we implement the Workforce Investment Act (WIA) is one of the most rigid federal programs you'll find. There's a set level of services, the types of services we provide... We follow that to a T… Who is at the table—who are the partners--is very clearly laid out. The community college is expected to be at the table. There are 16 other state and federal programs. (9/12/13)

A key advantage that Skillsource has been--by the fact that its courses are not-for-credit--that they can introduce courses quickly, without the 1-2 year approval process required for approval of for-credit courses by the State of Virginia. Jim Fabian explains how it works:

> *We can develop anything we want. We can customize based on what a business wants. We can pick and choose and create a customized program. The only real stricture is what is required in a credential. How do we prepare a student to sit for the exam to get that credential? (10/23/14).*

A second way that Skillsource is different than some of its partner organizations is that they have no admissions requirements for their courses. In this way, they have an open door to any individual wanting training to improve their employability.

Workforce Development does not provide "wrap around" support services, as do some of the other partners. Jim Fabian, explains that while they do make payments to NOVA for overhead expenses, their status as a non-credit program limits their access to certain supports NOVA provides to for-credit students:

> *I don't think I'm talking out of school here; at NOVA and a lot of schools there is a separation between for-credit programs and non-credit. We are self-supporting. We don't get the kind of tax dollars that the for-credit gets. We pay all our salaries, and plus, we give 30% of any dollar we make back to NOVA for overhead. But that doesn't mean that we necessarily get all the services that the for-credit programs get. (10/23/14)*

Fabian went on to explain that what Workforce Development does have is a business development team—its business-to-business arm that goes into the community, contacts businesses and contracts with them to train workers that they need. He said that last year this group contacted over 600 businesses.

Related to this, the Skillsource Group is working to develop is job placement services, something that are currently not offered, except through informal connections of an instructor knowing of a company that needs someone. Expressing his hopes for the future, he said, "If we can partner with the job placement capabilities that are already in NOVA for WD students that would be wonderful. That is beginning to happen." (10/23/14)

<u>Recruitment:</u>

Where the Adult Career Pathways program is part of the college but works hard to leave the campus to reach students, the SkillSource Group is a non-college entity that has deliberately moved *onto* campus to connect jobs to those getting an education. When asked what the SSG's goal was for the C2C program, Seema Jain, Director of Operations said this:

> *To integrate well with the rest of the NOVA campus—that's one of the things that we've learned from our work on the other campus. To understand how we can enhance what they want to do. (9/12/13)*

Collaboration with other student support agencies

Similar to ACP, a student's work with SkillSource does not preclude them working with other student development organizations such as Training Futures. A student's work with SkillSource may reach over multiple stages of the student's career.

Students may also be referred to SkillSource from other agencies. So, for example, a student may be referred from Training Futures to SkillSource once that student expresses an interest in going into IT, after Training Futures initial preparation for office employment.

Leveraging of Resources

As an entity separate from NOVA that receives funds from the Workforce Investment Act and other sources, the C2C funds and the operating costs provided by NOVA have been used to bring the SSG's resources to help NOVA students on the Manassas Campus.

Performance data

The SSG follows the Federal Workforce Investment Act (WIA) Common Measures, 9 performance benchmarks, and 2 employment and credential measures that monitor local and statewide outcomes associated with targeted adult and youth workforce programs and services.

As of this writing (May, 2014) ACP had 12 participants enrolled through the C2C initiative, with most either awaiting training or currently enrolled. As such, it is premature to review employment data. Data on these participants, to be released in SSG's end of year report on June 30th of this year, will be included in the follow-up to this report.

Sustainability

David Hunn, President and CEO of SSG describes the progress on their sustainability plan this way:

> *Our plan is to continue the NOVA Manassas SkillSource Center with other funds, as identified. Our costs are generally for the full-time center manager, so his costs could be combined from multiple funding sources. I would expect we will focus on our WIA formula funding allocation to cover his costs, but we have some time before that decision is made. SkillSource is committed to having a presence on the NOVA Manassas Campus. (5/13/14)*

Jim Fabian, Special Projects Director of NOVA's Workforce Development Division, described the process of getting all the partners "at the table" through C2C as Phase 1 for the changes he envisions. When asked about what comes next he spoke of Skillsource becoming an integrated part of a pipeline of student services, both providing some of what others don't have, and having students gain access to what Skillsource does not provide:

> *You continue the relationship on both ends of what we do: the student services/counseling, and then use the occupational training, and then the follow up with the job placement on the*

other end. That's really what I'm hoping will come out of all this. Is that the connections we're making now [will make that happen].

Up until now you've had credit and non-credit separate and never the twain shall meet. That's not how WD works any more. WD has to be both for credit and non-credit working together; a pipeline from here to there, stackable credentials. There has to be that. This is giving us the opportunity to do it in a formal way.

Now we're part of the stream. The stream was the student service counseling, academic counseling, and then job placement. Well, now along with academic programs you have Workforce Development getting the same services on both ends. That is what I really hope will come out of this and be sustainable. (10/23/14)

Key contributions of SkillSource to NOVA's IT Career Pathway

- Integration of a workforce development agency within the community college campus;
- Helping students find jobs, referring students to training for those jobs, or providing the training at Skillsource, so that they can support themselves throughout their community college career;
- Doing all this with particular attention to helping students find work in IT related jobs, and when necessary, to provide training so that they can do that work (Seema Jain, Vice President of Operations, 9/12/13)

3. Training Futures (a program of Northern Virginia Family Services)

Central focus

Training Futures (TF) actively seeks out adults who are disengaged from academic advancement to prepare them for entry into work in office environments. While the short term preparation by TF is for entry level positions, they pay a great deal of attention to developing students' self-knowledge, confidence, and ability to set goals for long term advancement.

When students enroll in TF they are automatically co-enrolled in NOVA facilitating a seamless transition to beginning and continuing their for-credit academic career.

Strong "wrap around" support from Career Navigators helps to keep students—who often come with the challenges of supporting families with low-paying jobs—to persist in their career development.

Key contributions of the Training Futures to NOVA's IT Career Pathway

Our data suggests that Training Futures key contributions to NOVA's IT Career pathway are:

1) Providing a "way in" to business and IT careers for students who may have given up or may have never believed that they were "college material;"

2) Addressing barriers to being successful in the office environment through their unique "Imaginal Learning" model (described in more detail below);

3) High success rates in terms of retention/graduation, employment, and attainment of college credit supported through intensive "wrap around support" from its Career Navigators:

    a. Graduation rate of Manassas Cohort 1: 95% (21 of 22) (Target 85%)
    b. Employment rate of Manassas Cohort 1 (graduated Dec. 2013): 71% (Target 85% employed within 6 months)
    c. Wage gain: 38% wage gain (Target: 25%)
    d. College credit attainment: 81% of completers obtained college credits; 66% obtained BIT credential. (Target 75% obtain college credits)
    (TF FY14 Outcomes, email from Sharon LeGrande, 5/22/14)

<u>Symbiosis: Training Futures and NOVA leveraging each other's resources</u>

When looking at the relationship between Training Futures and NOVA, it is not a matter of one party "leveraging" the other's resources—they both seem to leverage the resources of the other in a mutually beneficial relationship:

- NOVA gains students who might not normally consider going to community college, and, fiscally, they receive 15% of the PELL grants that those students bring to their work at Training Futures.

- Training Futures is able to have their students gain credit for their work at Training Futures, having their students avoid the decision about whether to continue on.

Sharon Lagrande, Director of Workforce Development at NOVA (which includes TF) describes how the relationship between the two organizations developed, beginning here in 2001:

> *At the time, Bill Browning, who was the program manager at Training Futures, had a relationship with NOVA. He had the idea--Could we take these TF folks and get them in the college, and therefore, start them on a pathway to a career as well as education?*
>
> *That's when we developed a 7-credit model—We would pay for the 1 credit, student orientation course and that would activate 6 transfer credits. So, when they completed the six credits they would get 7 credits total. That was the original model. (9/12/13)*

This 7 credit (2 course) model expanded to what is currently an 18 credit model, providing an easy "on-ramp" to students who might not of thought they could attend college. Sharon LaGrande explains:

> *The 6 transfer credits came from them collectively—the NOVA staff and the Training Futures staff looking at our curriculum and saying, "OK, you guys teach keyboarding and computers and it's equivalent to AST whatever. Therefore, it's a class that we can use to transfer. They*

did that with two courses back then. I want to say it was the keyboarding class and the computer class. Those two courses became part of the transfer model.

It was pretty exciting. It was pretty exciting for people who never thought they could go to college when they came for this training program, and now you're saying I've got 7 transfer credits and I didn't do anything extra besides the work we're doing here.

In 2006 or 2007, it expanded to the now full credit model, which started at 17 and is now at 18 credits. The 17-credit model became a funding source—it gave NVFS a more reliable funding source. I write the grants. We have certain grants that we go back to and know, "Yes, these guys support us." With this model, it was more a revenue stream. (9/12/13)

On the fiscal side, offering credit meant that Training Futures had access to federal financial aid dollars, and while NOVA received a portion as well:

We have an understanding with NOVA that we enroll – our target for Tysons is 100 people and 60 at Manassas. They will be eligible for the PELL grant. The financial aid that comes from the Pell grant goes directly to the college. We don't touch that. We just make sure that the students go through the FAFSA process and their credits are paid for through that system. Our agreement with NOVA is that 85% of that will actually come back to NVFS for revenue. So, based on our enrollment… the college keeps 15%. If I use one of the college's professors I pay that professor directly but the split is 85/15. It doesn't pay for the whole kit and caboodle. It represents about one fifth of what we need to fundraise each year. I would say it's probably $6500 per trainee each year. But it helps—it's money I don't have to fundraise. (Sharon LaGrande, 9/12/13)

Performance data

Training Futures sets targets for key indicators and evaluates its progress according to these. These indicators include the following: Graduation rates, employment percentages 6 months after graduation, wage gain, and college credit attainment.

From the Tables 3 through 6 one can see that in 2014 Training Futures has done exceedingly well in their graduation rates, wage gain, and the percentage of students obtaining college credits. The one area where they do not exceed their goals is in relation to the percentage of students who are employed 6 months after completing their program.

Tables 3 through 6 -- Training Futures – FY 2014 outcomes to date as of May 2014

Graduation: *Target Goal – 85% of participants complete*
Tysons Cycle 22 = 43 of 44 (97%)
Tysons Cycle 23 = 50 of 52 (96%)
Manassas M1 = 21 of 22 (95%)
Manassas M2 – in process; 27 enrolled

Employment (6 months after graduation): *Target Goal = 85% employed within 6 months*
Tysons Cycle 22 = 65% (graduated September 2013)

Tysons Cycle 23 = 34% (graduated March 2014)
Manassas M1 = 71% (graduated December 2013)

Wage Gain: *Target Goal = employed graduates increase wages by 25%*
Tysons Cycle 22 = 42% wage gain
Tysons Cycle 23 = 37% wage gain
Manassas M1 = 38% wage gain

College Credit Attainment: *Target Goal = 75% obtain college credits*
Tysons Cycle 22 = 86% of completers obtained college credits; 72% eligible for BIT credential
Tysons Cycle 23 = 96% of completers obtained college credits; 82% eligible for BIT credential
Manassas M1 = 81% of completers obtained college credits; 66% eligible for BIT credential

Discussing the Training Futures program with students, we heard strong support for both the curriculum and the work of the staff, such as these comments from a student we interviewed in our Year 3 site visit:

> *Here, everyone is open. If you make a mistake; that's ok. You are here to learn. They give us their hand. We don't feel hesitant. They want to build our confidence. They always smile. They are not indifferent. (10/23/14)*

This kind of testimony was supported by our observations of a supportive, family-like culture.

Program Sustainability

Training Futures is working on the sustainability at the Manassas site in the following ways:

1) They have hired a business development person to work on a more sustainable funding stream (Sharon LeGrande, 9/12/13)

2) They are continually seeking grant funds to sustain the site. As of 5/17/14, Sharon Legrande wrote that "We successfully raised private foundation dollars and some local government funding which is helping to operate the site now and are continuing to work on this strategy."

3) The site generates revenue from the partnership with NOVA through student enrollment, which represents about 15% of the total budget.
4) They are working on revenue generating model that would ask corporate partners to contribute as graduates are placed – this is still in early stages of development.

4. NOVA's Workforce Development Department and its Partnership with Multivision

Central focus

The Workforce Development Department on the Manassas Campus is part of the college. In contrast to Skillsource, which focuses on helping people to find jobs, Workforce Development focuses on understanding the needs of the local business community and providing continuing

education credit courses so that students can learn skills and gain certifications that allow them take advantage of those job opportunities. (Judith James, C2C Project Director, Phone 5/13/14)

One particular training site that Workforce Development "bridges" to is Multivision—an IT firm that runs training programs for unemployed workers who have both a college degree (either an associates or a 4 year degree) and have some experience in programming. By the fact that these candidates come already with IT skills, it is considered by Multivision, itself, to be a "finishing school."

Key contributions of the NOVA's Workforce Development Department to its IT Career Pathway

- Workforce development provides Continuing Education Units (CEUs) and certifications to its trainees, including those students who enter the training program at Multivision.

- Students in Workforce Development courses receive CEUs that can lead to various latticed and stackable certifications. Those who complete the Multivision training receive CEU credits along with certification from a program that is highly regarded by other employers. Some students move directly into employment at Multivision. The knowledge Multivision trainees receives is knowledge on the leading edge of what is needed by industry.

- Multivision receives a dependable pool of trainees who come with some IT experience who are partly incentivized by receiving CEUs and a certification provided by NOVA. As trainees, they can be hired, or not, depending on their performance with no obligation from Multivision.

C2C activities at Workforce Development

No C2C money is paid to Workforce Development or to Multivision (Jim Fabian Special Projects Director, NOVA-Workforce Development Division, 9/12/13, Ashwin Bharath, 9/12/13)

Recruitment:

When asked about Workforce Development's recruitment practices, Jim Fabian provided the following description:

> *Our main vehicles for informing the public of our services are the Workforce Link (our schedule of classes published each semester), our website (www.nvcc.edu/workforce), and through direct interaction with the business, military, gov't and non-profit communities. Although our leadership and staff are always in contact with these constituencies, we have a Business Development group whose function is to meet with prospective business clients, social service agencies, etc., to discuss their training needs. They also attend Chambers of Commerce events, host career fairs, information sessions, etc. (email, 5/22/13)*

For its part, Multivision offers a free one-day workshop to brief candidates about the Workforce Development Training program. Following this, they conduct one-on-one interviews. Those accepted typically have either an associates or 4-year degree. Of those accepted Ashwin Bharath says that they typically fall into one of three categories:

a) Career beginners
b) Career advancers
c) Career changers

Those who are not accepted typically are those who are missing strong fundamentals in the basics of programming and/or actual experience in that or education in that area. (Ashwin Bharath, 9/12/13)

How the collaboration between Workforce Development and Multivision works

While not part of NOVA *per se*, the collaboration between Workforce Development and Multivision is part of a constellation of opportunities for NOVA students in the IT pathway.

Here's how it works:

1) Workforce Development and Multivision collaborate to recruit a relatively elite group of unemployed workers who have both a college degree (either an associates or 4 year degree) and experience in computer programming;

2) Multivision provides its own curriculum built for preparing students for work in IT, paying attention to preparing trainees for industry specific exams for that skill and what is needed on the job;

3) Multivision carries out hands-on training of students on-site—an intensive 6 week program, 40 hours per week, program;

4) NOVA's Workforce development provides 24 continuing education credits (CEUs) to the students, which converts to 24 PDU's;

Performance data on training at Multivision

- Training capacity in 2009: 20 people
- Training capacity in 2013: 480 people
- Students trained since 2009: 500 students, unemployed workers and displaced IT professionals
- 150 recent college graduates hired by Multivision (2011 – 2013)
- 70+ community college graduates hired by Multivision, from 10 community colleges (2011 – 2013)
- Over 90% employment placement success rate after completion of Workforce Development Training Program, with average starting salary of $50,000

- Created and implemented a course on "work-based learning" for Northern Virginia Community College

Program Sustainability

Jim Fabian, from Workforce Development sees possibilities for extending the WD/Multivision model to other fields:

> *This grant runs for three years. What if another concept like this comes up—other areas in IT where WD can contribute to this grant… I see other possibilities. Like Cisco training. There are plenty of jobs out there. We have some capacity, but not full capacity to bring in other deserving people. (10/23/14)*

Ashwin Bharath tells of one of the obstacles to scaling up the program, explaining that the "social side" of this training--helping unemployed displaced workers—doesn't necessarily motivate businesses to hire workers. He says that, from the corporations' point of view, what they see when approached to hire a trainee is that "These guys are bringing in someone who has been out of work for two years and trying to stick them with me." They need to see the benefits of it. So what is needed to make it sustainable, is positive public relations for hiring the trainees.

He goes on, regarding winning over reluctant employers:

> *What we tell them is "We will give you the person for one month completely free. If you don't like them you don't have to keep them. If you like them you can hire them. This is absolutely free for them." Any time we have given people that assurance they have always come back to us. There should be someone on the business side, on the recruitment side who can do that. This is no disrespect to the academic community but you need someone who has experience getting jobs for people. (9/12/13).*

VI. Curriculum: How was the particular curriculum selected, used, or created?

Summary of findings in this section

NOVA's curriculum is built around how USDOL's TAACCCT SGA and NOVA's proposal that conceptualize curriculum as an important means of:

1. Supporting and encouraging innovation
2. Fostering outcomes
3. Engaging in authentic collaboration and being responsive to employer needs
4. Building organizational capacity to strengthen and expand programs

Training Futures, SkillSource, The Adult Career Pathways advising services and the Multivision partnership were selected for this project because they represented key curricular features of NOVA's strategic outlook that could be leveraged to move more quickly to scale and sustainable impact on a new geographic region.

Curriculum Strengths

6. Curricula authentically linked to the evolving employer needs in the high demand IT sectors;
7. Curricula specifically designed to build participants' competencies beyond the technical skills needed, also emphasizing professional "soft" skills including communication, team building, resume writing, interview skills and other job seeking skills;
8. Authentic learning contexts, as well as simulations of authentic learning contexts;
9. Wrap-around support networks and case management include "soft skills" curricular objectives;
10. Learning life, literacy and work skills in tandem;
11. Evidence of positive impact on students' self-perceptions and commitment. Some student expressed having transformational experiences;
12. Focus on problem-based and hands-on curriculum – fostering, critical thinking and increasing agency and independence.

Area to Consider for Further Growth

1. Examine those aspects of the NOVA program that are currently seen as non-curricular and consider how including some of these "soft skill training" in the written curriculum may help them strengthen this curriculum overall.
    a. Continue developing innovative ways of blending interpersonal development with professional skills dispositions and knowledge
2. Capture curricular innovations in writing and other forms that foster:
    a. greater replicability and continued leveraging of these resources
    b. less reliance on the organizational memory of "indispensable individuals" (cont.)

3. Continue to build the empirical support behind *Imaginal Learning*. The learning and cognitive sciences provide a wealth of insights about adult learning and could provide notable support and refinements to Boulding's (1956) original work.
4. Continue to build and refine adaptive and flexible models of workforce development.

Background of Curriculum Selection, Development and Use

Background: How USDOL and NOVA Central Conceptualize Curriculum

In order to effectively evaluate the programs curriculum selection, development and use, it will be helpful to provide a brief background on how the USDOL conceptualized curriculum in the SGA as well as how NOVA Central framed their proposal in response to this solicitation. According the USDOL SGA, one of the overall goals of the grant was to prompt programs to introduce "innovative and effective methods for curriculum development and delivery" that were responsive to specific workforce needs, and promote improved learning, retention, and employment outcomes. Similarly, the USDOL framed curriculum as a means of engaging employers in targeted industries to help identify skills and competencies that would be incorporated into programs' curriculum. In addition, the USDOL emphasized the importance of how applicants would incorporate these curricular innovations into the standard offerings of the institution. The USDOL integrates curriculum development throughout the SGA where it can be seen as an important means of supporting, strategic alignment, sustainability, program implementation as well as encouraging greater contribution and engagement from partners, employers and industry.

The NOVA proposal was congruent with how curriculum was conceptualized in the USDOL SGA. Here curriculum is framed as one of the central tools to fostering innovation and successful outcomes. For example, the proposal states, "The aim is to increase attainment of credentials through innovative and effective methods of teaching and learning through curriculum redesign and technology that ultimately lead to successfully preparing trade-impacted workers for fast-growing STEM occupational clusters."

Taken together, curriculum for the C2C consortium emphasizes:

13) Innovation
    a) Introduce innovative and effective methods for curriculum development and delivery

14) Fostering Outcomes
    a) Learning
    b) Retention
    c) Changes in self-perception and the presentation of self
    d) Employment

15) Authenticity
    a) Engaging employers and other stakeholders
    b) Increasing responsiveness to specific workforce needs

16) Sustainability
    a) Building organizational capacity by incorporating curricular innovations into the standard offerings of the institution

NOVA Curriculum Background

According to Bill Browning, a former Training Futures employee and NOVA workforce development leader, when the TAACCCT grants were announced, NOVA President, Dr. Templin authorized a strategic plan that linked TAACCCT priorities with a number of ongoing NOVA priorities. This strategic plan emphasized two key elements; that it be outcomes focused and sustainable beyond the funding period. In this way, all the partners committed to these elements and developed sustainability plans before even writing the proposal, which was intended to foster a greater sense of accountability among the participants. The USDOL grant was a good match for Templin's vision, serving as a mechanism for NOVA to pursue several of their institutional priorities.

As Bill Browning explained, the announcement was timely because Dr. Templin had been looking for a way to expand the capacity of the Training Futures partnership in an underserved part of Virginia. The Manassas campus was at the top of the list because it was a rapidly expanding area where there were virtually no non-profit job training programs operating. The TAACCCT Grant provided an opportunity to leverage the resources of both Training Futures and the Skillsource Group to meet the needs in the Manassas service. As Todd W. Rowley, chairman of the Northern Virginia Workforce Investment Board and Board member at NOVA, pointed out, "Joining with NOVA to offer job search services and career training fits our mission to strengthen the workforce and employment base."

Building on the background provided by Bill Browning, the Northern Virginia Regional "*Credentials to Careers*" Project Profile outlines that the core strategic mission of the project is to build from the capacity of the key partners and adapt similar methods that can attain high levels of credential attainment and employment outcomes for participants. This approach was modeled after the Aspen Institute's *Courses to Employment* (Aspen Institute, 2009) national demonstration project. The key findings from this demonstration project helped to inform the programmatic and curricular features that were identified and leveraged across the various partners. A review of these finding highlights congruency with the curricular framework emphasized by the USDOL's SGA. These findings emphasized:

1. "Boundary-crossing" student/participant support networks
2. Accelerated "bridge" or "on-ramp" training programs
3. Assessment and recognition of prior learning
4. Co-enrollment with training partners for college credit and/or CEUs
5. Wrap around academic and social support services
6. Job simulation training environments, technology and work-based learning methods
7. College/career advising and case management
8. Enhanced articulation agreements with 4-year institutions

This background is directly pertinent to the development, selection and use of curriculum because the NOVA local programs specifically identified programs whose curriculum were innovative, authentic, and sustainable while fostering positive outcomes and capitalizing on the prior success of these programs. In this way, NOVA strategically sought out programs that were supportive of both the USDOL SGA and built from their growing expertise in workforce development. As Bill Browning clarified, the programs and their curriculum were not altered but strategically extended to high need geographic areas.

Identification of Program and Curriculum that Aligned with the Strategic Mission

In short, the Training Futures, SkillSource, The Adult Career Pathways advising services and the Multivision partnership were selected because they represented key features of this strategic outlook that could be leveraged to move more quickly to scale and sustainable impact on the new geographic region. Particular features of the overall NOVA curriculum highlights of these leveraged resources include:

1. Career pathways models – multiple entry and exits points
2. Case management services and counseling – wrap around services
3. The importance of "soft" skills
4. Hands-on learning through internships and applied activities such as mock interviewing, job fairs and networking
5. "Imaginal" education – a focus on self-efficacy and self-concept training
6. Employable skills in high demand IT jobs
7. Job development services
8. Post-completion services
9. "Unique one stop shop" case management approach
10. Internships for credit

Table 7 -- Review of Individual Programs' Curriculum (in alphabetical order by program)

Program	Project Summary	Curricular features
Adult Career Pathways	Structured assistance provided to unemployed and underemployed adults, specifically designed to help them navigate the unique challenges adult learners face attending college.	While ACP indicated they are not curriculum-based, a number of the services associated activities highlight student self-assessment, goal setting, and planning; elements that are increasingly seen as central to quality curriculum development and use. These are: ▪ Identifing career goals and pathways to achieve them ▪ Learning about programs and opportunities available through NOVA ▪ Developing an individual plan of education, training or other programs ▪ Self-assessing their own skills and experience. (Cont.)

Program	Project Summary	Curricular features
Multivision	A free full-time 6-10 weeks problem-based learning IT training program designed to meet the current and evolving needs of IT employers.	Designed around 4 key principals, of screening applicants for (a) aptitude and (b) attitude, (c) project based learning using simulations, and (d) Technical mentorship for employment retention and continuous project success. IT curriculum in a range of skills and certifications including: ▪ Java/J2EE: Java ▪ JSP ▪ Servlets ▪ Web Services ▪ NET/SharePoint: C# ▪ Business Analysis ▪ Quality Analysis Professional "soft" skills in: ▪ Communication ▪ Team building ▪ Resume writing ▪ Interview skills
SkillSource	Provides case management services and job placeement assistance to job seekers	Assists program participants in a varity of career and job development skills and knowledge including: ▪ Resume writing workshops ▪ Interviewing workshops ▪ Skills assessment ▪ Students advising ▪ Assess job seeker qualifications ▪ Enroll clients into appropriate training programs ▪ Assist with job search activities
Training Futures	6-month administrative job training program framed within a career pathway to living wage jobs for high-potential, underemployed individuals. Program focuses on training and internships in technical, administrative and office computer and professional "soft" skills.	Based on a partnership with Northern Virginia Community College, TF trainees are co-enrolled in the community college and receive up to 21 college credits for their training in office technology and healthcare. ▪ Case management services ▪ Professional development workshops ▪ Networking opportunities ▪ Share employer expectations ▪ Business development activities ▪ Matching trainers to business internships ▪ Job fairs ▪ Job development services career counseling ▪ Post-graduation services for one year

Descriptions of the Curricula of Specific Programs

Adult Career Pathways program (ACP)

ACP provides structured assistance to unemployed and underemployed adults trying to navigate the unique challenges adult learners face attending college. Providing support to students through each step of the college experience ACP is built around a student-centered approach which capitalizes on

ongoing relationships among the students and a network of supporters. In addition ACP creates a career pathway that allows students to earn credentials and improve their employment and economic status as they advance through the different levels of the model. The demographic of these students include veterans, single parents, lower-wage workers, work-eligible immigrants, and unemployed and underemployed individuals.

Similary to SkillSource, ACP indicated on *Site Visit Data Collection Grid* the that Curriculum was not applicable to them and further detailed that "our program is a counseling/advising-based service, not curriculum-based." We can certainly see why ACP conceptualizes their work as non-curricular; seeing counseling and advising as supportive but separate from instruction. However, several aspects of there work does, in fact, have a curriculum and expanding how they conceptualize their work could help them strengthen how they identify, develop, refine and plan for the ways these services are provided.

The range of ACP services that we think could be considered within curricular domain include:

- Identifing career goals and pathways to achieve them
- Learning about programs and opportunities available through NOVA
- Developing an individual plan of education, training or other programs
- Self-assessing their own skills and experience
- Preparing for placement tests
- Topical webinars – example, 10 habits of highly successful students

Highlighted in these activities are student self-assessment, goal setting, and planning; elements that are increasingly seen in the PK-20 literature as central to quality curriculum development and use.

Summary of curriculum

NOVA's curriculum is built around how USDOL's TAACCCT SGA and NOVA's proposal conceptualize curriculum as an important means of:

1. Supporting and encouraging innovation
2. Fostering outcomes
3. Engaging in authentic collaboration and being responsive to employer needs
4. Building organizational capacity to strengthen and expand programs

NOVA utilized Training Futures, SkillSource, Adult Career Pathways and the Multivision partnership as key partners in the project because they represented key curricular features of NOVA's strategic outlook and could be leveraged to move more quickly to scale and sustainable impact on a new geographic region. The NOVA curriculum is focused on IT career pathways that provide structured, wrap-around support services, foster greater learning through problem-based and authentic learning and help develop a variety of the "soft" skills and dispositions needed to be successful job seekers and employees.

Multivision

The Multivision curriculum is focused on the skills and knowledge needed in the IT industry. As was outlined in the *Multivision Site Visit Data Collection Grid*, "After reviewing college curricula

and screening hundreds of IT-related college grads, we've determined the lack of specific technologies being taught in colleges and developed our program to supplement the skills gap". Similarly Multivision emphasized that "industry contacts have reiterated a skills gap between college grads and required skills for open jobs." Here we can see a focus on authenticity and working to increase responsiveness to specific workforce needs. Our interview with Ashwin Bharath, the Chief Operating Officer for Multivision, confirmed this focus on working with industry contacts to identify the skills gaps of college graduates as well as how this information shaped and refined their training curriculum. It was emphasized that because of the structure of higher education with curriculum committees and state approval processes, the time between the identification of new and evolving training needs and enacted curriculum and instruction can put programs behind the curve and limit their ability to be as responsive as private industry to changing needs in the job market.

The various documents provided about Multivision's training program outlines a free, full-time 6-10 weeks problem based learning IT training program designed to meet the current and evolving needs of IT employers. These documents highlight that their Workforce Development Department is based on 4 key principals focused on screening applicants for (a) aptitude and (b) attitude, (c) project based learning using simulations, and (d) providing technical mentorship for employment retention and continuous project success. The IT curriculum centers around training in currently marketable certifications in Java/J2EE: Java, JSP, Servlets, Struts as well as NET/SharePoint: C+, among others. In order build future employees competencies beyond the technical skills needs, the curriculum also emphasizes, professional "soft" skills including, communication, team building and problem solving, resume writing and interview skills. Finally the program offers mentoring and support during the job placement phase of the training.

The free employment-based training program makes Multivision a logical partner in the NOVA Local Consortium as it is a service that can be leveraged across the group in order to strengthen workers access to training programs with curriculum that is authentically linked to the evolving employer needs in the high demand IT sectors.

SkillSource

The SkillSource Career Services Center at the Manassas Campus of Northern Virginia in another example of how the NOVA consortium has leveraged local curriculular resources that are well positioned to offer programng that is innovative, focused on outcomes, authentic and sustainable. The Center opened on the Manassas campus in November of 2013 as part of the C2C grant.

In the preparation for our site visit, the SkillSource staff indicated on *Site Visit Data Collection Grid* that the Curriculum was not applicable to them. Intially this made sense to us as they primarily provide case management services and job placement assistance. However, as we more carefully reviewed the range of services they provide there were a number of areas we felt fell squarely within category of curriculum. Because SkillSource assists program participants in a varity of career and job development skills and knowledge we'd suggest that there are actually a number of clear ways that their work does involve curriculum. These include:

- Resume writing workshops
- Interviewing workshops

- Personalized counseling
- Skills assessment
- Students advising
- Assess job seeker qualifications
- Enroll clients into appropriate training programs
- Assist with job search activities
- Job placement
- Network with regional employers to identify workforce needs and to determine how

SkillSource staff also talked about the importance of helping students to be more self-sufficient, reducing roadblock for students, serving as a resource for enhancing student experience on campus, fostering "transformational" experiences and "immersing themselves into campus life". One SkillSource staff member said, that this work "represents the integration of a workforce development with community college campus life." Reviewing these job development skills and knowledge we see that the distinction between curriculum, instruction, counseling and advising becomes blurred, with these foci having both stated and implied curricular features. Recognizing this a such could be valuable way to strenthening how these services are identified, planed and delivered.

Regarding the decision-making process of the curriculum (including the course offerings) Skillsource is largely driven by the needs of the 600+ employers with whom they maintain contact. Jim Fabian put it this way:

> *We always do market research first, but typically we're getting hit over the head with it. Especially the cyber security thing—if we don't do anything we're going to be left in the dust. It starts happening at George Mason University, George Washington University--all the big guns. Scott was able to jump in with both feet. To have that many programs with the results being an actual credential—that's something. (10/23/14)*

Skillsource's quick development of its cyber security program is an example of the advantage it has over the for-credit programs of NOVA itself, in that its courses are not subject to the state review process, which can require 1-2 years before a for-credit course can be approved. (Jim Fabian, 10/23/14)

Training Futures

Our interview with the current Training Futures staff revealed that the program was "born out of the program's long history and shaped by the founders commitment to students and education". The Training Futures curriculum may best exemplify C2C's overall focus on innovative, outcomes focused, authentic and sustainable curriculum. Building from the success of Training Futures' established record, C2C leveraged this resource and expanded it to a new, underserved geographic area. This curriculum teaches computer skills, business English, business math, along with a number of other office and business management skills with an emphaisis on medical technology. Built around an immersion model, students experience training in an authentic professional setting. Training Futures trainees dress professionally, have real world job expectations, receive performance reviews and interact professionally with staff and fellow trainees. In many respects it is a problem based, hands-on curriculum where course content is taught within a simulated office setting.

Trainees are also provided one-on-one support during their job search with assistance in resume-writing, interviewing and business etiquette. In addition, trainees gain valuable direct business work experience through the internship program in local businesses and hospitals. Completion of the program can earn student up to 17 NOVA credits. The new Manassas campus expansion, begun under the auspices of the C2C grant, built from the basic Training Futures model with several changes/improvement made:

- Block scheduling as a program feature of NOVA
- Addition of medical terminology program
- Seeking new ways to market and recruit applicants

The overall curriculum consists of two main components as outlined below:

7) Office Management
   a) computer skills
   b) business English
   c) business math
   d) keyboarding
   e) filing
   f) medical terminology

8) Soft Skills and Job Seeking
   a) business communication skills
   b) resume-writing
   c) interviewing
   d) business etiquette

A key feature of the Training Futures curriculum is what they call, "Imaginal" education. This is a transformational approach to training that looks well beyond the distinct skills of office and business management and looks at the whole person and attempts to train for the full range of skills, knowledge, attitudes and disposition people need to successfully enter and stay on a career pathway. This model was adapted from the Institute for Cultural Affairs and the work of Kenneth Boulding (1956). Boulding asserted that:

1. People operate out of images.
2. Images determine behavior.
3. Images are created by messages that can be intentionally designed and communicated.
4. Images can change.
5. When images change, behavior changes.

Training Futures staff have noted that the most entering students have a negative self-image and have little self-confidence in their ability to learn. To directly address these challenges, key features of the "Imaginal" approach include:

1. Learning life, literacy and work skills in tandem
2. Hands-on simulated business environment

3. A "high-touch" model, where instructors also serve as coaches and training supervisors
4. On-site professional counselor/ case manager
5. Training and support in:
    a. Technical skills
    b. Communication skills
    c. Self-perception and self-esteem improvement
    d. Motivation
    e. Self-reflection and self-assessment processes

The Imaginal approach, as articulated by Training Futures staff, "begins with the quotes of the day and builds in fundamental questions about students identities and vision for their lives: Who are you? Where are you? Where do you want to be? The learner also powers it: This is who I am; this is where I want to be. We help them get to the place where they are employable and successful."

It was evident from our observations of the instruction and focus group interviews with students that the overall curriculum seemed to have shaped the students' outlooks, self-perceptions and abilities. Students spoke with great enthusiasm about their own personal transformation as they progress through the program. Several students articulated their hope that when they were employed they would be good representatives of Training Futures.

One theme that emerged from these observations and interviews was how meaningful the quote of the day was for them. The opportunity to reflect on an inspirational quote and share their insights and ideas seemed to be cathartic for many of the students.

Instructor Latoya Robinson explains that the emphasis on transformation reflects an awareness of the low status and difficult circumstances that many of their students come from:

> *We pride ourselves in empowering our trainees… We always start off our conversations with a quote conversation. This really gets a person to think. We try to find quotes that will empower them because they feel broken, or marginalized or that "I've been put into this box"… So definitely, we do have a platform. It's not in a manual. It's a tradition. (10-23-14)*

Similarly the Toast Masters public speaking opportunities were also seen as personally transformative.

In the classroom, we observed engaged students collaborating with peer and confidently interacting with the instructor. Students worked on logic problems, critical thinking activities, problem identification and problem solving activities. The instructor was inclusive in their instructional approach and provided opportunities for students to be engaged in discussion and questions and answers. Interviews with teaching faculty revealed a staff committed to both the curriculum and the students they served. We heard from instructors who had quickly become advocates for the Training Futures model of workforce development and had integrated these philosophies and practices into their teaching routines.

Regarding the origins of the curriculum for the medical courses, Instructor Sarah Swain told us that

that she meets every other month with the Assistant Dean at the medical campus. The Assistant Dean sets objectives about what the students need to know.

When we asked Training Futures Instructors where their lesson plans come from and how they know what to teach, Latoya Miller told us of how, for one class, there was a clearly laid out curriculum but for another, Business Communications, the curriculum was not yet developed. She told us about how Training Futures relationship with NOVA's academic departments allowed her to tap resources outside of the Training Futures staff.

> *…I was pulling my hair out, and I thought, "Light bulb! We have a relationship with NOVA. We have a liaison between Training Futures and Business Communications. I reached out to NOVA and asked if there was a business communications professor I could shadow and I could speak with. And tried to create some kind of relationship to get some kind of strategy. To say, "Here is what I'm thinking… am I going down the right path? Is it ok if I look at your syllabus and see what you do?" We had a couple of meetings… That's how I was able to create a curriculum and a lesson plan. (10/23/14)*

We also observed and heard about a strong collaborative spirit among instructors in Training Futures, discussing how they try to come at the same topics from the different vantage points of their classes.

> *LaToya Robinson [Instructor]: You all talk… It's not separate, it's all together.*
>
> *Sarah Swain [Instructor]: For example, Latoya, has been doing active listening skills. I'm the healthcare trainer. I have streamlined that into my lesson plan in my Healthcare class. If we're going to be talking about the same topic, what angle can I take in Healthcare and what angle can you take in Business Communications? (10-23-14)*

Later in the same conversation, we asked about how the collaborative spirit in curriculum development began. Sarah Swain said that she thought that this openness to learning feeds from the students to the instructors and back again:

> *The trainees come in vulnerable and open to critique, and that helps us as instructors be vulnerable and open to critique… [Instructors tend to pull knowledge from their peers]. It is informal. There's not a formal peer mentoring… We eat and ask, "How did your class go today?…" (10/23/14)*

Suggestions for Future Growth related to curricula

<u>Assess the Curricular/Non-Curricular Dichotomy</u>

The Training Futures curriculum in particular represents an innovative way of blending interpersonal development with professional skills, knowledge and dispositions. The program recognizes that creating effective learning environments requires the development of trusting and supportive networks that help build both individual and collective efficacy. Here we saw the integrated teaching

life, literacy and work skills in action. In many respects this represents some interesting boundary crossing between what are traditionally thought of as curricular and non-curricular activities; that is teaching and content on one-side and student support services on the other.

The work at NOVA under the auspices of the C2C grant blurs these traditional lines and provides students with a potentially more dynamic and effective way of fostering growth and success. We encourage NOVA to continue developing innovative ways of blending interpersonal development, career guidance, student support services with professional skills, knowledge and dispositions and challenge the various stakeholders to reconsider the traditional curricular/non-curricular dichotomy. The implementation of the Curriculum Development and Delivery Design Group discussed in Judith James's response to the site visit member check might be a good place to initiate discussion around this topic.

Formalize the Curricular Innovations

While some of the curricular materials at NOVA have been captured in writing and available as white papers, manuals and handbooks, there are a number of innovations that could be more formally captured. The further development of curricular resources would support greater replicability and continued leveraging of these resources across the organization. Similarly, capturing these innovations would help to lessen the reliance on the organizational memory of few "indispensable individuals" and allow for a greater expansion of the promising practices and lessons learned from C2C. This recommendation is already captured in the Training Futures Logic Model, stating the goal of documenting "new site activities in a new manual; providing a blueprint that could serve as an expansion tool for future site replication". We learned from our site visit that this can be a challenge given time and resources; when asked what some of the challenges of where, one stakeholder indicated, "putting it down on paper" and the larger focus group concurred. We encourage the team to explore ways of capturing their innovative curriculum in greater details.

Build Greater Empirical Support Behind Imaginal Learning

The Training Futures curriculum, in particular, was representative of many of the innovations we observed and we found the Boulding influenced *imaginal* education (1956) compelling. However, we suggest expanding from this original construct and conducting a broader literature review to update and further substantiate the model. The learning and cognitive sciences provide a wealth of insights about adult learning and could provide notable support and refinements to Boulding's (1956) original work. Increasingly there is very good synthesis research available that could expedite this work. Strengthening the empirical support for *imaginal* education could help in transferring the curriculum and lessons learned to other similar settings and sustaining the impact beyond the performance period of the grant and the Training Futures context.

Continued Development of Curriculum in the Service of the Strategic Vision

We found the idea of identifying and leveraging existing curricular resources aligned to a set of strategic goals compelling and worth refining and capturing. Documenting this kind of strategic planning and action could help build greater organizational capacity to meet the evolving workforce development needs and help sustain the effort beyond the performance period of the grant.

Continued Development of Adaptive Models of Workforce Development

One of the themes that was identified across NOVA Local's curriculum was what we might call adaptiveness; that is the ability of the organization to make modification to the curriculum based on changing and refined employer and marketplace needs. Multivision for example, talked about skills gaps between college grads and the needs of the industry. Jennifer Pocai, the Data Manager for ACP, emphasized that part of what they do at ACP is "Filling in the gaps between training and employment." It was emphasized by a number of the stakeholders and the structure of community colleges with curriculum committees and state approval processes can lack the temporal space between the identification of new and evolving training needs needed to enacted curriculum and instruction revisions thereby limiting their ability to be as responsive changing needs.

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Courses To Employment: Partnering To Create Paths To Education And Careers (http://www.aspenwsi.org/wordpress/wp-content/uploads/C2E.pdf)

Multivision website http://www.multivision.net/workforce_development/workforce_dev_training.htm

NOVA Press Release, SkillSource Career Services Center set to open at NOVA-Manassas November 7, 2013

NOVA website http://www.nvcc.edu/academics/additional-learning-opportunities/acp/partners/index.html

Training Futures Logic Model

WDD Multivision C2C Data Collection Grid

U.S. Department of Labor, Employment and Training Administration, Notice of Availability of Funds and Solicitation for Grant Applications for Trade Adjustment Assistance Community College and Career Training Grants Program. Washington, DC: US Department of Labor.

VII. Activities Conducted Under the Auspices of the Grant

Summary of this section

- C2C represents a complex interlacing of services that all come together strategically under the grant;
- The use of strategically leveraged funds increases the range and quality of services needed to scaffold and support the holistic needs of this student population.

Specifically, C2C Funds Support:

1. The Training Futures program on NOVA's Manassas campus (space and staffing)
2. ACP's three staff positions;
    a. Success advisor
    b. Grant project manager (part-time)
    c. Access counselor (part-time)
3. The new Skillsource office directly on the NOVA Manassas campus with specific support for the salary of a Community Relations Supervisor, as well as signage and videos that show on the campus' closed circuit TV's. C2C funds also funded the training of the instructor for the Skillsource Group's CISCO instructor, and have been used to expand their course offerings. In each of the new cyber security programs the instructor's salary is funded by the grant.

In terms of work that is still in progress, we have expressed concerns, and NOVA and its partners have begun to address these, regarding the need to make it easy for potential students to make sense of the network of organizations that are part of, or connected, to NOVA.

C2C represents a complex interlacing of services that all come together strategically under the grant. Some of these services are directly paid for through grant funds and others are leveraged from existing organizational capacity in a way that is designed to enhance the impact of the grant efforts. Consistent with the project's theme of career pathways, the grant's funding is designed to provide students with a full range of training and support services not possible through direct funding only. Here the use of strategically leveraged funds increases the range and quality of services needed to scaffold and support the holistic needs of this student population. As some indicated, the working relationships among the individuals and organizations have been long-standing and evolving, and the structures that support this work are complex.

Taken together, the overall use of grant funds is strategically designed to build a self-sustaining regional infrastructure to serve students in work-based learning activities with a primary focus in IT and STEM occupations. Specifically, the activities under the auspices of the grant are the following:

1. Funding the replication of the Training Futures program on NOVA's Manassas campus by paying for both space and staffing;
2. Supporting the work at ACP through a success advisor position (sometimes called a career navigator), a grant project manager (part-time) and an access counselor (part-time);
3. Funding aspects of Skillsource to create an office directly on the NOVA Manassas campus with specific support for the salary of a community relations supervisor, as well as signage and videos that show on the campus' closed circuit TV's.

No C2C money is used to support Multivision. That said, Multivision is part of the collaboration and can leverage resources to meet the strategic goals of the grant.

By the fact of the organizations above being part of the C2C grant, an overarching accomplishment of the grant has been increased collaboration between the partner organizations. When we asked if having less distance and more collaboration between the people of the different organizations seemed "compelling" to people and whether it would continue, Seema Jane, Vice President of Operations at Skillsource said that she thought that it would, as did Jim Fabian, Director of Special Projects at Skillsource.

By way of example of structures that would maintain the collaboration, Jane said that they, at Skillsource, had asked someone to be part of their design committee, and said that they had created an overarching "Employers' Solutions Team." To be part of this team, organizations sign off on a Memorandum of Understanding, and have begun sharing their data using SalesForce software on which each organization posts each of their industry partners, the nature of their collaboration, and the point person for contacting that employer. (10/23/15)

When meeting with a team of Skillsource joined by Susan Baker, the C2C Project Director, we were struck by the collaborative spirit among the various groups. We noted this to them, saying that we could imagine that things could have gone differently; that when you have a number of groups with closely related missions there could easily be a feeling of rivalry and territorialism. Susan Baker explained her view on why the collaboration was working:

> *I think that the idea of oversight with flexibility is huge. That just happens to be my management style. I have the advantage of having worked with all of these groups at one time or another so I know that they are all results driven. There's not one of these organizations that I know of that doesn't always meet their goals… Many times they exceed them.*
>
> *With a team like that, even if you're working in silos, if you can bring them together they can see how it improves the success numbers. Everyone asks, "Who gets credit?" I don't care. I hope they all get credit for what they're doing. We can only count the person once but if they started at Training Futures and moved to ACP, then they took extra courses in Workforce Development and then got placed at Skillsource. That's the happiest scenario out there… I like to see the creativity and I like to see the relationships being built. And I think that's where the strength is in all of that. Learning what the other people do, and how they can be successful. Then letting the great minds at the table, figure out, "Hey, we could partner on this?" It's about learning to think creatively at the table.*

How were programs and program design improved or expanded using grant funds?

How C2C Funds have been used at Training Futures (TF)

C2C grant money is being used to seed the new NOVA- NVFS Training Futures co-enrollment site in Manassas with an IT occupational focus is designed to train 120 low-income and laid-off adults during the 3-year project timeframe, and which will include an ESL Bridge onramp program. C2C funds the entirety of the Training Futures program at NOVA's Manassas Campus including both the space and the staffing (Sharon Legrande, Director, NOVA Office of Workforce Development which includes Training Futures, 9/12/13).

How C2C Funds have been used at the SkillSource Group

Here funds are being used to create a mini One-Stop SkillSource (WIA) Center located at NOVA's Manassas campus, to serve unemployed students and job seekers. Their focus is on matching participants with nearby IT/STEM employers seeking skilled talent and with training opportunities to prepare for these careers.

C2C funds support the salary of a community relations supervisor, as well as signage and videos that show on the campus' closed circuit TV's. (Judith James, 9/11/13; Seema Jain, Vice President of Operations, 9/12/13). Operating costs for the center are being provided by NOVA itself, apart from the grant funds. (Judith James, 9/11/13)

C2C funds also funded the training of the instructor for the Skillsource Group's CISCO instructor, and has been used to expand their course offerings. In each of the new cyber security programs the instructor's salary is funded by the grant. (Skillsource Group Special Projects Director, Jim Fabian, 10/23/14)

The cyber security programs now being offered through NOVA are the following:

- Comptia A+,
- Comptia Security J
- Systems Security Certification
- Systems security Certified practitioner
- Cert information systems security professional (CISSP)
- Comptia Advanced Security practitioner – CASP
- Certified Ethical Hacker (CEHv8)

Looking ahead, Jim Fabian is optimistic insofar as each of Skillsource's programs only exist if they are self-sustaining:

> *There's no question we'll sustain these courses whether or not the grant will pay for these instructors or not… These programs are going to grow. The C2C was nice to get it started but it will be self-sustaining like all our programs. (10/23/14)*

How C2C Funds have been used at Adult Career Pathways (ACP)

Initiating IT-focused Adult Career Pathways college and career advising services is another area that C2C funds are supporting. These services are especially for participants interested in IT/STEM occupations, to expand ACP's participants served within a high need geographic area.

ACP is supported by C2C funds in the following ways

- Success advisor position—an multi-faceted advisor to students, akin to what some programs call a "career navigator"
- Grant project manager (part-time) to ensure compliance with the grants they are receiving—a position funded by multiple grants
- Access counselor (part-time). This is a prior learning assessment specialist who manages referrals and facilitates entry into ACP

(Emails from Milan Hayward, C2C National Project Director, 5/13/14; and Kerin Hilker-Balkissoon, Director of NOVA Career Pathway, 5/13/14).

References

Northern Virginia's Regional "*Credentials to Careers*" Project Profile

VIII. Assessment of students

Summary C2C Student Assessment Tools:

Assessments in C2C Programs:

1. Accuplacer for ESL (College Board)
2. Virginia Placement Test for native speakers
3. Tests of Adult Basic Education – TABE (McGraw-Hill)
4. Local English placement test
5. GED or HS Diploma,
6. CareerScope (Vocational Research Institute)
7. Career Readiness Certificate (ACT)
8. One-on-one meeting with Case Manager to assess skill levels and career interest
9. Multivision: "Screen for aptitude"
10. Training Futures: 6-page application including 3 essay questions,
11. Training Futures: 4-page interview form
12. Training Futures: English test (for 9th grade skill level)
13. Training Futures: Math test (for basic computational skills)
14. Prior Learning Assessments (PLA) including a portfolio development course with credits given for demonstration of prior learning

Next steps suggested

We suggest the development of a college-wide system that helps students assess their needs and understand how they can meet those needs with *either* the programs within NOVA or the programs that partner with NOVA.

The Assessment and Screening of Students

The varied programs that fall under the C2C grant at NOVA use a wide range of assessment and screen instruments to place and monitor student progress. These fall into three main categories; English language learners, adult literacy, career interests and aptitudes.

<u>English Language Learners</u>

Because of the high percentage of non-native English speakers in Northern Virginia a variety of ELL assessments are used. These include:

- Accuplacer for ESL (College Board)
- Virginia Placement Test for native speakers

Adult Literacy

- Tests of Adult Basic Education – TABE (McGraw-Hill)
- Local English placement test
- GED or HS Diploma

Career Interests and Aptitude

- CareerScope (Vocational Research Institute)
- Career Readiness Certificate (ACT)
- One-on-one meeting with Case Manager to assess skill levels and career interest
- "Screen for aptitude" (Multivision)
- Training Futures Intake Sessions with 6-page application including 3 essay questions, and a English test to see if they meet 9th grade skill levels, and a Math test with "basic math calculations," and a 4-page interview form. In they interview they are concerned most with whether they "have that fight." (Sarah Swain, Training Futures Instructor, 10/23/15)
- Training Futures self-assessment given within a course. Latoya Ransom explains:

> *With the business communications training, in the beginning we give a self-assessment, and at the end, another self-assessment. I used to teach "What's your personal communication style?" Then, they go through the training, and they get their results and they say, "Oh! This is my communication style." (10/23/15)*

- Training Futures assessments designed to apply to the workplace given within a course. Sarah Swain, Training Futures instructor explains one particularly rich example:

> *We have the Hospital Comparison assignment: You have to research 3 hospitals in the nation and compare how they stacked up against each other. Do the doctors communicate well? Do the nurses communicate well? Do they give antibiotics at the right time? Not only do I want you to find this information, I want you to put this information in a PowerPoint slide. Then, I want you to get up there and present it. Then I want you to write a report. So those are all different elements of an office job. You would definitely have to research data, present it, and write a report. When I do my assessments, I have different grading scales. So, for your PowerPoint, was there clarity in your PowerPoint? Was it to the point? Were there minimal errors? Did you try not to stare at the screen and make eye contact with your audience. That is the baseline of the PowerPoint. On the report side, did you not cut and paste (laughs). Did you grasp the point of the assignment? What did you learn? (10/23/15).*

In the area of "Career Interests and Aptitudes" NOVA has been making strides to do greater prior learning assessments (PLA) and then give credit or advanced placement based on these. These assessments are done in the following formats (Ashely Poptanycz, 3/18/15):

- Evaluation of workplace training
- Evaluation of Military training
- Credit for portfolio development (a 1 credit course to develop this portfolio)

- Observations

Ashley reports that, in terms of PLA, NOVA is ramping up its outreach efforts – that they are looking at how the portfolio development class could be improved, lowering the cost of the course, and lowering the time/credits of the course.

Next steps: Moving towards "Screening In" rather than "Screening Out"

The assessments and screening procedures listed above are used in the placement of students once they apply or are accepted into a program. In this way, they can be used either to screen out applicants who are not a good fit with a particular program, or they can be used to make sure that, once accepted in a program that student receives instruction or training that addresses their needs without being either too easy or too difficult.

There is, of course, another purpose that assessment and screening can serve: to help guide a student *between* programs, both those within NOVA and those partnering with NOVA, so that they end up in the program(s) that are most appropriate for their needs. This something that the C2C team at Mott Community College in Flint, Michigan call "screening in" rather than "screening out."

At the beginning of the C2C Grant, the use of assessments/screening to navigate *between* programs is said to have happened rarely, if at all. Jim Fabian, Special Projects Coordinator at Workforce Development explains the problem:

> *Up to now, if they were told to go to the counseling center [at ACC], the counselor would say, "You're WD [Workforce Development], why are you here?" It would have to be the student saying, "I'd like to go further." (10/23/15)*

Or, in another example, Ashely Poptanycz, who does prior learning assessments told us that, "We noticed that a lot of people just don't know about PLA options--no one group of people were devoted to getting the word out there." (3/18/15)

Since the beginning of the C2C grant, participants say that there has been progress in collaboration across programs. "That culture has to change and it is starting to change. And I think a lot of it has to do with the connections made at this table," said Fabian of Workforce Development *(10/23/15)*).

One structural change that C2C participants point to as improvement in this area is the new practice of staff from Adult Career Pathways (ACP) going to classes and giving a 10 minute presentation about the range of programs related to the IT Career Pathway that the C2C grant supports. While a step in the right direction, the presentations in class have at least two limitations. First is the issue of sustainability. Fabian says,

> *I would suggest that that may go by the wayside if the funding ends. We need to find a way to continue that. Even if it's a flier that we hand out to each student at the first class. (10/23/15)*

The second limitation to the in-class presentations is the question of whether it makes sense for ACP—one of the individual partners—to be in charge of helping students to see the big picture. While, in the short term, it seems workable that they were able to take on the task using C2C funding, in the longer term it seems like a more appropriate function of the NOVA admissions and/or counseling department—a group whose purpose isn't just to run it's individual organization but to mind the big picture. Doing something as simple as NOVA counselors explaining to each inquiring student a brochure with the overview of NOVA and its affiliated partners would require a mind shift by that department so that it takes under its purview not just the services within the boundaries of NOVA itself, but also the partners that appear outside the lines.

In a focus group of program administrators, Paul Skilton-Sylvester, one of the co-authors of this report, asked about a scenario wherein assessment was integrated into a college wide system program of career navigation:

> *Paul Skilton-Sylvester: Let me throw out a pipe dream and you tell me if you think this would be a good thing: What if NOVA could have career navigators for every student who came to them, and those career navigators had one brochure or one booklet that had a conceptual map and then information about Skillsource, Workforce Development, Training Futures and ACP? And that career navigator--who was going to be with the student from early on in their career until they're in a job and then when they come back from the job for another certification—what if they could talk with them about this whole pipeline? Does that sound like it would be a good thing, or am I missing something?*
>
> *Susan Baker (C2C Director): Yes. That would be a great thing. (10/23/15)*

Seema Jane (Vice President of operations at Skillsource) concurred that greater system-wide coordination is needed and spoke of the steps that his group was taking in the mean time:

> *Yes. I know that there was a pathway that was diagramed out; that would show the roles of all the partners. I don't know if that was ever utilized. But I think that would be great… For our piece, what we're trying to do is to say, "How we can make sure that we're collaborating with the other partners, so that way, when someone comes in, it's not just about Skillsource, it's about what everybody is doing." We try to use the materials to the extent that we can. I think there is always going to be some challenges when we have multiple partners. But that would be the goal—to make sure that it's very collaborative and to make sure that, wherever someone was coming into the project, that they're learning about the other services. (10/23/15)*

Later, Susan Baker went on to point out that, while a much wider use of career navigators would be advantageous, there might be some sub-groups, such as veterans, who already have a course manager, who might not need the full services of a career navigator. Her point, that not all students need the same levels of support, has been handled by more than one community college in the C2C network by having a "red, yellow, green" coding system, by which some students are designated as "high support," and get frequent contact and financial support, while others are designated "medium" or "low" support.

IX. Factors Contributing to the Partners' Involvement

Table 8: What Each Organization Gives, Whom it Benefits and What They Get

Organization	What they give	Whom it benefits	What they get
NOVA's Adult Career Pathways	Students they recruit Wrap around support focused on academic success Financial tuition assistance Increased retention of high support students	Students NOVA academic mission Employers	C2C Funds to support salaries (from NOVA's C2C project) Participation in *SalesForce*® Software database of employer contacts (all agencies sharing data)
Skill Source Group	One stop employment services Training aimed at making students employable No skill or ability requirements for entry WIA funds to support the employment services and training 30% of any dollar earned paid to NOVA for overhead	Students NOVA academic mission Employers	C2C funds to Support salaries (From NOVA's C2C Project) Operating costs (from NOVA) The ability locate on NOVA's campus, allowing closer integration (from NOVA) and ease of referrals Signage and visibility on NOVA's closed circuit TV's ACP Staff person participates in their design team Participation in *SalesForce*® Software database of employer contacts (all agencies sharing data) Being part of a pipeline, so that their graduates have "next step" opportunities
Training Futures	Training for the office environment Personal development Simultaneous registration of students at NOVA NOVA credits Increased retentions of high need students	Students NOVA's academic programs Employers	C2C funding for the entire TF operation on the Manassas campus Academic credit for students from NOVA 85% of students' financial aid money, leveraged by NOVA providing academic credit Participation in *SalesForce*® Software database of employer contacts (all agencies sharing data) (Cont.)

Organization	What they give	Whom it benefits	What they get
NOVA's Workforce Development Office	Knowledge of the hiring needs of business in the region Courses on subjects that meet the hiring needs of businesses in the region	Students Employers	[No C2C funds are used] Participation in *SalesForce*® Software database of employer contacts (all agencies sharing data)
Multivision	Assistance to NOVA's Workforce Development in recruitment of trainees A curriculum for the trainees 4 Training programs $500 to NOVA's Workforce Development for every successful trainee	Trainees NOVA's Workforce Development Department Employers who hire their trainees	A steady stream of recruits A custom-trained pool of workers, from whom they can choose the best; Continuing education credits (CEUs) for students completing the MultiVision training from NOVA/WD. Intrinsic and public relations rewards for fulfilling a social good.

X. Contributions from Partners Most Critical to Success of the Grant

Summary of findings in this section

A key contribution of NOVA's IT Pathway is college's creative use of a wide variety of resources—particularly non-cash resources—to create synergisms between multiple partners for the benefit of students in need of employment.

> ***synergy*** *|ˈsinərjē| (also* ***synergism*** *|-ˌjizəm|)*
> *noun. The interaction or cooperation of two or more organizations, substances, or other agents to produce a combined effect greater than the sum of their separate effects*
>
> *ORIGIN mid 19th cent.: from Greek sunergos 'working together,' from sun- 'together' + ergon 'work.'*

While it is valuable to note the different contributions of the various partners in the NOVA IT Pathway, there is an over-arching approach to collaboration among these partners that should be recognized here as perhaps the contribution with the greatest impact, and which other colleges have the most to learn from NOVA.

When trying to understand the complex set of relationships, the first thing that struck us was the degree to which the IT Pathway was made up of partners *other* than NOVA's for-credit programs. "Where's the NOVA in all this?" we found ourselves asking. The answer, of course, is "All through it," but its involvement is done in ways that leverages a great deal from partners by creatively meeting their partners' own needs.

Looking at Table IX from the previous section, we see that NOVA's has used the following to leverage the services of its partners:

- C2C funds to support salaries until the partner can sustain them themselves;
- Operating costs until the partner can sustain them themselves;
- The ability locate on NOVA's campus, allowing closer integration;
- Academic credit for students from NOVA;
- A portion of students' financial aid money, leveraged by NOVA providing academic credit
- A steady stream of recruits provided by NOVA's Workforce Development
- Access to a shared database using *Salesforce* software of employer contacts and information on the collaborations they are involved in.

As recounted by Bill Browning, then Special Assistant to the President of NOVA, the vision for these overlapping partnerships came from the President, Robert Templin:

> *Dr. Templin sponsored a meeting. We laid out this document with what we were proposing. People said really great things. They were all going to get money. He wanted us all to look each other in the eye and agree to working collaboratively.*
>
> *There were two things that they needed to agree to: There will be outcome targets; and when the money goes away the burden for sustaining it is on you—not me; they had to come up with a sustainability plan. Everyone had to commit a paragraph that had a high level strategy about how they would sustain it. That wasn't in the grant. It was all aspirational stuff. The real point was for them to know that they had that accountability. (5/9/14)*

Looking from the vantage point of the organizations outside of the college, we heard an interesting suggestion for how NOVA could help at least one organization in ways that would not necessarily cost more money. Jim Fabian, of Skillsource, explained that his group—while paying NOVA 30% of what they earn in overhead—didn't have the capacity to do the kind of counseling services that help a student figure out their path, nor which organizations could help them on that path. He went on to say that they also do not have the capacity on the other end of a student's time with them for career counseling, internships or job placement in IT (10/23/14). He said that Skillsource only fills the niche of preparing individuals for entry level positions in IT, but that this niche is still a crucial one as long as it is connected to the wider pathway. What he pointed out was needed, was for those doing these other services—counseling in the wider college, and career navigation in Nova's Adult Career Pathways program—to think of themselves as partners with Skillsource. He said that this is "beginning to happen," thanks in a large part to the collaboration necessitated by the C2C grant.

In sum, the key contribution we wish to highlight is the vision of these mutual beneficial relationships that brought together these partners to create the synergisms of the Manassas IT Pathway. These relationships strike us as remarkably good, with the potential to be even better.

Appendix D: Information on participants

TAACCCT Year One Annual Report –
C2C Cumulative Report – NOVA/NVFS

Cumulative Participant Outcomes

1. Unique Participants Served/ Enrolled	22
2. Total # of Participants Who Have Completed a Grant Funded Program of Study	0
2a. Total # of Grant-Funded Program of Study Completers Who Are Incumbent Workers	0
3. Total # Still Retained in their Program of Study (or Other Grant Funded POS)	21
4. Total # Retained in Other Education Programs	0
5. Total # of Credit Hours Completed	207
5a. Total # of Students Completing Credit Hours	17
6. Total # of Earned Credentials	0
6a. Total # of Students Earning Certificates (Less than One Year)	0
6b. Total # of Students Earning Certificates (More than One Year)	0
6c. Total # of Students Earning Degrees	0
7. Total # Pursuing Further Education After Program of Study Completion	0
8. Total # Employed After Program of Study Completion	0
9. Total # Retained in Employment After Program of Study Completion	0
10. Total # of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment	0

C. Cumulative Participant Summary Information

1a. Male	4
1b. Female	17
2a. Hispanic/ Latino	8
2b. American Indian or Alaska Native	0
2c. Asian	3
2d. Black or African American	5
2e. Native Hawaiian/ Pacific Islander	0
2f. White	4
2g. More than One Race	1
3a. Full-Time Status	21
3b. Part-Time Status	0
4. Incumbent Workers	11
5. Eligible Veterans	1
6. Participant age (mean)	34
7. Persons with a disability	1

8. Pell-Grant Eligible	16
9. TAA Eligible	0
10. Basic Skills Deficient	17

NVFS
22
34

Appendix E: Site Visit Schedules

MYRAN AND ASSOCIATES SITE VISIT
September 11-13, 2013

<table>
<tr><th></th><th>Day 1 – September 11, 2013</th><th>Day 2 – September 12, 2013</th><th>Day 3 – September 13, 2013</th></tr>
<tr><td>8:00 – 9:00</td><td>Breakfast</td><td>Breakfast</td><td></td></tr>
<tr><td>9:00 – 10:00</td><td>Evaluator and key project personnel meeting: MIP- Informal meeting to clarify the goals of the visit and to ask and answer questions – Deborah Rosen, Judith James, Frank Skinner,</td><td rowspan="2">Meeting with institutional research and evaluation staff/faculty: identify and discuss data fields for the impacts phase of the evaluation. Conference call participation with: Frank Skinner, Judith James, Sharon LeGrande (TF), Kerin Hilker (ACP), Jennifer Pocai (ACP), Seema Jain(WIA-SKILLSOURCE), Esther Perantoni/Jim Fabian (WDD) (Need to reserve room at NOVA Manassas Campus)</td><td>9:00-11:00 - Observe Coach/Navigator meeting: Pender-Room ? – Judith, James, Jennifer Pocai, Suzy Mead, Erika Coddington, Debra Butler, Deidra Anderson, Jim Fabian</td></tr>
<tr><td>10:00 – 11:00</td><td>Focus Group interview with Coach/Navigators: Myra Mobely, Suzy Mead, Erika Coddington</td><td>11:00-12:00 - Q&A with Coach/Navigator team – (Continued meeting from above)</td></tr>
<tr><td rowspan="2">11:00 – 12:00</td><td>Training/classroom observation: Training Futures</td><td rowspan="2">Focus Group interview with program management staff: Pender- Room 118 (CBO) Bill Kosanovich-Judith James</td><td>12:00-1:00 - Evaluator debriefing: capture researcher field notes and other observations</td></tr>
<tr><td rowspan="2">Lunch with program faculty: (Ask Suzy if Faculty will be available)</td><td rowspan="2">1:00-2:30 - Lunch and site visit debriefing with program project lead: Judith James</td></tr>
<tr><td>12:00 – 1:00</td><td>Lunch with program Students:</td></tr>
<tr><td>1:00 – 2:00</td><td rowspan="3">Student focus group interviews: MIP – Training Futures</td><td>1:30-2:30 – Focus Group Interview: SkillSource – Judith James, Myra Mobley, Seema Jain</td><td rowspan="2"></td></tr>
<tr><td>2:00 – 3:00</td><td>2:30-3:00 - Evaluator debriefing: Pender - Room 118 - capture researcher field notes and other observations</td></tr>
<tr><td>3:00 –</td><td>Evaluator debriefing:</td><td>Tour of other programs</td><td></td></tr>
</table>

4:00	capture researcher field notes and other observations	**not visited: Multivision-** Ashwin Bharath, Judith James, Esther Perantoni (WDD), Kerin Hilker (Pathway to Baccalaureate-ACP	
4:00 – 5:00	**Evaluator and key project personnel day 1 debriefing**: discuss artifacts collected, ask questions about observations, etc.: Judith James and Suzy Mead (TF)	**Interview Program director.** Judith's Office - Judith James	

Myran & Associates Shoreline Site Visit Schedule Day 1, Tuesday, January 6, 2015

1:00 p.m.-1:15 p.m. (or so)	**Paul arrives and checks in at the Administration 1000 Building. Sherry will greet Paul there and walk or drive with him to the 2500 Building.**
1:15 p.m.-2:00 p.m.	**MFGT 246 Mechanical Maintenance Class 2500 Building**
2:00 p.m.-2:30 p.m.	**Interview with Jeff Purdy, Instructor 2500 Building**
2:30 p.m.-3:00 p.m.	**MFGT 106 Principles of Precision Machining Mathematics Class 2500 Building**
3:15 p.m.-3:30 p.m. (or so)	**Steve arrives and checks in at the Administration 1000 Building. Sherry will greet Steve there and walk or drive with him to the 2500 Building.**
3:15 p.m.-4:00 p.m.	**Interview with Steven Buck, Instruction and Classroom Support Technician 2 ("Teaching Tech") 2500 Building**
4:00 p.m.-4:30 p.m.	**MFGT 105/106 Principles of Precision Machining Class 2500 Building**
4:30 p.m.-5:00 p.m.	**Machine Shop/Lab 2500 Building**

Shoreline Proposed Schedule Day 2, Wednesday, January 7, 2015

9:30 a.m.-10:10 a.m.	**Interview with Chris Lindberg, Instructor 2500 Building**
10:15 a.m.-10:45 a.m.	**Interview with Sherry Byers, Grant Manager 2500 Building?**
10:50 a.m.-11:30 a.m.	**Interview with Keith Smith, Lead Instructor 2500 Building**
11:30 a.m.-1:00 p.m.	**Lunch**
1:00 p.m.-1:30 p.m.	**Interview with Heather Stapleton, Student Navigator 2500 Building**
1:30 p.m.-2:00 p.m.	**Interview with Michelene Felker, Career Navigator 2500 Building**

2:00 p.m.- 3:00 p.m.	**MFGT 106 Principles of Precision Machining Class 2500 Building**
3:00 p.m.- 3:30 p.m.	**Student Focus Group 2500 Building**
3:30 p.m.- 4:00 p.m.	**Evaluators' Time 2500 Building**
4:00 p.m.- 4:30 p.m.	**Interview with Dr. Susan Hoyne, Project Director 2500 Building?**
4:30 p.m.- 5:00 p.m.	**Wrap Up? 2500 Building?**

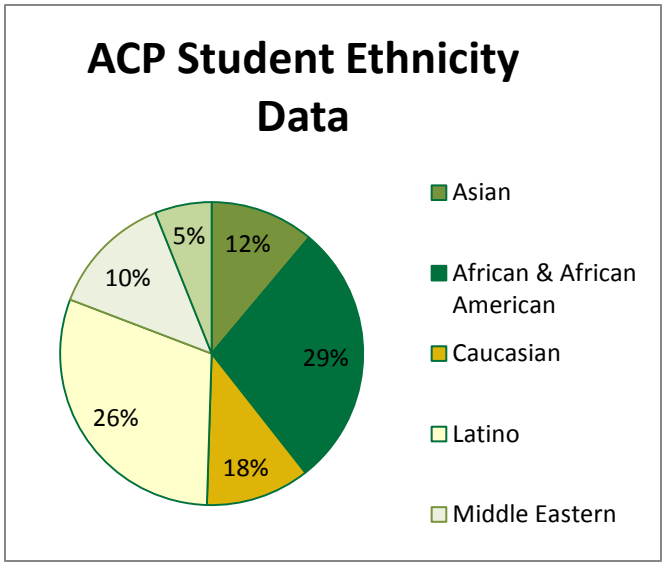
Appendix F: NOVA Adult Career Pathways Dashboard Goals FY 2012-13

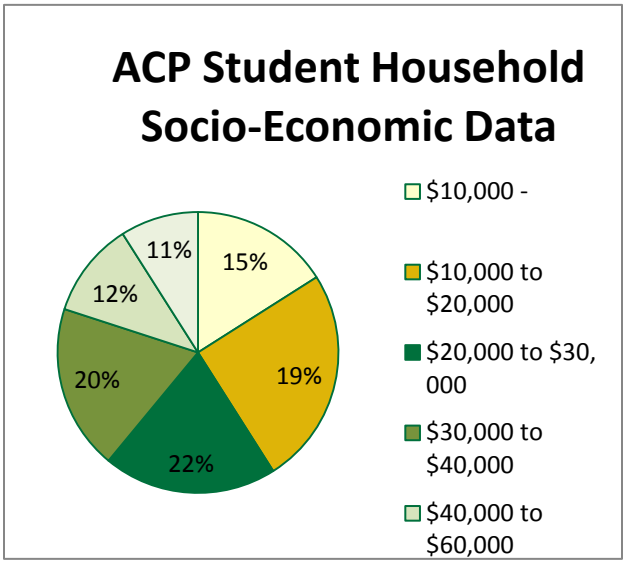
NOVA Adult Career Pathways Initiative
Dashboard Goals FY 2012-13
4th Quarter Report

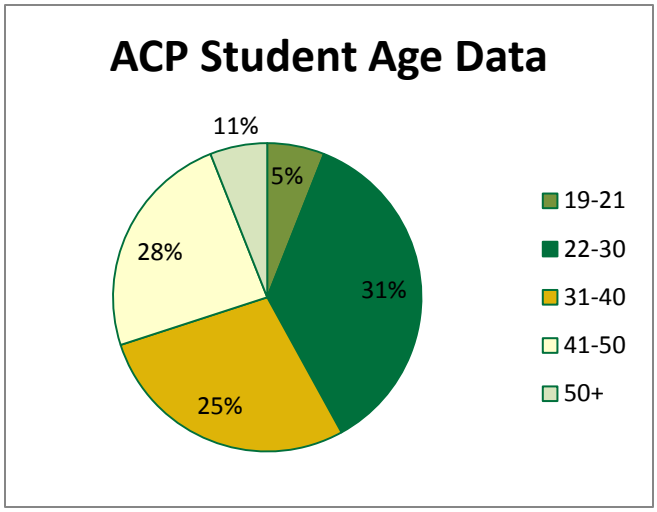
Mission Outcomes

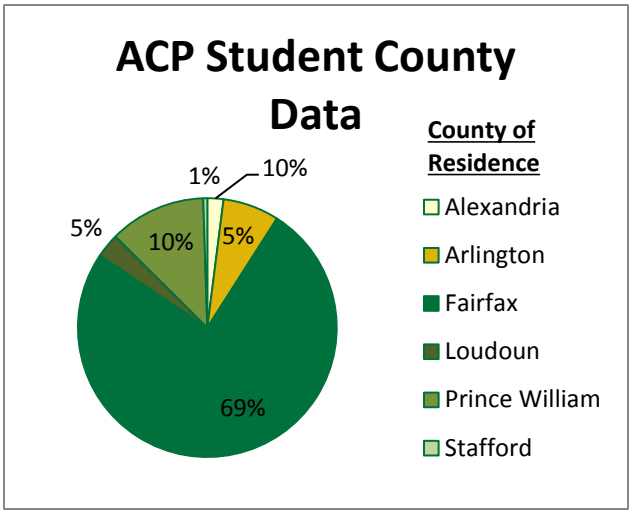
Category	FY 2013 Goals	Quarterly Progress Milestones
Service Volume	300 signed service agreements by 6/30/13*	ACHIEVED 307 signed service agreements as of 6/30/13
Key Relationships	7 partnership plans will be established by 6/30/13	ACHIEVED 9 partnership plans have been established as of 06/30/13
Activation	90% of ACP participants will develop and activate a plan of study	ACHIEVED 97% of ACP participants have developed and activated a plan of study as of 6/30/13
Initial Course and/or Program Completion	80% of active participants will successfully complete their initial semester coursework or training program	ACHIEVED During the spring 2013 term, 89% (110 of 124) of active ACP students completed their initial semester courses with a grade of C or better.
Retention and Persistence	80% of initial coursework completers will register for additional courses following their initial training program or semester	ACHIEVED For students whose initial semester was fall 2012, 87% (112 of 129) went on to enroll in spring 2013 courses. We are unable to report on persistence from spring 2013 to fall 2013 at this time.
Credential Earned	50% of initial completers will earn a marketable career credential within 1-2 years of completing their initial training program/semester	IN PROGRESS 56 individuals have received a marketable career credential within 1-2 years of completing their initial training program/semester as of summer 2013.
Tuition Resources Leveraged	Leverage $400,000 annually in third-party tuition funding to help participants pay for training*	ACHIEVED $628,313 leveraged in third-party tuition funding during the fall 2012, spring 2013, and summer 2013 terms. [12]

[12] *Note: Leveraged funds were a goal of ACP but not explicitly a part of the grant. The mention of leveraged funds for ACP should not be construed as something reportable under the grant.


ACP Student Ethnicity Data
12%
29%
18%
26%
10%
5%
Asian
African & African American
Caucasian
Latino
Middle Eastern


ACP Student Household Socio-Economic Data
15%
19%
22%
20%
12%
11%
$10,000 -
$10,000 to $20,000
$20,000 to $30,000
$30,000 to $40,000
$40,000 to $60,000


ACP Student Age Data
5%
31%
25%
28%
11%
19-21
22-30
31-40
41-50
50+


ACP Student County Data
1%
10%
5%
10%
5%
69%
County of Residence
Alexandria
Arlington
Fairfax
Loudoun
Prince William
Stafford

Appendix G- NOVA Logic Model

Training Futures Logic Model

LOGIC MODEL RECOMMENDATION: NOVA/DOL-TRAINING FUTURES

Name of C2C Institution:	

in office technology and healthcare.

Training Futures Logic Model

Inputs	Outputs		Outcomes		
	Activities	Participation	Short - 0-12 months	Medium - 12- 18 months	Long - 18-36 months
Professional Volunteers Guest presenters Employers	Provide 10 – 15 professional development workshops; Provide networking opportunities Provide information of employer expectations	Employers/Business Partners Trainees	Trainees will gain improved job-search skills including; Interviewing, completing online applications, writing cover letters, navigating job fairs, networking. Employers will gain more exposure to program and trainees		Graduates will achieve career track advancement promoting personal and family self-sufficiency
NVFS staff	Conduct Business Development activities Match trainees to business internships Organize 2 -3 Job Fairs Provide Job Development services Document services provided in database Host graduation event		Employers will have a source of work-ready trained clients	The life style of employed grads & their family will change as new work patterns change daily behaviors Create a direct pipeline for jobs	Graduates will have increased buying power to better provide for their needs.
NVFS staff NOVA Community College staff: Community Based Co-Enrollment office; Student Financial Aid office; Adult Career Pathway counselors	Host graduate alumni events Provide career counseling Guide applicants in applying for financial aid (FAFSA) Track retention Provide post-graduate services for up to one year following graduation		75% of graduates will earn college credits and a college credential 85% of remaining unemployed grads will receive Grad Support services until employment is achieved. Graduates will establish a college career pathway Graduates will have completed step 1 in their career pathway	75% of graduates will have maintained their job for 6 months or more	50% of graduates will have maintained their job for 12 months or more Graduates will have completed step 2-3 in their career pathway 30% of graduates will persist in other higher educational programs
Measurement System: Attendance roster, test scores, midpoint progress report, trainee and employer feedback, case notes, employment plan, database tracking, internship attendance and performance, college grades.					

Chapter 6: Shoreline Community College
Credentials to Careers Program

ABSTRACT

At Shoreline Community College the C2C grant is being used for to increase the number of certification programs within the broader Computer Numerical Control (CNC) Machinist Program, and build capacity within existing programs. More specifically, C2C funds have supported the development of two new CNC Machinist Programs—Quality Assurance, and Machine Maintenance--paid for the creation of new job titles and added additional personnel to existing job titles, purchased resources and equipment for programs, and allowed them to set up a satellite CNC Machinist Program at another community college in the area.

Chapter 6 Executive Summary

With 21,000 workers projected to be needed in the next 10 years by the Department of Labor, Credentials to Careers (C2C) grant funds are being used at Shoreline Community College to meet a pressing demand in the Seattle area for machinists, computer controlled machine tool operators, and other production workers.

To prepare unemployed and under-employed workers for these jobs, Shoreline has been aggressively expanding its Machinist/Manufacturing Programs from a single-level certification, to a series of stacked and latticed certifications. They now offer a second year with two programs, each with its own third party certification, and an Associates of Applied Arts. The two programs being added under the C2C grant are:

1) Machine Maintenance Certificate (with NIMS certification)
2) Quality Assurance Certificate (with ASQ certification)

Ultimately, there are two goals for the evaluation of the C2C projects in the seven-college consortium:

- To keep the various stakeholders informed about the project's progress;
- To contribute to the field of research on community college practices that provide workers with skills and knowledge needed to succeed in STEM related careers.

This report focuses on the *implementation* of changes using grant funds, where the final report will do more to highlight the *outcomes.* As such, this report uses qualitative methods and includes individual interviews and focus groups of students, teachers, career navigators, community partners, and administrators; as well as observations of class sessions and analysis of artifacts such as curricula.

Overview of the findings:

Uses of grant funds up to Year 3

- The development of new programs and new curricula for the Quality Assurance Program and Machine Maintenance Program;

- Increases in program Staffing: a C2C grant manager, career navigator, student navigator; shop manager; tool shop technician; teachers' assistants (officially, "instructional and classroom support technicians);

- Pay for instructors' salaries of instructors in I-BEST and disciplinary areas (with C2C funding reducing after Year 1). . I-BEST stands for Integrated Adult Basic Education. In the CNC Machinist Program, it involves math instruction for students whose skills require extra support.

- Financial support for Setting up Satellite Program at an another area community

college—a Precision Machining Program staffed by Shoreline personnel has been begun at Georgetown Community College in South Seattle;

- Acquiring and maintaining technology and machinery: curriculum (beginning Year 2); professional development for staff (beginning Year 2)'

Areas of progress noted in Year 3

- The written curricula of Shoreline's new programs have been adapted to a) meet the needs of industry and b) to meet the requirements for third party certifications;

- Creating a graphic that explains the relationships between the various CNC Machinist Programs to help students navigate their career development;

- The hiring of new personnel and the fact that students in the machine maintenance program are helping to keep up the machines has meant greater attention to student needs by faculty, allowed by the hiring of the new personnel listed above;

- Hiring of a female instructor supports Shoreline's efforts to recruit higher numbers of female students;

- There has been a slight increase in female students and successful integration of them into the shop culture according to the female students, male students, and faculty;

- Pass rates are said to have increased. [Specific numbers were not available at the time of writing];

- There has been an increase in the numbers of students;

- There has been greater persistence among the students. Specifically, more students are going on beyond the 120 class, where they used to leave after that and get a job—now more are going on to a 2 year and 4 year degree;

- Greater numbers of incumbent workers are signing up as students bringing the benefit of their experience to other students;

- Instructors report improved teamwork among the faculty through the weekly team meetings;

- Aligning with NIMS certification requirements throughout the program is said by students, instructors and administrators to have increased the stature of the program, increased the employability of completers, and allowed greater mobility of students between campuses, insofar as other programs can now can be assured of the knowledge and skills students have;

- Creating a satellite program at the South Seattle / Georgetown campus, which reaches an even higher need population, and creates new pathways to composites and welding;

- The number of industry partners collaborating with Shoreline continues to increase;

- Winning a TAAACCT Round 4 grant, as they have, promises to sustain many of the changes made using C2C (Round 2) funds;

- Improvements are being made to data management by the student navigator to allow greater differentiation of support services;

- Early steps have been made to use Prior Learning Assessments (PLAs) so that students who come with experience—veterans, being one notable example—can show mastery of skills and place out of 1-2 terms in the first year machining program;

- Loopholes have been fixed by the Dean so that outside organizations can no longer sign up students for the CNC Machinist Program, thus ensuring that all applicants have contact with either an instructor or navigator who can counsel them regarding their "fit;"

- Room for growth remains in the database of student information—a need that the program was working on when we visited in January of 2015;

- Within courses, assessment is based on a series of assignments, quizzes, and skill checks, which include performance of certain skills and job documentation by the student;

- Shoreline has negotiated three articulation agreements with programs at local 4-year colleges, so that students' work at Shoreline can contribute to credentials beyond the Associate in Applied Arts and Sciences (A.A.A.S.) degree;

- Regarding sustainability, the main challenge is the expansion of programs, particularly the need for more space.

<u>Strengths noted in our visit during Year 1 that have continued:</u>

- Positive culture – students, faculty and administration seem to genuinely enjoy their work. There appears to be a high level of collegiality within and between all three groups;

- Strong "interlacing" with industry:

    - The high demand for workers in the region is a strong motivation for industry partners to be involved with Shoreline;
    - Person-to-person contact between industry and Shoreline allows Career Navigators to match well-suited students to the needs of a particular worksite;
    - Industry partners value Shoreline's use of certifications as a way of gauging applicants' skill sets;

  - Industry partners value Shoreline's congruence with their own worksites;
  - Government is motivated to support community college expansion through competition between states for hi-tech jobs;
  - Low attrition and high job placement while having, what amounts to, nearly open enrollment;
  - Leadership in the coordination of institutions of higher education and regional employers (e.g. Center of Excellence board);
  - High involvement of employers in program and curriculum design;
  - Georgetown Community College, valuing Shoreline's faculty and curriculum, initiated a partnership in which Shoreline faculty implements a CNC Machinist Program at Georgetown faculty, splitting the funds of each full time equivalent (FTE) student.

- Innovative and successful instructional design:

  - Successful implementation of the "one room schoolhouse" model—students of multiple levels learn and interact in the same workspace, with more experienced students providing support to less experienced one, thereby consolidating their own skills through teaching;
  - Mastery orientation to instruction /assessment contributing to low levels of failure and attrition;
  - Successful integration of basic skills remediation with the machinists work that students find meaningful;
  - Inclusion of the "soft skills" (e.g. presentation of self) in the informal curriculum of the program;
  - Strong vertically integrated curriculum;
  - Supplementary instructional support via video units in the basic mathematics course;

- Strong support services

  - Strong career navigation (close relationships with employers, strong knowledge of the students' individual strengths and the employers' individual needs, leading to a high percentage of students succeeding in finding jobs);
  - Student support has been divided between the "Student Navigator," who works with students on the "front end" of their careers at Shoreline (intake and applications, support while they are doing their coursework, etc.), and the "Career Navigator," who works with students on the "back end" (building relationships with employers and doing job placement).

Current challenges

- Increasing capacity—industry partners say their main desire is for greater numbers of Shoreline trained machinists;

- Building support and collaboration from the Shoreline administration outside (and "above") the program itself;

- Related to the above, encouraging the Shoreline administration to build the infrastructure for large grants and support the potential growth of the program;

- The need for more faculty;

- The need for more physical space;

- Moving more content on-line. Here the limiting factor is said to be faculty time for designing on-line instructional units.

Some possible next steps suggested by Shoreline personnel

- Improving marketing:

    - Updating the college's website to more clearly present the stacked and latticed credentials available through the CNC Machinist Program;
    - Creating a map of King County showing where students are getting jobs;
    - Increased marketing of the Quality Assurance Program that is said to be "a tougher draw" than the Machine Maintenance Program;
    - Tapping the newly recruited female instructor and students to reach out to more females; doing so both informally (word of mouth) and formally (recruitment fairs, publicity materials);

- Obtaining more room for expansion;

- Putting more materials on-line;

- Connect with Austin Community College, another C2C consortium member regarding their low/medium/high classification for students' needs for support. Could Shoreline use (or adapt) their database rather than developing their own?

- Host a "women's night" at the machine shop;

- Be proactive in improving support from top college administration. Step 1: Understanding what they value; Step 2: showing how the CNC Machinist Programs help the wider college administration meet those values;

- Increased field trips or, more ideally, shadowing by students on job-sites.

-

Table 2 – Data Sources

Position	Name	Title/Affiliation	Interview?	Focus Group?	Observation?
Administrators	Sherry Byers	C2C Grant Manager	Yes (Yr. 1 & Yr. 3)	Yes (Yr. 1)	
	Susan Hoyne	Dean of Science, Math & Manufacturing	Yes (Yr. 1 & Yr. 3)	Yes (Yr. 1)	
Students	Student 1	1st quarter		Yes (Yr. 1)	Yes (Yr. 1)
	Student 2	3rd quarter		Yes (Yr. 1)	Yes (Yr. 1)
	Student 3	2nd quarter		Yes (Yr. 1)	Yes (Yr. 1)
	Student 4	1st quarter		Yes (Yr. 1)	Yes (Yr. 1)
	[Other students]	Assorted		Yes (Yr. 1)	Yes (Yr. 1)
	Student A			Yes, (Yr. 3)	
	Student B	1st quarter		Yes, (Yr. 3)	
	Student C	1st quarter		Yes, (Yr. 3)	
	Student D	2nd quarter		Yes, (Yr. 3)	
	Student E	3rd year		Yes, (Yr. 3)	(Cont.)
Navigators	Micheline Felker	Career Navigator	Yes (Yr. 1 & Yr. 3)	Yes	
	Heather Stapleton	Student Navigator	Yes (Yr. 1 & Yr. 3)	Yes	
Industry Partners	Tom Stevenson	Manager, Royell Manufacturing	Yes (Yr. 1)		Yes, (Yr. 1, Observation of machine shop)
	Bobby Holt	President, Pacific Tool	Yes (Yr. 3)		
Support staff (added Yr. 3)	Steve Buck	Instruction and Classroom Support ("TA's")	Yes (Yr. 3)		Yes (Yr. 3)
Instructors	Cliff Bergeson	Instructor, CNC Machinist Program	Yes (Yr.1)		Yes (I-BEST class obs.)
	Jeff Purdy	Instructor, CNC Machinist Program	Yes (Yr. 1 & Yr. 3)		Yes (Quality Assurance class obs. Yr. 1; Principles of Precision Maintenance Class Yr. 3)
	Keith Smith	Lead Instructor, CNC Machinist Program	Yes (Yr. 1 & Yr. 3)		Yes, (Blueprint reading, Yr. 3)
	Chris Lindberg	Instructor, I-BEST Program	Yes (Yr. 1 & Yr. 3)		Yes, (I-BEST class, Yr. 3)

IV. Activities Under the Auspices of the Grant

Summary of this Section:

Grant expenditures fall into the following major categories:

Program Staffing

- C2C grant manager
- Career navigator
- Student navigator
- Shop manager
- Tool shop technician
- Teacher's assistant (officially, "Instructional and classroom support technicians)

Faculty Salaries

- Courses in I-BEST and disciplinary areas (with C2C funding reducing after Year 1)

Development of new programs / new curricula

- Quality Assurance Program
- Machine Maintenance Program
- **Note: A MasterCam Program was also added but not through the use of grant funds.*

Resources/Equipment

- Acquiring and maintaining technology and machinery
- Curriculum (beginning Year 2)
- Professional development (beginning Year 2)

Program Staffing

In our visit to Shoreline during the first year of the grant, grant funds paid the salary of Grant Manager, Sherry Byers, as well as 100% of the salary for the career navigator position, held by Micheline Felker, (email, Sherry Byers, 7/22/15).

By the time of our site visit in Year 3 of the C2C grant, Shoreline had created and filled three additional new positions related to the machining program funded by the grant. Ultimately, the

allowed the machine shop to be more congruent with job sites and to run more smoothly. This improvement has freed instructors to have more face time with students--support that students told us in the Year 1 site visit that they needed. As Keith Smith, Senior Instructor at Shoreline said, "Life has changed vastly. If we had to go back—I shutter to think." (1/7/15).

Along with faculty having more time with students, instructors reported that the addition of these new positions means other improvements in the function of the program. Instructor Chris Lindbergh's comment typified what we heard, "It's very helpful to have additional staff. The machines are cleaner; machines are working more--they're not down even though they're not new." (1-7-15).

It's important to note that along with the new positions, the addition of the Machine Maintenance Program itself serves the program by enlisting students in maintaining the machines as part-and-parcel of the program itself.

Below are further details on the job responsibilities of the three new positions:

Shop Manager

The shop manager's job is to keep things running smoothly, oversee machine maintenance and machine repair, make sure that the shop is in compliance with federal safety regulations, implement to lean manufacturing practices, and to organize the work space for efficiency and effectiveness. Previously faculty members, reducing their teaching time with students, completed these tasks. (Jeff Purdy, Instructor, 1-6-15)

Tool Shop Technician

The tool shop technician assists the shop manager in the day-to-day operations of the machine shop but is more focused on the tools themselves.

An example of this work is establishing what's called a "shadow board"—a board where tools are hung that has the outline of each tool that belongs at that workstation. Each board is color-coded and all the tools are marked with that particular color so it's quickly evident where each tool belongs. Instructor Chris Lindbergh told us that such practices go a long way in helping align their worksite with industry practice.

Maintaining the inventories, issuing and organizing the tools, materials, and supplies are other duties. Related to these, they monitor the condition of the tools and assist in calibration, sharpening, cleaning, reconditioning, repairing and replacing.

The tool shop technicians also get involved in instruction related to the tools—showing students how to use and sharpen them. Related to first aid and safety, they monitor proper tool and equipment use and shop safety, including lock out/tag out, first aid, material safety data sheet (MSDS), and hazardous materials storage

Like the work of the shop manager, the work of the tool shop technician was previously done by faculty, cutting into their teaching time. (Jeff Purdy, Instructor, □□□□□□□

Teachers' assistant

The third position that has been created is the teachers' assistant (TA's)--more formally known as "instructional and classroom support technicians". Their duties include conducting orientations to safety and particular machines, overseeing and assisting students in their work on the machines, and preparing operations guides for the machines.

Again, the work of the TA's has freed up instructors to have more time with students.

Given the safety considerations, these are important tasks, and from our observations and an interview with one of the TA's, they seem to take pride in their work and have strong ownership for the program.

Student navigator (different than "career navigator")

Prior to the C2C grant, Shoreline had a career navigator who handled all student support from recruitment to job placement. As the program rapidly expanded, money from the C2C grant was used to hire a second navigator—this one with the title of "student navigator," whose responsibilities focused on the early and middle parts of students' academic career—recruitment, admissions, intake, and on-going support once they were enrolled in classes, e.g., helping students find money for tuition, books or tools. Her focus is "more on life issues rather than academics." Forty-six percent of the salary of this student navigator, Heather Stapleton, has been paid by the C2C grant.

In recruiting students, the student navigator works with outside partners in the Worksource Office and the Seattle Department of Social and Health Services (DSHS) so that they will give referrals from people who are seeking employment. She also builds relationships with the Department of Labor & Industry (L&I) so that if someone is hurt on the job and getting L&I benefits, their counselor can refer them for training. The student navigator also attends career fairs, particularly those focused on veterans and women, who are under-represented in the CNC Machinist Program. (1-7-15)

Creating the position of Student Navigator allowed the career navigator, Micheline Felker, to focus on the students' transition into jobs and more strategic interests of the program. She continually worked on recruiting industry partners, getting input from those partners on curricular matters, helping with job placements, and building new strategic partnerships such as the satellite campuses. She prides herself in continually adding to the list of industry partners working with Shoreline, and works to understand the needs of individual businesses so that she can connect them with the right students.

Industry partner, Tom Stevenson, attests to Micheline's vigilance:

> *The navigator position is what really what started to get a steady stream of business working with the school. That's where Micheline came into play. She got out and worked hard and began establishing connections with businesses in the area. She worked hard to establish a steady stream of employees. Now she knows who the hiring managers are and where to place students. In turn, we have been trying to expose the students to our work environment. So I've had an open invitation to the entire instructional staff to come out and shadow so that they can get an idea about what an actual work environment looks like. We highly encourage that. At least 1 group every year for the last couple of years has come through. (10/15/13)*

Positive steps and room for improvement regarding female enrollment

As the Table 3 below shows, by the third year of the C2C grant there had been substantial growth in the numbers of females, even if the overwhelming majority of students were still male. It remains to be seen whether the improvement in Year 3 will be a one-time jump or whether it will provide the critical mass that will encourage continued increases in enrollment.

Table 3: Enrollment of Females and Males by Year

Year	Total females enrolled	Total males enrolled	Percentage of Females
Year 1	6	109	5%
Year 2	5	125	4%
Year 3	11	120	8%

*Source: Chloe Nixon, C2C Data Manager, 9/12/15

Encouragingly, we heard comments about the ease with which more women were being integrated both from male and females, staff and students. When we asked female students about their experience once in the program the responses were uniformly positive. One female student told us:

> *I'm comfortable with these kinds of people…. They haven't treated me differently. It's fun doing better than the guys. (1/7/15)*

Keith Smith, Lead Instructor, said that he thought the increase in females was going well. He commented, "Most of the women who show up are confident, a bit unusual—sometimes it's a woman who has grown up with a family with all brothers." (1/7/15)

Referring to the male students, Smith said, "Usually students are pretty good about this. It hasn't been much of a problem. If we have a problem it would be with people helping out the woman too much…"

After the focus group, we asked one female if she had experienced any sexual harassment. She said, "No, but thanks for asking."

Faculty Salaries

In Year 1, grant funding has also supported some faculty salaries as well as stipends for curriculum development and professional development. C2C faculty roles are in the machine manufacturing disciplines and the Integrated Basic Education and Skills Training (I-BEST) courses. When we visited in Year 3 the contribution of C2C funds for faculty salaries had been reduced, but not yet discontinued.

In addition to the wholly new positions mentioned above, Shoreline hired an additional instructor. Notably, this new instructor is a female. Like some others on the faculty, she is a former student who had impressed the faculty with her abilities. Her salary and the salaries of other new faculty are not supported by the C2C grant. (Sherry Byers, C2C Manager, email 9/20/15).

New programs / New Curricula

With no limits in sight for industry demand for machinists of different stripes, Shoreline has expanded both the number and size of its programs. C2C grant funds were used to develop their two new programs—Quality Assurance, and Machine Maintenance.[13] Along with these new curricula, C2C funds were being used for professional development stipends for faculty.

Instructor Keith Smith describes the expansion this way:

> *It's making our programs much stronger. I used to tell people, just do the first year. I don't have much for you after that. Just go to work. Very few people would leave a program like this and become a programmer. Now that we're adding the QA and Maintenance Program we're structuring it so any student can take any of it or all of it. They could become more interested in one of those areas and not take any other electives. (10/15/13)*

[13] During the grant period a Mastercam Program was also developed but not using grant funds.

Quality Assurance Program

The Quality Assurance program trains people to make sure that products being produced are being made to specification. This program was said to be a "tougher draw" in terms of finding students to sign up. Students taking the Quality Assurance earn certification from the American Society for Quality (ASQ). Now that the first iteration of the Quality Assurance Program is being implemented, the faculty has begun moving lecture content on-line so that they can eventually implement the course in a hybrid approach (Sherry Byers, C2C Manager, email, 9/20/15).

Machine Maintenance Program

Among these new programs, industry partners were most excited by Machine Maintenance, insofar as hiring employees with this background would increase efficiency and reduce the need to hire outside contractors to do this work. Students in this program may earn up to 5 NIMS credentials.

The introduction to the written curriculum for the machine maintenance describes it this way:

> *The curriculum for the Machine Maintenance Certificate consists of five courses designed to give workers a basic understanding of how to maintain and repair modern manufacturing machines by, first, presenting the underlying principals upon which the machines are based, followed by an understanding of how machine systems utilize these principles to accomplish their functions. As this foundational knowledge is gained, students then solidify it by learning the practical skills needed to keep machines operating as intended. (p. 1)*

Currently there is no certification accompanying the Machine Maintenance Program. In addition to industry employment needs, a collateral benefit of the program is that students are now involved in maintaining the shop at ACC, doing work that previously had to be done by faculty. Faculty told us that the machines are now cleaner, better maintained, and more organized (e.g., "shadow boards" that use color coding of tools assigned to make it evident which machine they belong with, and whether a tool is missing). (Instructor, Chris Lindbergh, 1-7-15)

Expanding the programs, of course, has not been without some disruption—mostly related to space and the need for machinery. Keith Smith describes the challenges this way, "What we're doing now, adding new programs, there are a lot of growing pains: simple things, floor space, a lot of time to get that wall taken down. It causes a lot of confusion. It's making our programs much stronger." (10/15/13)

Moving Existing Curriculum Content On-line

With money from the grant, instructors have been paid for curriculum development hours to create online materials for our C2C funded programs. In particular, one of the I-BEST math/ESL/ABE instructors has produced approximately a dozen videos for our Principles of Precision Machining Program that explain mathematical calculations typically encountered in

precision machining (Sherry Byers, C2C Manager, email 9/20/15).

Precision Machining Satellite Program at a Neighboring Community College

At the request of a neighboring Community College that had the machines to run a machining program, but otherwise lacked the capacity to run the program, Shoreline has begun offering its Precision Machining Program at their site. C2C funds were used to help set this up insofar as the Shop Manager and Tool Room Technician cleared out and cleaned up the space, installed equipment, and organized the shop. Once the program was up and running Shoreline's Career Navigator has worked with their students, a position also funded by the C2C grant.

WAITING FOR RESPONSE FROM MILAN ABOUT WHETHER THOSE STUDENTS ATTENGING GEORGETOWN WERE IN FACT C2C PARTICIPANTS.

Resources/Equipment

A third major area of grant expenditures is for resources and equipment, including computer hardware, software, shop equipment, and tools. Given the growth in the program and curriculum offerings, acquisition and maintenance costs increased significantly in Year 2, according to grant manager Sherry Byers. Discussions with several course instructors, particularly, Cliff Bergeson, a senior faculty member, underscored the need to have modern, well-functioning equipment in order to teach the skills required by prospective employers. The two new programs—Quality Assurance and Machine Maintenance—are uniquely offered at Shoreline and require specialized technology and equipment to be effective and current. Donations of older machines from industry partners substantially reduce the cost burden, but are not sufficient to address all training needs.

Under the USDOL grant, they have also purchased computer hardware, software, shop equipment, and tools in support of our C2C funded programs. For example, the programs now have a sufficient number of professional-grade laptop computers, with Ethernet charging carts, to create mobile computer labs in shared classroom spaces. They have purchased classroom licenses for a software package that teaches and simulates Fanuc brand controllers. Equipment purchases include a portable coordinate measuring machine, a visioning system, three manual lathes, and a 5-axis mill.

Donations to the shop over the past three years have included tools, materials, coolant, software, free training, mills, manual lathes, a spindle and older machines for student use and practice in the Machine Maintenance Program, and, most recently, a Shizuoka mill with FANUC controller, a visioning system, and an electrical discharge machine.

V. Curriculum: How was the particular curriculum selected, used, or created?

Summary of Findings in this Section

- C2C funds have led to the creation of two curricula for the two new programs -- Quality Assurance and Machine Maintenance;

- The written curriculum has been adapted to a) meet the needs of industry and b) to meet the requirements for third party certifications;

- Shoreline taps the experience of students by having multiple levels of students present in the shop;

- While experience of students is leveraged, students value access to instructors' knowledge;

- Curricula for machinists integrate academic skills in practical applications;

- Instruction is based on mastery – (i.e. keep trying until you get it right);

- There is differentiation between the role of the "Student Navigator" and "Career Navigator";

- Inclusion of the "soft skills" (e.g. presentation of self) is made in the curriculum of the program and work of Career Navigators.

Possible next steps / Room for growth

- Continue to move more lectures on-line, "flipping the classroom" to maximize use of class time for application of content, and instructional support;

- Continue to grow the reputation and power base in the top level of the college to support the CNC Machinist Programs' continued growth;

- Increase capacity to train people to be computer programmers for machine shops (who occupy the highest end of the pay scale). Sherry Byers reported that to promote this goal;

- Increased field trips or, more ideally, increased shadowing by student on job-sites.

New Programs/Curricula supported by the C2C Grant:

The curriculum for the new Quality Assurance and Machine Maintenance Programs uses a textbook that one instructor described as the standard for most programs across colleges (Jeff Purdy, 1/6/15). The books were chosen by the lead instructor, Keith Smith. Insofar as there is standardization of content across programs, what seems to give Shoreline's programs their

particular character is the use of the one-room schoolhouse model, with students learning from more experienced peers as well as their instructors.

The written curricula has been adapted to meet the needs of industry and to meet the requirements for third-party certifications

The written curriculum for the Shoreline CNC Machinist Program seems to be guided by two main points of reference: the needs of Shoreline's industry partners, and the requirements of the third party certifications students are eligible for with the completion of different stacked and latticed credentials. Within these parameters, curriculum writing is supervised by Keith Smith, and done by individual faculty.

As Shoreline adds programs, it is seeking to attach various third party certifications to each of those (Susan Hoyne, 10/15/13). This effort has, from the start, been on the agenda of Dean Susan Hoyne. Keith Smith, Lead Instructor, said that NIMS is much more well known in the eastern regions of the United States and is "struggling to get a foothold" in the west—although it helps that the head of Boeing (based in Seattle) is on the board of NIMS. (1/7/15).

The requirements for third party certification seem to be welcomed in providing structure to their decision-making about what to teach. Lead instructor, Keith Smith told us, "Everything that is required for NIMS credentials is what we should be teaching anyway. It helps us have clarity. But it's not all we have in our curriculum." (1/7/15).

The certifications also aid students in getting hired. Keith Smith explains that,

> *They can go anywhere in the world and give them their social security number and they can see all the skills they have. (10/15/13)*

The certifications are also valued by the students themselves, said Dean Susan Hoyne, explaining, "A lot of it is building their self-esteem." (3/18/15)

Certifications also help allow students to transfer across colleges. Dean Susan Hoyne said that colleges used to complain that if they took someone from another college they could never be sure what that student knew, but that with the third party certifications, colleges can know what they're getting and it has allowed different colleges to develop specialties: "We do clean technology. North does HVAC. Students go back and forth, and it will all go towards a 2 year degree in clean technology." (1/7/15)

Both the staff of Shoreline and the industry partners appear to work hard to make sure that the both the written curriculum and the work processes themselves are well aligned.

The main, structural way that this happens is through the Industry Advisory Panel. Looking at minutes. it seems that these meetings are well attended by representatives from a few dozen manufacturing partners (though any one meeting may have 4-8 present), Shoreline staff members from all levels, representatives of third-party accreditation groups, and members of other community colleges.

Shoreline staff actively seeks input in other ways too. Tom Stevenson, of Royell Manufacturing, a key industry partner of Shoreline's, tells of the proactive approach of Keith Smith, a veteran instructor at Shoreline:

> *I've been able to work with Keith and the rest of the staff and put suggestions into place about what we'd like to see in the program…*
>
> *One of the first things Keith did was to look at the paperwork aspect of the job. He realized that every shop in the world is dealing with paperwork. This gives traceability to what happens in the shop.*
>
> *His big "ah ha" moment, was when I showed him a rack of parts. They were all basically all the same. I asked the class if they could figure out why they were sitting outside of the Quality Assurance office with a rejection tag on them. They were all scratching their heads. I said, "The problem is that the work order is for 47 parts and there are 50 parts here." We're required to know the traceability of the material used from the moment we receive the materials in the shipping bay to the moment it goes out the door as a finished part… All of these parts are at risk of being scrapped out if we're not able to recover the traceability. We're able to go back and audit… Just the thought that a paperwork and accounting issue could have been responsible for 50 components that were machine-complete being at risk of being scrapped out--it really struck a cord with both Keith and the students. At that point he went back and he really changed the class projects back to a normal shop paperwork type set-up. (10/14/13)*

Tom goes on to describe Keith taking the initiative to spend time at the Royell jobsite, which led him to a realization about how the work processes in Shoreline could be more congruent to job sites:

> *This last year, he came out during his some of his down time. He did some shadowing on the shop floor. His concern was to create more of a production environment. His concern was what happened when someone goes from day shift to night shift. In a school environment, you might put your project away and not be concerned with what the machine is doing. In a work environment, someone has to come in and pick up a very complex process, right in the middle, understanding right where you are and keep it going. And then the world is going to look different when that initial person comes back the next day… He was trying to figure out how to take the classroom environment and begin to mirror what happens in a production environment. (10/14/13)*

While industry needs and norms affect adjustments to the curriculum, they have also affected the creation of the two new programs for which C2C funds are being used. Dean Susan Hoyne explains industry's role in the creation of these programs:

> *We had industry come in and we talked with them for half a day about what their needs are and what advice they would give us for courses and what do they need in employees?*

> *They came up with two--Quality Assurance and Machine Maintenance. We developed with that money a Quality Assurance curriculum which now we offer. (10/115/13)*

While mindful of industry needs, Shoreline still uses outside providers for curricula. For the Quality Assurance Program—developed with C2C funds—they are using a company named Dacom to develop the curriculum but doing so with input from industry.

Part of students' instructional program includes tours of manufacturing sites. Keith Smith began the practice of asking manufacturers to focus their tours on a particular theme. So, for example, one tour might be particularly focused on issues related to defects in the manufacturing process.

By all accounts—we heard it from students, instructors, and administrators—one important support for the first three courses in the CNC Machinist Program is the I-BEST program. I-BEST Instructor Chris Lindberg describes one benefit of the I-BEST program for the machinist faculty,

> *The actual content instructor has more time out in the shop as a result of the I-BEST program. Every hour I'm giving a lecture is an hour that he can be out on the machine shop floor (10/15/13)*

The I-BEST curriculum seems too to be guided by the needs of industry. I-BEST instructor, Cliff Bergeson, says that he gets ideas on how to alter his curriculum by looking at industry ads for job openings (10/15/13). In our observations of I-BEST classrooms, the math lessons we saw used problem sets from the projects that students were assigned in the machine shop. The written materials for these lessons come from a variety of resources—machining textbooks chosen by the instructors themselves (Ibid.).

One I-best instructor, Chris Lindberg, has begun putting videos of his lectures on-line (www.Shoreline.edu/clindberg). To do this he used Keynote, which he describes as "a Mac-centric program" for making PowerPoints." (10/14/13)

Shoreline's Career Navigator, Micheline Felker, continues to work hard to anticipate trends in industry. When we spoke to her in Year 3 of the grant she was investigating starting a class that is more focused on robotics. (3/18/15)

<u>Use of the Curriculum: Shoreline taps the experience of students by having multiple levels of students present in the shop</u>

In the CNC Machinist Program, learning is modeled on a machinist shop:

- Students are introduced to tasks and then given time to work independently to complete those tasks;
- There are three 6-hour class sessions—one in the morning, one in the evening, and one on weekends;
- An I-BEST instructor is present for 3 of the 6 hours in a session.

- Within each 6-hour session, there are three levels of students present—those taking the first, second and third courses.

Instructor Christ Purdy describes the set-up this way:

> *Picture this as a big one-room schoolhouse. Three classes simultaneously… By giving them an opportunity to pass along what they learned they benefit. It's the adage that you learn best by teaching. We encourage it, but it happens very naturally. (10/15/13)*

Chris Lindberg, also an instructor, explains how a student's instructional time is used:

> *On a typical day, you either start off in the computer lab, working on some of the homework that is part of the homework that is on the computers—either on Canvas or KeyTrain—or you start in the shop. It's pretty open. Then, during the period that you're here, 6 hours, there's one hour of lecture at least, if not two. But it can be timed whenever. When I give a lecture, it's to one single level, either on math or blueprint reading. During that time you might have me as your instructor or Keith as your instructor… (10/15/14)*

Within this structure, Lindbergh trust students to make wise decisions about what lectures they need to attend and which ones they can skip if they know the content. (1-7-15)

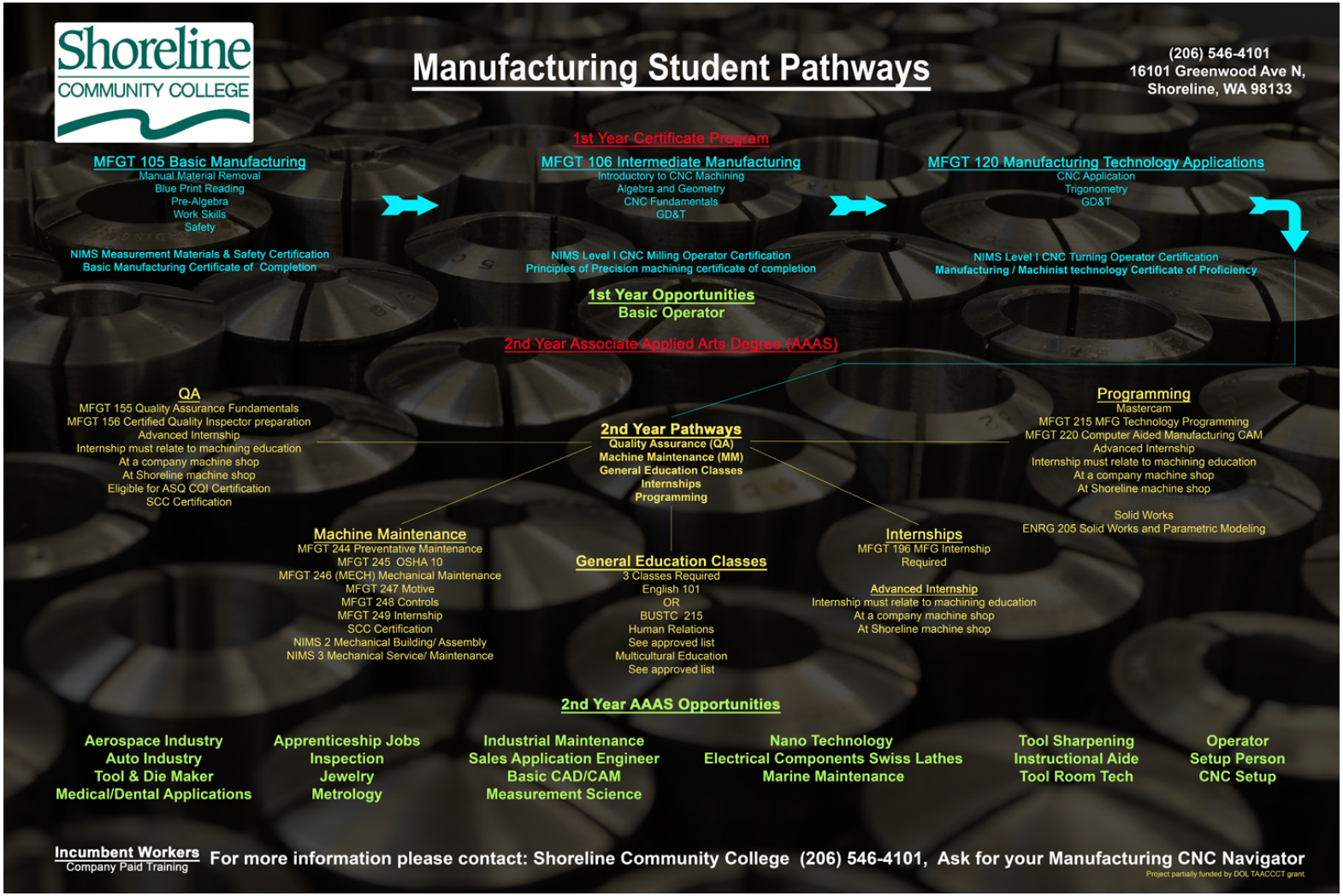
One factor that has been strengthening the one-room schoolhouse approach is that Shoreline's programs have been receiving higher numbers of incumbent workers who are then able to share their experience with novices and peers.

One of the constraining factors of Shoreline's expansion, as well as for students' hands-on learning, is the expense of the machines that they are learning to use. Instructor Cliff Bergson explained that while they don't have enough machines for everyone to use, the group work that students do also teaches valuable interpersonal skills:

> *We're heavy on teamwork. Industry is that way. You don't work alone,--you work in groups. You have to rely on your co-worker. With the new quality methods, everyone is responsible for the quality. I have a multi-national group—Nigeria, Eritrea, Latin American countries... We all work together. (10/15/14)*

I-BEST Instructor Chris Lindberg has begun putting his lectures on-line for students who are struggling. Given the premium on time using the costly machines of the shop, this seems like a wise choice and something that the CNC Machinist Program should consider doing more of that is, adopting a "flipped classroom approach" which moves content delivery to out-of-class time, so that more implementation and interaction with peers can happen during the class itself.

Figure 1: Stacked & Latticed Credentials in the Machinist/Manufacturing Programs of SCC



While experience of students is leveraged, students put a premium on access to instructors' knowledge

In our student focus group all of the students spoke highly of having mixed levels present within the shop at the same time. But even though the "one room schoolhouse" seems to be a win/win for both novice and experienced students, in our Year 1 visit all the students in their focus group stressed that it was still access to the experience and knowledge of their instructors that made the difference in their learning. All said that they wished all of the instructors would start off with a talk with one group at a time, rather than beginning with a general talk to all three groups.

When we returned in Year 3 of the grant, Sherry Byers, C2C Manager reported that they had made changes to address this input from students and all the instructors teaching Principles of Precision Machining (MFGT 105 and MFGT 106) and Manufacturing Technology Applications (MFGT 120) were meeting with each skill group separately every day of the sessions. (Email 9/20/15) Students in the Year 3 focus groups again reinforced the benefits of the mixed-level shop activities.

Curricula for machinists integrates academic skills in practical applications

When we asked students in a focus group what they liked about the machinist program, one student immediately replied that he liked that on the first day they began using the machines. The other three students nodded their heads in agreement. Continuing on the theme of their appreciation for the applied learning, another student explained,

> *In high school I had learning issues. [Here] you're not taking a math class and a social studies class. You're not figuring out how many pieces are in a pie… You're not changing subjects. You're focused on machining. It literally correlates the math with the machining. (10/15/13).*

The I-BEST program's instruction of math is also grounded in the practice of machining. Instructor Chris Lindberg explains that they teach the math skills that are needed for whatever the CNC Machinist Program is requiring for the students. "It's integrated," he says, showing the fingers from both hands interlaced.

Observing an I-BEST class, we saw these connections between machining and math skills being made. Here's one of the examples we saw:

> *[Written on the white board]*
>
> *.300 = three hundred thousandths*
> *.00003 = 3 hundred-thousandths*
>
> *Instructor: If you make a part is this going to make a difference? (Pause). It's going to make a HUGE difference? What would we actually call this in the machine job? .00003. We would say zero thousandths, three hundredths. That would keep us from making this mistake. (Cliff Berson, 10/15/13)*

In the machining courses themselves, we observed that the pedagogy was teacher directed but interactive. The instructors posed problems related to machining and students threw out ideas about how the problems could be solved. (e.g. Jeff Purdy, Quality Assurance Class, 10-15-13)

Instruction is based on a mastery level—(i.e. students keep trying until they get it right)

The implementation of the curriculum is done according to a "mastery" model—students continue working on a skill until they master it, even if this requires repeated attempts.

Instructor Cliff Bergson explains what this looks like in practice:

> *The patterns are there and we've built in ways to deal with it. If someone gets undersized by a little bit, we don't just scrap their part. We give them another chance. My philosophy is "You can get any grade you want--you just need to earn it." Tests can be taken as many times as they want." (10/15/13)*

In a focus group, one of the students said this of the mastery approach, "For the people who drop out, I think it's because they don't want to be here, not because they can't do the math." (10/15/13)

Support for struggling students is shared between course instructors, I-BEST instructors, and Career Navigators. Supports for students include extra time with the instructor, formal tutoring, and tutoring by other students (Micheline Felker, Career Navigator, 10/14/13)

This inclusive/success-oriented approach is especially noteworthy because the program does almost no "weeding out" of students who apply to the program. When asked about her criteria for how they decide who gets in, Heather Stapleton, Career Navigator, says "There are very few things that would weed them out—they have to understand what the program is; they have to want to do it; they have to have a certain ESL level–which we assess with the CASAS test. The reason for that is strictly a safety issue…"

It's only after they are admitted that they take tests for math and English to determine whether they should take part in the I-BEST math classes to bring those skills up to speed. (1-7-15)

Inclusion of the "soft skills" (e.g. presentation of self) in the curriculum of the program and work of Career Navigators

Lead Instructor, Keith Smith told us that "Ever since I started here… My goal is to try to replicate the work environment here." (1-7-15).

Heather Stapleton, Student Navigator, citing what she learned from her colleague, Micheline Felker, expressed a similar awareness of what educators often call "the implicit curriculum"—what students learn through the way their taught and the culture of the program--saying, "If a person is in this program, every interaction with them is preparation for the job."

In conversations with Career Navigators, they stressed the inclusion of "soft skills" related to professionalism and discussion of work ethic in the instructional programs and job placements. Micheline Felker explains:

> *[Regarding the] soft skills—nothing is formal. It starts on a case-by-case basis. Heather and I talk to them as a group at the beginning. We tell them what we expect: High attendance, clocking in, maintaining machines, crashes being reported to inspectors, telling us when they hit barriers. The expectation of communication is very high. It's mostly verbal. The standard is set the minute they get here. They have a lot of interaction with me the first two weeks of school. Her speech is, we can teach you the basics of machining but the most important thing is that you can work together. (10/14/13)*

When we, as evaluators, visited in Year 1 of the grant, soft skills were being taught both by instructors and navigators, but it seemed to be happening in an informal, ad-hoc way. In our year 1 Interim Report we suggested that they make this instruction more systematic, moving it more into the explicit curriculum so that it would be subject to discussion and review like other components of instruction. By Year-3, this approach was evidenced. Sherry Byers, C2C Manager, informed us of how soft skill teaching had evolved:

> *Select aspects are incorporated into the first year technical curricula (MFGT 105, MFGT 106, and MFGT 120). In addition, the Navigators inform students regarding soft skills during presentations to groups of students and in one-on-one sessions. Employers are invited to speak to students during class time, and usually they emphasize the importance of such aspects as work ethic, being on time, following directions, teamwork, etc. Further efforts will be developed to incorporate and focus on soft skills.*

<u>Possible next steps / Room for growth</u>

- Continue to move more lectures on-line, "flipping the classroom" to maximize use of class time for application of content, and instructional support. (This work has begun with the Quality Assurance Program, and is intended, eventually, for the other programs)

- Continue to grow the reputation and power base in the top level of the college to support the CNC Machinist Programs continued growth. C2C Manager, Sherry Byers gave us this update in the final year of the grant:

  > *At every opportunity, both internally and externally, the Manufacturing Technology Department promotes and highlights the accomplishments and successes of the machinist program and students. Efforts continue to increase awareness within the college and to develop and sustain employer partnerships in the manufacturing industry.*

- Long-term, increased capacity to train people to be computer programmers for machine shops (who occupy the highest end of the pay scale). Sherry Byers reported that to promote this goal,

> *the Manufacturing Technology Department has taken steps to work with the college's Engineering Department and the Computer Science Department in order to facilitate increased instructional opportunities for students who want to focus on machining programming (email, 9/20/15).*

- Improve the CNC Machinist Program's presentation on the college's website (http://www.shoreline.edu/cnc-machinist/default.aspx). Currently, the array of programs and the array of stacked and latticed credentials are not clear. A clearer presentation might include a schematic diagram of the progression of the courses, programs and accompanying certifications.

- Increased field trips or, more ideally, shadowing by student on job-sites.

VI. Assessment of students

Summary of this section:

Assessment for admissions, determining the student's needs, and holistic support

- Shoreline has a minimum of entrance requirements to the CNC Machinist Program;
- Assessment of general student needs is part and parcel with student support, and student support is divided between the student navigator who works with students on the "front end" of their careers at Shoreline (intake and applications, support while they are doing their coursework, etc.) and the Career Navigator who works with them on the "back end" (building relationships with employers and doing job placement);
- Person-to-person contact before a student is admitted helps establish whether the program is a good "fit;"
- Improvements are being made to data management to allow greater differentiation of support services;
- Early steps have been made to use Prior Learning Assessments (PLA) so that students who come with experience (veterans, being one notable example) can show mastery of skills and place out of 1-2 terms in the first year machining program.
- Loopholes have been fixed so that workforce development organizations can no longer sign up students for the CNC Machinist Program. thus ensuring that all applicants have contact with either an instructor or navigator who can counsel them regarding their "fit."
- Room for growth remains in the database of student information—something that the program was working on when we visited in January of 2015.

Assessment of learning within courses

- Within courses, assessment is based on a series of assignments, quizzes, and skills checks which include performance of certain skills and job documentation by the student.

Assessment for Admissions, Determining Student's Needs, and Holistic Support

Shoreline has a minimum of entrance requirements to the CNC Machinist Program

We'll begin by saying that there is room for growth at Shoreline's CNC Machinist Program in the area of assessment—something that we were convinced of by those closest to the process, the career navigators, who themselves expressed some dissatisfaction.

Currently, students are supposed to have contact with a career navigator before they can be admitted into the program, but there are ways around this, as we will detail below. There is some minimum English proficiency required for English Language Learners, but there is not a minimum requirement regarding mathematics. That said, the first place for improvement may not be in applying standardized assessments, but in making sure that the career navigator works with the applicant to establish whether it he program is a good fit.

Division of labor: Student navigator vs. career navigator collaborate for on-going assessment of student needs and progress

Shoreline has chosen to organize its support systems by dividing work into two different types of "navigator," one who works with students in the early stages of their career at Shoreline, and the other working with them in the latter part. (This contrasts to many colleges that have one type of navigator who is assigned to a student from their intake to their job placement). As mentioned in the chapter on the use of grant funds, C2C funds have paid for the addition of a second career navigator position, held by Heather Stapleton. Heather is designated as the student navigator," as opposed to the career navigator" position held by Micheline Felker.

Person-to-person contact helps establish whether the program is a good "fit"

The application and intake process for the CNC Machinist Program is less about screening out and more about "screening in"—a term we're borrowing from Mott Community College to mean that the goal is to find a way to accommodate the needs of the student, rather than to find reason to not accept the applicant. Along with the initial interview, Student Navigator, Heather Stapleton, who is in charge of applications and intake, explains that they also administer a survey. Note that this survey is used as a beginning of a conversation, rather than a checklist to disqualify applicants:

> *So, then I can go over those surveys so that I can see that if they're saying, "Yes, I need help with this, then I can call them in and ask them "What's going on? What can I do for you?". The survey has some personal questions but also includes questions that we need for our reporting for our quarterly reports like who is your funding source, their basic information about address; how did they hear about the program; do they have stable housing? Do you need help with financial aid. There's another part that's called a Life Matrix: We ask do you have stable housing? Do you have stable childcare? Do you have healthcare?… It definitely includes personal questions. (1/7/15)*

According to Career Navigator, Micheline Felker (who, until the C2C grant did all aspects of the student support), with the support of the I-BEST program, they are able to help students with deficiencies in their math skills once they are matriculated into the program, so this typically is not the sticking point in a student's career in the CNC Machinist Program. The crucial element in her view, especially if one doesn't have background knowledge, is "fire"--being excited and motivated to learn.

With the program's mastery orientation ("try as many times as you need until you get it right")

the decision to leave is less a decision of the teacher than of the student. When asked what percentage of students have not been successful, Instructor Cliff Bergeson said,

> *I had to flunk my first student in 3 years for non-attendance—he tried to explain what his issues are… He failed on his own. An international student. He didn't have the same work ethic. They learn right away whether this is right for them. Mostly by the first week they can decide. (10/15/13)*

To assess "fire" and other non-quantifiable characteristics in applicants, the CNC Machinist Program policy had been for every applicant to have person-to-person contact with the senior career navigator. In this contact the career navigator was to informally assess the applicant and the applicant was to tour the machine shop, see what's involved in the work, and assess if they were interested in the work.

Improvements in data management have allowed greater differentiation of support services

In Year 1 of the grant, we asked what was most challenging in the current system, Student Navigator, Heather Stapleton said that it was organizing the data on students and keeping track of their progress.

One suggestion we made in this regard, was to talk with the staff of Austin Community College—a C2C Consortium member—where they had begun implementing a system in which students were classified as needing high, medium or low support (color coded on their spreadsheets as red, yellow or green). Austin personnel said that such differentiation allows efficiency for allocating services to the students who most need them.

In Year 3, Ms. Stapleton said that, working with their Institutional Research Department, they had developed a database system that allows them to pull data in different ways. They had opted to not use a formal classification system such as mentioned above, but said that their personal relationships with the students allowed them to differentiate services as needed. (Email, 8/7/15)

Prior learning assessments (PLA)

In our Year 1 Report one suggestion we made was to consider using Prior Learning Assessments as a basis for advanced placement for more experienced students.

Although not one of their formally stated activities under the C2C grant, by Year 3, the Shoreline team had begun identifying and recommending qualifying individuals to undertake machining skills challenges, conducted by an instructor. Depending on the results of this assessment, qualified students may be allowed to skip one or two quarters of the first year machining program. C2C Grand Director Sherry Byers told us that they anticipated the use of PLA being especially helpful as they began recruiting more veterans in the third year of the C2C grant term, albeit with funds from a Round 4 TAACCCT grant (Susan Hoyne, 10/15/13, Sherry Byers, email, 7/22/15; Micheline Felker, email 7/22/15).

New and improved: Systematizing decision-making for entrance

In our visit during Year 1, some navigators expressed concern about a loophole in the application system that allowed some applicants to skip this one-on-one contact. Job referral agencies had, in some cases and at some points in the calendar year, the authority to admit students without the Career Navigators having ever established whether it is a good "fit"—both assuring that the student knows enough about the program, and that "the program" knows enough about the student.

In our Year 3 visit, they had taken the authority from anyone other than navigators and instructors to approve admissions of students. Under the new rules, outside agencies such as Workforce Development programs refer students to them but do not grant approval for admissions. (Micheline Felker, email 8/3/15)

Assessment within courses

Within courses, assessment is based on a series of critical work activities/experiences, quizzes, and skills checks, which include performance of certain skills and job documentation by the student.

An example of a critical work activity/experience is the following:

> *Candidate correctly performs preventative maintenance checks on a CNC mill. This includes checking all fluid levels, system pressure, tooling wear, component lubrication, and cleaning. (Smith, 2014, p. 2)*

Table 4: Year 1: Principles of Precision Machining -- Methods of assessment of learning and certifications offered by course

Year 1: Principles of Precision Machining (USDOL / C2C Funded)					
Quarter	**Course**	**Credits**	**Prerequisites**	**Assessments**	**State recognized Certification**
Quarter 1	MFGT 105 Basic Manufacturing	20-21 credits	Language and math placement tests	• Clock in for a minimum of 200 hours. Attendance and participation are monitored. • Participate in all aspects of the program, including machine shop work and classroom lectures. • In addition to the technical sessions, most students also are in applied math sessions, taught by our Manufacturing Technology Department's I-BEST math instructors. • Complete all graded assignments, including online in Canvas and skills projects in the shop. • Pass a mid-term exam. By this time in the quarter, the Instructor, the Teaching Tech, and the Navigators will have been working closely with any student who experiencing difficulties with attendance, participation, learning, or skills development. The Manufacturing Technology Department is committed to fostering the success of each student. • Pass a final exam with a score of 70% or higher. • Take a NIMS credentialing test.	Basic Manufacturing Certificate of Completion NIMS Measurement, Materials & Safety credential
Quarter 2	MFGT 106 Intermediate Manufacturing	20 credits	Passing grade (A, B, or C) in MFGT 105		Principles of Machining Certificate Completion NIMS Measurement, Materials and Safety Credential NIMS Level One Milling Operator credential
Quarter 3	MFGT 120 Manufacturing Technology Applications	20 credits	Passing grade in MFGT 106		Manufacturing/Machinist Technology Certificate NIMS Turning Operator credential

Table 5: Year 2 – Quality Assurance Program (1 of 2 options) -- Methods of Assessment of Learning and Certifications Offered by Course

Quarter	Course	Credits	Prerequisites	Assessments	State recognized Certification
2 quarters		**10 credits**		The curriculum for the two-quarter, 10 credit program is aligned with the American Society For Quality (ASQ) criteria. A successful student will clock in and participate as required, complete all graded tasks, including online assignments and shop projects, and pass the midterm and final exams.	Quality Assurance Certificate of Completion and one or more ASQ certificates.

Table 6: Year 2 – Machine Maintenance Program (2nd of 2 options) -- Methods of Assessment of Learning and Certifications Offered by Course

Quarters	Course	Credits	Prerequisites	Assessments	State recognized Certification
4-5 Quarters		**21-25 credits**		The curriculum for the four to five quarter, 21 to 24-credit program is aligned with NIMS. A successful student will clock in and participate as required, complete all graded tasks, including online assignments and shop projects, and pass the midterm and final exams, earning a Machine Maintenance Certificate of Completion and up to five NIMS credentials	**NIMS Machine Maintenance Certificate of Completion, and up to five other NIMS credentials:** (Level 2 Machine Building Mechanical Assembly, Level 3 Machine Building Mechanical Assembly, Preventive Maintenance, Machine Service and Repair, and Machine Repair/Rebuilding), plus an OSHA 10 certificate.

References

Smith, K. (2014). NIMS Mill Operator Credential/MFGT106 Alignment. Seattle: Shoreline Community College.

VI Contributions of the Partners

Summary of this Section

- Industry Partners are involved in curriculum development through both Shoreline's Advisory Council and the State of Washington's Center for Excellence;
- The involvement of industry partners happens on the detailed level of course objectives and on the more general level regarding which programs and certifications should be offered;
- NIMS and ASQ certifications provide stacked and latticed credentials;
- I-BEST program –Integrated Basic Education and Skills Training—provides math support that is integrated with the rest of the machinists' curriculum;
- The wider college and outside community based organizations provide some student supports (e.g. tutoring provided by the college);
- Georgetown Community College in South Seattle has provided space and machines for a Satellite Program;
- Industry partners' high demand for Shoreline trained machinists makes recruitment relatively easy, with the exception of women, minorities, and veterans;
- Partners do not appear to be directly involved in recruitment of Shoreline's instructors, who are often hired from within or from graduates who have spent time in industry;
- Shoreline has negotiated three articulation agreements with programs at local 4-year colleges, so that their work at Shoreline can contribute to credentials beyond the Associate in Applied Arts and Sciences (A.A.A.S.) degree;
- Regarding sustainability, the main challenge is the expansion of programs;

<u>Room for growth regarding contributions from partners:</u>

- Develop an action plan for building strong and productive relationships with members of Shoreline's wider administration;
- In general, Shoreline should leverage industry's high need for skilled workers for resources to continue to expand programs (e.g. Systematizing the appeals for donations of machines from industry); (Cont.)

Summary of this Section (cont.)

Room for growth regarding contributions from partners (Cont.):

To address lack of space for expansion, seek to leverage machine shop spaces that are not in use from industry partners as satellite sites;

Continue working with partners—both in industry and in community based job referral agencies—to improve the recruitment of women, incumbent workers interested in expanding their skills, non-immigrant minorities, ex-offenders, and others who might not normally seek out their services.

The "Partners"

The key partners of the CNC Machinist Program at Shoreline Community College are the following:

- American Society for Quality (ASQ)
- Clover Park Technical College (articulation agreement)
- Government of the State of Washington
- Industry Advisory Council
- Integrated Basic Skills and Education Program (I-BEST)
- Lake Washington Institute of Technology (articulation agreement)
- National Institute for Metalworking Skills (NIMS)
- Shoreline Community College administration (i.e. outside of the department itself)
- South Seattle Community College
- South Seattle College
- Workforce Development Council of Seattle-King County

Curriculum Development – Partners' Involvement

Industry Partners are involved in curriculum development through both Shoreline's Advisory Council and the State's of Washington's Center for Excellence

As discussed in this report's section on Curriculum, there has been extensive input from industry partners on the development of the Shoreline's machinist curriculum—both regarding the detail of course objectives, and regarding the broader development of the programs and certifications offered. This input happens formally through Shoreline's Industry Advisory Panel; through contact with the Career Navigator who develops person-to-person contacts at job sites; through faculty spending time in the manufacturing facilities; and through themed tours of manufacturing floors given to instructors and their students.

The first level that industry has been involved in curriculum development, is that of the close-to the ground objectives. Tom Stevenson, Manager at Royell Manufacturing and Chair of the Advisory Panel explains:

> *I see everything that's going to be proposed as an approved curriculum and I get to approve it. Everything about how the classes are selected, paperwork, machine selection—making sure that when they're buying equipment they're buying something that's current. (10/14/13)*

For the new Quality Assurance and Machine Maintenance Program, the curricula were developed after Shoreline distributed surveys to industry partners and held two Skills Panels for each of the programs. (Sherry Byers, C2C Grant Director, email, 5/19/15)

Along with Advisory Council, Shoreline partners with Washington State's Center for Excellence for Aerospace and Advanced Manufacturing. Susan Hoyne says that they request from the Center for Excellence the specific "knowledge, skills and abilities for each skill type." (10/14/13)

The second level upon which the industry partners influence the curriculum is on the broader decisions about the creation of new programs. Both the new programs developed with C2C funds—Machine Maintenance and Quality Assurance—were developed after a half-day gathering of industry partners with Shoreline (Susan Hoyne, 10/15/13)

The third level regards the decision of whether to create programs that lead to third-party certifications, as both of the new programs will do. One of the hallmarks of Susan Hoyne's tenure as Dean of Manufacturing and Machining has been her move to provide certifications for students at regular increments in their educational career, providing what are known as "stacked and latticed credentials." Hoyne explains,

> *What I continually heard from manufacturers is that if I hire a student from you, or X, I don't know what skills they come with. So we developed our first quarter that gave our basic skills with a "Shoreline Basic Manufacturing Certificate." We made that up—but it had a huge impact. They had something to show. We also told them, "You're not going to get a job with that."*
>
> *We now have 100% of our students who are now going on to the second quarter. They can get a job—not a great job—after the 2nd quarter. We again, developed a certificate: a "Principals of Precisions Machining Certificate."*
>
> *Other colleges came to our school to learn about our certificates and its outcomes… It then became a certificate being used across the state. Then, we developed more courses, bringing in Machine Maintenance—a certificate under NIMS.*
>
> *Quality Assurance—another certificate, is not under NIMS but under NAM. [National Association for Manufacturing, the body of which NIMS is a part]. They have curriculum. Now, we have a NIMS certificate for the first quarter—a safety*

> *certificate…So, by the time they finish the 2 year degree, we have many who go on to 4 year programs…. (3/18/15)*

I-BEST—Integrated Basic Education and Skills Training—provides math support that is integrated with the rest of the machinist curriculum

While not part of creating the machinist curriculum, the I-BEST program supports it by providing math instruction that is directly related to what students are carrying out in their machinist work.

The I-BEST program seems so integrated in the CNC Machinist Program that it's easy to forget that they part of a separate program, whose over-arching organization and funding exists outside the college itself. I-BEST is a program of the Washington Board of Community and Technical Colleges that provides supplementary services to bring students up to speed in basic skills related to their courses in job training. Here's how they describe what they do on their website:

> *I-BEST pairs two instructors in the classroom – one to teach professional and technical content and the other to teach basic skills in reading, math, writing or English language – so students can move through school and into jobs faster. As students progress through the program, they learn basic skills in real-world scenarios offered by the job-training part of the curriculum.*
>
> *I-BEST challenges the traditional notion that students must complete all basic education before they can even start a job-training program. This approach often discourages students because it takes more time, and the stand-alone basic skills classes do not qualify for college credit. I-BEST students start earning college credits immediately.*
>
> *(http://www.sbctc.ctc.edu/college/e_integratedbasiceducationandskillstraining.aspx, accessed 5/23/14)*

In our site visit to Shoreline, we did not meet anyone who was not a strong supporter of I-BEST. Administrators, faculty (from both the CNC Machinist Program, and the I-BEST Program), career navigators, and students all said that the services were helpful and that the collaboration was working well. Similarly, our classroom observations and interviews confirmed that the I-BEST instructors were both knowledgeable of the machinist job and able to connect the math instruction to the tasks students were being asked to carry out in the shop.

Besides the benefits for students, I-BEST students count as 1.75 of Full Time Equivalency (FTE), providing a positive funding stream for the college.

The wider college and outside community-based organizations provide some student supports

Part of the work of Heather Stapleton, Student Navigator, is to put students in touch with support services offered by the wider Shoreline Community College. Tutoring services are provided for free for students and are paid by the wider college.

For other issues, such as those that are psychological, financial, or related to transportation, Stapleton says that they rely on community-based organizations outside the college itself.

> *We have a company named Anew, funded by Skill Up Washington (funded from a grant through Boeing)… They will come and give a presentation at the beginning of the quarter. They can help with books, bus passes, sometimes they'll help with housing costs, gas cards… They get their money through a grant from Boeing. It's a trickle down. Boeing gives money to Skill Up; Skill Up gives the money to Anew; Anew gives the money to the students… We don't send them—they come to us. They meet them in our office. We'll set up a time for them to do a group presentation or we'll set up a time when they can meet with students 1:1. (1/7/15)*

Georgetown Community College in South Seattle provides and machines for a Satellite Program

By the time we visited Shoreline in Year 3 of the C2C grant they had developed a "satellite program" at another community college campus—South Seattle Community College. This arrangement came about because South Seattle had substantial machining equipment given to them by the State of Washington, but didn't have the faculty or interest to run the program themselves. For this reason, they arranged for Shoreline's faculty to teach the program, with the colleges splitting the count of Full Time Equivalent students (FTE's), upon which funding is based. (Dean, Susan Hoyne, 1/7/15)

When we asked Susan Hoyne why they do this as a satellite campus rather than Shoreline faculty and staff starting a consulting/professional development team and teaching the other college's people to do it themselves, she indicated:

> *[South Seattle] didn't want to be bothered with machining. This actually gets our students another pathway. If they finish a year with us, or two years with us they can go into an apprenticeship. Also, South is now offering an applied 4-year baccalaureate so our students can go there as well. (*1/7/15)

Career Navigator Micheline Felker who labored to create the arrangement despite bureaucratic barriers, explained some of the details about such benefits:

> *I'm not looking to replicate the CNC Program. I am looking for them to give electives to my students or visa versa. So, right now, Georgetown has composites and welding. Maritime operators need composite and welding experience. So now by opening those doors, I have made it possible that students can get credit for those classes for a degree.*
>
> *South Seattle already offers a 4-year degree in mechanical engineering. So Shoreline students could do a 2-year degree and then go to South Seattle for a 4-year degree. So I'm creating relationships that allow a student to have a real career and education pathway that's relevant to them. I'm not looking to re-create a classroom at other colleges. (1/7/15)*

Further, Hoyne pointed out that by the fact that Shoreline's programs come with NIMS certification by them extending their program to South Seattle, it allows greater articulation and transferability for students.

> *Colleges said, "I can get someone from X college but I don't know what they know." That's why we wanted the NIMS so that a student could go from one college to another. We do clean technology. North [Northern Virginia Community College] does HVAC. Students go back and forth, it will all go towards a 2-year degree in clean technology. (*1/7/15)

Micheline Felker said that before they created the satellite campus, she knew of no two community colleges that have shared FTE's, and said that,

> *Now the deans are working together. We have a pathway for students to go to composites and welding. It is the absolute whole reason this partnerships, sharing ideas, and curriculum. (1/7/15)*

Both Hoyne and Felker said that this is a model that they hope to replicate, beginning next year with Everest Community College, followed by Edmonds Community College. [1/7/15.]

Student recruitment: Partners' Involvement in Student Recruitment

Industry partners' high demand for Shoreline-trained machinists makes recruitment relatively easy, with the exception of women, and veterans.

Recruitment of white male students into Shoreline's CNC Machinist Programs—the most prevalent demographic group—comes relatively easily. For the C2C grant proposal Shoreline's set out to target "low-income and unemployed adults, largely representing a variety of immigrant groups, with priority given to trade-displaced workers and veterans".

Michelene, their Career Navigator, and Heather, their Student Navigator, recruit and work with these groups, and others. Full recruitment and outreach efforts, as well as case management and job placement linkages, are provided under our C2C subcontracted project with the Workforce Development Council of Seattle-King County and Pacific Associates. The full-time Recruiter/Case Manager under this subproject focuses on the target populations listed above, with an emphasis on veterans and TAA-eligible individuals.

A substantial number of minorities are represented in the "low-income and unemployed adults" categories. As of their last C2C quarterly report, for the period starting January 1, 2013 and ending June 30, 2015, "non-white" and "Hispanic/Latino" participants comprised 40.5% (N = 111) of our enrollment of 275 C2C students.

English is a second language for many of their students. Their ABE/ESL/Math I-BEST faculty provides instruction and tutoring to students in need of I-BEST teaching methodologies. (Sherry Beyers, email 9/26/15)

Recruitment is aided by the high demand for machinists in the Seattle area. Bobby Holt, President of Pacific Tool, said that they rely on Shoreline to provide workers because "around here the unemployment rate is virtually zero,"[14] He said that at any given time, 35-50% of their machinists are graduates of Shoreline programs.

Probably due to the fact that its programs are filled, some local employers that are hard-pressed for machinists are looking out of state. Tom Stevenson, at Royell, told us of trying—with difficulty--to recruit from depressed manufacturing cities such as Detroit (10/15/13).

Instructors are often hired from within

Regarding the recruitment of instructors, partners do not appear to be directly involved in recruitment of Shoreline's instructors, who are often hired from within or from graduates who have spent time in industry. Dean Susan Hoyne explains:

> *We've been fortunate. Jeff and Brian both came through our program. And they've already identified one or two who [they think would make good instructors]… When they've come through the program, the instructors have already identified their skills. And so that's the kind of thing that we want to be doing. I know this morning someone spoke to me about Renton's program and they can't get any instructors. (10/15/14)*

The need for machines is met partly through grants and partly from industry donations

The machines used in manufacturing cost in the hundreds of thousands of dollars. Given the on-going improvements in industry, there will always be the challenge of staying up to date. Keith Smith, Instructor, explains that the on-going goal "is to try to replicate the work environment here." (1/7/15)

One source for funds for new machines has been grants, but these have come in response to the needs of industry. As one instructor tells it, when Boeing threatened to move from the Seattle area, the Governor of Washington put out a challenge to colleges to provide quality workers and created a number of grants. Shoreline succeeded in getting grant dollars for buying new machines (Jeff Purdy, 10/15/14).

Sometimes this has worked out, other times, there have been difficulty making sure that the grant was written in a way that allowed them to buy the specific machine needed (Ibid.). "[The machine needed] didn't arrive because the grant had been written in a way that requested a type very similar to the one we had and had the wrong software. Rather than spend it on something not good, we returned the funds and had to reapply." (Ibid)

A second source for new machines has been the donations of machines from industry. There is a tension here, of course—CNC Machinist Programs, particularly those teaching foundational skills, can use machines that may not be the latest technology, but there is a point at which

[14] The Department of Labor listed the unemployment rate in the Seattle/Tacoma/Bellevue area for July of 2015 to be 4.5% (http://www.bls.gov/news.release/metro.t01.htm)

machines are simply obsolete. While staff reported that they have received some excellent donations saving the program thousands of dollars, we wonder whether this practice might be made more systematic, given the rapid advances in technology. One way that this might work is for the instructors to regularly be asked for their wish list of machines they would like the program to have and this wish list distributed by the Career Navigator to the appropriate designated contact at each industry partner.

As described in a prior section, one partnership that has leveraged machines, space, and ultimately, tuition dollars is one with South Seattle Community College. The Dean explained that South Seattle had received more new equipment from the state than any other college, but didn't have a machining program. In the partnership, South Seattle will hire Shoreline's instructors to teach on their campus and the two colleges will split the full time equivalent funding. In this way, Shoreline is using the resource that they have (instructors) to leverage what they need more of (machines and space).

Articulation Agreements

Along with Shoreline's system of stacked and latticed certification that students can earn within the manufacturing program, the Dean and Vice President of Shoreline also negotiated three articulation agreements from the Shoreline's machining program 2-year degree to degree to 4-year programs at three area colleges:

- Clover Park Technical College: Bachelor in Applied Science in Manufacturing Operations
- Lake Washington Institute of Technology: Bachelor of Technology in Applied Design
- South Seattle College: Bachelor in Professional Technology Teacher Education

The agreements identify the academic pathways available to students, based on the development of equivalencies or "cross-walks" of courses between Shoreline and the other colleges' curricula and the Associate in Applied Arts and Sciences (A.A.A.S.) degree.

Commitment to Program Sustainability

Regarding the sustainability of the CNC Machinist Programs at Seattle, the main issue seems to be how to ensure the continued expansion of programs, rather than maintaining them at their current levels. For now, the needs of industry ensure that those completing programs are getting decent paying jobs, and word of those jobs is attracting the next cohort of students to Shoreline.

When we asked Dean Susan Hoyne about barriers to sustaining their programs, she pointed to indications of upcoming governmental support due to industry pressure:

> *Well, that's an interesting question. This morning I was at that manufacturing meeting and the colleges are asking the State for 30 million dollars for aerospace, plus, if we can bring new FTE's in, they're going to be paying 10,000 dollars per FTE.*
>
> *The State is doing better than they thought—plus, they don't want Boeing to leave. I'm*

> *sure I can bring in 100 FTE's next year, which—at $10,000—will be quite a bit of money for the program. So that's my plan. (10/15/13)*

Challenges / Opportunities for the Future

More space is needed to allow further expansion of programs

Space was not something that Shoreline seemed to have leveraged at this point from its industry partners. While Dean Hoyle cited the need for space as the main barrier to expansion of their programs, she said that they were attempting to take over space from the Criminal Justice Program and that the tuition money should be able to pay for that. (10/15/13).

Shoreline should consider if there are ways that they could leverage the use of space from its partners. It seems worthwhile asking whether there are facilities lying fallow that might provide satellite sites to expand Shoreline's programs.

Collaboration between the Shoreline's CNC Machinist Programs and the administration of the wider college remains a challenge

In our Year 3 site visit when we asked about the greatest challenges they faced, Dean Susan Hoyne replied:

> *Bureaucracy! They don't' recognize or fully understand what we're doing. The VP of instruction wanted me to send back C2C funds. I said "Give me a week to figure out how I can spend it." I came back with the proposal for the Technical Assistants, the shop manager, the tool manager, and shadowing during the summer.*
>
> *There was no "Congratulations!" from the college for [me winning the TAACCCT] Round 4 grant. I have also run out of room. I've been looking around in the community [for more space]. [1/7/15]*

The C2C Grant Director was quick to agree about the single greatest challenge to the CNC Machinist Program:

> *Shoreline community college! What Susan was saying was pervasive. I would think that the college would want to do anything possible to foster this. There's not the infrastructure in place for big grants. (1/7/15)*

The need, along with the human need for recognition, is facilitating through grants or internal funds acquisition of the components necessary for expansion—faculty, space, and funds for putting more course content on-line.

Increasing mutually beneficial relationships with industry

When asked about opportunities for increasing further the benefits between Shoreline and industry partners, Micheline Felker said that she was interested in an idea that she had heard from the ASPEN Institute in which industry partners pay to come to take part in the panel and pay to receive the "best students." The problem she saw with this was that "Every company has a different idea of the best students, and they have that now. I don't want to chase them back to the temp companies" as a source for workers, as opposed to taking their students as they do now.

One other possibility cited by Felker was to have more *a la carte* classes for incumbent workers—something currently desired by employers.

VII Factors Contributing to the Partners' Involvement

Summary of this section

- The high demand for workers is a strong motivation for industry partners to be involved with Shoreline;
- Person-to-person contact between industry and Shoreline allows Career Navigators to match well-suited students to the needs of a particular worksite;
- Industry partners value Shoreline's use of certifications as a way of gauging applicants' skill sets;
- Industry partners value Shoreline's congruence with their own worksites;
- Government is motivated to support community college expansion through competition between states for hi-tech jobs;
- Georgetown Community College, valuing Shoreline's faculty and curriculum, initiated a partnership in which Shoreline faculty implements a CNC Machinist Program at Georgetown facility, splitting the funds from each full time equivalent student.

Challenges / Opportunities for Growth

- Industry partners we spoke to said that their main suggestion for how Shoreline could improve is to expand their capacity to provide more workers.

The high demand for workers is a strong motivation for industry partners to be involved with Shoreline

One obvious factor for motivating industrial representatives to partner with Shoreline's CNC Machinist Program is the demand for workers. The tables below with Department of Labor data cited in Shoreline's 2012 application for the C2C grant show that there are a high number of trade effected workers in Washington state since 2007, that they tend to only have a high school diploma and to be middle aged or older.

Table 7: TAA-Impacted Employers and Workers by Region

Consortium Site	TAA-Impacted Employers in Region Since 2007	TAA-Impacted Participants in Region Since 2007	TOTAL TAA-Impacted Participants in State (2011)
Seattle, WA	47	9,800	4,538

Sources: Official state and DOLETA databases, and area workforce boards

Table 8: Regional Industries/Education and Training Needs of TAA-Eligible Workers

Consortium Site	Industry/Occupations in Which the TAA-Eligible Workers Are or Were Employed	Current Skill Level of Skills and Educational Attainment of the TAA-Eligible Workers
Seattle, WA	Manufacturing, wholesale trade and transportation sectors	45% have only HS diploma or less and 83% are 39 or older

Table 9: Evidence of Employer Demand

Consor-tium Site	SOC Code	Occupation	Short-term employment projections (thru mid-2015)	Long-term employment projections (thru 2018)	Annual Mean Wages
Seattle, WA	51-4040 51-4041 51-9198	Machinist, Machine Tool Operators, Helpers Production Workers	Machinist (2.5% short-term growth rate King County); Computer Controlled Machine Tool Operators, Metal and Plastic (2.7%); Helpers Production Workers (4.3%)	21,000 new aerospace workers needed over next 10 years. Machinist (1.5%); Computer Controlled Machine Operators (.9%), Helpers Production Workers (2.8%)	$40,520

Source: USDOL and state workforce commissions

These data on the high demand for workers were reflected in interviews of both Shoreline faculty and administrators and in our interview with Tom Stevenson, Manager at Royell Manufacturing:

> *We have currently have 12 Shoreline grads on staff. We have 5 or 6 from the other community college program as well. Where our business is at, with the market saturation right now as far as available people who can run machinery, the only way we can keep our staffing up is to use people directly out of the college programs. In fact, we will talk to a student who is currently a student at Shoreline—and we've got 2-3 more—who are going to school and working at the same time… We have to work with, and mine the potential workforces candidates who are in colleges and even as far back as the high school levels. (10/15/13)*

Stevenson says that the shortage of workers is so pressing that they have begun reaching out to high school students to suggest that they begin thinking about a career in machining:

> *We have to work with, and mine the potential workforce candidates who are in colleges and even as far back as the high school levels… I had a group from the Everett School district teachers—they wanted to see how, what they were teaching is associated with business today. And then, in turn, to direct the at-risk kids to programs like Shoreline instead of thinking, "I have to go to a 4-year college." 1:59 (10/14/14)*

Also influencing Royell's close relationship with Shoreline is the value of taking part in the formation of a worker's skills to meet their needs. Stevenson explained that he was looking for a particular kind of person who would both not tinker with processes once they are set up ("conform to the process"), but also be able to gather data and step back to suggest systematic process improvements ("be creative"). The Career Navigator kept an eye out for students who would fit this need and shared their resumes with him. Keith Smith, Lead Instructor, explains the importance of matching the student to employer needs:

> *The biggest thing that [Micheline Felker, the career navigator] does is that she can find out what an individual employer's needs are… There are some job sites where you don't have to think much. There are others that will challenge you to grow. Micheline helps people find where they will fit. That makes the employer happy… (10/15/13)*

Stevenson spoke highly of the expansion at Shoreline to increase the number of grads that they can prepare, but seemed to think that they could go even further to build capacity:

> *The amazing thing about the program—and this is where the grants come in to play--when I first came into the program, there was one class—I think it was a night shift class and it was maybe half full. Now it's 3 shifts and all classes are full, and there's a waiting list. And we are still in the buildup mode in the aerospace industry. I know that not everyone in the class is going to come to work for Royell but it does provide a way for people to get skills and get into the workforce.*

In our visit during Year 3, Stevenson told us that the demand for workers was still exceeding the

supply; that he had tried to recruit from outside the Seattle area but it required a great deal of effort for little success

> *I think out of 7-8 people I got two where it actually worked out. It was an awful lot of trouble. We tried mining the Detroit area…. The problem was getting people who could actually afford to move… They would take too much of a loss to pack up and move, and sell off a house he had lived in 30 years. (10/14/14)*

Person-to-person contact between industry and Shoreline allows Career Navigators to match well-suited students to the needs of a particular worksite

The needs of industry are not, however, just a matter of the *number* of employees, but also in the qualities that they bring to the job. Bobby Holt, President of Pacific Tool, told us that the fact that an applicant had "made it through" one or more of the Shoreline programs attested to their quality (9/22/15). Beyond this, he said that the Career Navigator plays an important role in finding the right person for the right organization. Stevenson of Royell explains:

> *We, obviously, go to the meetings down at the school and get a chance to walk through the shop and meet the students and staff. We go to the open house at the end [of the term]. Micheline [the Career Navigator who helps with job placement] is also looking for different people and how they would fit with different groups.*
>
> *We are very focused on looking for people who will conform to the process; people who will take on more than just running a machine. Unfortunately, a lot of people will say, "You want me also to track data? That's not my job. I'm a machinist, not a data person." Well no, that's part of the design work here. People who tend to have a knack for that, she'll offer resumes, and we'll contact the individual and set up interviews. That piece of it has been very, very helpful in getting contact with the students. (12/15/13)*

Micheline, in turn, describes her efforts to achieve effective placements in this way:

> *One of the things that I have to offer is that I know the personalities and the mentalities of the people who would fit in here and I have a pretty good track record. Everyone wants to be skilled when they leave their program, so they do an internship, but they have to have an open mind. The biggest problem is getting people to show up to work on time, and listen when they're asked to do things. There are always going to be things that they don't know about the processes, but the issue is the attitude they come with. (10/14/13)*

Industry partners value Shoreline's use of certifications as a way of gauging applicants' skill sets

Tom Stevenson explains his involvement in these decisions:

> *The whole decision to become part of NIMS was something that I was supporting because I understand the need for solid measures of performance. I got to see the certification*

> *points for the criteria from NIMS. After seeing that, I understood that if they realized the curriculum the people would be getting [they would see that they would get] what they needed as far as their machining skills. It wouldn't be like the replacing the standardized testing, and everything would be teaching to the test. I did not see that happening with the NIMS accreditation. (10/14/13)*

Close ties between Shoreline's programs and industry partners built by their career navigator have resulted in the collateral benefit of an increased number of incumbent workers and workers who have recently been laid off by Boeing coming to Shoreline. Students and instructors commented to us that the skills and knowledge that these experienced workers bring to the program help in the education of the novices, something that is undoubtedly maximized by the "one room schoolhouse" model at Shoreline where more advanced students are expected to help in the instruction of the newer ones. (Shoreline Instructor, Chris Lindbergh, 1-7-15).

Industry partners value Shoreline's congruence with their own worksites

Tom Stevenson, Manager at Royell Manufacturing and close partner with Shoreline, regaled us with examples of the way that Shoreline had learned from what they saw at his facility and made changes to their program. His first example was when Instructor Keith Smith saw the light regarding the importance of students learning how to keep accurate paperwork on the products being manufactured:

> *One of the first things Keith did was to look at the paperwork aspect of the job. He realized that every shop in the world is dealing with paperwork. This gives traceability to what happens in the shop. His big "ah ha" moment, was, when I showed him [and the class that he had brought to the facility] a rack of parts. They were basically all the same. I asked the class if they could figure out why they were sitting outside of the quality insurance office with a rejection tag on them. They were all scratching their heads. I said, "The problem is that the work order is for 47 parts and there are 50 parts here." We're required to know the traceability of the material used from the moment we receive the materials in the shipping bay to the moment it goes out the door as a finished part. All of these parts are risk of being scrapped out if we're not able to recover the traceability. We're able to go back and audit… Just the thought that a paperwork and accounting issue could have been responsible for 50 components that were machine-complete being at risk of being scrapped out. It really struck a chord with both Keith and the students. At that point he went back and he really changed the class projects back to a normal shop paperwork type set-up. (10-14-13)*

Later, Stevenson told us of the same instructor coming on his own time during the summer to learn more about their work processes:

> *His concern was what happened when someone goes from day shift to night shift. In a school environment, you might put your project away and not be concerned with what the machine is doing. In a work environment, someone has to come in and pick up a very complex process, right in the middle, understanding right where you are and keep it*

> *going. And then the world is going to look different when that initial person comes back the next day… He was trying to figure out how to take the classroom environment and begin to mirror what happens in a production environment. (10/14/13)*

Government funding agencies are motivated to support community college expansion through competition between states for hi-tech jobs

As mentioned previously, Shoreline had been the recipient of state grants to purchase machinery for their programs that opened up after Boeing began to discuss leaving Washington State. At the time of our visit, Dean Hoyne told us at a meeting of colleges in which they were asking state for 30 million dollars for aerospace development. At that meeting, she learned that the state was going to begin paying $10,000 for each full-time equivalent student that they could bring in, saying that "the state is doing better [fiscally] than they thought—plus, they don't want Boeing to leave." (1/7/15)

Georgetown Community College, valuing Shoreline's faculty and curriculum enlisted Shoreline to run a CNC Machinist Program on their site

Although Georgetown Community College had more machines from the state than any other community college and space for a machining program, they lacked the faculty and curriculum to do it themselves (Susan Hoyne, 1/7/15). "They weren't interested," said Dean Susan Hoyne. It was for these reasons that they initiated a partnership with Shoreline in which Shoreline's faculty and support staff implemented the Precision Machining Program. As a secondary motivation, Georgetown splits the funds that accompany each full-time equivalent student.

Challenges / Opportunities for Growth

Both of the industry partners interviewed said that their main suggestion for how Shoreline could improve is to expand their capacity to provide more workers. They were pleased with the preparation of Shoreline students.

IX. Contributions from Partners Most Critical to Success of the Grant

Summary of this section

Contributions from partners that were most critical to the success of the grant so far seem to be:

- Dedicated people willing to put in the energy to expand the program
- Strong "interlacing" with industry
- Innovative and successful instructional design
- Successful integration of math instruction through I-BEST
- Strong support services

Dedicated people willing to put in the energy to expand the program

In our Year 1 visit, the expansion of the CNC Machinist Programs seems to largely have been pushed by the "get it done" attitude of Dean of Math, Science and Manufacturing Susan Hoyne and her high energy Career Navigator, Micheline Felker. Senior Instructor Keith Smith describe's Hoyne's contribution this way.

> *I started out going to school in 1978 to learn the trade. Eight years ago I came here. The program had been in mothballs… It's been fun to see the impact… Susan Hoyne has a lot to do with what we do here. She's a strong believer in what we do here. Her father was an electrician… She has a really understanding of the skilled trades… It's fun to have her as Dean. We're similar in terms of thinking about making it bigger. (10/15/13)*

Since the period when its revitalization began and the CNC Machinist Program gained students, the dean has created and filled new job titles and added to the team of existing ones. All evidence from our study suggests that Dean Hoyne means it when she says that, "My philosophy is you hire the best people possible and let them do their job." (I/7/15) In our Year 3 visit, we were struck by the dedication and enthusiasm of those who had been hired, and in student interviews, we heard praise not just for the faculty but also for the new support personnel (1/7/15).

The system that seems to working well for the program is to hire people who have come through the program as students, proven themselves there, but have also gone out and gained experience in industry.

An example of the high level of commitment and enthusiasm comes from Steve Buck, one of the newly hired technical assistants:

> *I was a student here – I'm one of those people who like to help—as a student I was always helping students… At the end of my education, I thought I realized that teaching*

> *would be more rewarding… I started realizing how much I liked teaching. Then, I started talking to my friends, and [at another college] they have a bachelors in professional/technical teaching… So I'm getting teaching degree in professional technical teaching. I get to apply here what I'm learning in my program. They saw that I'm someone who cares. I don't care how hard I have to work. I love it. That's what the teachers saw. Good opportunity. I can see my future, doing this until I retire. (1/16/14)*

As with any organization, there is a necessary transition in organizational form when one goes from, what amounted to, a scrappy start-up, to a bigger, organization that is not reliant on a few indispensable individuals. As Shoreline builds its capacity, it will be important for them to become explicit about what may still be only in the heads of leaders like Hoyne, Felker and Smith.

Strong "interlacing" with industry

Shoreline has begun to make the most of the need for higher skilled workers by developing strong outreach to multiple industry partners both their Industry Advisory Counsel and the Center of Excellence Board.

The attraction seems to be mutual—Shoreline welcomes industry's input on curriculum matters large and small. The trip to shop floors is being made by both career navigators and instructors. Industry partners come to Shoreline and give input to meet their needs.

Tom Stevenson, Manager of Royell, Inc.--an employer who recruits many of their workers from Shoreline--told us this of the ways that Shoreline and his company work on aligning the training program and the worksite:

> *Whenever I gave input I see evidence that it was understood and appreciated and incorporated… I see everything that's going to be proposed as an approved curriculum and I get to approve it. Everything about, how the classes are selected, paperwork, machine selection—making sure that when they're buying equipment, they're buying something that's current.*
>
> *I've had an open invitation to the entire instructional staff to come out and shadow so that they can get an idea about what an actual work environment looks like. We highly encourage that. At least one group every year for the last couple of years has come through. Keith [Smith, Lead Instructor] had an interesting way to deal with this. He wanted us to theme the entire tour. I think this particular time it was a focus on defects, and how we recognize defects.*
>
> *We, obviously, go to the meetings down at the school and get a chance to walk through the shop and meet the students and staff. We go to the open house at the end. Micheline [Felker, Career Navigator] is also looking for different people and how they would fit with different groups. (10-14-13)*

The Manufacturing/Machinist Technology Advisory Committee members and other employer partners and industry representatives have provided input on our 3 C2C Project programs of study. Approximately 5 years ago, Boeing was the catalyst for a reworking of the first quarters of our machinist program, to align with Boeing's skills, knowledge, and abilities (SKA) requirements, resulting in the initial version of the Principles of Precision Machining Program, which we have developed and enhanced further with C2C funding and recommendations from our Advisory Committee members and others. (Sherry Byers, email, 5/19/15)

Tom Stevenson of Royell Manufacturing, tells us of his input as Chair of the Advisory Panel:

> *…As far what I've been pushing for, I just want to make sure that the needs of employers like Royell are heard when changing the curriculum. We've gone through some changes in what's being taught. The whole decision to become part of NIMS [National Institute of Metalworking Skills, the agency that provides certification for some of Shoreline's CNC Machinist Programs] was something that I was supporting because I understand the need for solid measures of performance. I got to see the certification points for the criteria from NIMS. After seeing that, I understood that if they realized the curriculum the people would be getting what they needed as far as their machining skills. It wouldn't be like the replacing the standardized testing and everything would be teaching to the test. I did not see that happening with the NIMS accreditation. (10/14/13)*

In addition to advocating for NIMS certification (a change that Shoreline's Dean also pushed for) the Advisory Panel, with input from additional manufacturing representatives, was also influential in Shoreline's decision to create the new Quality Assurance Program and new Machine Maintenance Program. Shoreline distributed surveys and held two Skills Panels for each of these programs in order to design curricula to meet industry demands and standards. Based on ideas provided during our regular Advisory Committee meetings, Sherry Byers says that they continue to evolve their programs. (Ibid.)

Apart from the programs they've developed and written curriculum of those programs, Shoreline instructors have designed the work conditions so that there is a clear correspondence between conditions in the classroom with those in employment sites (the need for checking each other's work, collaboration; creating a machine maintenance program that will meet the actual need to maintain the program's machines...).

<u>Innovative and successful instructional design</u>

The CNC Machinist Program's "one room schoolhouse" model seems to make sense and work well. Students, faculty and administrators all told of us of its efficacy.

When there were complaints from students during our Year 1 visit, these concerned a desire for greater one-on-one access to instructors during work time. In our Year 3 visit, the addition of a workshop manager, technical assistants, and an additional instructor have, by the accounts of students and faculty, gone a long way to free up instructors to spend more time with students.

A caution regarding the one-room schoolhouse model comes from interviews of students, who, while liking the model, also expressed a desire for all their instructors to meet with them each day as a small group rather than only in a multi-level group. This structure remained unchanged in Year 3, although with the addition of the support staff mentioned above, this did not seem to remain a pressing issue when we interviewed students.

The other parts of this instructional program that seem to be working are its emphasis on getting students doing hands-on learning beginning on day 1, having a series of performance tasks so that assessment is part-and-parcel with learning; and a mastery orientation that allows students as many attempts as necessary to achieve a skill.

Successful integration of math instruction through I-BEST

The I-BEST of integrating math skill work with the machinists' performance tasks seems to be work as well in practice as it sounds on paper. What seems to make the integration to work are the I-BEST instructors' knowledge of the machinists' tasks and their willingness to adapt their curriculum so that the math skills they are teaching are the ones that students need when they leave the classroom and go back onto the shop floor.

Strong support services

Shoreline seems to be using strong career navigation (strong relationships with employers, strong knowledge of the students' individual strengths and the employers' individual needs leading to a high percentage of students succeeding in finding jobs).

An important addition has been made in adding a "student navigator" to the existing role of "career navigator." In this newer role, Heather Stapleton works with prospective and current students, informing them about our Manufacturing Department programs and referring them to, and assisting with, appropriate resources, including the college's Workforce Office, Veterans' Office, and Financial Aid Office, and off-campus agencies, such as Work Source, Workforce Investment Act agencies, and various community based organizations.

Shoreline has already begun to use the student navigator to fill one of the areas we've already cited for growth—outreach to women. With plenty of possibility for continued expansion, recruitment could reach others who might not so readily come through their doors: incumbent workers, US born minorities, ex-offenders, and the discouraged unemployed.

In the latter part of the C2C grant, Shoreline won a Round 4 TAACCCT grant, and included in this funding designated for a fourth student navigator, this one expressly charged with increasing enrollment for Veterans. That navigator—notably their first male—is reported to have begun having success in recruiting veterans.

Appendix D: Logic Model

MANUFACTURING/MACHINIST TECHNOLOGY CERTIFICATES EXPANSION
APPROVED LOGIC MODEL RECOMMENDATION July 26, 2013

Name of C2C Institution:	Shoreline Community College
Authorized C2C Project Director:	Sherry Byers

Top-Recommended Option for Logic Model Focus

Project Summary Description	**Briefly describe what is different or unique about this area of focus that makes it a potential promising practice**	**Briefly describe how/if this project relates to C2C's overarching model of college partnerships with community-based workforce organizations and employers**	**Identify which of the 6 C2C initiative's core elements is most closely associated with this project (see list below)**
Shoreline Community College (SCC) is increasing the categories and availability of high demand manufacturing/ machinist technology certificates awarded to students by expanding the types and scheduling frequency of SCC manufacturing/machinist technology programs.	The success strategy expands the types and availability of SCC manufacturing/machinist technology program credentials, which includes stand alone and stepping stone certificates that are recognized by, and are in demand by, regional industry employers. Increased availability and categories of certificates result in higher numbers of certificates awarded and higher numbers of credentialed students employed in industry.	SCC is allied with community- based workforce organizations, including the Seattle-King County Workforce Development Council, which recruit and refer individuals to SCC manufacturing/machinist technology programs. SCC partners with regional industry employers, who, in addition to other activities, participate in revising manufacturing/machinist technology course curricula and developing new programs, curricula, and certificates.	2-Build or enhance stackable "stepping stone" credentials 4-Plug regional program or service gaps

Manufacturing/Machinist Technology Certificates Expansion Logic Model

INPUTS	ACTVITIES	OUTPUTS	OUTCOMES
Shoreline Community College (SCC) Manufacturing Department (MD) Faculty MD Staff Science Department Administration Other SCC Department Staff, e.g., Institutional Researcher (IR), Workforce Office (WO) Seattle-King County Workforce Development Council (WDC) Learning Center North (LCN) Industry Partners Industry Employers Funding Sources Curricula and Training Software Machines, Equipment, Tools, Supplies, and Materials	Convene Skills Panels, that include industry partners, to advise on curricula and certificates Design and develop new programs and certificates Assess new programs' shop requirements; procure and set-up machines, equipment, and tools Train MD faculty as necessary Recruit, prepare, and place students (WO/WDC/LCN/other) Expand scheduling, initiate multi-level classes and new programs Offer I-BEST in basic program (Quarters 1-3) Increase on-line learning opportunities Review and revise curricula Provide MD Career Navigation serving students and employers Evaluate new programs and certificates	New programs developed and revised, through employers' input and feedback, that build skills in demand by industry New certificates developed and revised, through employers' input and feedback, that demonstrate mastery of in-demand skills National Institute for Metal- working Skills (NIMS) tests and credentials used to certify skills Diverse modalities of delivering instruction offered MD faculty skills updated I-BEST incorporated into basic program (Quarters 1-3) Veterans' recruitment and screening conducted by WDC Veterans' placement test prep implemented by LCN Credit-bearing internships developed with employers	**Short Term** Students in the basic program maintain continuous enrollment Quarters 1- 3 **Medium Term** Increased number of students enter the basic program High number of students earn certificates and degrees **Long Term** High number of credentialed/degreed students enter employment in the manufacturing/ machining industry Number of Participants=240 Credential Attainment=178 Career Advancement=150

Chapter 7: Virginia Western Community College
Credentials to Careers Program

ABSTRACT

At Virginia Western Community College, the C2C grant is being used to prepare unemployed or under-employed workers for Microsoft Office Specialist (MOS) certification in Word, Excel, and PowerPoint. Grant funds were directed to providing staff to administer the program (recruitment, training, support, partnerships, job placements), teach the courses, and purchase and maintain computer and course materials for MOS program delivery.

Results in Year 3 indicated increased success in student recruitment, program completion rates, and job placements. A significant activity was the establishment of an Employer Advisory Committee (EAC) that met for the first time in April 2014. Members of this committee provided a cross-representation of local employers, including the primary industry partner, Goodwill Industries, secondary partners, and VWCC program staff. A key challenge looking ahead remains recruitment of students and sustainability following expiration of grant funding and a reduced role by Goodwill Industries given changes in their own grant funding,

Chapter 7 Executive Summary

At Virginia Western Community College (VWCC), the C2C Grant is being used to prepare unemployed or under-employed citizens for Microsoft Office Specialist certification in Word, Excel, and PowerPoint. The training is designed to assist people who are currently unemployed or under-employed. The training is taking place in 14-16 week terms (depending on whether the student includes the additional healthcare focus) at Goodwill Industries of the Valley's facility, which serves an 18 county region and is headquartered in Roanoke. VWCC has used C2C funds to hire adjunct instructors who have expertise in the MOS curriculum and training techniques and methodologies for adult learners.

Goodwill Industries, the primary partner in the grant, offers essential support services in areas such as recruitment, student support, and job placement. Goodwill provides the classroom, office space, and other areas to make the program participants – many of whom are first generation college students or people who have failed in previous attempts at higher education – feel physically and psychologically safe. Goodwill and VWCC also have extensive contacts within the business community in the Roanoke region and have involved other major employers in the region.

Virginia Western Community College has a long and well-established relationship with Goodwill Industries. This relationship has underwritten the collaboration between the two entities in establishing the Information Technology/MOS Training Project (IT/MOS). In the partnership, VWCC provides IT training through a collaborative relationship with Goodwill Industries of the Valleys (Goodwill Industries) and an industry partner, Carilion Clinic, a not-for-profit healthcare organization based in Roanoke with over 11,000 healthcare –related employees. Goodwill Industries offers facilities as well as support services such as recruitment, needs assessment, and job placement.

This report details findings about the use of grant funds to design IT/MOS curriculum, and including the third year of the four-year grant. During the initial semester of the grant, a team led by an instructor created a IT/MOS program under the on the non-credit side of the college. The design of the course allowed students to complete the modules as many times as needed to be successful, and made it possible for class time to be used for students to engage in hands-on activities. In this model, often referred to as "the flipped classroom," students benefit by doing the application of content in the presence of their peers and instructor who can challenge and support their problem solving.

Ultimately there are two goals for the evaluation of the C2C projects in the seven-college consortium:

- To keep the various stake-holders informed about the projects progress;
- To contribute to the field of research on community college practices that provide workers with skills and knowledge needed to succeed in STEM related careers.

This report, like the Year 1 Report, focuses on the *implementation* of changes using grant funds, where the final report, will do more to highlight the *outcomes.* As such, this report uses qualitative methods and includes individual interviews and focus groups of students, teachers, career navigators, community partners, and administrators; as well as observations of class sessions and analysis of artifacts such as curricula.

With some work, the VWCC/Goodwill Partnership was able to organize an employer advisory committee. Once established, the EAC has proven extremely active, meeting seven times in its first six months. Members of this committee include the representation of seven employers (including the primary industry partner, Carilion Clinic), the Employment Specialist and WIA Director from Goodwill, VWCC Career Coaches and Career Center representative, VWCC Workforce Program Developer, the ITEC instructor, and the C2C Adult Career Coach/Program Director (ACC/PD). The EAC has generated internships and job shadowing opportunities through two employer partners (Friendship Retirement Community and Carilion), and job leads with consideration of employment for current and future participants through all employer partners. The employer expectations are clearly articulated to the adjunct faculty members who teach in the IT/MOS Training, and these expectations are also clearly explained to students.

Unique aspects and goals of the IT/MOS initiative include:

- Preparing students for careers that are in high-demand in the community (particularly involving medical records positions at Carilion Clinic)
- Providing opportunities for adults who have faced challenges in their personal lives and obtaining basic education skills and suitable employment
- Combining opportunities for case management (wraparound support), career preparation, and postsecondary education in a single program.

Overview of findings:

C2C funds have been used so far to:

- Fund VWCC staff for program administration, the C2C Project Director/Career Navigator, other administrative support, adjunct faculty members, and Information Technology (IT) support.
- Pay for supplies, such as hardware and software for the VWCC Computer Lab, which is located at Goodwill Industries of the Valley in Roanoke.
- Pay for facilities and case management services provided by Goodwill Industries

The VWCC program's primary goal and contribution to the community is preparing unemployed and underemployed adults for jobs involving information technology

predominately in health care services. Specifically, the training provided is directed to MOS certification through an accelerated curriculum. If students complete the training, they can acquire up to three credentials for employment in less than six months. Soft skills are taught in a 22 hour Job Readiness class and through on-going interaction with the Local Project Director, particularly during the job-search process. The MOS certificate alone provides a viable credential for many of the employment opportunities identified by the VWCC project.

The MOS preparation courses offered to the C2C students employ varied modes of instruction. One mode consists of teacher presentations and demonstrations in class. A second type is student seatwork using the Microsoft software. A third is individual assignments involving the application of the tested skills. A fourth is the opportunity for students to take practice tests in advance of the formal examinations.

What is described above was the curriculum that began in Year 1 of the grant, and remained the same when we visited in Year 3. It is anticipated, however, that to meet hiring needs and the goals of the present grant funding, the curriculum for Cohort 5 who began in August, 2015 will be upgraded to offer training that addresses skills needed for higher-level occupations, such as medical records and medical coding. This curriculum revision is still being explored as of this writing.

Year 3 findings primarily focused on student Cohort 3, which started in July 2014, and Cohort 4, which started in January 2015. During this period:

- Nine students (100%) from Cohort 3 completed the MOS with Healthcare focused training on November 14, 2014.
- . All nine participated in job shadowing activities with Friendship Retirement Community or Carilion Clinic.
- The 9 students earned 13 credentials in total.
- All 3 incumbent workers found better employment and received a wage increase.
- Four of the 6 unemployed students gained employment; two students remained unemployed and were working with the VWCC Career Coach and Goodwill Employment Specialist in their job search.
- Aggressive recruitment for Cohort 4 led to the enrollment of 16 students, the largest class thus far. Four of the students dropped out and one was terminated.
- The 11 Cohort 4 students who completed the program earned an average of 1.54 credentials, and six (55%) gained employment. The Program Director and others from VWCC are actively trying to place the remaining five cohort members.
- The Employer Advisory Committee (EAC) met for the seventh time in October 2014. The EAC generated internships and job shadowing opportunities through two of the employer partners, and job leads with consideration of employment for current and future participants through all employer partners.

- Plans were underway for Cohort 5 to begin in late summer, 2015. For this cohort, the training and curriculum will be upgraded to provide skills that focus on higher-level occupations, such as medical records and medical coding.

Critical to the successful implementation and slow but steady growth of the program remains the strong collaboration between the primary partners, Goodwill Industries and Virginia Western Community College. Each understands and respects the mission of the other organization. Officials at Virginia Western Community College value Goodwill Industries as a non-profit organization dedicated to helping people with disabilities and disadvantages overcome barriers to employment. Likewise, those at Goodwill Industries understand and appreciate the mission of the community college generally and Virginia Western Community College in particular. They recognize that their missions complement one another. Leaders, case managers, instructors, and others at both organizations share a commitment to addressing the real-life problems of people in the Roanoke Valley.

At the March 2015 C2C meeting, administrators and staff from the two organizations identified the following factors that have helped to make the partnership successful during the three-year project period:

- Goodwill's comprehensive and effective wraparound services
- VWCC's relentlessness in recruiting students, placing them, and supporting them individually throughout the program and, for many, following program completion
- Clear partner roles, defined by tools such as the logic model and organizational charts
- Frequent and transparent communications
- Cross-training between organizations
- Assigning mutual (not independent) credit for success
- The blending of services provided by each partner
- Positive beliefs in success (never say "can't do that.")
- Strong focus on student success

Challenges / Room for growth

In Year 3, students continue to express a need to improve opportunities to practice the MOS program outside regular class time and at locations other than Goodwill Industries. Sometimes this is a problem of the student not having a computer or not having Internet access, but sometimes the student has a computer that is too old to run the software necessary for the modules. The C2C Director, Shantara Alatorre has taken a number of steps to ameliorate this obstacle, but students report that challenges still exist. Ideally, funds from the college would be secured for each student to use a take-home device.

Recruitment challenges also impact sustainability. There needs to be more outreach to other organizations for referrals. For example, the Program Director and others are working with Roanoke Housing Authority to recruit full cohorts.

Another challenge is the continuing problem of moving program completers into degree or certificate programs at VWCC. Shantara Alatorre has received a commitment from the head of Administrative Support Technology [AST] that students from the C2C Program may receive credit for courses by testing out.

Sustainability will also require expanded efforts to find additional funding sources. Topics of consideration include: Will employers see the program as viable in the long run? Do they place enough value on the potential employees generated by the program to offer to support the sustainability of the program?

Other challenges identified by the findings of this study include the following:

- While program completion is strong, there are needs for more aggressive recruitment and enrollment by all case managers and program staff in general.
- While there is discussion about program sustainability after the grant period uncertainties exist at the present time about funding and partner commitments.
- A strong effort is needed to recruit candidates, especially more males, who can most directly benefit from the MOS program. Recruitment is a challenge for many non-credit training programs, but at times, this program has had unique difficulties. It takes too long for potential program participants to be approved for WIA funding. In the meantime, many either find employment or are "lost" before beginning the training. The Program Director is working with administrators from Goodwill to address this concern.
- Given the at-risk student population in this program, wraparound services are especially valuable for helping participants to overcome their personal barriers to attendance, program completion, and job placement.
- The program director is spread too thin with diverse programmatic tasks, case management, career navigation, partner interactions, and other responsibilities. She needs an administrative assistant, which would allow her more time for community outreach, recruitment and fund-raising to sustain the program.

Questions for the future / Things to keep track of moving forward

- Will VWCC find future funding to sustain the current, comprehensive program?
- Will Goodwill Industries continue to have sufficient and appropriate grant funding to provide the wraparound services that the target student population needs to be successful in the program?
- Will VWCC be able to effectively link the C2C credentialing with transitions to college-level coursework and degree work for greater numbers of students?
- If sustained, can the program accommodate students' needs for increased access to distance learning where they can take a greater proportion of coursework off site?
- If sustained, can the program maintain strong relationships with employer partners while developing relationships with new employers?
- From a research perspective, what are the long-term employment prospects for people who have the skills provided by the VWCC program? How does VWCC

work with the EAC to identify the evolving sets of skills regional employer will need in the future?

Table 1 – Data Sources

Position	Name	Title/Affiliation	Interview?	Focus Group?	Observation?
Administrators	Shantarra Alatorre	C2C Project Adult Career Counselor, Project Director	Yr. 1 & Yr. 3	No	Yes
	Lisha McCargo	Case Manager, Goodwill Industries	Yr. 1 and Yr. 3	No	No
	Suzanne Lozier	WIA Director, Goodwill Industries	Yr. 3	No	No
	Eva Lipscomb	Recruiter, Carilion	Yr. 3	No	No
Administrators (Cont.)	Kathy Harrison	HR Manager, Talent Acquisition, Carilion	Yr. 1	No	No
	Martha Devinney	Practice Manager, Carilion	Yr. 3	No	No
	Joy McKee	Employment Specialist, Goodwill Industries	Year 1 and Year 3	No	No
	Leah Coffman	VWCC Coordinator for Workforce Solutions	Year 1 and Year 3	Yes	No
	Marilyn Herbert-Ashton	VWCC Director of Grants, Development, and Special Projects	Year 1 and Year 3	Yes	No
	Jacqueline Rearick	VWCC Grants Specialists	Years 1 and Year 3	Yes	No
Instructors	Anonymous	IT/MOS Instructor	Yr. 1 and Yr. 3	No	Yr. 1 and Yr. 3 (class)
Students	Anonymous	Student	Yr. 1 and Yr, 3 (2 students)	Yr. 1 and Yr. 3 (class)	Yr. 1 and Yr. 3 (class)

IV. Curriculum: How was the particular curriculum selected, used, or created?

Summary of key points in this section

- VWCC uses the curriculum provided by Microsoft for the Microsoft Office Systems (MOS)
  Certification.

- By using the Microsoft curriculum, the training for "hard skills" is highly prescribed.

- The C2C Program Director works with students on "soft skills" related to employment through day-to-day interactions and the job-search process. This includes 22 hours of "soft skills" training effective behavior in office environments in a Job Readiness class and in day-to-day interaction with the Local Project Director.

- The soft skills taught are selected by VWCC's primary community partner, Goodwill Industries (because Goodwill knows the needs of program participants) as well as employer partners such as Carilion and Friendship Retirement.

- Instruction in "soft skills" is mostly done by the program's Career Navigators.

Generally, MOS certification is earned only by completing a formal program of study in Administrative Management Technology. Students in this program receive an accelerated curriculum where, if they complete the training, they could acquire up to three credentials for employment in less than six months. Soft skills are taught in a 22 hour Job Readiness class, but also through on-going interaction with the Local Project Director, particularly during the job- search process.

The specific certifications targeted by the MOS curriculum include Microsoft Word, Excel, and PowerPoint. Students take certification exams provided by Microsoft, and passing grades are awarded with a Microsoft Office Specialist certificate in the particular area. The MOS certificate alone provides a viable credential for many of the employment opportunities identified by the VWCC project.

The MOS preparation courses offered to the C2C students employ varied modes of instruction. One mode consists of teacher presentations and demonstrations in class. A second type is student seatwork using the Microsoft software. A third is individual assignments involving the application of the tested skills. A fourth is the opportunity for students to take practice tests in advance of the formal examinations.

Next steps / Room for Growth

To build on the valuable fundamental skills they were acquiring from the VWCC program, both students and staff discuss the advantages of expanding the curriculum to include more advanced IT skills, job readiness preparation, customer service skills, and medical training in order to be more career ready (e.g., training related to HIPPA, medical terminology, medical coding).

This project is designed to provide accelerated learning to allow students who are unemployed or under-employed an opportunity to pass the highly regarded Microsoft Office Specialist (MOS) certification. MOS is an industry-recognized credential that is valued by many employers in the Roanoke region and throughout southwestern Virginia. Generally, MOS certification is earned only by completing a formal program of study in Administrative Management Technology.

Students in this program, however, receive an accelerated curriculum. If they complete the training, they could acquire up to three credentials for employment in less than six months.

While the "hard skills" in the curriculum are prescribed by Microsoft, the soft skills provided in this program are also extremely valuable. Soft skills are taught in a 22 hour Job Readiness class, but also through on-going interaction with the Local Project Director, particularly during the job-search process. These soft skills are provided by Goodwill Industries and the community-based employer partners such as Carilion Clinic, and these skills include guidance in the employment interview and hiring processes, time management, self-confidence, motivation, and other coaching guidance from a Career Navigator. These soft skills help to ensure that program graduates who have acquired the technical skill set to do a job also become viable candidates for employment.

In order to meet the strict standards associated with MOS certification, the curriculum for this training is highly prescribed. The training curriculum is clearly defined and limited by Microsoft. The adjunct and full-time faculty members from VWCC who set the curriculum closely follow the criterion set by Microsoft. They develop the curriculum to meet student learning outcomes and MOS testing requirements. The Career Preparation course that comes in the latter part of the overall curriculum is taught by an adjunct and does not use a standard (external) curriculum. In the class, the instructor describes and demonstrates skills and practices needed to identify employment opportunities, apply for employment openings, and participate in interviews. Students practice these skills in groups and individually.

The specific certifications targeted by the MOS curriculum include Microsoft Word, Excel, and PowerPoint. Students take certification exams provided by Microsoft, and passing grades are awarded with a Microsoft Office Specialist certificate in the particular area. The MOS certificate alone provides a viable credential for many of the employment opportunities identified by the VWCC project. Having credentials in all three areas, however, increases employability substantially according to program staff and community-based employer partners.

The MOS preparation courses offered to the C2C students employ varied modes of instruction. One mode consists of teacher presentations and demonstrations in class. A second type is student seatwork using the Microsoft software. A third is individual assignments involving the application of the tested skills. A fourth is the opportunity for students to take practice tests in advance of the formal examinations. Some of the skills that are needed to be mastered in the three certification areas are summarized below:

Microsoft Word

- Creating and Managing Documents
- Formatting Documents
- Formatting text, paragraphs, and sections
- Creating tables and lists
- Applying references
- Inserting and format objects

Excel

- Creating and managing worksheets and workbooks
- Creating cells and ranges
- Creating a table
- Applying formulas and functions
- Creating charts and objects

PowerPoint

- Creating a presentation
- Inserting and formatting shapes and slides
- Creating slide content
- Applying transitions and animations
- Managing multiple presentations
- Protecting and share presentations

Year 3 Update: Curriculum

It is anticipated that to meet hiring needs and the goals of the present grant funding, the curriculum for Cohort 5 that started in August, 2015, will need to be upgraded to offer training that addresses skills for higher-level occupations, such as medical records, and medical coding. This curriculum revision is still being explored as of this writing.

According to the students in Cohort 3, the current curriculum provides good preparation and is well taught. Several students expressed the view that more math is needed in the curriculum, even though the time spent on math requirements was recently expanded.

To build on the valuable fundamental skills they were acquiring from the VWCC program, a few students expressed enthusiasm about receiving further training on more advanced IT skills, job readiness preparation, customer service skills, and medical training in order to be more career ready (e.g., training related to HIPPA, medical terminology, medical coding).

VI. Activities Under the Auspices of the Grant

Summary of this section:

There have been no major changes in the types of grant expenditures from Year 1 to Year 3. Specifically, the expenditures fall into the following major categories:

VWCC Staffing

Program administration, the C2C Project Director/Career Navigator, other administrative support, adjunct faculty members, and Information Technology (IT) support.

Equipment

Hardware and software for the VWCC Computer Lab that is located at Goodwill Industries of the Valley in Roanoke.

Goodwill Industries

Case management, facilities, and related expenses.

*Funding needs not met through the C2C Grant

- Financial support for students to pay for the Microsoft office exams $1,200 for MOS and $1,500 for MOS plus health care).
- Salary to provide an administrative assistant for the Project Director.

Staffing

The largest expenditures are to support salaries and benefits for program staff. The key positions include:

- The Project Director/Career Navigator
- 6 Adjunct VWCC faculty
- 2 IT faculty and 2-4 student workers

Drawing from on-site observations and interviews, our data suggests that the IT/MOS staff work harmoniously and productively in preparing students for career entry and continuing academic work at VWCC. Communications about students' needs and progress are frequent and useful.

Equipment

The foundation of the IT/MOS career preparation is the establishment and operation of the computer lab housed at the Goodwill Industries headquarters. Individual computers for students and the software required for the MOS curriculum are essential acquisitions. However, having made these initial investments in technology, these costs will diminish to hardware maintenance and replacement in subsequent years. A goal of the project is to develop expanded off-site and home access to the curriculum for future student cohorts. Such resources would address the problem of students being unable to complete assignments if unable to travel to the main facility.

During the site visit, several MOS classes were observed and researchers interacted with students and used the computers, and software programs (e.g., an Excel lesson). The lab had ample space and sufficient computers in excellent operating condition for the present cohort and future larger classes.

Goodwill Contract

A third primary expenditure category is the contract with Goodwill Industries for space and especially, support services for students. Given that the typical student has faced, and may continue to deal with, personal challenges in areas such as family needs, finances, and health, the wraparound services provided by Goodwill case managers are critical to their success in the program. For many students, ensuring transportation to the classes or having access to childcare to free up time for attending classes or project events are determining factors for completing program requirements. Case managers facilitate all of these supports.

During our site visit, we interviewed several students who described positive case management support that enabled them to participate fully in program activities and improve their personal lives. We met with the career navigators/case managers who described the broad array of supports they provided to various students according to individual needs.

Additional Resources/Support

Relative to the above categories, a much smaller portion of the grant funds are used for assorted needs identified by the Grant Director. Examples include funds for travel to visit various employment and community sites and professional development activities and training relevant to position responsibilities.

Funding needs not met through the C2C Grant

An ongoing challenge, that will also impact sustainability, is that USDOL regulations prohibited grant expenditure for the MOS Certification Examination. Therefore, the tuition now includes exam costs (three exams plus one retest), totaling $1,200 for MOS and $1,500 for MOS plus health care.

Another critical need, for which funding was lacking, is to hire an administrative assistant for the Project Director. This additional position would not be costly, but would allow the Director to focus on recruitment, employer relations, and updating the program curriculum.

Year 3 Update: Cohort Outcomes from Year 1 to Year 3

Table 2: Summary of Cohort Enrollment and Completion Data

Cohort	Date	Students[1]	Completion Rate[2]	Word[2]	Excel[2]	PowerPoint.[2]	Avg. Credits[2]	Employment rate[2]
1	9/9/13	8	87%	67%	50%	83%	2.00	67%
2	1/6/14	8	100%	50%	25%	88%	1.63	63%
3	7/28/14	9	100%	44%	44%	55%	1.44	100%
4	1/16/15	16	69%	55%	36%	64%	1.54	55%*

[1]Successfully completing the program
[2]These statistics are based only on program completers
*Placements are still being actively sought for this most recent cohort as well as for unemployed students in preceding cohorts.

The results shown in Table 2 indicate modest but consistent expansion in enrollment and relatively high completion rates other than Cohort 4, from which 5 students out of 16 dropped. The majority of its dropouts were due to those enrollees not having time to attend classes as a function work conflicts or personal issues.

Students who completed the IT/MOS Training increased their employment prospects, particularly those who did the additional training related to healthcare. The employment outlook was also enhanced by passing the well regarded MOS certifications and beginning the process of building "stackable" credentials.

It is important to note, however, that actual employment of program completers is not as strong as anticipated. There are several possible reasons for the current situation. First, the economy in the Roanoke Valley has been relatively stagnant. This has had a negative impact on employment opportunities (i.e., fewer people retiring or changing jobs). Employment with the health care-related employers depends on appropriate openings in the IT areas. Additionally, as described throughout this report, the unique student population served by the VWCC Program faces, in general, extensive challenges regarding involving family needs, transportation, personal finances, childcare, etc. Actual job placement for some students in this program requires the convergence of an appropriate job opportunity and personal circumstances that allow the student to accept it. Consequently, employment rates may take extended time to include many of the students/program completers.

VII. Assessment of students

Summary of this section:

In Year 3 of the C2C grant the assessment practices remain the same as reported in Year 1.

The assessment of students regarding acceptance for program participation and progress in completing certification requirements occurs in several ways:

WIA referrals

Referred students to C2C take tests of math skills and career interests.

C2C screening

Potential applicants are interviewed and must show a Career Readiness Certificate

Program-based assessments

Students complete Microsoft skills tests, a career and academic planning tool, a career preparation assessment, and, if successful, receive a VWCC certificate of completion.

Other performance assessments are conducted within courses as appropriate to content.

Prerequisite Screening

Given the focus of the Information Technology/MOS Training Project (IT/MOS) on careers involving technology skills in word-processing and data entry, and analysis, and presentation, it is essential that admitted students demonstrate acquisition of the appropriate prerequisite knowledge and skills. Specifically, potential applicants referred by the Workforce Investment Act (WIA) must surpass cutoff scores on the *Test of Adult Basic Education* (*TABE)*, which
measures basic reading, math and language skills. WI- referred candidates also complete the *Career Scope Assessment*, which identifies interests associated with various careers. Candidates lacking sufficient math prerequisites or interests relevant to potential IT/MOS job placements are not selected for program enrollment.

VWCC Entry Assessment

VWCC requires that entering C2C students have a *Career Readiness Certificate*. This certification is earned by surpassing cutoff scores on assessments of math, reading, and locating information.

All candidates are interviewed by Ms. Alatorre to evaluate commitment to and interest in the program.

Program Assessments

Multiple types of assessments are administered in connection with the IT/MOS program activities. These include:

- The *Virginia Wizard*: an online career and academic planning tool utilized by the Virginia Community College System.
- *Microsoft Office Specialist (MOS) Curriculum:* certification tests in *Microsoft Word*, *Excel*, and *PowerPoint* applications.
- Career readiness and skills: assessments associated with training skills related to applying for jobs, communicating with potential employers, and successful employment interviewing.
- Routine course exams and quizzes.
- *VWCC Certificate of Completion*: certification that the student has met all program requirements and is eligible for formal IT/MOS career placement support.

Section VIII Contributions of the Partners

Summary of this section

This section of the Interim Evaluation Report provides an examination of the partnership between Virginia Western Community College, Goodwill Industries of the Valley in Roanoke, and community-based employers such as health care business with over 11,000 employees in southwest Virginia. This section explores how each partner has contributed to the collaboration in eight strategic areas: program design, curriculum development, student recruitment and retention, workforce training, job placement, program management, leveraging resources for the partnership, and commitment to program sustainability.

While the basic roles and contributions of the major partners remain highly similar to those described in the Year 1 report, additional perspectives that have evolved from then to Year 3 are added to the narratives as applicable.

- Key partners are Goodwill Industries of the Valley and the Carilion Clinic
- Goodwill provides space for the program on their Jobs Campus, utilities, personnel, student recruitment, wrap around support services, and "soft skills" training;
- Goodwill Industries administers Workforce Investment Act (WIA) services such as counseling, job placement, and skills training to compete for those jobs;
- VWCC's Employer Advisory Committee is composed of 7 employers and gives input on what they need students to know to be employable;
- Carilion Healthcare, a key industry partner for the program, provides internships and—in some cases—jobs for program participants;
- Contact between the C2C Project Director and the Department Heads of the wider college has led to initial steps towards creating stackable educational programs with every exit point leading to employment.

Next steps / Room for growth

- Increase Internet bandwidth to allow students improve students' access to the MOS program at home;
- Increase the speed of registration;
- Research whether there are other impediments (besides speed of registration) that can improve recruitment levels;
- Develop a career ladder in collaboration with college department heads and industry partners so that those who complete the MOS training are clear on next possible steps along with employment.

Program Design

Virginia Western Community College has a long and well-established relationship with Goodwill Industries. This relationship has underwritten the collaboration between the two entities in establishing the Information Technology/MOS Training Project (IT/MOS). The Training is designed to assist people who are currently unemployed or under-employed. In the partnership, VWCC provides IT training through a collaborative relationship with Goodwill
Industries of the Valleys (Goodwill Industries) and an industry partner, Carilion Clinic, a not-for- profit healthcare organization based in Roanoke. Goodwill Industries offers facilities as well as support services such as recruitment, needs assessment, and job placement.

The Key Partnership: VWCC and Goodwill Industries of the Valley

The VWCC Project Director has taken responsibility for overseeing the sub-grant award to Goodwill Industries. Goodwill Industries provides space and also connection to wraparound services via a case manager. It is a high-energy partnership; there is a commitment from all major project staff members. Goodwill Industries provides valuable space for the program, a place that is both physically and psychologically safe for the program participants. The Goodwill Jobs Campus hosts the VWCC computer lab and provides the necessary utilities (electrical, Internet, telephone, as well as personnel). The Goodwill Jobs Campus is a non-threatening learning environment for first- generation college students who may not be comfortable on a traditional college campus. The co- location of the high tech computer lab at Goodwill Industries creates a non-threatening environment to both first-time in college students as well as those who may be returning to college after an unsuccessful experience in higher education.. In addition, Goodwill also provides space for the Office of Shantara Alatorre, C2C Program Director and Career Navigator.

The VWCC Project Director also establishes and maintains the relationships which make the collaborative program design successful. She works closely with all program partners through a "sharing promising practices" team-oriented approach. This cooperative environment has helped to sustain the partnership and has led to achievement of most of the initial grant objectives.

Goodwill's role in providing WIA (Workforce Investment Act) Services

Where at many colleges Workforce Investment Act services are administered by an entity unto itself, in VWCC's case Goodwill Industries provides the WIA services, as it does for multiple Workforce Investment Act (WIA) areas in Virginia. Goodwill has counselors who assist individuals who have either lost their jobs or who need assistance in finding training to gain employment or industry-specific credentials in occupation in demand in the Roanoke Valley. Services often include information on job vacancies and the skills necessary to compete for those job, initial assessment of an individual's skills and the additional skills required to find employment in the Roanoke area, information

on available services at Goodwill Industries and other service providers, and job search and placement assistance, including career counseling.

Active involvement by the Employer Advisory Committee

The close working relationship between VWCC and local employers led to the establishment of an Employer Advisory Committee (EAC) for the IT/MOS Training in April 2014. Members of this committee include the representation of seven employers, including the primary industry partner, Carilion Clinic, the VWCC Program Director, the Employment Specialist and WIA Director from Goodwill Industries, VWCC Career Coaches and Career Center representative, VWCC Workforce Program Director, the ITEC instructor, and the ACC/PD. The early work of the EAC and VWCC staff hired under the grant was to establish employer expectations and correlate those to the student learning outcomes of the IT/MOS Training. These employer expectations are clearly articulated to the adjunct faculty members who teach in the IT/MOS Training, and these expectations are also clearly explained to students.

In Year 3, the EAC has proven extremely active, meeting—on average—once a month since its creation seven months earlier. The EAC has generated internships and job shadowing opportunities through two employer partners (Friendship Retirement Community and Carilion) and job leads with the possibility of long-term employment for current and future program participants through all employer partners.

Curriculum and Partners' Involvement

The Microsoft Office Specialist (MOS) Curriculum is an industry-recognized credential that is valued by a number of employers in the Roanoke Valley, applicable to careers ranging from health care to manufacturing to service industries. For example, MOS is directly related to many positions at Carillion, a major employer in the health service. Additionally, MOS certification training allows for stackable academic credentials. Students can continue their studies at VWCC and earn an AAS Degree in either Medical Office Specialist or Administrative Management Technology.

As is the case with many community college programs, adjunct faculty members are vitally important to the IT/MOS Training. The adjunct faculty members are involved in every step in the process from working with employers to establish expectations, to translating those expectations to the classroom, to helping program participants into employment or into degree programs. In the IT/MOS Training, faculty members have prepared student workbooks, set course syllabi to reflect employer expectations, and participated in development of the entire program curriculum.

Partners' Involvement in Student Recruitment

Student recruitment is also a collaborative effort involving VWCC and Goodwill Industries. The VWCC Project Director participates in the process of interviewing, evaluating, and enrolling eligible IT/MOS Training participants. The Project Director is also responsible for

gathering and entering participant data to ensure accurate and timely reporting to the college and to the grantor. At the same time, Goodwill Industries' Case Managers recruit and screen potential IT/MOS program participants to see if they are program-eligible. The Case Manager, however, can also provide services related to financial assistance to allow participants to enter and complete the program. Goodwill case managers then work closely with the career navigators to assist with job searches.

Recruiting candidates who are in the greatest need for job training and can be successful in the rigorous academic program is a major challenge. Put another way, filling all available slots in future cohorts with those who can "most benefit" from the training should be a goal of the project. The employment demands anticipated at Carilion and other employers makes it essential that people with the potential to complete the training be identified, recruited, and supported through the enrollment process. Recruiting efforts have shown increasing success, with Cohort 4 garnering an initial enrollment of 16 students, by far the largest group since the project inception. As of this writing, the VWCC Project Director is actively recruiting students for Cohort 5; these students will participate in a revised and updated program to learn higher-level skills for more advanced (and higher paying) medical support careers.

Across all four cohorts, the average age of participants in the IT/MOS Training in Roanoke is 45.5. This is the oldest average age of participants in any of the seven Credentials to Careers (C2C) Programs, and eight years older than the program with the second highest average age. Of 23 total students older than the average (>46) who enrolled in the program thus far, 20 (86%) completed it. This high persistence seemingly reflects many older participants trying to take full advantage of this "second chance" in life. Some have tried and failed in public school or in some level of post-secondary education; several have had other jobs and have failed in employment.

All of the program participants in the first two cohorts of students are female. Efforts to recruit men resulted in a male participant (age 63) enrolling in Cohort 3 and completing the program. The one male student who has completed the program is featured in a recruitment video, and efforts are ongoing to recruit more male participants for the program.

Partners' Involvement in Training and Student Support

In addition to MOS Training, Goodwill Industries provides wraparound services to the program participants. These employment-related training activities include instruction in appropriate dress, punctuality and attendance, time management, counseling for job retention, customer service, and interpersonal skills.

Partners' involvement in providing internships

Internships are created formally at Carilion through programs that recruit qualified individuals (with high interest in prospective employees) and involve them in prescribed

experiential job-related activities. Outreach to VWCC students occurs regularly and as a partnership priority. Other internship openings occur more informally, as opportunities and needs arise, through members of the EAC and other community partners or stakeholders. The VWCC program director and, to some degree, case managers are vigilant about opportunities to engage local businesses in providing or facilitating internship activities.

The C2C Project Director also had praise for partners' work in finding internships for students. In Year 3, the bulk of the internships were at Friendship Retirement Center. The relationship with Carilion was also described by one interviewee as "much better than it was 18 months ago; a big benefit for GWI and their other programs which connect with Carilion." Lengthening internships beyond the usual four weeks was continuously recommended by the case management team.

Partners' Involvement in Job Placement

Job placement data for Cohorts 1-4 are presented Table 1 (see Section V, "Activities Under the Grant"). According to Project Director Tara Alatorre, placement activities are still active for all program completers, but especially those participating most recently, namely Cohort 4. The most successful job placement effort occurred for Cohort 3, in which 100% of the students were employed. During Year 3, employers of program participants included:

- Friendship Retirement Community (a primary partner)
- Carilion Hospital (a primary partner)
- Ace Private Insurance
- Capstone Logistics
- United Healthcare
- AEP (TN)
- Aerotech
- Walmart
- Post Office
- Blue Ridge Behavior Health
- General Sales
- Liberty Tax Services
- Kelly Services

The successful track record in placements by VWCC and its partners appears largely due to persistence, tenacity, and personal relationships with local and regional employers. At the March, 2015 C2C meeting in Roanoke, one of the case managers described the approach as:

> *Getting past the 'bouncers" to the correct people--we are employer driven. We are so conditioned. We used to be focused on the job seeker. Now we are focused on the employer.*

Another staff member offered:

> *When we talk to people at the businesses we're talking to bean counters—we need to be talking bean counter language; to say, "Each time we keep you from having turnover we're saving you 3-12K." We need to understand bean counter language better.*

The fruits of these labors and commitments are the new opportunities afforded to previously unemployed adults facing multiple life challenges and having little hope of finding suitable jobs. The hard work of the C2C Program Director and staff from Goodwill Industries has created new options for program participants who previously had very few opportunities to finding any employment, particularly jobs that paid a living wage. In the words of a middle-aged student whom the VWCC team is helping to place in an office position that utilizes her new skills:

> *…If it wasn't for this program, I don't really know where I would be right now. Goodwill has done so much—not just for me but for so many people in this valley. Words cannot express how much I appreciate it. I've had so many cheerleaders in my corner. When I say "No," they say "Go!" Of course I knew then that I couldn't give up. It doesn't do not good to give up. (3/19/15)*

Partners' Involvement in Program Management

Those interviewed in both Year 1 and Year 3 indicated the current partnership between VWCC and Goodwill Industries, the Information Technology/MOS Training, has much stronger management than prior projects that they had taken part in.

VWCC's Information Technology/MOS Training Project Director, Tara Alatorre, has made a concerted effort to fully involve the college's academic department heads in the project. This has led to the initial steps of creating stackable educational services (i.e., allowing those participating to prepare to work toward a certificate or an Associate's Degree) with every exit point in the process leading to employment. While they have not yet had students request credit for non-credit classes, Alatorre tells us that the program head of Administrative Support Technology [AST] has confirmed that there are no administrative obstacles for doing so.

> *We definitely have pathways for stackable credentials if the student chooses to pursue them, but the only discussion that took place about C2C noncredit classes being accepted for credit [was for one student whose program didn't end up requiring it]. If we have a student who earned a MOS Word credential go into a program with AST 141, they would be allowed to test out of AST 141. If the student has MOS Word, Excel, and PPT, I would present the case that the student could also do the same for AST 232. AST 232 has Access, which we do not teach, so I am not sure if it would be accepted or not, but we have a verbal agreement for the AST 141. (Sept. 17, 2014)*

In the Year 1 study, a major emergent theme was the active involvement of VWCC President, Dr. Robert Sandel. Throughout his tenure, President Sandel has emphasized the importance of partnerships and community-based collaboration to all aspects of the mission of the community college. VWCC has a tradition of seeking community partnerships, and that previous cooperation has allowed the current grant to be implemented effectively. President

Sandel often appears in the community with officials of Goodwill Industries, and he speaks publicly about the importance of this program to VWCC.

Another aspect of Program Management is the constantly evolving evaluation of the IT/MOS Training. For example, employers will also be asked to offer suggestions for program modifications to ensure students are learning the most current industry-required skills. The goal is to keep the program relevant and up-to-date. This will permit employers in the Roanoke area to continue to consider students from the IT/MOS Training to be strong and qualified candidates for available positions in the future.

If the program is sustained there is a need for an administrative assistant for the program director. Presently, the director is spread too thin among numerous areas of responsibility. Having an assistant would free her to spend more time with community outreach, employer relations, curriculum development, and fundraising.

Leveraging Resources

Administrators who we interviewed indicated they are planning to investigate additional sources for grant funding to continue and expand the Information Technology/MOS Training Program. Specifically, they mentioned speaking with the Chamber of Commerce about providing funding to sustain the program and to provide tuition assistance to program eligible people who were not entitled to WIA or Trade funding. As of this writing, the goal of securing new funding remains, but no commitments from local or federal funding sources have been obtained.

Next Steps needed for Program Sustainability

In Year 1, there were some concerns mentioned during the interviews with the VWCC and Goodwill administrators regarding program sustainability. One major issue was the lack of access by students to the appropriate technology when not on campus to allow program participants to practice their lessons while they are at home. While sometimes a student lacked a computer, other times they had a computer but it was too old to support the web-based download necessary to access the modules. (Shantara Alatorre, email 9/17/15)

In Year 3, the majority of students in the focus group discussion continued to express a need to improve opportunities to practice the MOS program outside regular class time and at locations other than Goodwill Industries.

This is not to say that efforts have not been made to remedy the situation. Allatorre explains the efforts made to remedy the lack of access to the modules from home:

1. *Those students who had laptops brought them to the instructor for installation assistance;*
2. *Students were allowed to come in early or stay later to practice in the MOS lab if they did not have the resources at home;*

3. *The open computer lab at the college is open 7 days a week and we asked IT to load the simulating MOS training onto the computers there so that students could practice in the lab at the college when Goodwill was closed;*
4. *I made sure the students had a student ID in the first week of training as it also acted as a bus pass for those who lacked transportation and needed to go to the lab on campus to practice. (Shantara Alatorre, email 9/17/15)*

Recruitment challenges also impact sustainability. Greater outreach to other organizations for referrals of students is needed. The Program Director and others are working with Roanoke Housing Authority to recruit full cohorts. Regarding recruitment, The WIA Program (at Goodwill Industries) has not fully worked well with the program. Potential participants get referred to Goodwill, but the processing of applicants and acceptance takes far too long; potential program participants are lost, often get discouraged, or find other (less suitable) employment. One VWCC administrator praised Goodwill Industries as a partner and particularly for its in-kind office space, computer lab, and other resources, while lamenting that the " WIA is sometimes too bureaucratic for the college's purposes, …causing delays which discourage potential students/program participants."

For sustainability and program improvement, there is interest from the Program Director, and some officials at VWCC in exploring the possibility of developing a "career-ladder" for program participants who may wish to pursue an Associate's Degree at VWCC. Students also expressed an interest in this. A comprehensive review should take place to determine if C2C courses could be approved for credit toward an AAS Degree. This idea fits within VWCC's mission and the state and regional commitment to increase the number of college graduates. We hope that VWCC will be open to allowing successful program completers to access opportunities to earn a certificate or degree.

As noted in the prior section, sustainability will also require expanded efforts to find additional funding sources. Topics of consideration include: Will employers see the program as viable in the long run? Do they place enough value on the potential employees generated by the program to offer to support the sustainability of the program? Encouragingly, the program is building a name for itself and the involvement of the local employers gives it more opportunity for sustainability. Microsoft credentials add prestige to employment applications; this enhances the chances for sustainability of the program. Hopefully, employers will recognize increasingly the value of hiring from this program

IX. Factors Contributing to the Partners' Involvement

Summary of this section

- Both of the primary partners, Goodwill Industries and Virginia Western Community College understand and respect the mission of the other organization. Officials at Virginia Western Community College value Goodwill Industries as a non-profit organization dedicated to helping people with disabilities and disadvantages overcome barriers to employment.
- Likewise, those at Goodwill Industries understand and appreciate the mission of the community college generally and Virginia Western Community College in particular. They recognize that their missions complement one another.
- Leaders, case managers, instructors, and others at both organizations share a commitment to addressing the real-life problems of people in the Roanoke Valley.
- In Year 3, the partnership between Goodwill Industries and VWCC remained vital and strong.

Shared Missions Make Partnership with Goodwill Industries an Easy Choice

Leaders of Virginia Western Community College, Goodwill Industries, and the community-based employers recognize that by working collaboratively, they can each fulfill their individual missions. For Virginia Western Community College, the mission is to provide affordable, accessible, and quality educational opportunities and workforce training to meet individual, community, and global needs. For Goodwill Industries, that mission is helping people and families in our community achieve a better life through work and independence. The mutual "mission respect" found among leaders and front-line employees at both organizations allows VWCC and Goodwill Industries to work together efficiently and to work with secondary partners such as area businesses.

At the March 2015 C2C meeting, administrators and staff from the two organizations identified the following factors as making the partnership successful during the three-year project period:

- Goodwill's comprehensive and effective wraparound services;
- VWCC's relentlessness in recruiting students, placing them, and supporting them individually throughout the program and, for many, following program completion;
- Clear partner roles, defined by tools such as the logic model and organizational charts;
- Frequent and transparent communications;
- Cross-training between organizations;

- Assigning mutual (not independent) credit for success;
- The blending of services provided by each partner;
- Positive beliefs in success (never say "can't do that.");
- Strong focus on student success.

At that same C2C meetings, the beliefs and goals of the partnership were cogently articulated by VWCC President Robert Sandel during a panel discussion:

> *We [VWCC and Goodwill industries] are both in the business of getting people jobs. It stops the vicious cycle of dependency from continuing. People need to know that we care about them. Those who come here [to Goodwill Industries] might not be comfortable walking on a college campus… Together we can make a bigger difference than we could separately. That's their bottom line. (3/18/15)*

In turn, Bruce Phipps, President and CEO of Goodwill Industries of the Valleys echoed these sentiments as follows:

> *CEO's and Presidents are said to have big egos. Maybe we do, but we see each other as partners rather than competitors. It's much easier to get grants as a partnership than an individual organization. (3/18/15)*

It is important to note that Goodwill Industries and VWCC know the importance of involving area employers in this partnership from the beginning. This collaboration involves partnering with community-based business and industry that can provide jobs to program participants. The partnership is committed to solving real-life problems in the Roanoke Valley Region. These employees will have both the academic skills and the soft skills the companies indicated they would seek in new employees, including the "soft skills" related to interviewing skills, teamwork, communication, etc.

Through the active and public involvement of senior leadership, both organizations have avoided institutional opposition to change. Goodwill Industries and VWCC have demonstrated, however, the importance of overcoming resistance through open and public communication about the partnership both within each organization and in speaking to the general public. Both organizations promote the partnership and publicly discuss the advantages of a community college and a nonprofit working together to provide workforce training for low income adults. For example, according Tara Alatorre, the involvement of VWCC President Sandel is important to the current and future success of the partnership:

> *He emphasizes collaboration and relationships in many aspects of the college mission. He is visible in the community with officials of Goodwill Industries, and he promotes the partnership and the grant in speeches he gives in the community VWCC has a history of cultivating community partnerships, and those previous investments have allowed the current grant to be implemented effectively and smoothly.*

Participation by Area Employers

Area employers are willing and active participants in the partnership with VWCC and Goodwill Industries, benefiting by the preparation the program gives individuals in their applicant pool.

In our Year 3 site visit, we found that the Employer Advisory Committee had solidified its role in bringing key service, community, and employer partners together. Important contributions to VWCC program included review of the curriculum and the purposes of each course to ensure alignment with local job needs. The EAC has met bi-monthly since its inception in 2014 and switched to quarterly meetings in w2015. .

Of the possible employers in the area, the one with greatest need for the trainees is the Carilion Clinic, a non- profit health care organization based in Roanoke. It serves over one million people in southwestern Virginia and West Virginia, and it has over 11,000 employees. Carilion needs entry-level, knowledgeable, medically trained people e.g., example, medical terminology and customer service skills). According to a letter from Kathy Harrison, Manager/Talent Acquisition at Carilion Clinic:

> *Carilion has identified an ongoing need for administrative positions within its certainly have received training that would be beneficial to their employment in these types of positions. We typically hire well over 100 individuals with this type of skill set annually . . . Over the next several years, we look forward to working closely with Virginia Western Community College and Goodwill to prepare skilled workers for success in our organization.*

From our Year 3 Site visit it seemed that relations with Carilion, the primary employer partner, become closer during 2014-15. Carilion is now providing students with some shadowing experiences, internships, test runs at the front desk, and so on. Carilion also reviewed the curriculum and supported the MOS classes (e.g., Excel, MS Word, etc.), customer service training, medical terminology and coding focuses.

A more recently created employer partner is the Friendship Retirement Community, the largest skilled nursing care facility in Virginia. Services include assisted living support, an eye care and dialysis center, personal home care services, and outpatient therapy. Friendship Retirement Community has offered VWCC program participants opportunities for internships and for full-time jobs using their newly acquired IT/MOS and health industry skills. In our Year 3 site visit we found that this relationship had continued to develop and that several students engaged in internship experiences and were then being considered for job opportunities.

I. Contributions from Partners Most Critical to Success of the Grant

Virginia Western Community College

- VWCC provided qualified adjunct faculty who can not only teach the Microsoft Office Specialist (MOS) Curriculum but also understand the challenges and opportunities in teaching the students who enroll in this program. Adjunct faculty members are also involved in the development of the curriculum to meet MOS standards. They work to ensure that program participants are successful in MOS assessments. They also want to ensure that program participants are prepared, if they desire, to enter degree-seeking programs at VWCC.

Virginia Western Community College's Vision Statement:

As a student oriented center for life-long learning, Virginia Western Community College will meet the needs of our diverse community by providing comprehensive educational programs and work-force development.

- VWCC appointed a dedicated Project Director who has established and sustained an effective working relationship with all grant partners, particularly Goodwill Industries of the Valley.
    - She has clearly initiated a team-oriented approach to the administration of the grant and the training program.
    - She is reaching out to area employers for their input and suggestions regarding the training curriculum and the desired outcomes of the training.
    - She is working with officials at VWCC to manage the grant and to collect appropriate data on program outcomes to ensure timely and accurate reporting to NOVA.

One of VWCC's Institutional Goals

"*To cultivate relationships and partnerships with the educational community, business, industry, and government to create educational and workforce development opportunities to support economic vitality.*"

The partnership with Goodwill Industries and area employers helps the college to meet this goal and to serve the college's service region.

- Through well-established working relationships, VWCC has an informal Employer Advisory Committee which provides comments and suggestions on the program curriculum and the proposed the student learning outcomes. Other long-term goals

of the Employer Advisory Committee include providing mentoring and internship opportunities for program participants and participating in workshops on job application and interviewing skills. The objective is to encourage current employers to contribute to the program participants' self-confidence and ability to be hired upon completion of the training program.

- Provide the support staff needed to hire adjunct faculty members, administer class scheduling, enroll students, and help with student retention.

Goodwill Industries of the Valley

The Mission and Vision Statements of Goodwill Industries of the Valley

Helping people and families in our community achieve a better life through work and independence.

Through the work of Goodwill, people will have the opportunity to achieve their greatest potential

- Goodwill Industries' Case Managers recruit and screen potential program participants. They also provide essential support services. After successful completion of the training, the Case Managers provide assistance in the job search and hiring processes.

- Goodwill provides a physically and psychologically safe place to hold the training program, and co- location of the C2C Program Director/Career Navigator. Since many program participants are either first-time in college or people who were unsuccessful in an earlier attempt in higher education, they may find the classrooms at Goodwill Industries to be a place in which they will be more comfortable and likely to learn. By having the Program Director/Career Navigator on-site, students have easier access to support throughout their studies.

One of the core values of Goodwill Industries of the Valley is collaboration.

"We will work collaboratively with community organizations as well as fellow teammates to advance the mission of Goodwill".

This commitment to collaboration helps Goodwill Industries of connect with lo local employers to ensure that training programs prepare participants to meet their employment needs

- Goodwill Industries, like VWCC, has long-standing relationships with employers in Roanoke and throughout its 18 county service region. In 2013, Goodwill Industries of the Valley placed 2,894 people into competitive employment positions.

Chapter 8: Synthesis Observations

Summary

Concluding the implementation section, we report on four key synthesis observations drawn from all 7 colleges. These are 1) "minding the gaps", 2) investing in curriculum and tapping local knowledge, 3) career navigators as means of expanding efficiency and 4) collaborating with community partners to meet employers and community needs. We conclude this section of the report exploring the possibilities for moving lessons from C2C funded programs to the wider colleges.

The synthesis observation, "minding the gaps" came from Bill Browning of the Aspen Institute who made the observation that many colleges seemed to be working on "minding the gaps" that is helping students through transitions from one part of their career pathway to another. Across our analyses that the C2C colleges sought out and implemented ways of helping students navigate otherwise difficult transition between the different stages in their career pathway. Examples of such strategies detailed in this section include designing a program that mimics the structures and culture of what's coming next, providing wrap around support services that crosses the gap from one level (or program) to the next and lessening the gap in time between taking part in one level and the next (e.g. "summer boot camp" fills the gap of summer vacation);

The second synthesis observation highlighted efforts the consortium members made to develop purpose driven curriculum designed to meet local need and tapped into local knowledge. We identified a wide range of ways that curriculum was used by consortium that included collaboration between faculty, creating shared knowledge and improved instruction through what scholars have called communities of practice (Wenger, 1999). Specifically, the following observations were made about the use of curriculum to drive the goals of the grant.

1. Curriculum as local and shared knowledge;
2. Curriculum designed to meet industry and employer needs
3. Curriculum that supports transferability through articulation agreements, stacked and
4. latticed certifications and credentials'
5. Curriculum designed to meet students "where they are";
6. Curriculum for active learning;
7. Curriculum that uses the varied backgrounds and experiences of staff and students for
8. greater congruence to the needs of employer;
9. Curriculum as a tool of organizational efficiency.

The third synthesis observation focused on how the consortium utilized career navigators as a means to more efficiently support students progression through their job training programs. In all colleges of the C2C consortium the role of the career navigator (sometimes called case managers) played a vital role. Career navigators differ from conventional college counselors in that they provide more types of support and these supports typically extend across a student's career training, from recruiting to job placement and sometimes beyond. Career navigators' roles typically included recruitment, assessments, career counseling, assistance in goal setting, crisis intervention, soft skills" training, fostering self-efficacy, transition to internships and/or

employment. Career navigators typically reach out into the community for recruitment of special populations who might normally come through the college's doors, and to employers so that they understood the needs of employers and could also arrange internships and employment for their students.

Finally, we discuss our synthesis observations about how the consortium collaborated with community partners to meet employers and community needs. We found that the consortium developed program features that emphasized comprehensive, active and public collaboration in building and sustaining partnerships, including industry's involvement in curricular and program development that interlaced services in a way to benefit each stakeholder and build capacity and supported sustainability. In addition, consortium members worked with their community stakeholders to identify shared goals, values and beliefs; addressing real-life community needs and supporting the congruence in the work being done at worksites and training programs. Lastly we found that consortium members worked with community partners with specific attention made for meeting the needs of vulnerable populations, that is unemployed/under-employed and under educated/under trained community members.

The section of the implementation report concludes exploring the possibilities for moving lessons from C2C funded programs to the wider colleges. This section details a number of examples in which the lessons of C2C rose to the attention of administrators of the wider college and have begun to be implemented on a wider basis outside the particular program(s) funded by C2C. The changes made through the C2C work concern the creation of career pathways, the use of evidence-based design, and strategic alignment of programs with the needs of employers. Examples of such implementation include, The Biotechnology/ Biomanufacturing program at Los Angeles Trade and Technical College acting as a prototype for creating career pathways college-wide, the data driven expansion of the career navigation model of student support at Muskegon Community College from the CAD/CNC career pathway to 6 other programs in the Applied Technology Program and changes at Northern Virginia Community college to make their extensive network of community partners more easy to navigate by students and the employers.

"Minding the gaps" – Building Seamless Career Pathways

Summary

This section looks at the ways that C2C colleges found ways of "minding the gaps" between different stages in the career pathways of students. The strategies detailed in this section are the following:

1. Designing a program that mimics the structures and culture of what's coming next;
2. Integrating instruction regarding those skills missed at the previous level into hands-on learning at the next level (so that students are applying the skills as they learn them);
3. Providing wrap around support that crosses the gap from one level (or program) to the next;
4. "Going to them"—providing outreach and services to students (and potential students) close to where they are located, reducing the obstacles posed by geographical distance;
5. Sharing data from one side of the gap in a career pathway to another;
6. Providing support as a community college for community based organizations who help students cross gaps in their career pathways;
7. Using holistic assessment by career navigators to connect students with the greatest needs to the most intensive support services;
8. Starting the next phase of the career pathway while still in the initial phase, thereby eliminating the gap between the two;
9. Providing "flexible funding" (or help to find outside funding) to help individuals and families over temporary gaps in their personal finances;
10. Tapping alumni as role models/instructors to bridge the gap between school and employment;
11. Moving faculty and/or support staff with students from one phase of their work to another;
12. Providing information to students about the entire network of support organizations, both those within and outside of the college itself;
13. Lessening the gap in time between taking part in one level and the next (e.g. "summer boot camp" fills the gap of summer vacation);
14. Creating a "half step" to support students in moving to the next level.

Introduction

At a peer-to-peer learning conference in Year 3 of the C2C grant participants from the seven colleges met in small groups and discussed the leading edges of their work. Commenting on his impressions from listening in on these conversations, the facilitator from the Aspen Institute, Bill Browning, made the observation that many colleges seemed to be working on "minding the gaps"--helping students through transitions from one part of their career pathway to another.

This section looks at where those gaps lie in career pathways of community colleges and job training programs. It details the strategies that the C2C colleges have used to help bridge these gaps. Our goal in writing this is so that a college that is successfully using strategies A &B may consider also implementing strategies C & D from another college.

The importance of minding the gaps in students' pathways is not unique to the C2C project. The Association of American Community Colleges (AACC) has brought the issue to the fore in its report, *Empowering community colleges to build America's future* (2014). Creating seamless career pathways is framed by the AACC as a way to address the problem of low completion rates--only 46% of the students who enter community college intending to complete a degree or credential currently attain that goal, move to a baccalaureate institution or stay enrolled 6 years later (2014, p. 4). With data from across the nation's community colleges, the theme running through their intervention strategies is the need to invest in *collaborative support structures (p. 28)*, that is, ways of collaborating from one side of each divide to the other to create seamless pathways from education to employment.

Strategies for minding the gaps among community colleges in the C2C consortium

The following is an annotated list of strategies we found being used by C2C consortium colleges to "mind the gaps" and create seamless career pathways:

1) Designing a program that mimics the structures and culture of what's coming next

   At Training Futures, a community based affiliate of Northern Virginia Community College (NOVA), they prepare pre-college trainees for work in business offices by re-creating the atmosphere of office settings in their program. Below are some of the ways that they did this during the C2C grant:

   - Trainees were required to dress in business attire suitable for an office setting and were supported in doing so through access to a storeroom of business-appropriate clothing that trainees can have free of charge.
   - The physical make up of the facility was that of an office setting rather than a school;
   - Participants were known as "trainees" rather than as "students."
   - Those instructing the trainees were referred to as "supervisors" rather than teachers.
   - Students were expected to speak Standard English and were given support for doing so through a Toastmasters course, with special assistance for trainees whose first language is not English and those whose first dialect is not Standard English.
   - Students were held accountable for behavioral norms such as consistent attendance and punctuality.

   All of these features are part of what Training Futures refers to as "Imaginal Education." This model was adapted from the Institute for Cultural Affairs and the work of Kenneth Boulding (1956).

   Boulding asserted that:

   a. People operate out of images.
   b. Images determine behavior.
   c. Images are created by messages that can be intentionally designed and communicated.

d. Images can change.
e. When images change, behavior changes.

Training Futures staff members have noted that many entering students have a negative self-image and a lack of confidence in their ability to succeed academically. Imaginal education is designed to help students look well beyond the distinct skills of office and business management and to train them in a range of skills, knowledge, attitudes and dispositions people need to successfully enter and stay on a IT career pathway.

2) Integrating instruction regarding those skills missed at the previous level into hands-on learning at the next level (so that students are applying the skills as they learn them).

At Shoreline Community College we saw the implementation of the Integrated Basic Education and Skills Training (I-BEST) program, a program developed by the Washington State Board for community and technical Colleges. The I-BEST program integrates basic skills classes with the students' training in for-credit college level courses. Students who showed the need for education in basic math skills had intermittent classes—short breaks from their machining work--in rooms adjacent to the machine shop. Through the close collaboration of the faculty of the machining program and the faculty of I-BEST program the developmental math was closely tied to the machining projects that students were conducting. In this way, math skills were taught in the context of their next assignment using the machines, rather than as a separate class that delayed them from beginning the hands-on work that they said they found motivating.

Within the I-BEST program there was differentiation so that students who did not need a particular math skill were not required to attend sessions where that particular skill was taught. Students we interviewed that were part of the I-BEST program were unreservedly enthusiastic about it, as were the faculty in I-BEST and the machinists program. Similarly, a study by the Community College Research Center out of Columbia University's Teachers College, found that faculty across Washington's 29 community colleges agreed that it was "an effective model for increasing the rate at which adult basic skills students enter and succeed in postsecondary occupational education" (Wachen, J. Jenkins, D., Van Noy, M., 2010, p. 28).

Providing wrap-around support that crosses the gap from one level (or program) to the next
"The key is the Career Navigator—not just handing over the person," said Dan Rinsema-Sybenga, Local Project Manager at Muskegon College in a small group conversation on "minding the gaps" in 2014. So, for example, the work of the career navigator at Muskegon's CAD/CNC included, but was not limited to, connecting students for scholarships, assistance with completing the FAFSA and financial aid appeals, employment opportunities, job development, and career preparation

Figure 1: Where are the gaps in community college career pathways? (Gaps appear in gray)[15]

Life before college / Life in the community	Stage I: Community Connections:	Stage II: College readiness	Stage III: Access and entry	Stage IV: Enrollment	Stage V: Preparation courses	Stage VI: Gatekeeper courses	Stage VII: Program of study	Stage VIII: Student completion	Stage IX: Beyond completion	Life after college / Life in the community
High school or other forms of education/ training, a job, or unemploy-ment	Community relations; Recruiting/ marketing (e.g. college nights)	E.g. K-12 and adult education partnerships, summer bridge programs, etc.	Admission; financial aid; orientation; and entry assessment	Advising and academic planning-- course placement, registration (traditional and late start)	If ready for college level courses: "student success courses;" life skills; Time management; study skills; individual program plan	Selection of a program or major;	Career education; & transfer to for-credit courses at the community college	Degree; and/or certificate	Student success and satisfaction; community success and satisfaction; business success and satisfaction	4 year college; or on-the-job training, or apprentice-ship; or employment, or unemployment
					If not ready for college courses, accelerated pre-college literacy or math development	Supplemental instruction; learning communities; experiential learning; early alert; class attendance monitoring by counselors; tutoring.				
"Off ramp" option: 4 year college										
"Off ramp" option: On the job training / apprenticeship										
"Off ramp" option: employment										
"Off ramp" option: unemployment or underemployment										

[15] This graphic was adapted from the *Student Flow Model* of Wayne County Community College's student completion 2020 Project (2012).

At a program at Virginia Western Community College they provide training and certification in Microsoft Office as a first step into clerical work in collaboration with Goodwill of the Valley. The Program Director, Shantara Alatorre, served as the Career Navigator, providing job support once students left the training program and moved into employment, in contrast with programs that end support with completion of their certificate. Alatorre reported that the communication was reciprocal--students reach out to her, as she worked to maintain contact with them.

3) "Going to them"--Providing outreach and services to students (and potential students) close to where they are located, reducing the obstacles posed by geographical distance

Among the C2C consortium of community colleges there are a number of examples of programs decreasing the physical distance that students need to get to their programs, reducing this as an obstacle for enrolling or moving to the next stage of a career pathway.

- At Mott Community College they made crossing one of the gaps a matter of crossing a parking lot. MCC's C2C program, which focuses on preparing displaced and unemployed adults for STEM-related healthcare careers, was led and managed by MCC's Workforce Education Center (WEC). The center operated out of an off-campus site that was just across a parking lot with Michigan Works, a branch office of State of Michigan's workforce development agency. While the WEC provided non-credit and short-term job skills training, Michigan Works provides job placement services.

- At Northern Virginia Community College (NOVA) the Adult Career Pathways (ACP) program took both recruitment and support out into the community rather than expecting the prospective or enrolled students to always come to them. The Director of the program, Kerin Hilker, explained: "It's very different than the traditional student services. We're meeting in Starbucks..." (9/12/13).

- At Shoreline Community College in Seattle, they began a satellite machinists program at a neighboring community college in an underserved community, creating new pathways for those students into other related areas. This arrangement came about because the other college had substantial machining equipment given to them by the State of Washington, but lacked qualified faculty or interest to run the program. For this reason, they arranged for Shoreline's faculty to carry out the program, with the colleges splitting the count of Full Time Equivalent students (FTE's) upon which funding is based.

4) Sharing data from one side of a gap in a career pathway to another

a. At Mott Community College in Flint, Michigan, both the Health and Human Services Organization and Michigan Works share information on a database called the Michigan Information Service (MIS).

b. At all of the colleges in the C2C consortium, due to the requirement for quarterly reporting on students' progress through the career pipeline (including employment data), they increased their capacity to gather and learn from data across a student's enrollment in courses and into their employment. At some colleges (LATTC, MOTT, Muskegon and VWCC) they sought and received this employment data directly from the students or employer partners who have hired them. At NOVA and Shoreline community colleges the data comes from the state, and at Austin Community College this information came from an outside source, the Ray Marshall Center.

5) Providing support as a community college for community based organizations who help students cross gaps in their career pathways

- At Los Angeles Trade and Technical College (LATTC) they facilitated a community based employment center to locate at the college and created a space for partners to serve the local community. This "work source" center was collaboration between LATTC and Coalition for Responsible Community Development (CRCD). LATTC's contribution to the partnership is to provide rent-free space for CRCD and the affiliated agencies listed below:

  - Friends Outside—a group whose mission is to help the children and families of incarcerated or recently incarcerated, providing immediate and long-term support;

  - All Peoples' Community—a social service center;

  - EDD – Employment Development Department – the state's employment services office;

  - CRCD - Community for Responsible Community Development: a group that works on sustaining, coordinating and improving planning, development, and community services.

6) Using holistic assessment by career navigators to connect students with the greatest needs to the most intensive support services

- At Austin Community College's Capital Idea Program, a community-based student support program that focuses particularly on low-income adults, services were allocated based on student need. Students are coded in computer systems as red, yellow, or green, based on their assessment of whether they have a high, medium, or low need for services. Theresa Soto, Career Navigator for Capital Idea, said that 10% of her caseload were classified as needed high support, 80% needed medium support, and 10% were needed low support.[16] This support was continuous throughout the

[16] All of the colleges in the C2C consortium had some sort of case management/career navigation whether done by a the college itself, an individual program within the college, a separate organization within the college, or a community based partner (See Section VI)

career pathway rather than having the student "handed off" to a new support person as they transition from one stage in the career pathway to another.

7) Starting the next phase of the career pathway while still in the initial phase, thereby eliminating the gap between the two

- At Los Angeles Trade and Technical College (LATTC) pre-college training filled the gap between previous schooling and/or employment and entry into for-credit community college courses.

- College programs can also overlap with high school. At Muskegon Community College, high school students can earn early direct credit from our Career Technology Center for Computer Aided Design (CAD) 100 and Machine Technology 101a.

  Or, in another example, Los Angeles Trade and Technical College (LATTC) has built bridges to the local high schools in a number of ways, led by their outreach team, Bridges to Success. In the area of curriculum, articulation was developed by review of curriculum and identification of competencies by the faculty at both the high school and at LATTC. The goal was to have articulation for high school students to receive college credit for the Biology 3 course, one of the first core classes within their Biotech/Biomanufacturing program of study.

  LATTC also hosted STEM-related events on campus where they invite their high school partners and students to visit the college campus and interact directly with faculty and staff in science disciplines. LATTC's staff also participated at an off-campus event called "Cash for College" at the Staples Center where they did recruitment of current high school students for the incoming semester at LATTC.

  And like Muskegon, throughout LATTC, they had high school students enrolled concurrently with students' high school.

- Co-enrollment also happens between community based organizations and community colleges. At Training Futures, a program that prepares students for work in office/IT settings, students were automatically co-enrolled with the college. While often their students arrived not feeling that they were "college material," many were surprised and pleased that they would earn college credit in this program. With this sort of "overlap" Training Futures did not give students the chance to doubt their suitability for college.

- Non-credit programs within a college overlapped with for-credit programs within the college. At Virginia Western Community College's non-credit Microsoft Office certification program, they had an articulation agreement with the for-credit wing of the college whereby completers received Prior Learning Assessment (PLA) credits for their work. Here again, staff reported that many of the students entered with low expectations for their career and benefitted from the overlap between non-credit and for-credit programs.

8) Providing "flexible funding" (or assistance in finding outside funding) to help individuals and families over temporary gaps in their personal finances

- At Austin Community College, Capital Idea, an affiliated student support agency, provided tuition and childcare assistance so that, if students were eligible for Pell grants, they could use those funds for living expenses. If they were struggling in other ways ACP counseled them on how to get support from public services such as SNAP (the federal Supplemental Nutrition Assistance Program, formerly "food stamps").

- Mott Community College's Workforce Development Office gave bus cards to help students with transportation.

- NOVA's Adult Career Pathways leveraged $400,000 annually in third-party tuition funding to help its participants.

9) Tapping alumni as role model/instructors to bridge the gap between school and employment

- Shoreline Community College's machining program has made it a practice to hire instructors and shop managers who were graduates of their programs and who have worked in industry. This practice became such an explicit part of the culture that the staff was in the practice of identifying current students who they wanted to recruit as instructors or teachers' assistants down the line. With insider knowledge of both the students' program and the world of work, these individuals were well suited to smooth the gap between the two, making the machinists' program congruent with needs of industry and providing personal connections with employers to help students get hired.

- At Virginia Western Community College, alumni were encouraged to keep in touch with each other and with current students via a Facebook group, bridging the gap between program completion and employment.

10) Moving faculty and/or support staff with students from one phase of their work to another (a practice known in the K-12 world as "looping").

- At the majority of the colleges and/or support agencies in the C2C consortium the person who provided intensive case management—the "Career Navigator"—typically followed a student from the student's acceptance or even recruitment, all the way through their program at the college or community based organization, and into their job placement. In some cases, such as at Virginia Western, that person stayed connected even after employment. This relationship, and the support provided through it, helped students to both choose the career path that best suits them, and supported them as they proceed from one step to the next.

- At many C2C colleges (LATTC, Muskegon CC, Austin CC, and Shoreline CC) full time faculty who had developed the curriculum taught multiple core topics, which allowed

them to develop knowledge of, and relationships with, particular students, learning about the ways that the different stages of the curriculum can be made to fit more cohesively with each other.

11) Providing information to students about the entire network of support organizations, both those within and outside of the college itself

- Northern Virginia Community College (NOVA) has taken steps to create a map of the extensive interweaving of organizations that are part of, or affiliated with, the college. Adult Career Pathways, a student support agency that is part of NOVA, has begun giving brief presentations at the beginning of classes in the IT Career Pathway to explain the services provided by such diverse groups as Skillsource, Training Futures, the CISCO training program, NOVA's Workforce Development program, as well as other college-based programs.

- Mott Community College's Health Career Pathways utilized a comprehensive assessment process that is designed to "screen-in" students to the right program, figuring out which parts of the college and which community based organizations could meet their needs. The use of this "screening-in" process took people where they are and found the best fit for them. This took more time and resources early on but mitigated individuals "stopping-out" of their programs. Screening in requires those doing the initial recruitment and assessment to have knowledge across the boundaries of the organization, including that between non-credit and for credit programs.

12) Lessening the gap in time between taking part in one level and the next level (e.g. summer boot camp fills the gap of summer vacation);

- The Michigan Works at Muskegon Community College Michigan Works ran 12 months per year so they avoided any gaps in time between finishing one program and beginning the next. By being separate from the academic program, they also reduced the time between the moment when employers told them they had a need for workers trained in a certain area (e.g. asbestos removal) and the beginning of a training program for those jobs.

- Los Angeles Trade and Technical College ran a 5-week "summer boot camp" that included academic work. Examples of the academic work in the summer boot camp include a math refresher courses geared to teaching math skills as preparation for a biology course that they would take later on; mini courses in life skills and career navigation; and visits to industry partners who have a history of hiring students from their programs. After this boot camp, students took the TABE assessment (Test of Adult Basic Education) and selected a program of study. In this way, the program served to bridge the gap between June graduations and the beginning of summer classes—a time that often leads to "summer melt"--the tendency for students who have signed up in spring to not show up in the fall.

13) Creating a "half step" to help students to the next level

> Before the C2C work, at Austin Community College the health science prerequisite courses were weeding too high a high percentage of students who were interested in health sciences. Students were being discouraged by a lack of success in the pre-requisites and stopping out of the health sciences pipeline—an area where employers were in need and wages were high. To help students to gain background knowledge and the confidence Austin created a course that students could take *before* the pre-requisites called Biology Fundamentals (BIOL 1308). This was the first of three courses that the college designed using C2C funds so that students could learn the content using on-line modules at home (and at their own pace) before applying that content in hands-on, small group work in class.

In summary, the challenge to help more community college students to widen their life options and help them to secure greater economic stability is, among other things, a challenge of creating greater continuity in career pathways. Colleges from the C2C consortium have each found ways to "mind the gaps" between different stages in students' progress. Given the number of points at which students may veer from their path, these innovations provide ways that each college—and others around the nation—can apply new remedies to the sites where their respective students tend to face challenges.

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Investing in Curriculum / Tapping Local Knowledge

Summary

This section looks at the wide range of ways that curriculum was used by the colleges in the C2C consortium. We emphasize the ways that collaboration between faculty have created shared knowledge and improved instruction through what scholars have called "communities of practice"--groups of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly (Wenger, 1999).

In this section we detail the following:

- Curriculum as local and shared knowledge;
- Curriculum designed to meet industry and employer needs
- Curriculum that supports transferability through articulation agreements, stacked and latticed certifications and credentials'
- Curriculum designed to meet students "where they are";
- Curriculum for active learning;
- Curriculum that uses the varied backgrounds and experiences of staff and students for greater congruence to the needs of employer;
- Curriculum as a tool of organizational efficiency.

Introduction

"Curriculum" is one of those words often used to mean very different things, and rightly so—different users adapt it in a variety of ways. In this section, we highlight different aspects of curriculum development among C2C colleges. We emphasize the ways that collaboration between faculty have created shared knowledge and improved instruction through what scholars have called "communities of practice"--groups of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly (Wenger, 1999).

The positive effects on outcomes of communities of practice are well supported by outside research, beginning with Lave and Wenger (1991) on communities of practice's role in creating local, useable knowledge; Lev Vygotsky (1978), on the ways that learning is fundamentally a social activity, and Marzano, Waters, and McNulty's (2003) provocative findings that off-the-shelf programs are most effectively implemented when adapted to local needs rather than implemented with fidelity to their authors' intent.

The value of such situated learning depends on three claims: 1) that decontextualized, abstract or general knowledge is less useful than contextualized, situation-specific, practical knowledge; and 2) that new knowledge and learning are properly conceived of as being located in communities of practice (Tennant 1997, p. 77), and 3) that the productive relationships within communities of practice, lead to behavioral change: "change that results in greater knowledge sharing, which in turn positively influences business performance" (Lesser and Storck, 2001).

Background: The Department of Labor and Curriculum Design

According the US Department of Labor's (USDOL) Solicitation of Grant Activity (SGA), one of the overall goals of the TAACCCT grant was to prompt programs to introduce "innovative and effective methods for curriculum development and delivery" that are responsive to specific workforce needs and promote improved learning, retention, and employment outcomes. Similarly, the SGA framed curriculum as a means of engaging employers in targeted industries to help identify skills and competencies that would be incorporated into programs' curriculum. In addition, the USDOL emphasized the importance of applicants incorporating these curricular innovations into the standard offerings of the institution. The USDOL integrates curriculum development throughout the SGA as an important means of supporting strategic alignment, sustainability, and program implementation, as well as encouraging greater contribution and engagement from partners, employers and industry.

The NOVA proposal for the seven community colleges that formed the C2C consortium was congruent with how the USDOL's SGA framed it as one of the central tools to fostering innovation and successful outcomes.

Below, we enumerate ways that C2C colleges innovated in their curricula to create local, useable knowledge to prepare students for gainful employment.

1. Curriculum as Local and Shared Knowledge

Austin Community College's modules created by faculty

Austin Community College provides an excellent example of faculty collaborating to create curriculum that both produced a shared knowledge base and created cohesiveness in the team that created that curriculum.

With funds from the C2C grant, Austin Community College revamped the curriculum and pedagogy of three of its health science pre-requisite courses: Fundamentals of Biology (BIOL 1308), Anatomy (BIOL 2304) and Introduction to Anatomy and Physiology (BIOL 2404). The

nature of the redesign of these courses was consistent with what is known as "flipping the classroom"—providing content for students to learn outside of the classroom, and then to class time to for students to apply that content in interactive and integrative ways. Among educators this change is known as "flipping the classroom" because these steps have traditionally been done in the opposite order, with content provided in class and the application of this content happening by students outside of class.

From the start, faculty carried out the process of redesign. Faculty member, Rick Fofi, led curriculum redesign for the C2C grant with coordination by the Grant Director, Alice Sessions. As Fofi tells it, his boss, Dean of Math and Sciences, David Fonken said to him, "We got this grant -- make it happen" (9/26/15).

What followed over the next three years was a process that began with great enthusiasm but a steep learning curve. By all accounts the initial rollout for the first course had plenty of glitches, and the team rallied to make improvements by the time the second time the course was offered. By summer of that year, this first course was receiving rave reviews from both students and faculty. The grant director's view was that it was fortunate that the design team faculty members had tenure; that this allowed them to take the risks necessary to try out new methods without fear that poor student evaluations would have dire consequences.

Throughout the process of curriculum redesign, faculty's investment of time exceeded the Learning Equivalent Hours (LEHs) the faculty members were receiving in return for their time. In an accommodation to this, during the second half of the grant period money was used to hire an instructional designer to help with the process. While the instructional designer became part of the team, the cohesive, still enthusiastic group of faculty continued to lead the process, and—having completed the redesign of one course—continued in a clearer and more confident way to redesign the second and third course.

By 2015, the third full year of the grant, there were new faculty members eager to take part. Team members' schedules were adjusted so that they could meet all day every Friday. Working closely together helped faculty have a shared understanding of the curriculum, so much so that they shared office hours so that if a student came in for help and found their instructor occupied, they could go to any of the others.

One of the lessons that should be noted from the Austin example is the need for resources to be allocated when faculty are given the additional task of creating curricula. Schools designing their own curriculum materials or adapting existing curricula to site specific needs should be wary of trying to do so by relying on the generosity of enthusiastic faculty. While such an approach may work in the short term, in addition to the ethical considerations of exploiting the good will of instructors, ultimately the strain could weaken the process of reform.

Faculty driven curricular innovation at Los Angeles Trade and Technical College

At Los Angeles Trade and Technical College [LATTC], the responsibility for curriculum development, like at Austin, was given over to a sub-group, actually a pair of faculty, Mark Diaz and Angela Gee. Here the curriculum development was fueled by the dedication of the two.

Institutional resources (such as Austin's Learning Equivalent Hours) did not follow the added workload.

The result of this collaboration was a comprehensive curriculum for an Associate of Science Degree in Biomanufacturing. Their model was titled Pathways to Academic and Career Success (PACTS), an approach that emphasized stackable credentials and was built on the foundation of students developing self-efficacy. The LATTC's Biomanufacturing curriculum had a multidisciplinary and interdisciplinary focus which included soft-skills, science, mathematics and a workplace/industry focus. It is also was student centered, designed to foster active engagement in learning and student ownership. Most importantly it was designed to teach students to be able to think on their feet and solve problems. Gee and Diaz created a curriculum with close input from their industry partners which included Baxter Bioscience and Grifols Biologicals, Inc. Working with these partners they identified core competencies and student-learning outcomes, developed and refined a curriculum, and did the work to get it approved at the college, regional and state levels.

As described in Section VII, what was crafted as a labor of love by two faculty members, has been adopted across other departments of the college and is now a key part of the college's brand.

Training Futures' expansion and extension of the implicit curriculum

Training Futures (discussed in Section IV) is a community based organization that used C2C funds to set up a new program at NOVA's Manassas campus, a geographical area with a high number of lower income households. Completion of the Training Futures program earned students a Career Studies Certificate.

The academic or "explicit" curriculum at Training Futures focused on business and IT and prepared trainees for entry level office work. Students learned computer skills, business English, business math, and a number of other office and business management skills. In all of these areas there was an emphasis on medical technology, one of the STEM areas focused on by the TAACCCT grant.

The implicit curriculum focused on positive and empowering self-image. It encouraged a certain vulnerability of trainees with their peers regarding challenges they have faced and continue to face. Trainees told us that by bringing their challenges into the shared conversation the group became more cohesive and supportive. Faculty, for their part, pushed trainees to reimagine the possibilities for themselves. While through much of this section we stress the creation of communities of practice among faculty, Training Futures, seem to have also fostered this among trainees.

Trainees told us of two activities in particular that fostered the culture of vulnerability and personal transformation. The first was Toastmasters public speaking course. Trainees, new to the program, told how they were all required to give a biographical speech telling they got there. In these speeches they were encouraged to talk about the challenges they had faced. Secondly, each class began with a philosophical or inspirational quote that trainees wrote about and

discussed. Trainees told us that it was through the discussion of these quotes that they really began to rethink their views of themselves.

Also part of the process of getting trainees to re-imagine their identities was the program's overall design. The program was built around an immersion model, with trainees experiencing classes in an professional setting like the one where they might eventually be employed. Training Futures trainees were required to dress professionally, had to meet real world job expectations for attendance and punctuality, received performance reviews and interacted professionally with staff and fellow trainees.

This implicit curriculum was replicated at the new site in Manassas in a very organic way. Much of this implicit curriculum was not yet spelled out in a guidebook or a written curriculum. The ways and expectations of veteran staff enculturated both new faculty and trainees. An instructor, Latoya Robinson, explaining how she learned the culture: "It was instilled on me to not solely depend on yourself but collaborate with others. I also feel that it is the climate. It is highly collaborative. It helps to know that you have colleagues who are passionate… It splats onto you" (10/23/14).

When we asked her about the origin of this ethos, interestingly Ms. Robinson gave credit to the trainees: "The trainees come in vulnerable and open to critique, and that helps us as instructors be vulnerable and open to critique…It is informal. There's not a formal peer mentoring… We eat and ask, 'How did your class go today?' (10/23/14)

While this kind of transmission of the culture of the organization seemed successful, we, as evaluators, in our interim reports encouraged the staff at Training Futures to also write more of it down, in case there were ever the loss of key individuals "carrying" the institutional memory.

2. Curriculum Designed to Meet Industry and Employer Needs

Shoreline Community College in Seattle provides an example of a curriculum designed from top to bottom to meet the needs of students. One of the key ways that they accomplished this is through creating a system of *stacked and latticed credentials* [See Figure 2]

Early on, Shoreline's Dean, Susan Hoyne, recognized two particular needs of students: first, they would be more employable if employers had some assurance of the skillset(s) they had mastered; second, students would be able to financially support themselves during their program if they were able to earn certificates or credentials that made them employable. Shoreline's dean, Susan Hoyne, explained why the NIMS certification greatly improves students' employability--"They can go anywhere in the world and give them their social security number and they can see all the skills they have" (10/14/13). Similarly, a student in one of our focus group said, "What it does is give you credibility… If you have it on a resume, it will give you the edge over someone else who doesn't have it" (1/16/15).

Students earned certifications from either NIMS--the National Institute for Metalworking Skills (for the Machine Maintenance Certification), or ASQ--American Society for Quality Training

(for the Quality Assurance program). In cases where no national certifications were available, Shoreline's own administration created one as their stamp of approval.

Beginning with an understanding of students' needs, the administration, faculty and industry advisors planning curricula worked backwards from the requirements of industry and the requirements for the third party certifications.

These two influences, the needs of industry and the requirements for certification, of course, had a great deal of overlap. A manager of one of Shoreline's key industry partners-- Tom Stevenson, of Royell Manufacturing, told us that he pushed for the NIMS certification, the first national certification that Shoreline began to offer because "I understand the need for solid measures of performance" (10/14/13).

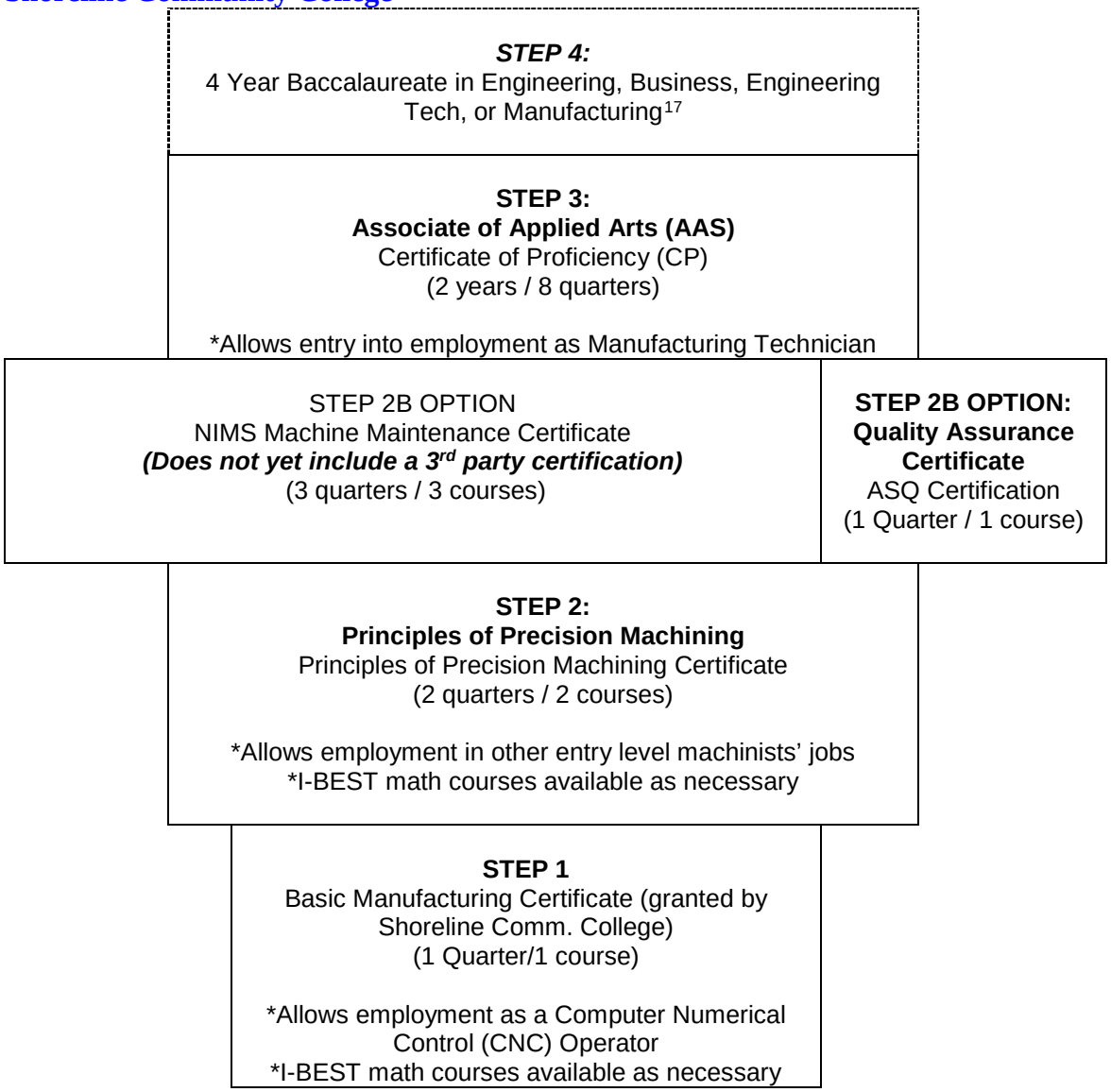
In some cases students from Shoreline used their certifications to get jobs on the side while continuing coursework, and more rarely, students left the program altogether for employment, with the option of returning to earn additional skills and certifications or credentials. When we spoke to those at Shoreline in the third year of the C2C grant, 100% of those who completed their first semester students were continuing on to the second semester and earning a certificate from NIMS.

3. Curriculum that Supports Transferability Through Articulation Agreements, Stacked and Latticed Certifications and Credentials

Many colleges in the C2C consortium made great strides towards designing programs that supported transferability to other colleges and worksites through articulation agreements, certifications and credentials.

At Northern Virginia Community College and Mott Community College they have articulation agreements from both the local high school and the workforce development office to the college

Figure 2: Stacked & Latticed Credentials in the Machinist/Manufacturing Programs of Shoreline Community College



campus. In both these cases, this means that students can convert previous non-credit coursework into college credits through Prior Learning Assessments.

Similarly, at Muskegon Community College, they have made it a priority to articulate the redesigned CAD/CNC program and other career education programs with regional secondary schools and universities.

[17] Note: Currently courses only General Education courses of the AAS degree transfer for credit but they are currently working with another community college to create an Applied Baccalaureate degree so that the courses will transfer.

Certifications also help allow students to transfer across colleges. Dean Susan Hoyne said that colleges used to complain that if they took someone from another college they could never be sure what that student knew. With the third party certifications, colleges can know what they're getting and it has allowed different colleges to develop specialties: "We do clean technology. North [another community college in Seattle] does HVAC. Students go back and forth, and it will all go towards a 2 year degree in clean technology" (1/17/15).

While most of the certifications earned by students allowed them to get a new and higher paying job, the dean said that she was frank with students that the exception to this was Basic Manufacturing Certificate, earned after the first course. Even so, Hoyne said that even this certification and the others made up by Shoreline had a huge impact on students' sense of success and self esteem. (1/7/15)

4. Curriculum Designed to Meet Students "Where They Are"

At Mott Community College in Flint, Michigan, the notion of the curriculum has been an expansive one; a blend of student services, support, and "soft skills," on the one hand; and professional skills, knowledge and dispositions on the other. This work represented a paradigm shift for Mott, with a host of student-focused resources within the college and outside of it. (Those student supports outside of the college functioned under the direction of Workforce Development). What this coordination of services meant in practical terms is that Mott's aimed to understand the individual student well enough that they can help the student to find the organizational niche--to "screen in" students rather than screening them out.

The Mott program recognizes that industry skills and knowledge are not sufficient for students to be successful. In many respects this represents some interesting boundary crossing between what are traditionally thought of as curricular and non-curricular activities-- teaching and content on one side, and student support services on the other.

The group at Mott emphasized that this type of approach requires "seeing the student differently--as a complete individual…" They have a philosophy of "seeing people as people," and "seeing their work as a [that of] facilitators vs. [that of] a machines."

The C2C staff at Mott developed the following insights regarding the entry needs of displaced and unemployed adults that must be met during the screening in process and beyond to empower them to benefit from other aspects of the WEC/Michigan Works wraparound services:

- Their students need a caring, nurturing, and attentive faculty and staff. A culture of caring and concern seemed to be the WEC's "secret sauce."
- Their students need "small successes" all along their time in the career pipeline.
- Their students benefit from working with a cohort with common experiences as a mutual support group.
- Their students benefit from a very structured schedule and structured classroom methods including required attendance and make-up arrangements.

- The time courses are offered is important to their students; it is important that they fit with their childcare and other responsibilities. The students prefer, for example, that there are no early morning classes.
- Their students benefit from assistance such as gas cards, bus cards, books, business clothing, and access to computers, tutoring services, etc.
- Their students prefer to be referred to as students rather than as clients.
- Their students need to visualize clear career pathways—"How does each class contribute to my goal of getting a good job?
- Their students benefit from experiential learning—they welcome any exposure to their chosen career field such an internship, corporate visit, classroom visit by an employer, and participating in a mock interview.
- Their students are very curious and anxious about job opportunities—they want to know who the employers are, what jobs are available, how they can get help to find a job, and what their chances are of finding a job upon program completion.

In sum, by redefining curriculum to not only mean the hard skills of academics but also the soft skills of student support, they have created a culture focused on student success.

5. Curriculum for Active Learning

A review of some of the key literature about learning highlights that one of the key principles of learning is what Vosniadou (2002) describes as learning environments that encourage students to be active learners. As she points out, "Learning at school requires students to pay attention, to observe, to memorize, to understand, to set goals and to assume responsibility for their own learning. These cognitive activities are not possible without the active involvement and engagement of the learner" (p. 8). Similarly, Bandura (1997; 2006) proposed the overarching concept of human agency. As Bandura (2006) points out, through one's agency and self-regulation, one can set goals and proactively work towards those goals while assessing their progress, making subsequent adjustments and achieving one's goals. Students who actively in deliberate, and take proactive and reflective learning strategies experience better learning outcomes, deeper processing and new cognitive structures (Meichenbaum & Biemiller, 1998).

Active learning by students

Austin's curriculum innovations exemplify curriculum development congruent with these key principles of learning. Using on-line learning modules, students were able to master content not in the small window when a lecture was given, but at times that suited their schedules as parents and workers. They could proceed at their own pace, and return to challenging content as many times as they wished. Then in class, students actively engaged in using the knowledge to do problem solving as small groups.

Students took agency in the ways that they utilized the curriculum. Regarding a tool called *Poll Everywhere* that allowed instructors to post questions on a screen in and students to log answers by texting a code from their cell phones, one student told us "I was taking screen shots of the correct answer—another way to game the system" (11/13/14). Another in the same focus group said, "I take screen shots of the models we make in class and then I can take my time studying

them… We have tape so we can write labels on our models, then take a photo." Still another, "I put the module photos on my phone. I have those with me… I work for 50 hours per week at two jobs. I skim through the photos there."

In this way students created their own means of to take greater ownership and self-actualization in relation to the curriculum as they found it.

Active learning by faculty--continuous improvement during redesign

Austin's curriculum for a flipped classroom and their process for creating it continued to evolve in the redesigned courses rather than staying fixed once they were "done."

Along with this assumption of continuous improvement, they held the assumption that individual teachers would adapt the curriculum to complement their personal strengths, thereby creating a culture of expected adaptation. So, for example, by the time the team was redesigning the third course they had seen that they could improve student mastery by creating activities for the 3-4 areas of each on-line module that were most difficult for students to understand rather than for all parts of each module.

The team also got clearer about what they were trying to do in their on-line modules. The instructional designer hired in the third year explained,

> *My understanding—and I've only been here 3 months—is that we really break down the content, emphasizing words. I use the word "chunking"—that means breaking it down into smaller bites for digestion and comprehension so they don't have to separate as much of the content for themselves. We're making a lot more connections for them between the content and the image that goes with it. Trying to help them see how things fit together. (11/12/14)*

From a student's perspective the redesign looked like this:

> *It was eye opening how easy it was. I had not taken biology in 6 years. It was better than a textbook. I've realized that bio is a bunch of layers that build on each other. With the modules, with the numbered slides, telling you--'Now we're moving onto the next layers. This is what we're going to be talking about." Instead of just trying to follow along it kind of ushers us along. (11/13/14)*

Continuous improvement after the curriculum was implemented

As the redesigned courses were honed and had begun showing success, the next challenge was the adoption of the curriculum by instructors who had *not* been part of creating it. Here the curriculum innovators veered towards adaptation and flexibility, rather than locking it in as "finished." The design team and their dean encouraged new users to take part in improving the curriculum on an on-going basis. "I want this to be a living thing," said the team leader, Rick Fofi. "Let's evolve. I'd like to think that the new people we pick up, we look at them as—'Hey, maybe they will bring something new'" (11/14/14).

In Fofi's comments we see what some have called *double-loop learning*--using feedback to detect challenges and identify corrections that involve modifications to the habits and norms of the organization. (Argyris and Schon, 1978)

Flexibility in implementation – Active learning by those who did not design the curriculum

As part of the implementation of the redesigned courses, the design team and their dean chose to encourage instructors to use whatever parts of the redesign they felt comfortable implementing, rather than pushing an all-or-nothing approach. Research on the implementation of comprehensive school reform programs supports this approach, finding that the most successful implementation of such programs are in schools that adapted it to meet the site specific needs of that school. (Marzano, Waters, and McNulty, 2003, p. 82)

To play to instructors' strengths, the redesign team supported faculty in adapting the curriculum in a number of ways: they created both PowerPoint slides and guided notes; they created two or three hands on activities for each lesson; they encouraged "cross fertilization" conversations where faculty shared what worked for them and what did not; and they changed the weighting of grades to allow for more discretion by the instructor--of the 1000 points that a student can earn for a course, 170 of those were not connected to any given activity but were left to the instructor's discretion.

Finally, both the Dean and the redesign team communicated to instructors that they could choose to *not* adopt the redesigned materials at all. "There are certain teachers who are not suited to give up the lectern," the grant director told us (11/13/14). Team leader, Rick Fofi, said that while there were some instructors who were less than enthusiastic--those with a "strong feeling for academic freedom" he said--these were the outliers, and that he mainly had a lot of instructors who want to teach the BIL way (11/14/14).

6. Curriculum that Uses the Varied Backgrounds and Experience of Staff and Students for Greater Congruence with the Needs of Employers

Many of the colleges in the C2C consortium of colleges made a practice of hiring instructors from employers where students would eventually be applying for work or graduates of their programs who had worked in industry, creating a classroom culture more in tune with the workplace.

At Mott Community College they hired a machinist from industry to work with students on the machine shop floor. He was not an educator per se, but an experienced helper who could point students in the right direction and bring a stronger connection to the world of work.

At Shoreline community college local experience was tapped in other ways. First, the program made a practice of hiring its own graduates once they had experience in industry. This practice was so common that we met students who aspired to this "out and return" route even while still in one of the programs.

Shoreline didn't wait until students had graduated to tap their experience. Their classes were set up as a "one room schoolhouse," with students of different levels working side-by-side in the same space. The effect of this arrangement was that less experienced students would seek out the help of those further along. The benefits were not just for the less experienced students—the skills of the experienced workers were reinforced and consolidated as they taught them to their peers.

7. Curriculum as Tool of Organizational Efficiency

Austin Community College's curriculum developed as a creative response to two complementary problems—the need of employers for students attaining credentials in the health sciences, the needs of unemployed people in the area for decent paying jobs. In the Aspen Institute report from 2010 on ACC's programs in the health sciences, the most common "off ramp" for students from the learning process was during the prerequisite phase. (P. 36)

Not surprisingly, it was the students who persisted and received a degree that experienced the greatest increase in income. The students who earned an associates degree went from a median income of $13,544 annually to $44,222.39 in their first year after earning their degree—an increase of 226%. (p. 11)

ACC Biology Department Chair explained that students were arriving unprepared for prerequisite courses. "They didn't know what a cell was," he said. Understandably, the under-prepared students were intimidated. The Biology Chair said that even if students had received came "college ready" they were often not "science ready." These data raised the question for Austin's team of what could be done to support students at the phase before they began the health science prerequisites so they do not leave before the big pay-off of completing a healthcare program degree.

As scaffolding to student success in this area the Department of Math & Sciences created the new course—BIOL 1308. The creation of BIOL 1308 occurred before the beginning of the C2C grant but was redesigned through the grant. As described in Section IV this redesign involved creating on-line modules where students could learn the content at home and then apply this in hands-on activities during class time.

The rationale for the instructional model of the new curriculum was as follows:

- Putting students "in charge of their learning";
- Allowing students to have flexibility about how to learn the material and when they learn it – some students do modules before class, others do them afterwards;
- Differentiating through technology–instructors had access to data from students' performance on the on-line modules before class, allowing them differentiate according to student needs in class;

- Encouraging students to work at home allowed more time in class for support of particular needs.

Discussion: Considering the transferability of "local, useable knowledge

As the USDOL's grant funding for the Credentials to Careers approached its end, what remained is the question of whether, when the C2C colleges make their curriculum materials available as requested by the SGA, other colleges will be able to make use of them.

In our view, the successes that occurred in curriculum innovation at C2C colleges were based in the knowledge created by communities of practice well grounded in understanding of the needs of their students and the employment context. If the transfer of curriculum materials is going to be successful it will depend on other college's communities of practice adapting these using their own local knowledge.

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Career Navigators and Possibilities for Expanding Efficiency

Summary

In all colleges of the C2C consortium the role of the career navigator (sometimes called :case managers") played a vital role. Career navigators differ from conventional college counselors in that they provide more types of support and these supports typically extend across a student's career.

Career navigation was not offered for all students in any of the consortium colleges. Some colleges had a central location for support services that would refer some students for support, some colleges had career navigation for students in a particular academic program; and still others offered the services for students in programs for high support students. Career navigators' roles typically included recruitment, assessments, career counseling, assistance in goal setting, crisis intervention, soft skills" training, fostering self-efficacy, transition to internships and/or employment.

Career navigators typically reach out into the community for recruitment of special populations who might normally come through the college's doors, and to employers so that they understood the needs of employers and could also arrange internships and employment for their students.

We conclude with a discussion of the possibilities for making the work of career navigators even more robust by making their curriculum more explicit and systematic and by the use of predictive analytics.

Introduction

One of the common themes running across the work of C2C colleges has been the value of the Career Navigator's role. In this section we'll explain the role of the career navigator, how it is different from traditional college counseling services, how it can be used to help students to build self-efficacy and discuss the potential for predictive analytics to increase the scope of these services.

What Career Navigators Do

Career navigators provide comprehensive support for students, from their early contact through their coursework and into internships/employment or the next certificate/credential program. The work of career navigators differs from the role of traditional college counselors, whose involvement in students' lives is typically limited by the number of students on their caseloads. Career navigators' services involve more types of support and typically extend across a student's career. Career navigation is the thread of continuity in a student's time at a community college. Career navigation means that someone knows them, their aspirations and the obstacles to their progress. Knowing the student means allows appropriate support can be provided in time for it

to be useful. Typically career navigation is targeted at certain sub-groups of the student population—low-income students, first-time college students, returning veterans, or other under-represented groups.
While not all Career Navigators do all of the following activities, the ones listed below are typical of the work they do:

- Recruitment and help with the application process;
- Financial aid counseling;
- Assessment (including Prior Learning Assessment [PLA], which may lead to credits being granted for experiences the student has already had);
- Counseling regarding choosing a career pathway and setting short-term and long-term goals;
- Counseling regarding both non-credit and for-credit programs;
- Helping find ways to pay the bills while pursuing the next certificate or credential, in some cases granting money to alleviate a financial crisis;
- Support for persistence (within and across semesters) once they are in a program:
    - Accountability for attendance and support regarding this
    - Support for persistence (i.e. staying from one semester to the next)
    - Logistical support (childcare, transportation, sometimes rent assistance, coping with homelessness, etc.)
- Professional "soft skills education";
- Transition to internships and/or preparation for employment:
    - Job search and placement assistance
    - Interviewing skills
    - Application and resume writing
- Job placement (finding the "right fit");
- Support once employed.

Pam Thomas, Supervisor of Career Navigators at Adult Career Pathways at Austin Community College, described the work of the navigator's this way:

> *They have between 80-126 students. They do the same case management as an academic counselor but they also do check-ins. We're different from an academic counselor in that the students have to see us on a weekly, bi-weekly or monthly basis depending on whether they are high, medium or low support. And we reach out to them more than they reach out to us. We have a relationship with our students. When it's going bad they will tell us. Our community connections go deep so we have resources in the community, so that that crisis can be averted. (11/13/14)*

Career Navigators, not surprisingly, cost more per student than traditional counselors. That said, research has shown that, in the long run, they can be more cost effective than less intensive counseling services. Research by the Ray Marshall Center on Capital IDEA (CI), a program providing intensive case management at Austin Community College, found that CI's return on investment are a wise investment for taxpayers (Smith & King, 2011a; Smith & King, 2011b). The Marshall Center's research found that "over the first 10 years, each dollar invested in Capital

IDEA training returned $1.65 to taxpayers, which translates to an annual return rate of 9% per year. Over 20 years, each dollar invested in Capital IDEA returned $5.01 to taxpayers—an annual return rate of 17% per year."

Where's Career Navigation? Inside and Outside of Colleges

Because not all students need intensive support and because career navigation is labor intensive (and therefore relatively costly in the short run), none of the colleges in the C2C consortium offered career navigation to all of its students.

The colleges who "cast the net most widely" were those who centralized the assessment of student services so that all incoming students were considered for the provision of services. Los Angeles Trade and Technical College and Muskegon Community College, for example, had this kind of hybrid model that included a student services building that centrally located all "wrap around" (or "high support") services although these did not include employee connections. The C2C director for C2C programs did the employee connections only.

Other colleges had career navigation for those students who enrolled in a particular organization or college program. Mott Community College provided career navigation services for any person who sought the help of their workforce development program. Shoreline Community College provided career navigation for students who entered the college's Manufacturing/ Machinist program. Virginia Western provided career navigation for all students in its IT/Microsoft Office training program.

Still other colleges provided career navigation through separate programs that serviced students with high support needs. Sometimes these organizations were part of the college itself, while other times the organizations were entities outside the college themselves with close collaboration with the college. For example, at Northern Virginia Community College (NOVA), the Adult Career Pathways Program is a student support agency that is part of NOVA itself, whereas Training Futures—a community based organization closely allied with NOVA—is run by an outside group, Northern Virginia Family Services. At Austin Community College, there was a similar relationship with Capital Idea, also an outside student support organization.

Connecting to Colleges to Communities and Employers

Part of career navigator's role is to recruit students who might not otherwise walk through the enrollment office's doors. To do this, they work to maintain contact with other community based organizations and employers. Career navigators told us of reaching out to churches, public libraries, social service agencies, grocery stores where Spanish is spoken, employers, and those putting ads in foreign language newspapers. Kerin Hilker, Director of NOVA's Adult Career Pathways program, explained their work this way: "We're going to them. It's very different than the traditional student services. We're meeting in Starbucks..." (9/12/13).

Sometimes, program events are moved to the targeted community. Capital Idea, a student support agency affiliated with Austin Community College, did their orientations three times per year in the community rather than on campus.

In other cases, community based organizations have their entire programs located off-campus or in the community whose students they are trying to reach. Virginia Western Community College's collaboration for it's program training Microsoft Office is based, not on campus but at the Goodwill facility, providing a non-threatening learning environment for college students who may not be comfortable on a traditional college campus. Locating off campus may also be more welcoming for those who may be returning to college after an unsuccessful experience in higher education. In the words of a middle-aged student whom the VWCC team is helping to place in an office position that utilizes her new skills:

> *…If it wasn't for this program, I don't really know where I would be right now. Goodwill has done so much—not just for me but for so many people in this valley. Words cannot express how much I appreciate it. I've had so many cheerleaders in my corner. When I say "No," they say, "Go!" Of course I knew then that I couldn't give up. It doesn't do any good to give up. (3/19/15)*

It is also is incumbent on career navigators to maintain open relations with employers and be knowledgeable about the demand and pay for different jobs. Connections with employers are important both for recruitment at the front end of their programs and for job placement at the tail end. Career navigators stay connected with employers in a variety of ways: visiting interns on the job, recruiting employers to work on their program's advisory council, visiting graduates of their programs once they have been employed, and talking with recruiters from staffing agencies.

At Shoreline Community College outreach to employers has been delegated to one career navigator, while recruitment and student support during coursework is the bailiwick of the person known as the *student* navigator.

One of Shoreline's industry partners, Tom Stevenson, described the mutually beneficial relationship developed by the career navigator.

> *The navigator position is what really what started to get a steady stream of business working with the school. She worked hard to establish a steady stream of employees. Now she knows who the hiring managers are and where to place students. In turn, we have been trying to expose the students to our work environment. So I've had an open invitation to the entire instructional staff to come out and shadow so that they can get an idea about what an actual work environment looks like. We highly encourage that. At least 1 group every year for the last couple of years has come through. (10/15/13)*

Admissions & Assessment – Sometimes an Intervention in itself

Career navigators begin their personal connection with a student during the assessment process. We found a variety of assessment tools being used by the C2C colleges. The list below represents the range of assessment tools used by one or more of the seven C2C colleges:

- Accuplacer for ESL (College Board)
- Virginia Placement Test for native speakers
- Tests of Adult Basic Education – TABE (McGraw-Hill)
- Local English placement test

- Consideration of whether a GED or HS Diploma had been earned
- CareerScope (Vocational Research Institute)
- Career Readiness Certificate (ACT)
- One-on-one meeting with a case manager or career navigator to assess skill levels and career interest
- An application including 3 essay questions
- A 4-page interview form
- An English test (for 9th grade skill level)
- A Math test (for basic computational skills)
- Prior Learning Assessments (PLA) including a portfolio development course with credits given for demonstration of prior learning

Assessment tools are used for a variety of purposes

Assessments are used at different colleges for different purposes – to screen out, to screen in, to build a bond, and to build student commitment from the student.

At Virginia Western's Information Technology/MOS Training Project (IT/MOS) only those candidates with sufficient math prerequisites or interests relevant to potential IT/MOS job placements are selected for program enrollment. In this case, with assessment being done for one particular program--rather than a range of programs for the wider college--assessment is done to screen out candidates who are not ready to participate.

On the other hand, Mott Community College's health career pathways program—which includes a range of programs--utilizes a comprehensive assessment and screening process that is designed to "screen-in" students to the right program. The Work Keys Service Center provides a job analysis profile, skills assessment and instructional services utilizing a range of assessments. Consistent with the theme of being responsive to employer needs, the Work Keys assessment system works with employers to determine the skill requirements of various jobs, determine the current skills of employees/students and use this information to help educators/trainers target their instruction to help students fill these gaps.

At Shoreline Community College's CNC Machinist Program assessment is part of the process of building relationship with the student to see if they have the passion necessary to stick with the program. Career Navigator at Shoreline, Micheline Felker, explained that the crucial element for their programs is not so much background knowledge but "fire"--being excited and motivated to learn. (10/14/13)

Heather Stapleton, a student navigator, also at Shoreline, described the survey they give to students is used as "the beginning of a conversation, rather than a checklist to disqualify applicants." She explained,

> *I can go over those surveys so that I can see that if they're saying, "Yes, I need help with this, then I can call them in and ask them "What's going on? What can I do for you?" The survey has some personal questions but also includes questions that we need for our reporting for our quarterly reports like who is your funding source: their basic*

> *information about address; how did they hear about the program; do they have stable housing? Do you need help with financial aid? There's another part that's called a Life Matrix: We ask do you have stable housing? Do you have stable childcare? Do you have healthcare?... It definitely includes personal questions. (1/7/15)*

At Capital Idea, a community based student support organization that feeds students to Austin Community College, the application and assessment process for the various healthcare/biotech programs are, by design, rather long and involved. Interestingly, we were told that this multi-step process is more about building commitment from students rather than screening out students based on a lack of aptitude. This process involves five steps: 1) Orientation; 2) Test and sign up; 3) Career Guidance meeting; 4) "Final Commitment Interview; 5) And if the student commits to working with the program the final step is for the student to be assigned to a career navigator.

Assessments can lead to differentiation of instruction & support

Besides determining if a student will be admitted, student assessments allow differentiation of instruction and special services.

At Shoreline Community College's Manufacturing/Machinist programs assessment leads to differentiation of instruction. Students who need to improve their math skills are enrolled in the state funded I-BEST Program (an acronym for Integrated Basic Education Skills Training). I-BEST at Shoreline involves math instruction offered in classrooms adjacent to the machinists' shop and focuses on the math skills necessary applicable to whatever students' current machining assignment is. In this way, remediation is integrated into the main program rather than as something that students must get through before they can begins the hands-on activities that drew them to the program.

At Capital Idea assessments are used in the allocation of support services. After a student is accepted, services are allocated based on student need so that students are coded--red, yellow, and green--based on the perception of whether they have a high, medium, or low need for services. Theresa Soto, Career Navigator for Capital Idea, said that of her caseload 10% were classified as needing high support, 80% needing medium support, and 10% low support. (11/13/14).

Prior Learning Assessment allow students to earn credit for prior experience

Prior learning assessments (PLA) allow students to gain college credit for experience that they come with.

At NOVA community college PLA assessments are done in the following formats:

- Evaluation of workplace training
- Evaluation of Military training
- Credit for portfolio development (a 1 credit course to develop this portfolio)
- Observations

At Shoreline Community College's Manufacturing/Machinist Program the focus is solely on

prior skills related to machining (in contrast to NOVA's assessments for all programs). There they offer in-coming students the chance to take various "machining skills challenges" conducted by an instructor. Successful students can qualify to skip one or two quarters of the first-year machining program. As they began greater outreach to veterans in the latter part of the grant period, they anticipated PLA being especially helpful with these students.

A common theme at many C2C colleges related to PLA was the desire and intention to develop their programs further.

Soft Skills Training

Although the teaching of soft skills sometimes happens in students' courses, this work is, more typically and more extensively done by career navigators. The term "soft skills" includes, but is not limited to the following:

- Career counseling, planning and goal setting
- Helping students to consider their career as a progression through stacked and latticed credentials (building from one step to the next rather than achieving one credential and then stopping)
- Personal development and changes in self-image
- Problem solving
- Presentation skills
- Oral and written communication
- Presentation of self (e.g. clothing and deportment)
- Organization / time management
- Team building
- Conflict resolution skills
- Interpersonal communication skills--how to deal with personal problems, interact with others and adapt to challenges, etc.

Micheline Felker described how soft skills are taught by career navigators in Shoreline Community College's Manufacturing/Machinist program:

> *[Regarding teaching] soft skills—nothing is formal. It starts on a case-by-case basis. Heather [the Student Navigator] and I talk to them as a group at the beginning. We tell them what we expect: high attendance, clocking in, maintaining machines, crashes being reported to inspectors, telling us when they hit barriers. The expectation of communication is very high. It's mostly verbal. The standard is set the minute they get here. They have a lot of interaction with me the first two weeks of school. Her speech is, "We can teach you the basics of machining but the most important thing is that you can work together" (10/14/13).*

Different formats for teaching soft skills

There is a range of ways that soft skill training is done by colleges and community based organizations.

At Muskegon Community College they have, what some students call, "soft skill Fridays," sessions designed to help students learn how to deal with personal problems on the job, interactive effectively with others and adapt to challenges.

At Virginia Western soft skills are taught in a 22 hour Job Readiness class and through on-going interaction with the Local Project Director, particularly during the job-search process.

Other programs, such as Shoreline's Manufacturing/Machinist program and NOVA's Training Futures program, try to align the norms of the training site with those of students' likely work environments. Navigators at Shoreline like to say, "Every interaction with students is preparation for the job." Lead Instructor at Shoreline, Keith Smith told us that "Ever since I started here… My goal is to try to replicate the work environment here" (1-7-15).

Building Self-Efficacy

One of the goals when teaching soft skills is often to increase a student's sense of self-efficacy. The term self-efficacy addresses a range of people's beliefs about their ability or capacity to perform and achieve in different aspects of their lives. (Bandura, A., 1994) Self-efficacy is closely related to motivation and impacts one's cognitive behaviors, outward behaviors and life choices. People with high self-efficacy tend to believe that they are capable of reaching their goals, can navigate and overcome the challenges they face along the way and can monitor and adjust their efforts in pursuit of their goals.

An instructor at Austin Community College, Mary Parker, offered an example of a student's self-efficacy when she described the students that come from a Capital Idea to her introductory course in statistics:

> *[They are] not better prepared but they persist. They don't just drop out when something goes wrong. They don't come in better, but they are propped up better. And they're also better motivated. They jumped through a lot of hoops to get in. (10/31/13)*

Fostering self-efficacy is often a joint effort between career navigators, instructional planners, and the faculty.

One way that Career Navigators build self-efficacy is in helping students think past the immediate certificate or credential to consider that as a stepping-stone to the next one. Shoreline community college machinist program is designed so that students earn different certifications throughout their coursework, allowing them to stop out of the program to get work to support them and then return when they are ready to earn a new credential. Students at Austin Community College who wish to pursue a career in health sciences often start with a program that grants them a phlebotomy certificate that takes weeks rather than months, and allows them to increase their income beyond a minimum wage job. A credential as a Certified Nurse's Assistant serves a similar purpose. Career Navigators can help students first, know of this option, and second, help students think of it as only the beginning of their studies in health sciences.

When we sat in on a counseling session done by Erika Coddington, Career Navigator at NOVA's Adult Career Pathways program, we noticed throughout the session how she worked to build the student's self-awareness—a key ingredient of self-efficacy. The student, a Latina English language learner, was relatively new to their program. First, Erika went over a Career Inventory Assessment—beginning, not by telling the student what it said about her future, but by asking what the student thought about the results. She told the student what she knew about the skills she had excelled at in class and helped the student see the unique qualities she possessed. She focused on their strengths rather than her weaknesses. She went on to ask the student what she considered her ideal job. The student told her, "When I was a child I always pictured myself sitting at a desk" (9/13/13). Erika said that she should use these sorts of ideas but also to notice their energy level when doing different IT related tasks in the program. These could be areas where she might excel, she explained. She connected the idea of noticing which areas give her energy to areas of strength from her Career Inventory results. All of these interactions seemed well suited to build the student's self-efficacy through her self-awareness.

In the same career navigation session, Erika also seemed to follow the dictum that "knowledge is power," sharing knowledge about how the student could navigate her path. To help the student pick classes she told her about website "RateYourProfessor.com" (something that many people in higher education would rather forget about). She shared her knowledge about the kinds of IT related jobs her previous students had gotten, the current level of demand for different jobs, and the general differences in pay between jobs. Finally, Erika asked the student about a wide range of her needs: financial, scheduling, and general wellbeing, so that she could support her. Again, all of these interactions seem well suited to increase the student's self-efficacy.

Another way that some programs build a student's self-efficacy is through a mastery orientation. Mastery learning means that the student may try as many times as you need until you get it right. This is the approach used at Shoreline's Manufacturing/Machinist program. It is very rare for a student to fail out of their program, although some students decide that the program is not for them. Instructor Cliff Bergeson told us that in three years he only has had to ask one student to leave the program. In this case the issue was non-attendance (10/15/13). Bergeson says that most students know within the first week whether or not the program is for them. Deciding against a program is a form of self-efficacy too.

Another way that career navigators build students' self-efficacy is through the involvement in industry. Through well-established working relationships, Virginia Western Community College formalized its Employer Advisory Committee (EAC). Along with providing input on the curriculum and its student learning outcomes, the EAC provides mentoring and internship opportunities for program participants and by participating in workshops on job application and interviewing skills. The objective is to encourage the employers to be part of building participants' self-confidence and ability to be hired upon completion of the training program.

Finally, one example of a program with seamless integration for building self-efficacy is the Training Futures program [Discussed in more detail in Section IV]. Training Futures program is designed to replicate the atmosphere of administrative office. The building itself is designed like an office rather than a college. Students are required to dress in business attire (and given access

to free clothes from their "clothing closet." Students all take a Toast Masters course in public speaking, which includes work on accent reduction and code switching for speakers of non-standard English. Attendance and punctuality are strictly monitored. All of this helps students feel prepared for the transition to the business environment. While career navigators help students re-imagining themselves and their future, in this case every other aspect of the program's design complements their work.

Making the Curriculum Taught by Career Navigators More Systematic

When we, as evaluators, visited in Year 1 of the grant, sometimes the soft skills being taught by both instructors and navigators seemed to be happening in informal, ad-hoc ways. In our Year 1 Interim Reports we suggested to these program that they make this instruction more systematic. Erica Coddington, a career navigator at Adult Career Pathways of NOVA whose work we discussed earlier, told us in our Year 1 site visit,

> *When I first started, I was told that one of my first duties would be to write a program manual for the program. All the parts of this program had existed in the heads of the two founders. None of this stuff had been written down. [Pointing to another part of the room] It's over there under construction… I've been working on that, basically on the weekends…… I had been working hear for six and a half years and I had access to the founders and I had access to some of the documents. (9/11/13)*

In making the suggestion to write down and make more systematic the social or implicit curriculum, we nonetheless recognized that doing so could have both advantages and disadvantages. A disadvantage is that, like any written curriculum, it can seem to those who implement it like "the recipe." If this becomes the case, those implementing it can feel bound by it and not empowered to change and improve it. For this reason, staff needs to be vigilant to frame the curriculum as a perpetual work in progress. Alternately, the advantages to writing down and systematizing the curriculum are that, first, it is no longer dependent on a few essential individuals, in which case there is the danger that it could be undermined when those individuals move on. Second, writing it down can move it into the "light of day," allowing a team to review it more systematically, seeing where it is strong and where there are pieces missing. Finally, it may, in some cases, gain recognition as equally important as the academic curriculum.

Possibilities for Extending the Reach of Career Navigation.

Our observations of career navigators, the reports of students, faculty and administrators, and past studies on their cost-effectiveness, all provide data on the positive role of career navigators in supporting community college students. That said, in all of the colleges of the consortium only a subset of student received the service of career navigators, so these data also beg the question of how this number of students can be expanded.

The first, and easiest way that colleges can work towards expanding career navigation is through internal and external public relations. Colleges can and should use studies like the ones by Smith, King and Schroeder (2011) and Smith and King (2011) to show the cost effectiveness to their own college administrators, development offices and outside donors/funders.

Along with the work to be done promoting the data regarding the efficacy of career navigation, a second way to expand the reach of career is by using student data to increase the efficiency by which services are allocated, allowing programs to use existing dollars to reach more students. One-way to this is do this is through the use of data. One example of data being used to maximize the time of career navigators at Austin Community College is their system of coding incoming students as "red/yellow/green" depending on whether they appear to need high, medium or low support. This system is based largely on qualitative data gained in the intake process.

Mott community college also maintains a comprehensive set of student data through their Efforts to Outcome (ETO) system which provides a systematic way of making data informed decisions. This approach helps the organization to assess which of the strategies were most effective and which need to be improved. Workforce Development uses the system for wide variety of problem solving and action.

The use of data to flag which students need support is sometimes called predictive analytics. An example of predictive analytics being done on a large scale using quantitative indicators comes from Georgia State University (GSU). While GSU was not one of the C2C participating colleges, the work they have done is suggestive of possibilities for other institutions of higher learning. (All data below come from Renick, 2014)

GSU started with some clear trends from their data:

- The lower the income of the student, the lower their chance of completion;
- The higher the amount of unmet financial need, the lower their academic performance;
- The demographics of their student body were changing, with greater numbers of students arriving with Pell grants, indicating higher levels of financial need.

To address the challenge they were facing, GSU began a deliberate intervention program. Its precepts are that it would,

- Be data based;
- Pilot programs that they would revise;
- Pilot programs that they would revise *again;*
- Promote successful programs to donors and funders;
- Scale up to maximize impact.

They used 10 years of data on grades and completion to identify key indicators for when students needed support.

- Students who received a grade of C or lower in the introductory course of their major had dramatically lower graduation rates than those who received an A or a B.
- Students who did *not* change their major their first year had 38% higher risk of not completing than those who *did not* change their major.

- Students with a 3.0+ GPA from high school who did not attend the college's HOPE program had a 21% retention rate as compared with their peers who did attend the program and had a 61% retention rate. (The HOPE program granted students $500 per semester for one year on the condition that they attend academic skills workshop and individual advisement).

GSU used data points such as the ones above to inform their pilot/revise/scale up model to create a series of successful broad scale interventions.

- A dashboard for their counselors that would send them daily alerts if a student had missed any one of the markers allowed counselors to track at-risk and on-track students by individual course and by department;
- Summer Success Academies for the 215 highest at-risk freshmen helped those students raise their average GPA's above the college-wide student body;
- Freshmen Learning Communities (FLA's) helped those students raise their 1st year GPA, retention and graduation rates in all three areas above their counterparts who were not in FLA's.
- Supplemental Instruction (SI) programs increased average course GPA to 2.91 compared to non-SI students whose GPA was 2.41, and raised one-year retention rates for SI students to 91% compared to 83% of non-SI students. This program alone served 9,700 students.

<u>What does the work at GSU mean for how career navigation is used at the C2C consortium colleges and others?</u>

College should use predictive analytics to maximize the efficiency and expand the reach of career navigation and any other proven intervention.
First, data collection and intervention should happen at the college level rather than solely within individual college programs (e.g. the machinist program) or separate student support programs (e.g. Training Futures). These college-wide efforts should not replace the separate programs insofar as they are designed to reach students who would not otherwise enter community college.
Second, colleges should consider adopting GSU's five step model for innovation: collect data/pilot programs/revise/revise again/promote successful programs and then scale up to maximize impact. At GSU this process illuminated key indicators for students in need of special support and led to a series of high impact support programs.

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Collaborating with Community Partners to Meet Employer and Community Needs

This section describes the features of one of the prominent themes across the C2C consortium—the ways that colleges collaborated with community partners to meet the needs of employers and the broader community. The themes and sub-themes are summarized below:

1. Design Features: The Importance of active and public collaboration in building and sustaining partnerships

   a. Active, and collaborative partnerships: Industry's involvement in curricular and program development;

   b. Comprehensive partnerships - Interlacing of services for the benefit of each stakeholder;

   c. Partnerships building capacity and sustainability.

2. Shared goals values and beliefs: Addressing real-life program of the community needs

   a. Addressing real-life needs of communities and programs;

   b. Congruence in the work being done at worksites and training programs – connecting theory and practice;

   c. The importance of commitment and belief in collaborative goals;

   d. Meeting the needs of vulnerable populations: unemployed/under-employed and under educated/under trained.

Introduction

One of the more notable themes that emerged from the work of C2C consortium members was the collaboration with community partners in a way that helped to meet employer and community needs. Synthesizing our findings from the implementation portion of our research over the performance period of the grant, we found consortium members 1) developed a number of key design features that helped them actively engage in public collaboration and build sustainable partnerships and 2) identified authentic and actionable shared goals, values and beliefs that helped the collaborations stay committed to meeting the needs of vulnerable populations.

Collaboration with Community Partners – An Overview

Across the seven colleges we observed the development and refinement of robust collaborative partnerships with other community agencies and regional employers that helped to support the

overall strategic goals of the C2C mission. These partnerships contributed to the goals of the C2C mission in eight strategic areas:

- Program design
- Curriculum development
- Student recruitment and retention
- Workforce training
- Job placement
- Program management
- Leveraging resources for the partnership
- Commitment to program sustainability

Supporting these collaborative partnerships, three of the seven colleges had formed formal advisory committees and the others engaged in routine informal interactions. Members of these collaborative networks recognized that their missions complement one another and shared a commitment to addressing real-life problems faced by their students. These shared missions created synergism between, and among, multiple partners that promoted mutually beneficial relationships. In some cases we found examples of the integration of a workforce development agency and other key social services within the community college campus. Strong examples of this integration include Los Angeles Trade and Technical College (LATTC) and Mott Community Colleges.

This commitment to collaboration helped programs connect with local employers to ensure that training programs prepared participants to meet their employment needs. We found that the strength of these partnerships rested heavily on the outreach of program coordinators and career navigators who were often the primary point of contact for these collaborative networks. Across these partnerships we observed willingness to:

- Do things differently than they have in the past – seeking out creative and innovative solutions, even when they required creating news ways of doing business;
- Find way to creatively leveraging scarce resources;
- Blur traditional boundaries between the various partnerships that allowed the stakeholders to take more active roles;
- Create stronger strategic alignments between organizations that make boundary crossing possible;
- Develop more applied and authentic learning opportunities that meet the real-world need of employers and employees.

We observed that across the various collaborations, community partners recognized that:

- Their success rests heavily on the strengths of the partnerships and collaboration;
- Employers benefit by having access to future employees;
- Employees will benefit through training that is better aligned to the needs of employers;
- The mutual “mission respect” found between those who train and those who hire employees is vital to this collaboration, and it enhances the relationship;
- Involving area employers in this partnership from the beginning is critical;

- Collaborating with employers and community partners on curriculum and program development is mutually beneficial;
- Stacked and latticed credentials were mutually beneficial to employers, programs and students;
- There are rapidly changing skill requirements of the workforce and partners so must respond to the escalating knowledge and skill requirements of the workforce and the technology-centered economy;
- There was a common interest in the economic stability and growth their regions;
- Collaboration created unique opportunity to transform the workforce and career education systems within their communities;
- Building strong partnerships created opportunities to promote social equity;
- Community based assets were leveraged to better meet and sustain the mission of the partnership;
- Recruiting students is often a shared responsibility – students and prospective employees don't necessarily just show up at the doors of the community college;
- Frequent and transparent communications are critical;
- Cross-training between organizations can help to leverage resources and better meet the shared mission/goals;
- Assigning mutual (not independent) credit for success can help build trust and motivation to continue the collaboration;
- Blending of services provided by each partner can help leverage and extend capacity;
- Positive beliefs in success helped collaborators feel motivated and connected to the partnership;
- A strong focus on student success was crucial to the partnerships.

1. Design Features: The Importance of Active Collaboration in Building and Sustaining Effective Programs

a. Active collaboration

Perhaps the most important design feature of successful collaboration meeting employer and community needs was active collaboration, rather than perfunctory ones. It can often be the case that collaboration is on paper only in the form of a memorandum of understanding (MOU) designed to meet the requirements of a grant application. Our observation of the C2C consortium collaborations indicated that these efforts were authentic and involved the direct and active participation of all stakeholders.

Los Angeles Trade and Technical College (LATTC) provides a strong example of such active engagement by employers. LATTC's Biotechnology and Biomanufacturing program's multidisciplinary curriculum was developed through collaborative partnerships with industry representatives helping faculty to identify core competencies and student learning outcomes. By building the program and curriculum through collaboration with industry, LATTC addressed a wide range of educational goals. These goals included fostering students as active agents in their own learning and problem solving, as well as soft skills such as communication with colleagues and the ability to work effectively in a team.

In another example, the written curriculum for the Shoreline Machinist Programs were guided by two main points of reference: the needs of Shoreline's industry partners, and the requirements of the third party certifications that students are eligible for the completion of different stacked and latticed credentials. Industry partners were involved in curriculum development through both Shoreline's Advisory Council and the State of Washington's Center for Excellence. The involvement of industry partners happened on the detailed level of course objectives and on the more general level of deciding which programs and certifications should be offered.

The requirements for third party certification seem to be welcomed insofar as it provided structure to the administration and faculty's decision-making about what to teach. Lead instructor, Keith Smith told us, "Everything that is required for NIMS credentials is what we should be teaching anyway. It helps us have clarity. But it's not all we have in our curriculum." (1/7/15). The certifications also aid students in getting hired. Keith Smith explained that, "They can go anywhere in the world and give them their social security number and they can see all the skills they have" (10/15/13).

A further example of the power of industry's involvement in curricular and programs development and refinement can be found at Virginia Western Community College (VWCC). There the Microsoft Office Specialist (MOS) curriculum is an industry-recognized credential valued by a number of employers in the Roanoke Valley and applicable to careers ranging from health care to manufacturing to service industries. Skills with Microsoft Office were directly applicable to many positions at Carillion, a major employer in the health service. Additionally, MOS certification training was a first step to a number of other academic credentials beginning with AAS Degree in either Medical Office Specialist or Administrative Management Technology.

Another aspect of program management at VWCC was the constantly evolving evaluation of the IT/MOS Training. For example, employers were also asked to offer suggestions for program modifications to ensure students were learning the most current industry-required skills. The goal was to keep the program relevant and up-to-date. This permitted employers in the Roanoke area to continue to consider students from the IT/MOS Training as strong and qualified candidates for future available positions.

<u>b. Comprehensive partnerships – Interlacing of services for the benefit of each stakeholder</u>

Another important finding about the college's collaboration with employers and community based organizations was that partnerships were not narrowly conceived but involved interlacing of services allowing each party to benefit from the other, helping each to build capacity.

Key to this was involving area employers and other stakeholders in partnership from the beginning. Including businesses in the collaboration from the earliest stages of program management and curriculum development to job placement procedures helped make the enterprise effective and prosperous. Taken together, these contributions were typically well designed to help participants navigate the complex and full range of factors they face endeavoring to improve their work and economic conditions of the community. These include:

- Recruitment and support of students who may be disengaged from other academic organizations by colleges and community based organizations;
- On-going support and mentoring by same;
- Focus on long term academic and career success through stackable credentials, career pathways, articulation agreements and CEU options;
- Data driven program planning– a focus on key outcomes;
- Integration of a workforce development division within the community college campus.

Northern Virginia Community College for example, through its active collaborations with their community based partners Adult Career Pathways, *SkillSource* Group, Inc., Training Futures (Northern Virginia Family Services), and the Workforce Development Division of Multivision, learned to leverage a wide range of skills, knowledge and experience to address the regional workforce development needs in the IT and STEM related sectors. These leveraged resources included:

- A full range of "wrap-around" advising and support services:

    - Financial aid
    - Career counseling, planning and goal setting
    - College registration
    - Problem solving skills
    - Application and resume writing
    - Interviewing skills
    - Job search and placement assistance
    - Personal development
    - Professional "soft" skills

2. Workforce Development and Education

    - Technical, administrative and computer skills
    - Hands-on internships
    - Real-world, hands-on training strategies
    - Post training mentoring

For their part NOVA's partners gain the following from their partnerships with the college:

- C2C funds to support salaries until the partner can sustain them themselves;
- Operating costs until the partner can sustain them themselves;
- Allowing an organization to locate on NOVA's campus, allowing closer integration with the college;
- Academic credit for students from NOVA;
- A portion of students' financial aid money, leveraged by NOVA providing academic credit;
- A steady stream of recruits provided by NOVA's Workforce Development;
- Stacked and Latticed Credentials, Transferability and Articulation:
    - College credit options (students can earn up to 21 college credits)

- Career Studies Certificate from NOVA
- Industry-desired certifications

Similarly, at Shoreline we found a strong interlacing of services and resources with industry. The high demand for workers in the region is a strong motivation for industry partners to be involved with Shoreline. Person-to-person contact between industry and Shoreline allows Career Navigators to match well-suited students to the needs of a particular worksite. Industry partners value Shoreline's use of certifications as a way of gauging applicants' skill sets. Industry partners value Shoreline's congruence with their own worksites.

At VWCC we saw the interlacing of services in which Goodwill Industries provided valuable space for the program--a place that was hoped to be less intimidating for the program participants than a site on the college's campus. The Goodwill Jobs Campus hosted the VWCC computer lab and provided the necessary utilities (electrical, Internet, telephone) as well as personnel. The VWCC Project Director participated in the process of interviewing, evaluating, and enrolling eligible IT/MOS Training participants. Highlighting the effectiveness of this approach, those interviewed in both Year 1 and Year 3 at VWCC indicated that the current partnership between VWCC and Goodwill Industries, the Information Technology/MOS Training, had much stronger management than prior projects that they had taken part in. Emphasizing the power of such interlacing services, Robert Sandel, the VWCC President, said,

> *We [VWCC and Goodwill industries] are both in the business of getting people jobs. It stops the vicious cycle of dependency from continuing. People need to know that we care about them. Those who come here [to Goodwill Industries] might not be comfortable walking on a college campus… Together we can make a bigger difference than we could separately (3/18/15).*

The foundation of the collaboration between community colleges and private not-for-profit organizations is that through teamwork and positive associations, they can enlarge their capacity to meet their mission of open access, workforce development, and serving both individual and society. A positive relationship between a community college and a community-based nonprofit can allow each institution to serve more people and reach more of those who are traditionally under-served in society.

This relationship is reflected in the comments of Dean David Fonken who spoke of the success of the partnership with Capital IDEA in preparing low-income adults for workforce training and the evolving change in culture at ACC:

> *It has helped the culture to evolve. We've had a longstanding relationship with Capital IDEA. For a number of years we've helped them out with their College Prep Academy. We provide the Curriculum and faculty, and they provide the scaffolding and that sort of thing. This is the next step—beyond college prep. Now we're looking at—"What do they do when they get to us?" I sat down with Steve one day and looked at this gap. They were very successful in getting people ready for college. The students who got into the programs like nursing were very successful. But in between—in the pre-requisite courses, they weren't so successful. We decided that the grant would be the perfect way*

> *to address that.*
>
> *So I would say that it [the grant] definitely helped our culture of collaboration with non-profits and community programs. I would like to see it keep developing. Capital IDEA has a lot of great things that they do with their case management program that I think if we adopted them here at the college, it would help us considerably with development education (9/25/13).*

Lastly, at Mott Community College, The Workforce Education Center (WEC) has developed partnerships that benefit the C2C program including employers, Michigan Works, family service organizations, local governmental agencies, and other educational institutions. A critical partnership with Michigan Works involves shared staffing and student services. Partnerships with regional employers provide practical advice for program developers, experiential learning opportunities for students, job placements for graduates of the program, labor market information on which to make decisions on program directions, and professional development opportunities for the C2C program faculty and staff.

c. Partnerships building capacity and sustainability

Through these comprehensive partnerships and the interlacing of services programs build both capacity that would not be possible with each sector working independently, and sustainability. The two are related: it is this capacity building that program participants often pointed to as supporting the sustainability of their programs. For example, at ACC, in discussing the sustainability of their program Dean of Math and Sciences, David Fonken, spoke about expanding the partnership with Capital IDEA in the future:

> *We're talking to employers, but mostly through Capital IDEA. We are strengthened by their focus on jobs. They primarily support students who are interested in a few carefully selected jobs. We benefit from that directly. I would like to see Capital IDEA expanded greatly. Biotech is probably the next partner… Beyond that, the sky's the limit. We're thinking about this as the model for other partnerships (9/25/13).*

Fonken also expressed that when examining cost per program completer, Capital IDEA has been less expensive per completer than ACC. He said he would like to see the college investigate more alliances with other nonprofits. Additionally, since all of their courses must be self-sustaining, Director of Workforce Development, Diane Laudenslager, anticipated no problems in sustaining the courses in the healthcare track. (11/14/14)

At Shoreline, we observed a number ways that the capacity building they did would contribute to sustainability. For example, the success of their machining program positioned them to help a neighboring Community College that had the machines to run a machining program but otherwise lacked the capacity to run the program itself. Shoreline has begun offering its Precision Machining Program at this other campus, leveraging the skills and knowledge built up by the C2C collaboration and expanding the number of students served by the this knowledge base.

Similarly, Shoreline has negotiated three articulation agreements with programs at local 4-year colleges, so that their work can contribute to credentials beyond the Associate in Applied Arts and Sciences (A.A.A.S.) degree. Micheline Felker, Career Navigator at Shoreline, said that before they created the satellite campus, she knew of no two community colleges that have shared Full Time Equivalent counts, and said that,

> *Now the deans are working together. We have a pathway for students to go to composites and welding. It is the absolute whole reason for this partnerships, sharing ideas, and curriculum*. (1/7/15)

Further, then Susan Hoyne, then Dean of Math, Science and Engineering, pointed out that, by the fact that Shoreline's programs come with NIMS certification it allows greater articulation and transferability for students.

At Virginia Western Community College, President Sandel also emphasized the importance of active, authentic and comprehensive partnership that interlace services to meet the complex needs of area employers and workers:

> *CEO's and Presidents are said to have big egos. Maybe we do, but we see each other as partners rather than competitors. It's much easier to get grants as a partnership than an individual organization (3/18/15).*

Here Sandel emphasizes that there is more to be gained through collaboration than through competition.

2. Shared Goals, Values and Beliefs: Addressing Real-Life Needs of Programs and Communities

The second major theme that emerged from our data on colleges' ability to meet employer and community goals was the importance of shared goals, values and beliefs between colleges, employers and the community. Sub-themes related to this included the need to address real-life needs of communities and programs; congruence in the work being done at worksites and training programs; the importance of commitment and belief in collaborative goals; and meeting the needs of vulnerable populations including unemployed, under-employed and under-educated/trained.

We found the clear presence of shared goals among the most critical aspects of the collaborations between the community colleges, community partners and local employers. The partners of colleges involved in the C2C grant appeared to be strongly committed to a specific mission of empowering individuals who have at-risk factors for career and educational success such as low income, limited literacy skills, and limited skills to get good jobs and advance in their careers. In many respects, this contribution, more than others, has the potential to have the most direct impact on the vulnerable populations these programs are designed to serve. The direct pathways between the current manufacturing needs and the training programs provided a level of congruence that often not found in academic programs.

a. Addressing real-life needs of communities and programs

Under the theme of shared goals, the need to address real-life needs was an important factor in colleges' partnerships' ability to meet the needs of employers and the broader community.

At Austin Community College (ACC), for example, we noted that the collaboration with Capital IDEA helps the program to meet the needs of both low-income adults and employers in the greater Austin region. Faculty at ACC told us that they could not supply enough nurses or healthcare workers for their region—the job demand was significantly higher than their ability to prepare graduates. That said, for those who did earn credentials there was a high rate of success in getting hired. ACC's Workforce Development Director, Nancy Laudenslager, said that their placement rate for certified nurse assistants was "around 100%." The demand from employers was matched in interest from students. Early in the life of the grant, of the 650 students participating in Capital Idea some 75% were pursuing healthcare, with expansion to new campuses planned. The problem was that student interest wasn't being matched by student success. ACC faculty saw that too many students were being weeded out at the pre-requisite stage, so the C2C work the ACC team did was to redesign three of these pre-requisites courses.

Employers, for their part, engaged with college programs most often through Employer Advisory Committees (EACs). At LATTC, based on the request of those on their EAC from Grifols USA, Inc. and Baxter Bioscience, their biotechnology and Biomanufacturing curriculum added soft skills program to assist students in preparing for employment interviews and the rigors of the employment process, and an employment preparation course, CT141. Grifols USA produces protein therapies and products for hospitals, pharmacies, and health care professionals; the company employs over 11,000 people worldwide. Baxter International produces products for health care professionals. It is significant to note that according to meetings held in July of 2013 with officials from LATTC, Grifols anticipates hiring 70 to 80 entry-level specialist positions by the end of the year. Further, with the addition of a new 94,000 square foot facility, they will be hiring around 75 people in manufacturing technician positions, with the possibility of promotion to management positions. In the long-term, they hope to hire up to 800 new people over the next 3-4 years, with about 50% of the new positions in manufacturing technician positions. Grifols is working with Pasadena City College in addition to LATTC to prep to meet their hiring needs.

Grifols prefers to hire people who have earned an Associate's Degree because they view these workers as better prepared. With this preference, Grifols requested that the curriculum for the AS Degree focus more on manufacturing rather than Biology. The participation of Grifols at the earliest time in the program development process stands to pay dividends for program graduates when they are seeking job placement.

In Muskegon, Michigan, a region of the country where manufacturing jobs, once the backbone of the economy, were scarce, the community and employers partners recognized that the Muskegon region must respond to the escalating knowledge and skill requirements of the workforce and the technology-centered economy. The Muskegon C2C project has been centered around a computer –aided design (CAD) and computer numerical control (CNC) Associate Degree program. Traditionally machining and industrial design were taught in separate programs, however as the nature of manufacturing has changed, there has been a greater need for workers who are cross-

trained in these two areas. Their program came about as the result of ongoing partnerships with Muskegon area manufacturers who have expressed the need for workers with this combination of skills. Muskegon Community College (MCC) is also partnering with Michigan Works as the local workforce development agency.

Across the state of Michigan, Mott Community College was also responding to the decline of manufacturing jobs. Guided their Workforce Education's experience prior experience, Mott's C2C project used individuals in business and industry as adjunct instructors. And by building career pathways that a) have multiple entry and exit points and b) connect non-credit and for-credit programs they have helped students to set proximal goals to sustain them both economically and motivationally.[18].

At Virginia Western Community College (VWCC) the Employer Advisory Board helped them to establish employer expectations and aligned the student learning outcomes of the IT/Microsoft Office Training with these. These employer expectations have been clearly articulated to the adjunct faculty members who teach in the IT/MOS Training, and these expectations have also clearly explained to students. Since the establishment of the EAC, the group has met monthly to review the curriculum and program design, and are reported by the C2C Program Local Project Manager, Shantara Alatorre, to be "very pleased with the training" and reporting "that we are producing viable candidates for employment."

<u>b. Congruence in the work being done at worksites and training programs—Connecting theory and practice</u>

A sub-theme of the importance of shared goals among key partners was the recognition that students needed experiences that helped them to navigate the space between theory and practice. In many programs we observed the power of contextualizing the academic skills students were learning in the work that they would do as employees. Besides preparing the students well, students told us that they found the connections with work to be motivating. We found examples at all seven colleges of various types of authentic hands-on learning that came out of communication and collaboration with area employers.

At Shoreline Community College, instructors and students made regular visits to job sites, noting ways to make the machine shops at the college align with the conditions of the workplace. Lead Instructor, Keith Smith, told us that "Ever since I started … my goal has been to try to replicate the work environment here" (1-7-15).

Tom Stevenson, Production Manager at Royell Manufacturing, a key industry partner of Shoreline's machining program, provided a detailed illustration of the way that direct contact by college personnel with the workplace can make a training program better aligned to the real-life challenges of a worksite:

> *I've been able to work with Keith and the rest of the staff and put suggestions into place about what we'd like to see in the program.… One of*

[18] The development of this program began before C2C with a prior externally funded program called Breaking Through.

> *the first things Keith did was to look at the paperwork aspect of the job. He realized that every shop in the world is dealing with paperwork. This gives traceability to what happens in the shop. His big "ah ha" moment, was when I showed him a rack of parts. They were all basically all the same. I asked the class if they could figure out why they were sitting outside of the Quality Assurance office with a rejection tag on them. They were all scratching their heads. I said, "The problem is that the work order is for 47 parts and there are 50 parts here." We're required to know the traceability of the material used from the moment we receive the materials in the shipping bay to the moment it goes out the door as a finished part… All of these parts are at risk of being scrapped out if we're not able to recover the traceability. We're able to go back and audit… Just the thought that a paperwork and accounting issue could have been responsible for 50 components that were machine-complete being at risk of being scrapped out--it really struck a cord with both Keith and the students. At that point he went back and he really changed the class projects back to a normal shop paperwork type set-up. (10/14/13)"*

Here we see that the active collaboration allows the partners to address very detailed oriented issues that help the program fine-tune and maintain a high standard of training. Such an active approach helps to assure that students need less re-training once they get on the job.

A second way that Shoreline helps students connect academic skills with the demands of the workplace is through the I-BEST program (Integrated Basic Skills Training Program). For students who arrive at the program in need of greater math proficiency, I-Best teaches just-in-time math skills needed for the machinist projects that they are working on at that time.

At LATTC, faculty took students on field trips to various biomanufacturing companies in the Los Angeles area that helped students better contextualize the science concepts they were learning in the classroom.

At Muskegon Community College, the use of computer numeric control (CNC) simulators in the classroom helped students experience equipment on the shop floor in a low-risk learning environment before trying them on the machines.

At the Training Futures that feeds students to Northern Virginia Community College we saw students learning office management skills in a simulated office setting. Students came to the program dressed in business attire and took classes in a setting designed to look like an office rather than a school. Programs features such as internships, hands-on training programs and post-training mentoring all provided a greater contextualization that blurred the lines between theory and practice. In one specific example, Sarah Swain, Training Futures instructor explains one particularly rich example:

> *We have the Hospital Comparison assignment: You have to research 3 hospitals in the nation and compare how they stacked up against each other. Do the doctors communicate well? Do the nurses communicate well? Do they give antibiotics at the*

> *right time? Not only do I want you to find this information, I want you to put this information in a PowerPoint slide. Then, I want you to get up there and present it. Then I want you to write a report. So those are all different elements of an office job. You would definitely have to research data, present it, and write a report.*
>
> *When I do my assessments, I have different grading scales. So, for your PowerPoint, was there clarity in your PowerPoint? Was it to the point? Were there minimal errors? Did you try not to stare at the screen and make eye contact with your audience? That is the baseline of the PowerPoint. On the report side, did you not cut and paste (laughs). Did you grasp the point of the assignment? What did you learn? (10/23/15).*

Constant communication with area employers and the more adaptive nature of workforce development allowed for iterations of program refinements, stakeholder feedback and future refinements. For example, at Muskegon Community College, Michigan Works (Michigan's workforce development commission) provided a range of instruction on the "soft skills" identified by area employers as lacking among many workers. These sessions were designed to help employees deal with personal problems, interact effectively with others and adapt to challenges. What some students called "soft skills Fridays" included instruction and experiences in problem solving, presentation skills, oral and written communication, organization, team building, conflict resolution skills and interpersonal communication skills.

c. The importance of commitment and belief in collaborative goals

While it's possible for organizations to collaborate *without* shared beliefs and goals, collaboration is—of course—much easier when parties share these.

At Muskegon Community College, for example, there was a shared interest in the economic stability and growth in the Muskegon region. All of the partners--the college, Michigan Works, employers, the public schools and charter schools--sought to contribute to the economic stability and growth of the region.

At NOVA Community College, C2C has provided a platform for greater collaboration among the various regional stakeholders and, as such, created greater opportunity to understanding the complex needs of the different agencies and employers. Since the beginning of the C2C grant, participants say that there has been progress in collaboration across programs. We heard that, at the most fundamental level, a shared sense of mission began to improve with the necessity for stakeholders coming together at the same table (literally) for the C2C grant. Commenting on the importance of better understanding of each other's objectives, Jim Fabian, Special Projects Director of Workforce Development, said of the C2C collaborative efforts "That culture has to change and it *is* starting to change. And I think a lot of it has to do with the connections made at this table" (10/23/15).

Similarly, at Virginia Western Community College (VWCC), we found that the Employer Advisory Committee (EAC) had solidified its role in bringing key service, community, and employer partners together. Active and public involvement of senior leadership at VWCC and Goodwill helped to avoid institutional opposition to change. The objective was to encourage

current employers to contribute to the program participants' self-confidence and ability to be hired upon completion of the training program. Important contributions to VWCC program by the EAC included comments and suggestions on the curriculum, purposes of each course and learning outcomes to ensure alignment with local job needs. Other long-term goals of the EAC included providing mentoring and internship opportunities for program participants and participating in workshops on job application and interviewing skills.

Lastly, at Austin Community College (ACC), each entity involved in the partnership understood and respected the mission of the other organization, and recognized how those missions complemented each other. The people we spoke to at ACC seemed to respect Capital IDEA's mission of helping working adults out of poverty and into living wage careers. Likewise, those at Capital IDEA understood and appreciated the mission of community colleges in general and Austin Community College in particular. Leaders, case managers, instructors, and others at both organizations share a commitment to addressing the real-life problems of people in the Austin area through an increase in services through the partnership.

<u>d. Meeting the needs of vulnerable populations. Unemployed, under-employer and under-educated/trained</u>

Perhaps one of the most important aspects of the shared goals we observed was that of meeting the needs of vulnerable populations.

In Austin, Capital IDEA brings to the partnership with ACC the ability to help low income adults find employment by building the "soft skills" (communication, timeliness, interview skills, etc.) needed to find, acquire, and keep jobs as well as to advance to higher paying jobs.

Part of ACC's work during the C2C process was to relocate and develop programs in a part of town that was higher poverty than their main campus. Biology Department chair explained:

> *I wish there was not a poor side of town, but the east side has traditionally been lower income and poorer schools. We're already seeing a change—students who have been going through the phlebotomy and CAN program. We just launched it last month. (9-27-13).*

Capital Idea's program includes a focus on the self-esteem and confidence to help students to be successful in the job search, interview, and hiring processes. This is a very challenging aspect of the program design because no two Capital IDEA clients are alike. As with most first generation adult college students, these clients have a wide variety of personal challenges, which vary as their life circumstances change, and they need student services which are tailored to meet their constantly evolving needs.

ACC's biology department chair, Meg Flemming recounted an anecdote that spoke to the appreciation we found among students for the work of the programs involved in C2C. We were discussing a student who was a single mother of five children who had been working while attending ACC.

> *At the end of the program Sarah saw me, she came over, gave me a big hug, grabbed my hand and said, "Come here, I want to introduce you to the President [of the college].*
>
> *I said, "Merriam--I've met him."*
>
> *She insisted, and said to the President, "This is Meg Flemming. This is the physiology prof I was telling you about. My first semester she gave me a C."*
>
> *I said, "No, you earned a C."*
>
> *She said, "But then I came back and my second semester she gave me an A!"*
>
> *I said, "Nooo, you earned an A."*
>
> *She's a great example of really how motivated—kids without a good education in high school. I met her parents. They are bilingual now. They weren't when she started this. She has made them go get ESL classes. I think it has taken her a total of 7 semesters, having to repeat classes because this program [with the curriculum redesign through C2C] wasn't in place for her. Capital Ideas' was. She's bright enough that if we had been able to put her through BIOL 1308 first, it would have made a huge difference. She's a poster child for the partnership between ACC and Capital Idea. (9/27/13)*

The program that Flemming refers to is the C2C funded redesign of three health care pre-requisite courses. The online modules for these classes allowed students greater flexibility for mastering the content of the courses—an aspect that was especially important for students like Sarah who have children and have typically had a low success rate in the courses.

While community colleges have historically served people who struggle to enter the workforce, a second part of their strength was wrap-around services provided by career navigators. Part of the support provided by career navigators that students told us was vital was in job placement. According to Capital Idea Director Nancy Laudenslager, the college's C2C program has participated in the partnership with Capital IDEA to help place participants in jobs that provide both a livable wage and the opportunity for advancement:

> *The placement rate for the CNA field is around 100%. If participants complete the program they get a job. In two years they're making $12.00 or 12.50 per hour. [The salary] kinda caps there though. But if they get acute care skills, then they have an option of working in a hospital, and they have the opportunity to get into other programs like Medication Aid training. (9/26/13)*

Here one can see the value of the concept of stackable credentials and how the collaboration is critical between community based organizations like Capital Idea help students with their initial preparation and the for-credit programs at ACC that will allow them to earn the next credential.

Similarly, Hilker, NOVA's Director of Career Pathways, talked about the goal of reaching into the community to reach students who might not otherwise connect with NOVA. She said,

"We're drilling down into the [community based] organizations and identifying pockets of students who were completely disengaged from education" (9/12/13).

Similarly at VWCC, the program's primary goal and contribution to the community is preparing unemployed and underemployed adults for jobs involving information technology predominately in health care services. As one VWCC leader put it,

> *We [VWCC and Goodwill industries] are both in the business of getting people jobs. It stops the vicious cycle of dependency from continuing. People need to know that we care about them. Those who come here [to Goodwill Industries] might not be comfortable walking on a college campus… Together we can make a bigger difference than we could separately. That's their bottom line (3/18/15).*

The fruits of these labors and commitments are the new opportunities afforded to previously unemployed adults facing multiple life challenges and having little hope of finding suitable jobs.

Moving Lessons from C2C Funded Programs to the Wider Colleges

Summary

This section details a number of examples in which the lessons of C2C rose to the attention of administrators of the wider college and have begun to be implemented on a wider basis outside the particular program(s) funded by C2C. The changes made through the C2C work concern the creation of career pathways, the use of evidence-based design, and strategic alignment of programs with the needs of employers. The examples detailed are the following:

- The Biotechnology/ Biomanufacturing program at Los Angeles Trade and Technical College acting as a prototype for creating career pathways college-wide;

- The data driven expansion of the career navigation model of student support at Muskegon Community College from the CAD/CNC career pathway to 6 other programs in the Applied Technology Program;

- The integration of for-credit and non-credit programs at Mott Community College into a single admissions system, with both types of programs having access to Pell funding;

- The changes at Northern Virginia Community college to make their extensive network of community partners more easy to navigate by students and the employers;

Models for change include the following:

- Collaboration between an administrator above, who brings a vision, and faculty below, who create a prototype, to allow the administrator to spread the model;

- Use performance data to spread your model;

- Win over newly hired individuals while they are still open-minded;

- Listen to those who are most resistant and meet their needs to gain buy-in.

Introduction

Any time a large organization, or a consortium of organizations, receives a grant to implement new and innovative programs, there is always the question of a) whether that program will die off at the end of the grant, b) whether it will find a way to continue in its own corner of the organization, or c) whether it will continue *and* expand its scope to have a broader impact. In this section we look at how the lessons of C2C have influenced the wider colleges in which they were embedded. In the cases we describe below the programs implemented with C2C funds rose to a more strategic level—to the purview of Deans and Presidents—who chose to make changes in other parts of their colleges.

Change from Top Down and Bottom Up: C2C as a Prototype for Career Pathways Across Los Angeles Trade & Technical College (LATTC)

The PACTS model at LATTC and the development of multiple career pathways

Before the C2C grant ever began, Leticia Barjas, the Vice President of Academic Affairs and Workforce Development at Los Angeles Trade and Technical College had a vision of career pathways for academic programs. The C2C grant provided an opportunity to create a prototype of his vision through the creation of the Biotechnology/ Biomanufacturing program. The program subsequently became the model for the restructuring of the entire college's academic programs. This new structure, called the Pathways to Academic, Career and Transfer Success or PACTS [See Figure 3], became "Strategic Priority #1" for the *Educational Master Plan* of the college that documents how the college's strategic plan would be implemented. In this document The Vice President of Academic Affairs continued to lead the charge with her name listed as the lead for each implementation step.

With support from above, the Biotech/Biomanufacturing program was developed largely by two faculty members, Mark Diaz and Angela Gee (as discussed in more detail in Section V, Investing in Curriculum). This program was part of the college's Applied Science Department. What was new about Diaz and Gee's work was making the program was a pathway: a deliberate sequence of learning experiences—many outside the traditional course structure— rather than a collection of courses.

The PACTS model is composed of four "tiers":

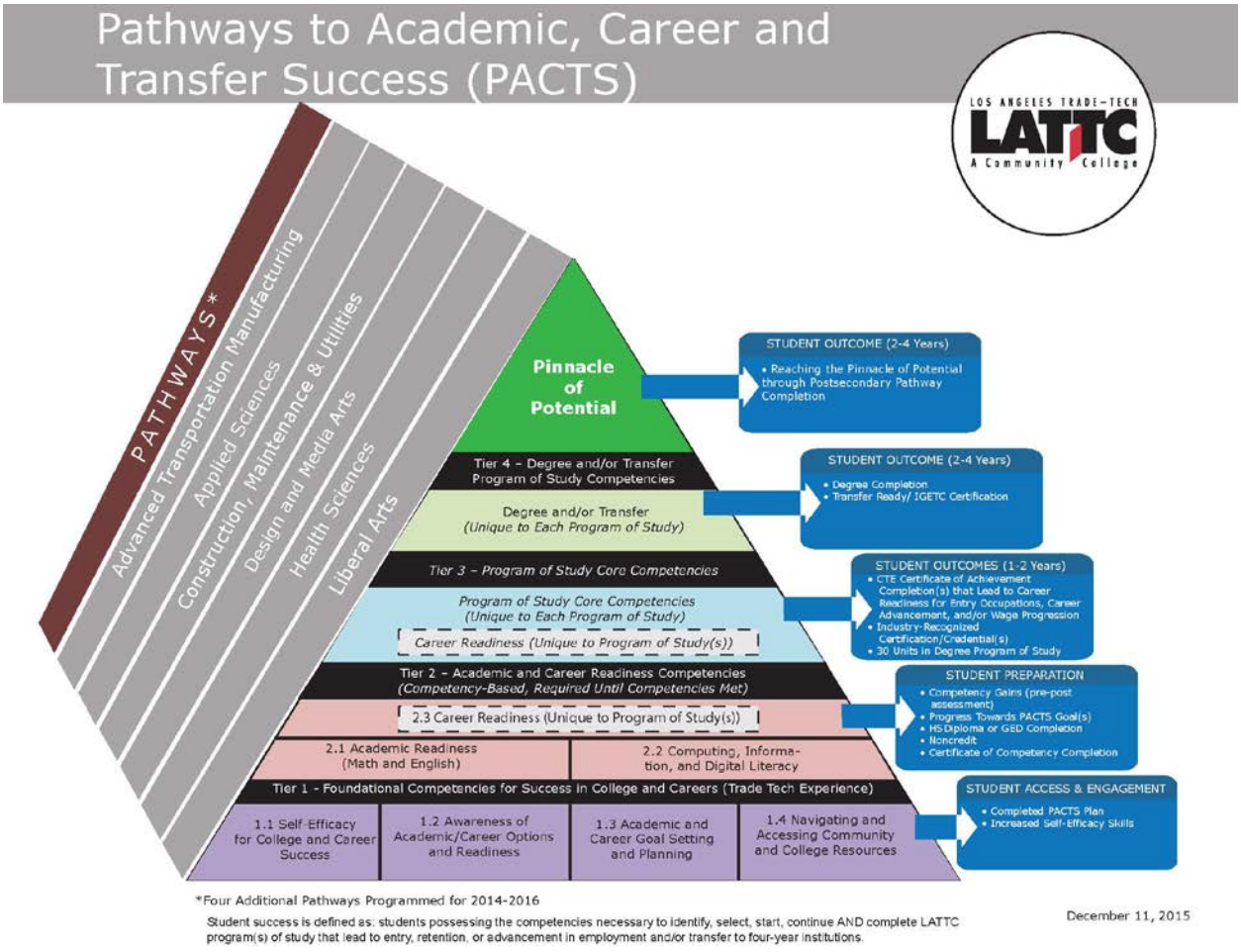
- Tier 1: Foundational competencies for success in college and careers
- Tier 2: Academic and career readiness (competency based and required until the competency is met)
- Tier 3: Program of study core competencies
- Tier 4: Degree and/or transfer program of study competencies (followed by post-secondary pathway completion)

The PACTs model is also designed to allow students to earn stacked and latticed credentials, making it easier for them to move beyond minimum wage work until they earn the next certificate or diploma. While the programs are tailored to specific needs, the progression of credentials follows the same pattern: the first certificate in the stack is a fundamentals certificate which focuses on industry-wide and specific-sector competencies; the second certificate

addresses occupation level knowledge and skills; the AA/AS degree is the third point in the stack. This design provides options for individuals to pursue multiple career paths and multiple credentials.

Following the lead of the Applied Sciences programs, LATTC has now created a career pathways using the PACTS model for Liberal Arts; Health Sciences; Design and Media Arts; Construction, Maintenance & Utilities; and Advanced Transportation Manufacturing.

Figure 3



<u>Summer Bootcamp – the beginning of each career pathway</u>

Each of the PACTS career pathways begins with a "Summer Bootcamp" focusing on Tier 1 and Tier 2 competencies. The Summer Bootcamp is an intense training setting where students interact with peers and faculty through interdisciplinary content and applied or hands-on learning opportunities.

The Tier 1 competencies are the following:

- Self-efficacy for college and career success
- Awareness of academic and career options and readiness
- Academic and career goal setting and planning and
- Navigating and accessing community and college resources.

The Summer Bootcamp included a balance of lectures and hands-on lab experiences as well as industry guest speakers. Also of note were applied labs in topics (e.g. cheese production) that allow students to see the lecture and course readings and topics in action.

Improvement to the Summer Bootcamp were made using, among other data, surveys of students regarding each of its components [See Appendix A]

The career pathways as a team

The development of the Biotech and Biomanufacturing program also led to a restructuring of the college's organizational structure, with each pathway functioning as a team, including a career navigator, faculty, a counselor, a department chair and a dean. The assignment of a dean to each pathway gave each pathway its own sense of unity insofar as they were led from within rather than by a dean who was responsible for many areas.

The use of a career navigator in addition to a career counselor was also innovative. As discussed in more detail in Section VI, career navigators provide comprehensive support for students, from their early contact, through their coursework, and into internships/employment or the next certificate/credential program. The work of career navigators differs from the role of traditional college counselors, whose involvement in students' lives is typically limited by the number of students on their caseloads.

With the addition of career navigators to each pathway, the role of the college counselor also changed—rather than seeing students from across the college, no matter what program they were pursuing, counselors were only responsible for helping students within their particular pathway.

In all the process of change at LATTC was a combination of top down and bottom up efforts. While the initial vision came from the Vice President of Academic Affairs and Workforce Development, the success of the prototype was largely the work of those closer to the action. This prototype then became the model used to win over support from others for the PACTS model.

Buy-in across the college

In a phone interview with Christie Damm, C2C project coordinator at LATTC and their first career navigator she continually talked about how "we" carried out the project. When I asked her whom "we" referred to she said that "It was the entire college" *(5/3/16).* She explained,

> The administration had the ideas but the entire college was part of it. You needed buy in. There were physical moves—people moved into the unit. You had to get buy in from everyone to do it. It was a complete restructuring. We were able to get one pathway at a time. Now, that the deans are assigned to a pathway. People say, "Wow, we have our own dean assigned to this particular pathway."

When I asked her which stakeholder group was most difficult to convince she said,

> *Initially, our general counselors were unfamiliar with what we were trying to do. The general counselors asked, "Why do we need someone embedded in a pathway?" But*

> *then we had some counselors step up and say, "We're going to have counselors be knowledgeable about the latest in that particular field" (5/3/16).*

As C2C coordinator and the first career navigator, Damm was a linchpin in the process of restructuring other departments. Along with coordinating services at the student level, she coordinated the development and implementation of services at the faculty and staff level, coordinated connections with employers and worked with the college's leadership to align their strategic outlook with what was actually happening on the Biotech and Biomanufacturing group. In this way she was an intermediary between all levels of the organization.

Through Damm's work with employers, Biotech and Biomanufacturing has served as a model for employee involvement in career pathways. Members of the Employer Advisory Council (EAC) worked with science and math faculty members from LATTC as well as the Project Director to develop curriculum and program core competencies. They also worked with college officials in program management and student placement. They are expected to provide opportunities for job shadowing and internships, application and interviewing tips/practice and, ultimately, employment. Furthermore, employers have been engaged in the learning process and mentoring program participants as well as student visits to manufacturing sites and guest lectures by various industry representatives.

One of the challenges C2C staff at LATTC faced was the lengthy process of regional and state approval of the new Biomanufacturing/biotechnology program. As of the Dec 2014 site visit the LATTC Curriculum committee, Los Angeles Community College District Board of Trustees, and Los Angeles Orange County Regional Consortia have approved the new Biotechnology/Biomanufacturing Certificate/AA Degree program and they began offering courses to students in Fall 2014.

Expanding Student Support Upward and Outward at Muskegon Community College

The CAD/CNC programs at Muskegon Community College, supported by the C2C grant, gained the attention of college administrators and garnered resources to expand, and appears to have influenced the expansion of career navigation to other programs in the college.

The CAD/CNC career pathway at Muskegon Community College (MCC) originally came about as the result of ongoing feedback from local manufacturers in the Muskegon area who were calling for skilled workers who could navigate between design and fabrication. Responding to this feedback, MCC developed four program options that fall on a career pathways continuum that range from an 8-week academy to an Associate's Degree in CAD/CNC (see list below). This pathway begins with a CAD/CNC Accelerated Academy, which helps students move quickly into entry level jobs in the field and ends with an Associate's Degree that will aid students in obtaining high skill, high paying manufacturing jobs. MCC describes the 8-week program as a "jump start into the 2-year Associates Degree program." Similarly, this first step on the career pathway provides the first of a number of stackable credentials.

During the grant period, career navigation for the CAD/CNC pathway was handled by Valerie Shelby, C2C Grant Coordinator. The fact that the salary for this position came from C2C funds

begged the question, of course, of whether the presence of a career navigator would continue after the term of the grant.

Shelby said that the role of career navigator was especially important because students were typically 33-34 years old, had been out of school for a number of years and so were not used to using the Internet for either applying for employment or further schooling.

The feedback we, as evaluators, received from students strongly supported the notion that the career navigation provided had been of help. Student specifically talked about how Shelby helped them navigate all of the issues they had getting enrolled and settled into the program. These data are also born out by numbers: students enrolled in the CAD/CNC program had higher GPA's, higher persistence and retention rates than those enrolled in courses but not part of the program (Table 2). The difference in treatment of these groups was that the latter group—those enrolled in courses but not part of the program--did not receive career navigation including but not limited to: connection for scholarship funding, assistance with completing the FAFSA and financial aid appeals, employment opportunities, job development, and career preparation.

Table 2: Muskegon Community College Performance Data: Fall 2013-Winter 2015

	Average GPA	**Persistence** (i.e. continuing to the following semester)	**Retention** (i.e. still taking classes one year after commencing)
Non-Participants (i.e. those who have taken classes but were not enrolled in the program)	2.8	44%	17%
Participants (i.e. those who were enrolled in the program)	3.0	65%	61%

The expansion of the career navigation services from Muskegon's CAD/CNC program throughout the other programs carries with it at least two lessons in organizational change. The first lesson is about the use of outcomes data to show department heads what they have to gain. Val Shelby recounts how she used the data to convince others:

> *I definitely dealt with the politics and resistance to change. It took time and I worked hard to communicate with all of the departments involved. I would get on staff meeting agendas and provide information such as program updates and outcomes. Basically, I just put the student's first, utilized the available college resources and let the data speak for itself. I worked hard to show staff that I was here to make their job easier and assist in student success. Once I had buy in from some key staff, then it snowballed.*
>
> *[These changes had to happen] over multiple departments…Applied technology was the easiest as we had support pretty much from the start as Tom Martin [a C2C participant]*

> *is the Department Chair. I'm referring more to student services, administrative offices, facilities/copy center. Each of these offices have different key personnel (7/6/16)*

The second lesson is that outside entities can begin to change the culture of the college. In this case it was the nationally recognized community college support organization, Achieving the Dream (ATD). Shelby explains.

> *Our partnership with ATD has also helped as the buzzwords around the college are now stackable credentials, guided pathways and high impact practices. Val*

The changes Shelby "sold" to other programs increased the number of students receiving career navigation from 135 to over 500, and increased the number of programs with career navigators from 1 program to 7. Significantly, this widening of services was paid for by the wider college rather than the department itself. The career navigation role has replaced the traditional counseling role, and Shelby's role has become part of the college budget rather than dependent on grant funds.

A second significant development, along with the widening of career navigation services, was that the Applied Technology Department was moved to a new downtown campus giving them a more prominent profile within the college. Until the move, they were spread between two sites, with their administrative offices in once place and machine shops in another. The new space for the entire departments is a re-purposed printing factory with plenty of space for them to grow.

Changes in Funding Provided an Opportunity for Mott Community College to Close the Gaps Between For-Credit and Non-Credit Programs

One of the common divides in community colleges is the gap between for-credit programs and non-credit/continuing education ones. Mott Community College reduced this gap when its leadership figured out a way to use Pell grants for both types of programs by integrating services.

Under the C2C grant Mott developed its Medical Assistant and Medical Administrative Secretary programs. Prior to this work, in 2010, Mott had suffered the decline in funding as Michigan's No Worker Left Behind tuition assistance program faded out. To address the decline in funding for these programs, Mott found a way to use Pell grants for non-credit and continuing education—a divergence form the typical practice of using Pell monies only for for-credit programs.

The change in the use of Pell grants was the impetus for a number of changes to the wider organization beginning with the Office of Financial Aid. Where the non-credit programs had previously kept their own records of credentials earned, Financial Aid now needed to track both non-credit and for-credit students. To do so they create a single application portal on the college's website. As students were admitted they were assigned a student ID number and were entered in a unified data system--wherever a person applied they would go through the same admissions process, reducing the gap later if a student wish to move between non-credit and for credit programs.

When I asked Dartanyan Jameson, Director of Workforce Development, about resistance to the changes he said that initially there was some resistance from some in the Office of Financial Aid, where they were being asked to take on new tasks:

> People were really trying to wrap their mind around how to do this non-credit Pell. Workforce and Continuing Education programs have become very, very essential to most colleges and universities. So learning how to access these funds has been really, really critical. So us showing that the benefits outweighed the challenges of trying to figure out how to get it done. (7/5/16)

As Robert Matthews, then Executive Dean, told it, a key to these changes was having a champion at the executive leadership level—the Vice President of Student and Administrative Services. Then Mathews said an opportunity came when the college got a new financial aid director:

> That gave me a chance to go to our VP of Student and Administrative Services and talk to them. A week into our new financial aid director's tenure we began to meet. The VP convened the first meeting. He shared the history. (10/8/15)

Matthews said that when they ran into obstacles would keep the focus on the bigger picture—reaching more students. Rather than just pushing from the top down, Matthews' approach was to listen to the fears of those in financial aid: "My position was that 'It isn't an option for it to not happen because we know it can happen. Tell me everything that could go wrong. What obstacles do we have to get rid of?'" (10/8/15).

Understanding the fears of those who were resistant paid off. Roberts said that what helped seal the deal with the Office of Financial Aid was that the Workforce Development Office agreed that their Career Navigators would take on some of the load that would have gone to the Financial Aid Office: helping incoming students prepare the FAFSA; checking to see what requirements students meet for financial aid; and doing attendance reporting. Workforce Development would also help the Financial aid by flagging in their data system students not making satisfactory academic progress. These services have been more than offset by the increases in enrollment.

Along with these changes there have been changes in the organizational structure of the college. The administration established the Workforce Development Integration Council (similar to an academic senate) that discusses the challenges to integrating institution-wide what they had developed on the non-credit site. Also part of the restructuring, the college created a new position, Associate Vice President of Workforce and Economic Development. The creation of this position, has allowed workforce development to spread to all of the other sites alongside the for-credit programs.

In all it took about two years of work after the new director of financial aid came aboard to make these changes. Ultimately these changes have meant an increased flow from non-credit to for-credit programs and greater solvency for the college. These data reinforce the understanding of how non-credit programs support for-credit enrollment, creating a feedback loop.

Beyond the walls of Mott, their personnel have been asked to speak at other colleges, participate in webinars and provide written materials about their use of Pell funding and the changes that accompanied this.

*The details of these changes at Mott have been documented in the Promising Practices Brief, *The power of Pell: Mott Community College's use of federal aid to train unemployed workers and dissolve silos between credit and noncredit*, from the Aspen Institute's Workforce Strategies Initiative and Achieving the Dream (2016).

Making the Network of Partners Easier to Navigate at Northern Virginia Community College

From the start, Northern Virginia Community College (NOVA) was not typical of the colleges in the C2C consortium. NOVA's role as grant leader and its fiscal agent grew out of the initiative of the college's then President, Robert Templan. In his address to C2C participants in November of 2013 he emphasized the importance of community colleges' collaboration with community-based organizations that provide high student support. Examples he cited were NOVA's collaboration with Training Futures, Virginia Western's partnership with Goodwill, and Austin's collaboration with Capital Idea. When he originally convened a meeting of community colleges and some of their affiliated partners to propose participation in the C2C grant he made participation contingent on their commitment to finding ways to institutionalizing the changes they made following the end of the grant. In sum, the lessons from C2C didn't need to rise to the higher administration at NOVA--President Templan was leading the charge.

While the broad strokes of key practices among C2C colleges were already in place at NOVA and were extended by the grant to create a new campus with an IT career pathway, other changes to the broader college did come about as a result of the C2C work. As Kerin Hilker, Director of NOVA's Career Pathways Initiative put it: things at the NOVA and its partners had been "highly decentralized… with employers often struggling to navigate NOVA's systems or to share issues and concerns" (6/28/16). In our Year 1 Interim report we, as evaluators, described this decentralization as follows:

> *NOVA's IT pathway involves a variety of partners that include both non-profit student support and development agencies and for-profit job training sites. There are multiple "on-ramps" to NOVA's IT pathway. Students can begin their program through one of the intensive student support agencies – SkillSource Group, Training Futures, or Adult Career Pathways—or they may simply begin enrolling in NOVA for credit courses. (2014)*

Towards the end of the grant period we returned to Kerin Hilker to ask whether the grant had affected the wider college. Her response reflected positive changes to coordinate the diverse partners (6/28/16) brought about by a number of face-to-face meetings of participant partners. First, she told of work to make the college more user friendly for employers:

> *First and foremost, we identified gaps in structure, coordination, and service for internships/experiential learning, and employer relations. The job placement component of C2C resulted in our restructuring internally at NOVA to provide a streamlined intake*

> *process for employers who wish to engage with the college, a single portal and process for posting of internship and student employment opportunities*

Second, she told us of changes to make things easier for students to navigate opportunities for internships and experiential learning.

An exchange at a meeting of the grant participants lays open the challenge. A participant from another college asked the ACP panel: "If you went to the website and said, "I want to become a student at NOVA, how would you hear about ACP?" (10/8/15). Christine Hubbard, Associate Director of ACP responded, "You're hitting the nail on the head… We generally make contact with them out in the community. We might first make contact with students at a local library. We're a one-stop shop so we can't do the entire enrollment ourselves. It's hit-and-miss whether you get connected to NOVA. If a counselor doesn't know about ACP they wouldn't make that referral."

Later, Kerin Hilker explained that they had begun to address the challenge of making ACP easier for students to hear about by "centralizing our previously campus-based career services to allow our students, employers, faculty/staff, etc. to view career and experiential learning programming and access electronic resources through a centralized system and to access these services through a single, college-wide point of contact" (6/28/16).

Along these same lines, in our Year 3 visit, NOVA had taken other steps toward making their programs more user friendly, creating an overview chart, and having a representative from Adult Career Pathways (ACP) visit classes to provide students a quick spoken overview of services available. In addition, the partners that make up NOVA's IT Pathway said that they felt like the grant had already helped them to establish better knowledge and communication with the partners at the other organizations, and that this was helping in many intangible ways.

In this way NOVA is taking steps in the right direction, but long-term this still seems like an area where there is potential for further growth. When we emailed to ask Christina Hubbard, Coordinator of Counseling Services at ACP, regarding whether she thought it was for ACP to continue to be the body that informs students about the big picture of the various organizations that make up the NOVA network through classroom visits, she wrote, "No, probably not" (*3/14/16*). Explaining, she cited the enormity of NOVA's student body: 78,000 for-credit students and 24,000 workforce development/continuing education students. "We simply don't have the resources to do that across all disciplines. Additionally, we reached out to numerous classes with inconsistent yield from those efforts," she said.

Ms. Hubbard, nonetheless, did see ways that that ACP could continue to develop its capacity in this area:

> *Instead, I think our better approach is to continue building a name for ACP within the college by informing students, staff, and faculty about these programs in ways that push a larger dialogue about opportunities. So, for example, ACP's plans for the upcoming year include starting to attend campus-based student services staff meetings in order to connect with campus peers who are connecting with the greater population on a daily*

> *basis. We are also planning to have our advisors develop specialty areas… in order to have them connect with the faculty cluster from a specific content area which will provide more visibility to these programs and opportunities for faculty as well. Then, hopefully, we'd be able to better count on faculty and staff to support these efforts, make more referrals to our affiliates, and also reach a far greater yield of students. (Email, 3/14/16)*

Further, Ms. Hubbard also saw ways that the classroom visits might still be appropriate for certain sub-groups:

> …We know that there are certain populations that might benefit more from our programs. So, for example, I could see us continuing classroom presentations in strategically selected classes like evening early childhood classes. This student population tends to meet our demographic and can benefit from some additional targeted outreach. (Email, 3/14/16)

These ideas for development strike us as good ones and the use of ACP to carry out this task seemed like it should continue, but for the long term it seems the task of helping students who *don't* enter NOVA's programs through a program like ACP to see the big picture of the affiliated services, it would be best if it was also taken up NOVA counseling services. Essentially, what we're suggesting is that this information should be disseminated at all entry points—whether a student gets that start coming through the "main door" of NOVA, or through Training Futures, ACP, or some other affiliated organization.

This, of course, would require a substantial investment by the college, with recognition that in the long-term, career navigation has proven itself to be more cost-effective than the less intensive counseling services offered to all students. While analysis of data during the grant period allowed ACP to improve its efficiency in targeting services to increase career navigators' loads from 75 to one, to 150 to one, these rations are still much lower than the 800 to 1 ratio for the counseling center of the college.

What gives reason for optimism about continued movement towards widening student support services and making the network of partners more user friendly is ACP's use of data to gain support. What remains to be seen is whether President's Templan's successor will continue to provide leadership in this area.

References

Aspen Institute's Workforce Strategies Initiative and Achieving the Dream *(2016). The power of Pell: Mott Community College's use of federal aid to train unemployed workers and dissolve silos between credit and noncredit*, Promising Practices Brief.

Appendix A: LATTC Summer Bootcamp

APPLIED SCIENCE BOOTCAMP WORKSHOPS 2014
ACTIVITIES TO ACHIEVE FOUNDATIONAL COMPETENCIES (TIER 1 & 2)

DAY	TIME	ACTIVITY	TIER 1 & 2 FOUNDATIONAL COMPETENCY	HOW COMPETENCY IS BEING MET	FACILITATOR
MON. June 16, 2014	10:00-11:30	General Orientation	Navigating and Accessing Community & College Resources	Students will receive overview of how to navigate the college website and identify services offered as well as where to go for assistance	BTS staff
	11:30-12:00	Financial Aid	Navigating and Accessing Community & College Resources	Students will receive an overview of financial aid options and how to apply as needed	Financial Aid Staff
	LUNCH 12:00-1:00PM				
	1:00-3:00	Workshop: Moodle, Mahara, E-Portfolio	Navigating and Accessing Community & College Resources & Computing Information, and Digital Literacy – Tier 2	Students will be given a crash course on using Moodle, Mahara, and how to begin building an E-Portfolio while using digital tools to enhance their college navigation skills as well as their workforce marketability	Academic Connections
TUES. June 17, 2014	10:00-12:00	Industry Partner presentation	Awareness of Academic Career Options & Readiness	Students hear first-hand from an individual working @ Amgen; with a general overview and opportunity for Q&A, they will understand what is expected in the workforce	Amgen representative – Hans Lee
	LUNCH 12:00-1:00PM				

TUES. June 17, 2014	1:00-2:00	Workshop: Time Management & Study tips	Self-Efficacy for College & Career Success	Students will receive tips on time management: personal time management & classroom time management (note-taking & study tips)	Applied Science Pathway Navigator
	2:00-3:00	Group Activity: Students will work in Team	Self-Efficacy for College & Career Success	Students will be divided into teams, given a scenario, role-play the problem, and have group discussion	Applied Science Pathway Navigator
WEDS. June 18, 2014	10:00-12:00	Industry Partner – guest speaker	Awareness of Academic Career Options & Readiness	Students hear first-hand from an individual working @ AMVAC; with Q&A and opportunity for dialog, they will get to hear what is expected in the workforce	AMVAC Chemical Corporation
	LUNCH 12:00-1:00PM				
	1:00-3:00	Group Activity: Students will work in Teams	Self-Efficacy for College & Career Success	Students will be given an opportunity to work in teams to address a given problem (conflict resolution skills) within a specific time frame (time management skills) and provide a class presentation with every team member participating (public speaking/ communication skills)	Pathway Navigator
	10:00-11:00	TABE (post boot camp test)	Academic Readiness (Math and English) Tier 2	Students will be assessed so the NOVA team can identify whether improvements have been made in their Math and English scores taken pre-boot camp	BTS staff and Applied Science Pathway navigator

THURS. June 19, 2014	11:00-12:00	Workshop: Decision-Making Models	Academic Career Goal Setting and Planning	Pathway Navigator will give presentation various Decision-Making models so students will be ready to determine which course to take for Summer 2014 and identify which program is best suited for them in the pathway	Applied Science Pathway Navigator
	LUNCH 12:00-1:00PM				
	1:00-2:30	Applied Science Pathway Counselor	Academic Career Goal Setting and Planning	Applied Science Pathway Counselor will explain the various job opportunities for students completing the 3 programs within the pathway	Applied Science Counselor
	2:30-3:00	Enroll in either Bio 3 or PT 104	Navigating and Assessing Community & College Resources	Students will be locating the area and self-enroll to understand the college enrollment process for the remainder of their time @ LATTC	BTS staff and Applied Science Pathway Navigator

This boot camp schedule was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or owner.

PART 2: PARTICIPANT OUTCOMES AND IMPACTS

Chapter 9 – Participant Self-Efficacy

Background: Self-Efficacy and Credentials to Careers

Self-efficacy was a key concept that was held in common across the seven community colleges and the grant partners the Aspen Institute and Achieving the Dream. Achieving the Dream emphasizes the development of self-efficacy in initiatives such as Gateways to Success and The Alliance for College Readiness, and the Aspen Institute has emphasized self-efficacy in much of their work including Career Advance and the Aspen Challenge. Five of the seven colleges are members of the ATD network, these are, Muskegon Community College, Mott, NOVA, Los Angeles Trade and Technical College, and Austin Community College.

Several colleges specifically name self-efficacy as a core focus in their workforce and career development programs. Los Angeles Trade and Technical College (LATTC) specifically names self-efficacy as a core part of their Pathways to Academic, Career and Transfer Success (PACTS) model. PACTS is a career pathways model that emphasizes stackable credentials, and is built on the foundation of students developing self-efficacy, greater academic and career readiness and awareness, career goal setting and learning to navigate and utilize college and community resources. Similarly Northern Virginia Community College's partner, Training Futures utilizes "Imaginal" education, which focuses on self-efficacy and self-concept training. Specifically, Training Futures (TF) actively seeks out adults who are disengaged from academic advancement to prepare them for entry into work in office environments. Strong "wrap around" support from Career Navigators helps to keep students—who often come with the challenges of supporting families with low-paying jobs—to persist in their career development.

Other Colleges in the consortium infuse the development of self-efficacy into their programs, referencing it in their discussion and implementation of their work even if it's not a stated component in their strategic planning. For example, Shoreline's Dean Susan Hoyne, emphasizes, their program helps to build student self-esteem and confidence (3/18/15). Virginia Western Community College emphasizes soft skills which include time management, self-confidence, motivation, and other coaching guidance from their Career Navigators. Furthermore, VWCC engages with their employer partners to encourage them to contribute to the program participants' self-confidence. Similarly, Austin Community College's partner, Capital IDEA focuses on the self-esteem and confidence building that will allow students to be successful in their education/training, job search, interview, and hiring processes. This is a very challenging aspect of the ACC program as with most first generation adult college students, these clients have a wide variety of personal challenges which vary as their life circumstances change, and they need student services which are tailored to meet their constantly evolving needs. Lastly, Moving well beyond a simple list of content to be covered and resources students will use, the Mott career pathways curriculum is student-centered and comprehensive with a focus on "Screening-in" that is meeting students where they are and identifying the most needed and appropriate resources, "Empowerment Events", intensive case management (wrap-around services), life-skills and work/life balance. At the core of Mott's career pathways programing is a focus on motivation and Self-Esteem Support.

Identifying Self-Efficacy as an Optional Variable

Because self-efficacy, or one's belief in their capacity to exert control over their own motivation and behavior that lead to success, is a stated focus of some programs and implied across the C2C consortium NOVA central and Myran and Associates agreed to use this construct in the evaluation design. Capitalizing on the Department of Labor's option of an additional variable to enhance the required variables we sought and received permission from Dr. Gabriel at the DOL to use self-efficacy as our optional variable. As a part of the overall analysis of the impact of C2C on participant outcomes we surveyed C2C program completers' on their self-reported self-efficacy using a retrospective pre/post approach that measures this construct at the beginning of their program of study or job training and after their completion of that program. In this same instrument we also asked program completers to rate five C2C core design elements (see outline below). Being able to measure possible relationships between C2C program features and the degree to which those were related to changes in participants' self-efficacy would provide valuable evidence about the potential impact of these program features on students' self-efficacy.

Core Element 1: Evidence-Based Design

1. Had opportunities to take advantage of prior learning assessments, credit-by portfolio, CLEP, ACE, military training or other ways of receiving college credit for related experiences.
2. Felt that I had guidance and support from program staff to handle various challenges and obstacles that helped me persist and complete my program of study or job-training program.

Core Element 2: Stacked and Latticed Credentials

3. Felt I was on a pathway to a good job
4. Offered opportunities to move from non-credit coursework to for credit course work
5. Had opportunities to work towards and obtain industry certifications or credentials while completing a community college degree

Core Element 3: Online and Technology-Enabled Learning

6. Had opportunities to utilizes online learning and other technology enabled learning
7. Online and technology enhanced learning helped me to be more successful

Core Element 4: Transferability and Articulation

8. Offered guaranteed admissions opportunities to other programs (including programs within the your current community college and transfer agreements to 4-year colleges)
9. Offered opportunities to move from non-credit coursework to for-credit coursework
10. Met representatives from the employment sector I trained to work in (or did visits to worksites).

Core Element 5: Strategic Alignment

11. Had learning opportunities relevant to the work in the employment sector I trained to work in. [Revised from what's currently on the GSE]
12. Was provided training, support or guidance from non-college partners such as non-profit organizations, state employment agencies or employers.

Self-Efficacy Construct, Instrumentation, Scoring and Sampling

Self-Efficacy

Bandura (1993) defines self-efficacy as people's beliefs about their ability to exercise influence over events in their lives. Self-efficacy "determines the goals people set for themselves, how much effort they expend, how long they persevere in the face of difficulties, and their resilience to failures." (Bandura, 1993 p. 131). Said more plainly, self-efficacy addresses a range of people's beliefs about their ability or capacity to perform and achieve in different aspects of their lives. Self-efficacy is closely related to motivation and impacts ones cognitive/thinking behaviors, outward behaviors and life choices. People with high self-efficacy tend to believe that they are capable of reaching their goals, can navigate and overcome the challenges they face along the way and can monitor and adjust their efforts in pursuit of their goals. As such this construct has clear implications for the work of the C2C consortium.

Instrumentation

After investigating the most appropriate measurement of self-efficacy we settled on the Generalized Self-Efficacy (GSE) scale (See Tables 2 & 3). The GSE has been used in several studies of workforce development (Tai, 2006) as well as college student GPA, Attendance and retention (Becker & Gable, 2009). In addition, there is strong evidence that self-efficacy positively shapes students' college to work transition (Tai, 2006). The construct of Generalized Self-Efficacy represents the optimistic self-beliefs of an individual (Schwarzer, 1992), that is beliefs that one can accomplish various tasks and cope with adversity. These beliefs in turn mitigate goal-setting, effort investment and persistence in the face of adversity. Using 10 items to measure this construct, each item refers to successful coping and implies an internal-stable attribution of success.

While most conceptions of self-efficacy view it as being domain-specific as a function of different domains or contexts, others have framed self-efficacy as a universal construct (Sherer & Maddux, 1982; Skinner et al., Schwarzer & Jerusalum, 1999). The GSE approaches self-efficacy as a universal construct, conceptualizing it as a broad and stable sense of personal ability to cope with adversity in a variety of context (Scholz, Gutierrez-Dona, Schwarzer, 2001). The GSE shows strong reliability statistics with Cronbach's alphas ranging from .76 to .90, with the majority in the high .80s in samples from 23 countries. Cronbach's alphas for our instrument were .90 for the retrospective pre measure and .92 on the post measure.

The GSE is said to be suitable for a broad range of applications. However, because it is a general instrument, it doesn't measure specific behavior changes. Becker & Gable (2009). Argues that "more generalized self-efficacy measures may be appropriate when attempting to predict results that are important, but less task-specific" (p. 2). In this work we were interested in how a range of related workforce development and student support services might support the improvement of program participant's self-efficacy. Along these lines Bandura suggests "Often, the interest is in predicting a wide range of activities from efficacy beliefs assessed across different levels or facets of functioning within a given domain. In this way we sought to examine the perceived aggregated or general self-efficacy as a function of the C2C core strategies, that is, different levels or facets of functioning with the C2C context.

We designed the assessment of C2C student self-efficacy using a retrospective approach (Goehart & Hoogsstratein, 1992; Lamb & Tschhard, 2005) which allows the researcher to ask participants to self-report based on their prior experience and then based on their current perceptions. The survey (See Table 2) measures participants' self-reported retrospective outlook on their self-efficacy prior to their degree or job training program and then their current assessment now that they have completed this program. It is often the case that researchers assume that participants' perspectives are invariant across pre and post measures, however, participants on a pre-measure prior to a growth experience may overestimate their self-efficacy. Thus participants may overestimate their knowledge and skills prior to training (Bray, Maxwell, & Howard, 1984). In this way, the conventional pre-posttest may over or under estimate gains by creating a response shift bias (Howard & Dailey, 1979; Howard, Ralph, Gulanick, Maxwell, Nance, & Gerber, 1979; Pohl, 1982; Sprangers & Hoogstraten, 1988; Rockwell & Kohn, 1989; Rohs & Langone, 1997). We sought to address this problem by asking participants to respond comparatively within the survey itself after they had had the experience. Because respondents are rating their experiences at the same time from the same perspective they should be free of response-shift bias (Rohs, 1999), thus, the retrospective survey may produce more valid results (Pratt, McGuigan & Katzev, 2000). This is of course not without its limitations as a retrospective approach to evaluation, where participants are asked their views once the intervention is completed, is open to a number of biases including recall errors and demand characteristics (Grant, Curtayne & Burton, 2009).

Table 2: Retrospective General Self Efficacy Scale

Scale 1: Not at all true, 2: Hardly true, 3: Moderately true, 4: Exactly true	PRIOR to my program of study or job training program I felt:				NOW that I've completed or am nearly finished with my program of study or job training program I feel:			
	1	2	3	4	1	2	3	4
I could/can always manage to solve difficult problems if I tried hard enough.								
If someone opposes me, I could/can find the means and ways to get what I want.								
It was/is easy for me to stick to my aims and accomplish my goals.								
I was/am confident that I could deal efficiently with unexpected events.								
Thanks to my resourcefulness, I knew/know how to handle unforeseen situations.								
I could/can solve most problems if I invested the necessary effort.								
I could/can remain calm when facing difficulties because I know how to rely on my coping abilities.								
When I am confronted with a problem, I could/can usually find several solutions.								
If I am in trouble, I could/can usually think of a solution.								
I could/can usually handle whatever comes my way.								

Scoring

Scoring simply involves adding up all responses to a sum score. The range is from 10 to 40 points. Schwarzer (2014) does not recommend categorizing research subjects as discretely high or low self-efficacious, suggesting that there is no cut-off score. Instead it's recommended to establish groups on the basis of the empirical distributions of a particular reference population. While the C2C population is not a uniform group many are first generation college students. In a study of first-generation college and non-first generation college students (Stallings, 2011) total self-scores for FGS students ranged from 26 to 40 with a mean score of 36.09. Our purpose here was to assess if and to what degree participation in C2C supported workforce development programs impacted self-efficacy beliefs of the C2C population. In this way this comparison are for point of reference purposes only, not a direct comparison to other populations.

Sample

Across the 7 C2C consortium colleges it is estimated that there were approximately 878 program completers (see Table 3). Career Navigators and/or other key college personnel sent an invitations and subsequent reminders designed by the program evaluators to participate in the

GSE survey. The survey was open in March of 2016 and remained open until June of 2016. A total of 202 complete responses were collected representing a response rate of approximately 23% (see Table 3). With a total population of 878 the estimated sample size with a margin of error of 5% and a confidence level of 95% and a response distribution of 50% we would need to be 267. Our sample feel below that mark, with an estimated margin of error of 6.05.

Table 3: GSE Sample and Response Rate

Program	Approximate # of Completers	Respondents	Percentage of Program Completers
ACC Capital IDEA	40	8	20%
Other ACC programs	75	2	3%
LATTC Bio-manufacturing	Unknown	8	
Mott WDD	136	18	13%
Muskegon CAD/CNC	79	33	41%
NOVA Training Futures	140	76	54%
NOVA ACP	61	19	31%
NOVA SkillSource	14	8	57%
Other NOVA	18	2	11%
Shoreline Machining	273	13	5%
VWCC MOS	42	19	45%
Other programs not listed	n/a	10	n/a

Findings

Overall findings show a clear improvement in self-reported self-efficacy. Mean retrospective self-report of self-efficacy was 30.25 compared to 36.16 for the post ratings. This observed difference was statistically significant using a paired t-test, $t(201) = 14.16$, $p < .000$, and was found to have a rather large effect size of 1.17. Here significance testing by itself can be misleading as it only tells us the probability that the observed difference was not by chance alone. Effect size calculations tell us the magnitude or size of the effect. In this case, an effect size of 1.17 tells us that there is slightly more than one standard deviation improvement between the pre and post measures of self-efficacy. Said more plainly, an effect size of 1.17 would represent a shift from the 50^{th} percentile of a group to the 88^{th} percentile; clearly a notable change.

We also ran paired-samples t-tests and effect size calculations on the 10 individual items to assess if there we changes in particular aspects of the GSE construct (see Table 4). Here we found significant changes from pre to post scores across all 10 items with mean differences ranging between .502 and .746. Effect size calculations also demonstrate large changes in self-reported self-efficacy from the students' retrospective self-assessment of their prior beliefs to after the students C2C experience. Here we see effect sizes between .72 and 1.10. Of note are the particularly large effect size estimates for the items "It was/is easy for me to stick to my aims and accomplish my goals", "I was/am confident that I could deal efficiently with unexpected events", and "Thanks to my resourcefulness, I knew/know how to handle unforeseen situations".

Table 4: Paired-Samples t-tests and effect size calculations

N=201	Prior to C2C		After C2C						
	Mean	SD	Mean	SD	Mean Difference	T	df	Sig. (2-tailed)	Effect Size
1. I could/can always manage to solve difficult problems if I tried hard enough.	3.15	.664	3.66	.535	.502	10.378	200	.000	0.85
2. If someone opposes me, I could/can find the means and ways to get what I want.	2.84	.792	3.37	.667	.537	10.273	200	.000	0.72
3. It was/is easy for me to stick to my aims and accomplish my goals.	2.90	.794	3.61	.608	.706	11.985	200	.000	1.00
4. I was/am confident that I could deal efficiently with unexpected events.	2.88	.810	3.63	.524	.746	12.643	200	.000	1.10
5. Thanks to my resourcefulness, I knew/know how to handle unforeseen situations.	2.93	.755	3.61	.547	.682	12.193	200	.000	1.03
6. I could/can solve most problems if I invested the necessary effort.	3.21	.725	3.74	.503	.532	10.566	200	.000	0.85
7. I could/can remain calm when facing difficulties because I know how to rely on my coping abilities.	3.06	.794	3.66	.535	.592	10.723	200	.000	0.89
8. When I am confronted with a problem, I could/can usually find several solutions.	3.03	.761	3.61	.565	.577	11.080	200	.000	0.87
9. If I am in trouble, I could/can usually think of a solution.	3.15	.733	3.66	.515	.512	10.064	200	.000	0.81
10. I could/can usually handle whatever comes my way.	3.10	.717	3.63	.524	.522	10.794	200	.000	0.84

In order to identify any programs that were more effective than others in terms of fostering self-efficacy we ran paired t-tests on each college (See Table 5). Here we see that students' at all seven colleges reported increases in their perceived self-efficacy. In addition modest to large effect size changes were found for all seven colleges. Only Austin Community College wasn't significant. However, given the small sample size of 9, this can't be said to be representative of the C2C participants at Austin and should be evaluated with caution. Similarly, while LATTC, VWCC, Mott and Shoreline all showed significant improvements their smaller samples sizes

suggest great caution in any interpretations. Interestingly, those programs that appear to serve the most vulnerable populations, NOVA and LATTC recorded the largest changes in self-efficacy.

Table 5: Pair-Samples t-tests and Effect Size by College

		Prior to C2C		After C2C		Paired Differences					
C2C Colleges	N	Mean	SD	Mean	SD	Mean Difference	SD	t	df	Sig.	Effect Size
Austin	10	34.30	5.12	30.8	5.77	3.50	6.26	1.769	9	.111	0.61
NOVA	93	36.96	4.30	29.1	6.198	7.86	6.59	11.500	92	.000	1.27
LATTC	12	37.17	3.04	30.08	6.667	7.08	5.52	4.447	11	.001	1.06
VWCC	19	36.05	3.55	30.89	5.363	5.16	4.94	4.555	18	.000	0.96
Mott	18	35.72	3.91	30.89	4.071	4.83	4.48	4.582	17	.000	1.19
Shoreline	15	36.67	2.53	34.2	3.802	2.47	3.48	2.744	14	.016	0.65
Muskegon	34	34.26	4.34	30.88	5.454	3.38	4.10	4.805	33	.000	0.62

Beyond simply measuring if students experienced improvements in their general self-efficacy, we were also interested in being able to measure possible relationships between C2C core elements and changes in participants' self-efficacy. We ran bivariate correlation analyses between all 10 core element items and the composite GSE score and found all but one were statistically significant, meaning the relationships found were not likely due chance alone, but the Pearson r values were all rather small, with some approaching a medium strength of association (See Table 6). The core element, "Had opportunities to work towards and obtain industry certifications or credentials while completing a community college degree" was not significant. Typically Person Correlations strength of association is considered small when it ranges between .1 and .3, medium between .3 and .5 and large between .5 and 1.0.

Table 6: Correlations Between C2C Core Elements and GSE Composite Scores

	Pearson's r	Sig	N
Core Element 1: Evidence-Based Design			
Was made aware of opportunities to take advantage of prior learning assessments, credit-by portfolio, CLEP, ACE, military training or other ways of receiving college credit for related experiences.	.261	.001	174
Felt that I had guidance and support from program staff to handle various challenges and obstacles that helped me persist and complete my program of study or job-training program.	.293	.000	199
Core Element 2: Stacked and Latticed Credentials			
Felt I was on a pathway to a good job	.262	.000	200
Offered opportunities to move from non-credit coursework to for credit course work	.247	.002	162
Had opportunities to work towards and obtain industry certifications or credentials while completing a community college degree	.136	.068	180
Core Element 3: Online and Technology-Enabled Learning			
Online and technology enhanced learning helped me to be more successful	.240	.001	194
Had opportunities to utilize online learning and other technology enabled learning	.247	.001	192
Core Element 4: Transferability and Articulation			
Was made aware of guaranteed admissions opportunities to other programs (including programs within the your current community college and transfer agreements to 4-year colleges)	.232	.001	185
Met representatives from the employment sector I trained to work in (or did visits to worksites).	.242	.001	189
Core Element 5: Strategic Alignment			
Had learning opportunities relevant to the work in the employment sector I trained to work in.	.239	.001	196
Was provided training, support or guidance from non-college partners such as non-profit organizations, state employment agencies or employers.	.292	.000	187

Interestingly, we expected to see stronger correlations between the various self-reported measures of the C2C core elements and the student's self-reported self-efficacy. We found significant yet small correlations across the C2C core elements, which demonstrates that there are potentially important implications for colleges providing these kinds of supports, but the small correlations limit the strength of this assertion. Looking more carefully at the distribution of the measures of the C2C core elements we found all the variables were skewed and restricted; essentially they fell into a bivariate distribution with about 75-80% indicating "strongly agree" and the rest saying "strongly disagree" or "disagree" with very few, if any falling in the middle. We re-coded these as bivariate variables, agree and disagree. Table 7 highlights the mean differences in the composite GSE scores for those that disagreed and agreed they had received the various supports under the C2C core elements. Using these bivariate measures of the core elements and the composite GSE scores we ran one-way analysis of variance (one-way ANOVA) analyses and found statistically significant differences between those that agreed they'd experienced the core elements and those that disagree on 6 of the 10 core element items. Effect size estimates for these ranged from modest (.51) to large (.83). This is suggestive that those who felt supported by these core elements experienced greater gains in self-efficacy.

Table 7: One-Way ANOVA and Standardized Effect Size

	Composite Post Self-Efficacy						**One-Way ANOVA**	**Effect Size***
C2C Program Features	Agree			Disagree				
	Mean	**N**	**SD**	**Mean**	**N**	**SD**		
Core Element 1: Evidence-Based Design								
Was made aware of guaranteed admissions opportunities to other programs (including programs within the your current community college and transfer agreements to 4-year colleges)	36.72	133	3.80	34.7	44	4.24	**.003**	**0.51**
Felt that I had guidance and support from program staff to handle various challenges and obstacles that helped me persist and complete my program of study or job training program	36.46	188	3.71	34.44	9	6.69	.129	0.52
Core Element 2: Stacked and Latticed Credentials								
Felt I was on a pathway to a good job	36.38	186	3.74	33.29	14	7.69	**.007**	**0.75**
Was offered opportunities to move from non-credit coursework to for credit course work	36.73	124	3.92	34.7	33	3.99	**.009**	**0.51**
Had opportunities to work towards and obtain industry certifications or credentials while completing a community college degree	36.41	159	3.94	36.11	18	4.03	.762	0.08
Core Element 3: Online and Technology-Enabled Learning								
Online and technology enhanced learning helped me to be more successful	36.45	166	3.89	34.92	24	4.13	.075	0.39
Had opportunities to utilize online learning and other technology enabled learning	36.38	173	3.88	34.5	16	4.40	.069	0.48
Core Element 4: Transferability and Articulation								
Was made aware of opportunities to take advantage of prior learning assessments, credit-by portfolio, CLEP, ACE, military training or other ways of receiving college credit for related experiences	36.81	135	3.65	34.6	35	4.47	**.003**	**0.57**
Met representatives from the employment sector I trained to work in (or did visits to worksites)	36.75	152	3.62	34.85	33	5.28	**.013**	**0.48**
Core Element 5: Strategic Alignment								
Had learning opportunities relevant to the work in the employment sector I trained to work in	36.41	178	3.67	36.13	15	6.128	.792	0.07
Was provided training, support or guidance from non-college partners such as non-profit organizations, state employment agencies or employers	36.86	155	3.613	33.67	27	5	**.000**	**0.83**

* The effect size estimate corrected using Hedges and Olkin (1985) Fixed-Effect method

Summary

Because self-efficacy, or one's belief in their capacity to exert control over their own motivation and behavior that lead to success, is a stated focus of some programs and implied across the C2C consortium we included this construct as part of the overall analysis of the impact of C2C on participant outcomes. Using a retrospective pre/post approach we surveyed C2C program completers' on their self-reported self-efficacy as well as their ratings of the 5 C2C core elements. Our goal was to be able to measure possible relationships between C2C program features and the degree to which those were related to changes in participants' self-efficacy. Our sample included approximately 23% of the roughly 878 program completers.

Overall findings showed clear and statistically significant improvements in self-reported self-efficacy across several analyses. We also ran a number of effect size estimates, which showed moderate to large magnitude of change across most of the analyses preformed. We found that students at all seven colleges self-reported increases in their perceived self-efficacy. All but one of these were statistically significant with moderate to large effect sizes. Small sample sizes limit these observations. Of note is that of those programs that appear to serve the most vulnerable populations, NOVA and LATTC, recorded the largest changed in self-efficacy.
In addition to evaluating changes in student self-efficacy, we also explored the possible relationships between C2C core elements and changes in participants' self-efficacy. Bivariate correlation analyses between all 10 core elements items and the composite GSE score found all but one were statistically significant, with small Pearson r values between .136 and .292 suggesting only small relationships between the core elements and changes in self-efficacy. We noted however that the distribution of measures of these core elements were skewed and restricted; essentially falling into a bivariate distribution. As such we re-coded these as bivariate variables and ran one-way analysis of variance (one-way ANOVA) analyses. Here we found large differences in self-reported self-efficacy between those who agreed they'd experienced the various supports and those who had disagreed, suggesting that those who felt supported experienced greater gains in self-efficacy.

Significance

Taken together, what do these analysis mean and why do they matter? As Bandura pointed out, one's behavior is not caused by environmental factors, but are only mediated by these external influences. In this way the features of a given program don't cause behavioral or motivational changes in the learner; they only mediate what are purposeful cognitive acts of the individual learner. In other words, people exercise influence and control over their own behaviors. This observation is critical to programs like C2C. For all the good intentions educational reformers may have, if the support networks, planning, curriculum and instructional strategies don't facilitate opportunities for the learner to exercise direct and purposeful control over their own growth and development, little change in student outcomes can be expected. The critical observation here is that programs don't produce or cause change in the learner, only the students' active cognitions can cause change. Instead, the role of educators, trainers, workforce developers and others engaged in similar work is to foster opportunities for students to increasingly take greater purposeful control over their own learning; to create support networks that provide resources and confidence to increasingly become active, purposeful and deliberate agents in their

own development. While the GSE data collected and analyzed here do not definitively prove that the C2C consortium has supported this kind of individual development, it does suggest that students experienced significant growth in their self-efficacy and that they are further down the road of being the active agents in their own learning that Bandura and others have emphasized is critical to learning and personal growth. These data provide support for the value of the "wrap around services" emphasized by the C2C consortium and how they may help to foster students self-efficacious learning behaviors.

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Chapter 10: Participant Outcomes, Employment and Wages

Background

The outcomes portion of this final evaluation report was guided by a non-experimental cohort comparison design that sought to address possible impacts of the C2C program on the following variables.

1. program completion
2. program retention
3. completion of credit hours
4. credentials earned
5. enrollment in further education after program completion
6. employment
7. earnings

The Participant Outcomes and Impacts portion of the project involved a planning phase which included site visits to review the data record layouts and/or data dictionaries to understand the current data that the colleges collect, confirm sources of data, obtain all needed approvals, establish data collection, storage, variable naming protocols and begin collecting data. Much of this work was to be coordinated with the grant funded Data Coordinator who worked for NOVA Central, whose was to serve as a bridge between grant personnel, colleges and partners, and the evaluators. This position was intended to streamline data collection and management, ensuring the collection of necessary data in a timely manner. The goal was for the team to coordinate and confirm data needs and data collection. Myran and Associates in turn were to carry out data cleaning and merging, develop protocols and appropriate syntax for propensity score matching and/or related analysis and finally end-of-project analyses and final report writing. Outcomes and impact data collection from the colleges were coordinated by the NOVA Data Coordinator in collaboration with the Myran evaluation team using secure measures that were to ensure the confidentiality of participants and comparison group members and their personally identifiable information.

Three lead colleges' programs were selected (Shoreline Community College, Austin Community College and Northern Virginia Community College) for conducting the non-experimental analysis, chosen because the review of grant materials indicates that these three colleges have programs that are already established, where the training intervention can be considered at a "steady state." The four other colleges, (Log Angeles Trade Technical College, Southwest Virginia Community College and Muskegon and Mott Community Colleges) which are at a more formative stage, did not serve an adequate number of participants to be able conduct non-experimental analyses. Of note here and which will be discussed in greater detail in the body of the report, only NOVA and Shoreline were able to produce data that met the minimum criteria for the non-experimental cohort comparison design. In short, both ACC and the larger consortium conflated participants with completers and didn't accurately project the likely number of completers that would be expected by the end of the grant cycle. In addition there was additional misunderstanding among the consortium membership between student level data and cumulative program level data that summed participant in their data collection models. In this way inferential outcome estimates are based only on NOVA and Shoreline.

In the early phases of the project this interaction unfolded as intended. Myran and Associates had a standing weekly phone meeting with the Data Coordinator and carefully designed variables. Cite visits were carried out which included meetings with personnel at each college identified as responsible for data management. In order to facilitate the efficient collection of outcomes data the NOVA Data Coordinator in consultation with Myran and Associates developed a Data Dictionary, data sharing agreement and data collection process using NOVA's SharePoint system as a secure means for collecting these data (See Appendix A). Early on Myran and Associates worked with NOVA Central's Data Coordinator to identify and confirm the variables to be used in the outcomes and impacts portion of the evaluation. We developed a document that listed out these variables which was widely shared at cite visits, the annual C2C stakeholders conference, as well as numerous phone and video conferences with Shoreline Community College, Austin Community College and Northern Virginia Community College as well as representatives from the Ray Marshall Center who were contracted by Austin Community College to produce the needed student level data (See Appendix A). As the implementation phase of the project came to a close we held numerous meetings with the three comparison colleges to reiterate the data requirements. However, as the project closed out and NOVA's Data Coordinator and Myran and Associates made the final data requests, with the exception of NOVA, we encountered significant challenges obtaining the agreed upon data from Shoreline and ACC. These issues are discussed in greater detail below.

Data Collection Challenges

Noteworthy to the evaluation team's ability to make empirical links between C2C program features and outcomes are the numerous challenges the team faced obtaining the agreed upon data. In short, an apparent lack of data literacy caused consortium stakeholders to underestimate the complexities and staff resources that would be required to identify, obtain and turn over the needed data. The most notable barriers we encountered in gaining access to the required data involved a lack of understanding about the difference between cumulative data and student/participant level data, over-estimates on access to comparison groups, and in the case of ACC overestimates on the number of completers their program would have. Both in the writing of the grant proposal and in the early phases of the grant implementation colleges agreed to the data fields that we identified (see Appendix B). More importantly the specific parameters of these data fields were communicated by the Myran and Associates team as well as NOVA's Data Coordinator throughout the implementation phase of the project. A further challenge was the SharePoint system developed by Frank Skinner, the first NOVA Data Coordinator, encountered numerous challenges and as a result was never able to compile the needed data as intended leaving the final data collection to be done at the end. In the end we were able to obtain incomplete data from NOVA and Shoreline that each presented a host of data cleaning and data analysis challenges and no useable data at all from ACC.

A notable challenge for collecting the needed data for Shoreline was their inability to identify an appropriate comparison group – a built in component of the grant proposal and a feature that had been discussed at length in numerous C2C meetings and events. The NOVA Data Coordinator and Myran and Associate team members met several times with Shoreline specifically to discuss this challenge and explored comparisons to other colleges, state level data and other options but

they were not able to identify other appropriate comparison groups or sources of data. Shoreline staff sought to identify comparison groups for the Machinists Program from before the program was improved/expanded with C2C Funds as they did not feel that there would be any other comparison group. A further challenge, which is discussed in greater detail below, was the obtained data represented pre and post C2C Machinists Program completers from a vast array of employment fields. NAICS and SIC employment codes were provided and included completers who were employed in fields from Soybean Farming (NAICS code 111110) to Gold Ore Mining (NAICS code 212210). In this way these data had to be cleaned to limit to only those employed in the field for which they were trained which significantly limited the statistical power of the dataset.

The Myran and Associates team along with the NOVA Central's Data Coordinators team made significant investments in time meeting with representatives from Austin community college and the Ray Marshall Center, who ACC had contracted with to provide confidential student level data for the purposes of the program evaluation (See Appendix B). We first began discussing data requirements in the very earliest phases of the project with NOVA Central's first Data Coordinator, Frank Skinner. We first discussed having conversations with the Ray Marshall Center in Nov of 2013. At that time Frank updated the team that ACC was unable to develop the process for gathering wage data for their participants so he was brokering a contract between them and the Ray Marshall Center to conduct the work. Frank emphasized that the Ray Marshall Center at the University of Texas had done a great deal of this kind of work for a number of other organizations and didn't foresee any issues with them. At that time he highlighted that the one area that the team would need to get a handle on is the comparison group for ACC and how they will be identified so we can begin tracking them. We had our first conference call on Jan 31 2014 with Christopher King and other staff members at the Ray Marshall Center as well as representatives from Austin Community College. We met on a number of other occations with various grant related personnel and each time it was agreed that we would be able to obtain the needed data. Given the background and the capacity of the Ray Marshall Center for doing this type of work these oversights should've been identified earlier in the project. Also playing a notable role in the challenges faced was the turnover of staff at the Ray Marshall Center over the course of the project. Members from the Myran and Associates team and NOVA staff members met on number of occasions with the Ray Marshall Center but due to the turnover each of these meetings largely started from the beginning.

In trying to identify a comparison group for the Austin program there were two issues that made obtaining usable data impossible. First, while ACC were enrolling a significant number of students in the program, very few of their students had completed the program's Associates degree. This was due to a timing issue between a three-year long grant period, which got a late start, and a program that required two years of full-time study. Second, a major feature of ACC's C2C program was providing students redesigned courses intended to help historically marginalized populations pass what have historically been barriers to gaining entry into Associates degree health care programs. As such, the ACC students were taking prerequisite courses, which further delayed them completing the program in two years. In this way, it was unlikely from the beginning that a significant number of student would complete the program within the grant period.

Furthermore, we encountered difficultly tracking the number of completers. We were able to get enrollment data, but the number of actual completers was difficult to obtain. For example in the final semester of the grant period ACC had 450 students enrolled in C2C funded classes, but were unable to give us a figure for the number of anticipated completers. The Ray Marshal Center received a total of 1,139 students for the comparison group from ACC. Of these, only 20 had completed a comparable degree or certificate. Based on the ACC definition of a Non-C2C completer (degree or certificate in a Health Sciences field), only four students qualified as a comparison. In this way we were not able to obtain a sample size anywhere close to what is required to draw any inferential claims.

Taken together the ultimate failure to obtain the requested data from ACC is perplexing. The specificity of the data request was integrated into the communication and interactions with the consortium from the very beginning of the project. This included specific efforts to define student or participant level data at numerous consortium meetings, monthly phone calls and specially arranged phone and videoconference meetings to address data requests. It's evident that the lack of data literacy on the part of consortium members and the likelihood of the Data Coordinator and the Myran team failing to communicate the needed level of specificity in terms that are clear and understandable to the practitioner may have also played a role. While it's beyond the scope of our evaluation and beyond our direct observation, it also appeared that there were significant miscommunications between ACC and the Ray Marshall Center

NOVA Non-Experimental Outcomes Data

Comparing Group Characteristics

In total we were able to obtain data for 177 C2C program completers and a comparison group of 230 Business Information Technology program completers from non-C2C NOVA programs. The two groups were similar demographically being nearly identical in terms of race/ethnicity (see Table 1), and the large majority in both groups being non-veterans.

Table 1: Race/Ethnicity

	Treatment		**Comparison**	
	Frequency	**Percent**	**Frequency**	**Percent**
American Indian or Alaska Native	1	.6	4	1.7
Asian	33	18.6	42	18.3
Black or African American	57	32.2	70	30.4
Native Hawaiian or Other Pacific Islander	1	.6	2	.9
White	36	20.3	56	24.3
Hispanic	47	26.6	50	21.7
Member of more than one of the racial group	2	1.1	1	.4
Total	177	100.0	230	100.0

Research Participants differed on a number of other variables. Differing on Pell grant eligibility, 91 percent of C2C participants were eligible while only 49 percent of the control group participants were eligible. Participants also differed in terms of gender with 75% of the C2C student being female compared to 59% for the control group. Incumbent worker data also differed (see Table 2), with the primary difference being to control group participants were reported as part-time workers. Full/part-time status also differed between groups with roughly 75% of C2C participants full-time and only 20% of the comparison cohort full-time.

Table 2: Incumbent Worker

	Treatment		Control	
	Frequency	Percent	Frequency	Percent
Full-Time	37	20.9	115	50.0
Part-Time	70	39.5		
Unemployed	32	18.1	49	21.3
Blank	38	21.5	66	28.7
Total	177	100.0	230	100.0

Participants also differed in the number of credits earned as well as credentials. All but one of the treatment group participant earned only 1 credential while 30% of the comparison group earned 2, and 12% earned 3 or more credentials. Similarly, over 30 percent of the control group had earned at least an AA degree while none of the treatment group had yet earned a degree. Lastly, participants differed in retaining of employment (see Table 3)

Table 3: Retaining Employment

	Treatment		Control	
	Frequency	Percent	Frequency	Percent
No	3	1.7		
Yes, in the Second Quarter after exit	3	1.7		
Yes, in the Third Quarter after exit	21	11.9	20	8.7
Blank	150	84.7	210	91.3
Total	177	100.0	230	100.0

Data Limitations with the Control Group

TAA Eligible, Basic Skills, Veteran status, and Disability variables were not available for the control group. This significantly limited our ability to match control and treatment group participants. A further limitation was that in order to generate a similar sized treatment group, we had to expand our data request to include control group participants that we admitted into their programs as far back as 1992, while the treatment group participants were all admitted within the performance period of the grant. This was mitigated significantly however in the propensity score matching that was done with our final matching including participates more closely matched in terms of admission dates.

Outliers

In an effort to mitigate the weaknesses of the comparison group data we first examined the data for outliers. While there is no consensus on what constitutes an outlier and whether to remove them or not, some suggest a simple visual inspection and identification of values greater than three standard deviations above the mean, or the probability that in a normally distributed population about 1% of your subjects would be 3 standard deviations above the mean (Osborn & Overbay 2004). Using this standard, we identified 3 treatment and five control cases that were over 3 standard deviations above the wage 1 and wage 2 means.

Matching Techniques

Matching can be performed in many different ways (see Stuart, 2010), but as Thoemmes and Kim (2011) note, most commonly straight-forward and simple techniques such as 1:1 nearest neighbor matching are used, meaning that a single treated participants is matched to a single untreated participant who has the most similar estimated propensity score. Here we used a 1:N nearest neighbor matching technique using a binary logistic regression technique using the Age, Gender, Race/Ethnicity, school status, and Pell eligibility as our covariates. This generates a probability scores, which we used to manually match cases. This produces sets of individuals with similar probability of all of the same propensities (e.g., age, race/ethnicity, Pell eligibility, etc.) but differing on whether they participated in a C2C funded training program of a similar business technology program at NOVA Community College. One of the benefits of this approach is that after the matching is completed, the matched samples may be compared by simple unpaired t-tests (Schafer & hang, 2008).

In this way we used a one to many (1:N) nearest neighbor propensity score matching technique using binary logistic regression using the Age, Gender, Race/Ethnicity, school status, and Pell eligibility as our covariates. Other covariates we'd hoped to match on were incomplete in the provided data. The regression analysis generates propensity (probability) scores, which we used to manually match cases, first identifying the best match and then the next best match (Parsons, 2004; Rassen, Shelat, Myers, Glynn, Rothman & Schneeweiss, 2012). This approach matches participants from the treatment condition, C2C participants to participants from the control condition who have a very similar estimated propensity score. This produces sets of individuals with similar probability of all of the same propensities (e.g., age, race/ethnicity, Pell eligibility, etc.) but differing on whether they participated in a C2C funded training program of a similar business technology program at NOVA Community College. Matching on the probability of having similar characteristics (the covariates used in the binary logistic regression) allows the researcher to create a matched sample where covariate differences are reduced (Austin, 2011).

Sample Characteristics after Removing Outliers and Matching

After removing the outliers and completing the 1:N propensity score matching, we had a sample of 102 C2C program completers and 141 comparison group research participants. The matching technique narrowed the gaps between Pell grant eligibility by a small margin, narrowed the gender differences, with 70% female in the treatment group and 60% in the control group. Race and ethnicity remained balanced with nearly identical percentages with the exception of Asian student (5% difference). Incumbent worker status narrowed, with 35 percent of the treatment group at full-time compared to the comparison group at 78%. Full/part-time ratios remained largely the same. Matching all but eliminated the group differences on number of credentials, but not number of credit hours (mean of 18 for the treatment group and 49 for the comparison).

Inferential Tests of Mean Differences in Percentage Wage Increases

With the matching complete we first set about to investigate the descriptive outcome data. Treatment group participants were employed between Jan 2013 and Jun 2015 while the comparison cohort were employer between Jan 2012 and Jan 2014. Wage data comparisons between the two groups can be seen in Table 4. Here we can see that the comparison groups had notably higher average earnings in both quarters reported. Due to these large starting differences, comparing the Wage 2 outcomes across groups is problematic given the unequal starting point.

Table 4: Treatment/Control Wage Data

		Treatment	Comparison
Wage 1	N	106	113
	Minimum	$21.33	$39.09
	Maximum	$17,423.00	$25,943.28
	Mean	$4,395.8242	$7,396.0606
	Std. Deviation	$3,467.75259	$5,280.06231
Wage 2	N	74	127
	Minimum	$543.00	$115.00
	Maximum	$19,923.05	$27,722.48
	Mean	$5,908.8699	$7,797.9779
	Std. Deviation	$3,223.74519	$5,444.57305

In order to address this challenge we calculated the percent increase from wage 1 to wage 2, (w2 - w1) / w1)100, to generate a standardized score which allowed us to compare groups directly. Descriptive statistics revealed a number of cases that had percentage change over 600%. On examining these, it appeared that these may have been data entry errors or partial reporting for only a small portion of wages for the quarter. Because there is no way of knowing the cause of this extremely larger changes in wages and no common method for dealing with these likely outliers, we removed the most extreme cases based on visual inspection. These average percentage increases in wages are seen in Table 5.

Table 5: Standardized Mean Percentage Change in Wage

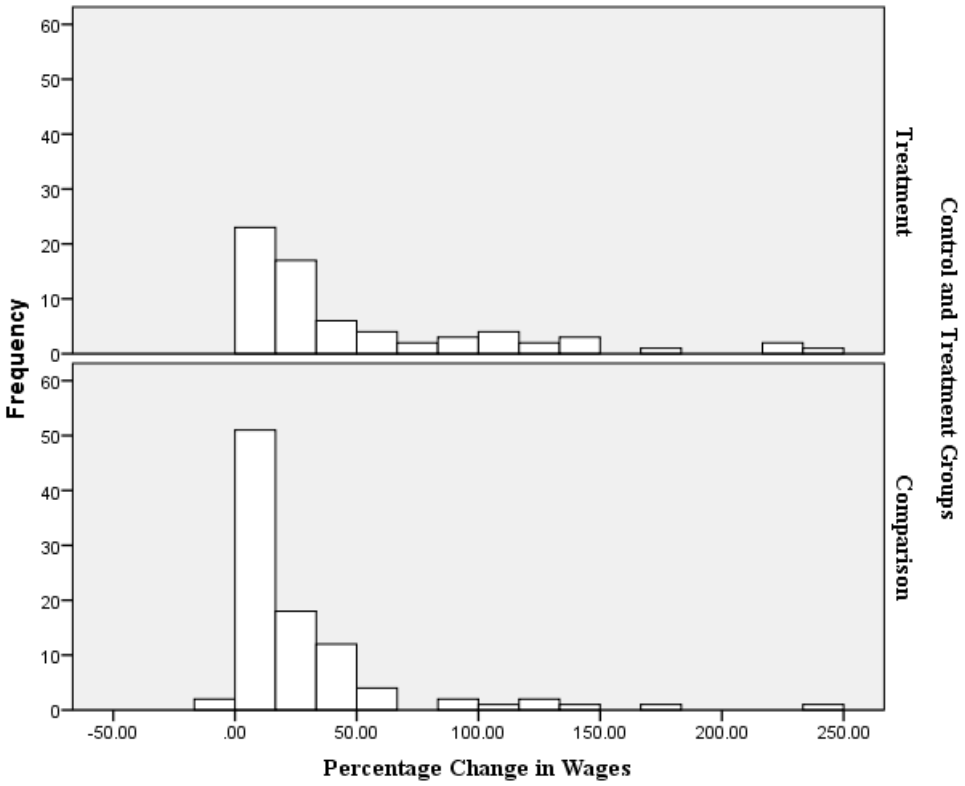
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Treatment	68	1.48	237.76	51.0611	57.94131	1.681	2.355
Comparison	95	-.52	246.86	27.5949	38.95123	3.112	12.100

t-Tests

While there is a lack of consensus in the literature on the most appropriate statistical procedure to use for comparing groups after propensity score matching (PSM), because these covariate differences have been addressed in the PSM procedure and assuming the dependent variable is continuous, outcomes can be directly compared between the treatment and control groups using a simple two-sample *t*-test (Austin, 2011; Schafer & Huang, 2008). This is because within the matched sample, the treatment group and comparison group can be regarded as independent (Schafer and Kang, 2011).

The descriptive analysis above (Table 5) shows large differences between the percentage wage increase between the treatment and control groups. However we noted that a much larger range in values (as evidenced by the large standard deviation) for the treatment group compared to the control group. In this way the assumption of homogeneity of variance, an assumption of inferential statistics – that all groups have similar variance should be investigated before running any inferential statistics. To these ends we ran a Shapiro-Wilk's test ($p >= .05$) and calculated skewness and kurtosis values, as well as doing a visual inspection of histograms, and normal Q-Q plots for the standardized measure of wage increase. We also ran a Levene's test of equality of variance, which was also significant ($p >= .05$), indicating that the variance between the two groups are in fact different. This is a problem for the interpretation of the two-samples t-test, limiting the confidence in the results of such an analysis. We also checked the Skewness and Kurtosis, which should be in the range between -1.96 and 1.96. Here we noted that the treatment group data nearly conform to this standard while the comparison group did not. Similarly, visual Q-Q plots and histogram inspections showed skewed distributions (See Figure 1).

Figure 1: Distribution



Following traditional guidelines, this departure from normality is a violation of the assumption of normality associated with *t*-tests and should not be performed at all or at a minimum interpreted with caution. However, a number of scholars (e.g. Edgell & Noon, 1984; Micceri, 1986, 1989; Sawilowsky & Blair, 1992) have found that as long as the variables were independent, sample sizes are equal and fairly large and tests are 2-tailed rather than 1-tailed, *t*-tests are robust to violations of normality, even extreme violations in combined distributions. With this in mind we ran the independent samples *t*-test and found a significant difference between the C2C participants and their comparison group on average percentage increase in wages, t(161)=3.092, p=.002. Effect size calculations demonstrated that this significant difference was of modest magnitude of .5, or haft of a standard deviation difference between groups.

Given the caution of running a t-test with non-normally distributed data, we also ran a non-parametric alternative, the Mann-Whitney. The Man-Whitney can be used when the dependent variable is scale or ordinal, are independent of each other and the independent variable has two levels (Gravetter & Wallnau, 2016). The important difference is that data in the dependent variable don't have to be normally distributed. This parametric alternative allows us to interpret our findings with less caution. Our analysis using the Mann-Whitney test indicated that the average percent increase in wages was greater for the treatment group (mean =57.06) than for the comparison group (mean = 27.59), U=2270.0, p=.001. This tells us that the probability that the observed differences were not by chance alone, but doesn't explain the magnitude of the difference. We ran an effect size calculation to detect this and found a modest effect size of .49, indicating a half of a standard deviation improvement in the percentage of wage increases.

One interesting observation is that when we looked at the C2C participants who were identified as basic skills deficient, they actually outperformed in terms earning (both wage 1 and wage 2) their non-deficient peers.

Summary of NOVA Participant Outcomes

Data provided strong evident of program completion and program retention, with all but one of the C2C participants earning one credential. At the time of the data collection none had earned an AA degree. Data on employment retention was incomplete with 84.7% of the C2C data and 91.3% of the comparison group with empty data cells.

In total we were able to obtain data for 177 C2C program completers and a comparison group of 230 Business Information Technology program completers from non-C2C NOVA programs. The two groups were similar demographically being nearly identical in terms of race/ethnicity and the large majority in both groups being non-veterans. Research Participants differed on a number of other variables however propensity score matching techniques generate nearest neighbor matches, which mitigated these differences. Participants also differed in the number of credits earned as well as credentials.

Matching was performed using a straightforward 1:1 nearest neighbor matching technique, meaning that a single treated participants is matched to a single untreated participant who has the most similar estimated propensity score. This produces sets of individuals with similar probability of all of the same propensities (e.g., age, race/ethnicity, Pell eligibility, etc.) but differing on whether they participated in a C2C funded training program of a similar business technology program at NOVA Community College. Matching on the probability of having similar characteristics (the covariates used in the binary logistic regression) allows the researcher to create a matched sample where covariate differences are reduced (Austin, 2011). After removing the outliers and completing the 1:N propensity score matching, we had a sample of 102 C2C program completers and 141 comparison group research participants.

Our initial analyses highlighted that treatment group participants were employed between Jan 2013 and Jun 2015 while the comparison cohort were employer between Jan 2012 and Jan 2014. Here we can see that the comparison groups had notably higher average earnings in both quarters reported. Due to these large starting differences, comparing the Wage 2 outcomes across groups is problematic and as such we we calculated the percent increase from wage 1 to wage 2, (w2 - w1) / w1)100, to generate a standardized score which allowed us to compare groups directly. The descriptive analysis showed large differences between the percentage wage increase between the treatment and control groups. Independent samples *t*-test revealed a significant difference between the C2C participants and their comparison group on average percentage increase in wages, $t(161)=3.092$, $p=.002$. Effect size calculations demonstrated that this significant difference was of modest magnitude of .5, or haft of a standard deviation difference between groups.

Shoreline Non-Experimental Outcomes Data

Shoreline data was collected through their registration forms gathered at the college level after the completion of the grant, but they struggled to identify a comparison group. The NOVA Data Coordinator and Myran and Associate team members met several times with Shoreline staff to discuss this challenge and explored other options, but they were not able to identify an appropriate comparison group. As a result shoreline staff sought to identify a comparison group from the Machinists Program prior to its improvement/expansion with C2C funds. To address this challenge and NOVA, Myran and Associates and Shoreline agreed to utilize a type of control-group time series design comparing participants from the pre-C2C program to C2C program completers. This was a departure from the original research design and a significant limitation as Shoreline was already implementing a number of C2C specific innovations, particularly wrap around services supported by a career navigator prior to partnership on the C2C grant. As such, it is difficult to say that the non-C2C and the C2C participants experienced different training programing and limit any inferential statements that can be made.

Initially the data received from Shoreline didn't report any actual wage data, only reporting a binary yes/no wage increase variable. NOVA and Myran team members phone conferenced with Shoreline and requested the full dataset. Shoreline provided quarterly income data going back to 2009 for the comparison group and from 2013 for the C2C group (some data were available prior to 2013 but these represented less than 30 cases per year and were not included in any analysis). This was a large file with separate sheets for each year of the C2C grant along with the comparison group data. Each of these sheets combined quarterly wage data from 2009 through 2015 and in this way the participant variable had multiple rows of data for a single case which required a complicated restructuring to merge these into single unique student level cases. Furthermore each individual sheet for each year of data contained a different number of variables with varying variable labels, which further complicated the data restructuring process and our ability to generate a comprehensive dataset. The lack of a clear data structure that could produce student level individual cases created a host of limitations on the analysis that was possible.

A further challenge was the obtained data represented pre and post C2C Machinists Program completers from a vast array of employment fields. NAICS and SIC employment codes were provided and included completers who were employed in fields from Soybean Farming (NAICS code 111110) to Gold Ore Mining (NAICS code 212210). In this way these data had to be cleaned to limit to only those employed in the field for which they were trained which significantly limited the statistical power of the dataset. Furthermore, while filtering these data to Machinists related jobs according to the NAICS codes mitigated this limitation, these codes likely represent a broad range of types of employment, which may or may not be directly related to the nature of C2C job training. These challenges were made that much more challenging because the wage data are not directly comparable given the typical increases in income and the difference in experience between the already trained non-C2C and C2C participants.

While total wages earned and hours worked where provided a new variable for the mean (average) hourly rates needed to be calculated to have a standardized and comparable wage variable. Outliers were identified in this process and case of less than 6 dollars an hour and over $300 were deleted as extreme outliers. These represented .7 percent of the all the cases.

Given these challenges the design of the Shoreline outcomes evaluation was altered to a control-group time-series design, which compared C2C supported students and non-C2C supported students from the same program. One of the benefits of this approach was the groups were directly comparable on the matching variables initially intended to be used in a propensity score matching technique. Only TAA eligibility and veteran status variables differed between the C2C participants and the comparison group. In contrast however this approach had a fundamentally fatal flaw of comparing those who have been trained, employed, gained experience and advancement with newly trained similar population as well as receiving at least some of the same services and training as C2C funded students.

Comparing Group Characteristics

In total we were able to obtain data for 99 Shoreline C2C program completers and a comparison group of 88 non-C2C Machinists Program completers. Not surprisingly the two groups were similar on all of the matching variables with the exception of TAA eligibility and veteran status. Approximately 5% of the C2C participants are TAA eligible while comparison group contained only missing data for this variable. There were also a significantly larger percentage of veteran C2C participants (25.9%) compared to non-C2C participants (9.5%). The binary wage increase data Shoreline provided for C2C participants and the comparison group showed an average wage increase of 85.5 for year-one C2C students and an average of 87.4 for the comparison group. Years 2-4 had slightly smaller averages of approximately 80%. This is not surprising as the C2C participant would have had less experience and fewer opportunities for career advancement.

Participant Persistence, Completion and Employment

Data demonstrates a dropout rate of between 13.5% (year 1) and 35.4% (year 3). The remaining students continued (6-15.7%) or completed their programs of study (14.3% -- 53.8% per year), while some enrolled in a different program at SCC (7.7% - 20.4%). Merged data for all four years showed a completion rate of 53.5% and 7% enrolling in other programs (See Table 6). Finally we reviewed the percentage of the certificates completed by C2C and non-C2C participants. These included a Certification of Completion for Basic Manufacturing, Principles of Precision Machining and Manufacturing/Machinist Technology. Compared to non-C2C participants C2C student completed a certificates at a much higher rate than their non-C2C peers (see Table 7).

Table 6: Status of C2C Program Completion

Enrollment Status	Frequency	Percent
Completed	237	53.5
Continuing C2C Program Year 1	5	1.1
Continuing C2C Program Year 2	18	4.1
Continuing C2C Program Year 3	8	1.8
Continuing C2C Program Year 4	14	3.2
Continuing Other Program Year 4	5	1.1
Continuing Other Program Year 3	1	.2
Dropped SCC	124	27
Enrolled in Different Program Year 1	11	2.5
Enrolled in Different Program Year 2	5	1.1
Enrolled in Different Program Year 3	10	2.3
Enrolled in Different Program Year 4	5	1.1
Total	443	100.0

Table 7: Certificate Completion

	C2C Participants				Non-C2C Participants
	Year 1	Year 2	Year 3	Year 4	
Received Certificate of Completion (Basic Manufacturing)	47.8	68.5%	85.4%	96.3	71.4%
Received Certificate of Completion (Principles of Precision Machining)	17.4	48.5%	56.9%	88.9	6.5%
Received Certificate of Proficiency (Manufacturing/Machinist Technology)	53.9	51.5%	29.2%	50%	11.1%
Received AAAS (Manufacturing/Machinist Technology)	27.8	19.2%	6.9%	7.4%	1%

Inferential Tests Comparing Average Hourly Wages of C2C and Non-C2C Participants

Given the close covariate similarities between the C2C and non-C2C participants in Shorelines program and assuming the dependent variable of hourly wage is continuous, outcomes can be directly compared between the treatment and control groups using a simple independent samples *t*-test. This is because within the matched sample, the treatment group and comparison group can be regarded as independent (Schafer and Kang, 2011). Mean hourly rates were calculated for each year and these data and as one would expect showed increasing wages from 2013 throught 2015 for both the C2C participants and the comparison group. In order to mitigate the variation in quaterly wage data for each research participant initially only those cases with at least three quarters of wage data were included in the alanysis. While this approch mitigated aspects of this issue, due to the relitive difference in prior work experience and opportunities for career advancement only cases that contined 2015 data were utilized in the *t*-test comparison.

The descriptive analysis below (Table 8) shows large differences between the average hourly wage the C2C and non-C2C participants. We checked the assumptions of homogeneity of variance, using Shapiro-Wilk's test (p >= .05) and calculated skewness and kurtosis values (see Table 9), as well as doing a visual inspection normal Q-Q plots for the standardized measure of wage increase (see Figure 2). Skewness and Kurtosis deviated slightly from the normal range of between -1.96 and 1.96. Similarly, visual Q-Q plots which show a departure from normality (See Figure 2). We also ran a Levene's test of equality of variance, which was also significant (p >= .05), indicating that the variance between the two groups are in fact different. This is a problem for the interpretation of the two-samples t-test, limiting the confidence in the results of such an analysis.

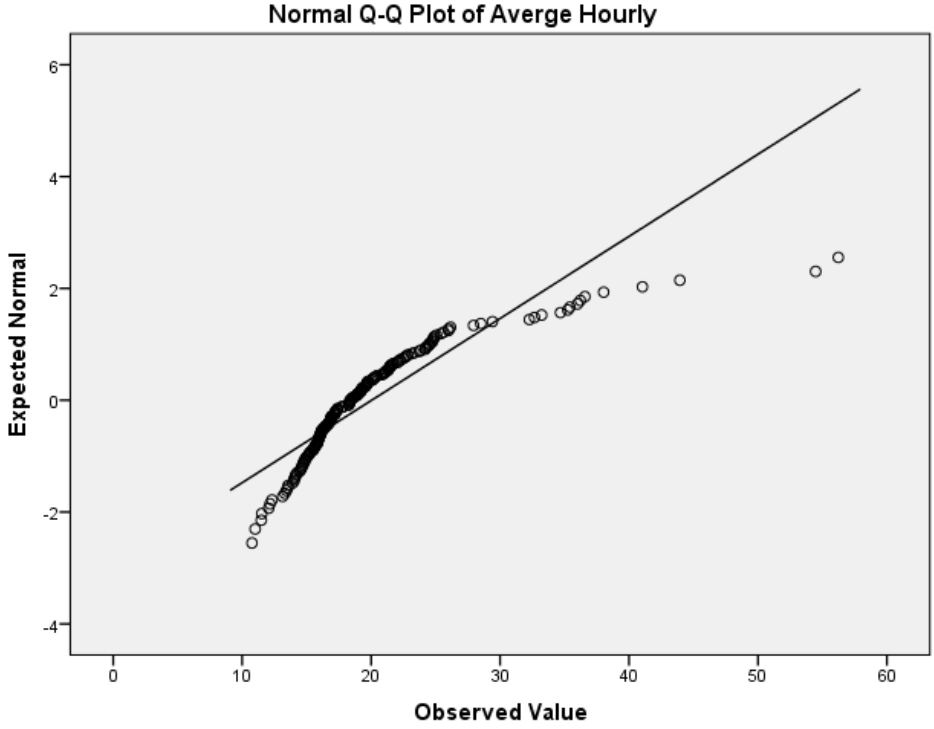
Table 8: Mean Hourly Wage Data

Control/Treatment	N	Minimum	Maximum	Mean	Std. Deviation
Treatment Group	99	10.76	56.23	18.7115	6.48249
Control Group	88	11.52	54.47	21.5456	6.89177

Table 9: Tests of Normality for Average Hourly Wage

Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
.153	187	.000	.788	187	.000

Figure 2: Normal Q-Q Plot of Average Hourly Wage



While traditional guidelines suggest that *t*-tests should not be performed when the assumptions of normality are violated, a number of scholars (e.g. Edgell & Noon, 1984; Micceri, 1986, 1989; Sawilowsky & Blair, 1992) have found that as long as the variables were independent, sample sizes are equal and fairly large and tests are 2-tailed rather than 1-tailed, *t*-tests are robust to violations of normality, even extreme violations in combined distributions. With this in mind we ran the independent samples *t*-test and found a significant difference between the Shoreline C2C and non-C2C participants, with the comparison group earning a significantly higher wage (see Table 10). Given the caution of running a t-test with non-normally distributed data, we also ran a non-parametric alternative, the Mann-Whitney, which produced similar result. Effect size calculations demonstrated that this significant difference was of small magnitude of .26, or roughly a quarter of a standard deviation difference between groups. In this way the actual wage difference between the C2C participants and their comparison groups, while statistically significant was fairly small.

Table 10: Independent Samples *t*-test: Limited to Only 2015 data.

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	16.035	.000	-10.355	186	.000	-5.67810	.54837	-6.75514	-4.60106
Equal variances not assumed			-10.006	186	.000	-5.67810	.56748	-6.79338	-4.56282

Summary of Shoreline Non-Experimental Outcomes Data

Due to a host of data collection challenges NOVA and Myran and Associates along with Shoreline Agreed to utilize a type of control-group time series design that was a departure from the original research design and a significant limitation as Shoreline was already implementing a number of C2C specific innovations, particularly wrap around services supported by a career navigator prior to partnership on the C2C grant. As such, it is difficult to say that the non-C2C and the C2C participants experienced different training programing and limit any inferential statements that can be made.

Dropout rates across the four years of data shows student leaving SCC at between 13.5% (year 1) and 35.4% (year 3). The remaining students continued (6-15.7%) or completed their programs of study (14.3% - 53.8% per year), while some enrolled in a different programs at SCC (7.7% --

20.4%). Merged data for all four years showed a completion rate of 53.5% and 7% enrolling in other programs. The percentage of the certificates completed by C2C and non-C2C participants ranged between 6.9% and 96.3% for the C2C participants and between 1% and 71.4% for non-C2C participants. These included a Certification of Completion for Basic Manufacturing, Principles of Precision Machining and Manufacturing/Machinist Technology. Compared to non-C2C participants C2C student completed a certificates at a much higher rate than their non-C2C peers.

In developing a matched participant/non-participant dataset we were able to obtain data for 99 Shoreline C2C program completers and a comparison group of 88 non-C2C Machinists Program completers. Not surprisingly the two groups were similar on all of the matching variables with the exception of TAA eligibility and veteran status. Approximately 5% of the C2C participants are TAA eligible while comparison group contained only missing data for this variable. There were also a significantly larger percentage of veteran C2C participants (25.9%) compared to non-C2C participants (9.5%). The binary wage increase data Shoreline provided for C2C participants and the comparison group showed an average wage increase for 85.5 for year one C2C student and an average of 87.4 for the comparison group. Years 2-4 had slightly smaller averages of approximately 80%. This is not surprising as the C2C participant would have had less experience and fewer opportunities for career advancement.

While total wages earned and hours worked where provided a new variable for the mean (average) hourly rates needed to be calculated to have a standardized and comparable wage variable. In total we were able to obtain data for 99 Shoreline C2C program completers and a comparison group of 88 non-C2C Machinists Program completers. Not surprisingly the two groups were similar on all of the matching variables with the exception of TAA eligibility and veteran status. Approximately 5% of the C2C participants are TAA eligible while comparison group contained only missing data for this variable. There were also a significantly larger percentage of veteran C2C participants (25.9%) compared to non-C2C participants (9.5%). The binary wage increase data Shoreline provided for C2C participants and the comparison group showed an average wage increase of 85.5 for year one C2C student and an average of 87.4 for the comparison group. Years 2-4 has slightly smaller averages of approximately 80%. This is not surprising as the C2C participant would have had less experience and fewer opportunities for career advancement.

The descriptive analysis showed large differences between the average hourly wage of the C2C and non-C2C participants. We ran the independent samples t-test and found a significant difference between the Shoreline C2C and non-C2C participants, with the comparison group earning a significantly higher wages. Effect size calculations demonstrated that this significant difference was of small magnitude of .26, or roughly a quarter of a standard deviation difference between groups. This small difference is likely explained by the non-C2C participants having been employed longer than the newly trained C2C participants.

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Appendix A

C2C Data Dictionary (Insert Logo Here)

The goals of the C2C Data Collection tool are to:
1. Provide the opportunity for the consortium partners to report the successful activities of the various to highlight the important work of the consortium and its staff;
2. To provide timely and accurate data to U.S. DOL to fulfill the requirements of the grant agreement;
3. To provide to the external evaluators a clean and functional dataset for them to analysis and evaluate the impact of the consortium partner programs and to develop a final report based on this analysis.

Each partner that is providing a funded program service under the C2C/ TAACCCT grant will collect and store the required information in accordance with the security protocols outlined the grant agreement. On a XXXX basis, partners will then review the data, to ensure accuracy and completeness, before they upload it to the designated reporting portal.

The data dictionary is meant to assist users in identifying the field, format, definition and values of the data elements required by the C2C grant. Users may also use this as a basis to developing a crosswalk protocol to existing data sources from which they need to access this information if this database is not the primary source.

Assumptions

- Data Submission
    - Each partner will collect consistent data on clients to ensure that all grant reporting requirements are fulfilled.
    - The C2C project manager at each partner site is responsible for submitting the data files.
    - The sites will submit all prescribed data to the C2C Data Manager, via the secure portal.
    - Data quality is the responsibility of each partner. Internal quality checks should be conducted on a regular basis.
    - Data elements are readily available from the student data information systems maintained by each college or program specific intake forms maintained by each partner.
    - Timelines for data submission will be set to meet grant reporting guidelines.
    - The data collection will support the third party evaluators.

Data Sharing Agreement

According to the memorandum of agreement that each partner has certified, data regarding the client participation in the C2C grant is authorized to be shared with the designated officials within the C2C program, our evaluation partners and U.S. DOL.

Guidance

1. NOVA acknowledges that it will be receiving student information, including, but not limited to identifying information and educational records.
2. NOVA will maintain such information securely and in accordance with its own information security policies and procedures, state and federal law, and industry standards.

3. In the event of a security breach, if any, NOVA will notify affected consortium members and students.
4. NOVA will comply with all USDOL information disclosure requests and supply information via secure channels.
5. All C2C consortium members should communicate all confidential information to NOVA using appropriate security measures that comply with industry standards and applicable law, including, but not limited to, encryption of digital, confidential information.
6. Prior to sharing the data file with the external evaluators, the Social Security Number (SSN) and college identification numbers will be removed and a study identification number will be generated. The crosswalk between the study identification number and the SSN and college identification number will be maintained in a secure location at NOVA.

Data Collection Process (Need to be more fully developed)

1. Student level data files will be created by each partner. These files will reflect data on students enrolled in a credential program offered by the partner.
2. Content of the files is described in the next section.
3. Student data files will be submitted according to the submission schedule as follows:

Range of Activity to include in submission	Files must be received by NOVA -- no later than:
October 1, 2012 – September 30, 2013*	October 21, 2013
October 1 – December 31, 2013	January 21, 2014
January 1, 2014 – March 31, 2014	April 21, 2014
April 1, 2014 – June 30, 2014	July 21, 2014
July 1, 2014 – September 30, 2014	October 21, 2014
October 1, 2014 – December 31, 2014	January 21, 2015
January 1, 2015 – March 31, 2015	April 21, 2015
April 1, 2015 – June 30, 2015	July 21, 2015
July 1, 2015 – September 30, 2015	October 21, 2015

*Only for programs with active enrollments in Grant Year 1

4. The final report to USDOL is due no later than November 15th of each year. Therefore, it is imperative that the data files due on October 21st are submitted on time.
5. Data files will be submitted to via the secure reporting portal. Instructions on how to submit will be outlined in another document.
6. Responsibilities of the NOVA C2C team include:
    a. Summary of individual institution reports and aggregate grant reports will be produced by NOVA C2C and submitted to the grant officer and the participating institutions for review and approval.

b. NOVA C2C will maintain the data files on a secure server. Access to these files will be restricted to only staff assigned to the project.

c. Data files shared with the third party evaluators will not include SSN or the Site assigned student identifier; students will be assigned a new unique identification number. NOVA C2C will maintain the link between this unique identification number and the Social Security number and site identification number in case of questions related to the data.

o NOVA C2C will prepare site specific reports and summary reports to meet the grant requirements. All summaries will be reviewed and approved by the participating sites prior to submission.

TAACCCT Data Elements

Field ID	Field Information	Crosswalk Information
CASE_ID	**Data Type:** Numeric **Size:** 6 **Allow Null:** No **Definition:** A unique identifier assigned to each client upon first contact with a C2C intake specialist. The identifier will be retained by the client throughout the course of their association with the C2C program. This identifier can be used to crosswalk to SSN. **Valid Values:** The form of the identifier is as followings (000000) The first digit used will identify the co-grantee responsible for the client. 1 – Austin 5 - NOVA 2 – LATTC 6 - Shoreline 3 – Muskegon 7 – Western VA 4 - Mott For example, the first Austin client will be #100001.	
DATE_INTAKE	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** This eight character code is used to determine first contact between the client and program staff. This code may be different or the same from the date of enrollment. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined	
SSN	**Data Type:** Numeric **Size:** 9 **Allow Null:** Yes **Definition:** The nine digit social security number of the client when available. This field only holds valid SSNs, although not all clients supply this information. Will be used to crosswalk to official employment and wage records. **Valid Values:** The form of the value should be (000000000) 999 – Blank/ Null/ Undetermined	
NAME_LAST	**Data Type:** Text **Size:** 50 **Allow Null:** Yes	

	Definition: This field is used to record the last name of the client. **Valid Values:** The form of the name should use the common 26 characters in the Latin alphabet and may use various punctuation to appropriately identify the client. 999 – Blank/ Null/ Undetermined	
NAME_FIRST	**Data Type:** Text **Size:** 50 **Allow Null:** Yes **Definition:** This field is used to record the first name of the client. **Valid Values:** T The form of the name should use the common 26 characters in the Latin alphabet and may use various punctuation to appropriately identify the client. 999 – Blank/ Null/ Undetermined	
NAME_MI	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This field is used to record the middle initial, if given, of the client. For clients with more than one middle name, please use the one most appropriate for matching college and employment records. **Valid Values:** The form of the initial should use one the common 26 characters in the Latin alphabet. 999 – Blank/ Null/ Undetermined	
DOB	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** The client's date of birth in (MM/DD/YY) format. If the date is invalid, the field is set to Null. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined	
AGE	**Data Type:** Numeric **Size:** 2 **Allow Null:** Yes **Definition:** The two digit age of the client that is derived from the date of intake minus the date of birth. **Valid Values:** (##) 999 – Blank/ Null/ Undetermined	
GENDER	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This one character field is use to record those that self-identify themselves as either male or female. **Valid Values:** 1 – Male 2 - Female 999 – Blank/ Null/ Undetermined	
RACE_AMER IND	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as American Indian or Alaska Native which includes persons having origins in any original peoples of North America and South America (including Central America) and who maintains cultural identification through tribal affiliation or community recognition.	

	Valid Values: 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
RACE_ASIAN	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as Asian which includes persons having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent (i.e. Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka, and Sikkim. This area includes, for example, Cambodia, China, Japan, Korea, Laos, Malaysia, Myanmar, the Philippine Islands, Thailand and Vietnam. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
RACE_AFRAMR	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as Black or African American which includes persons having origins in any black racial groups of Africa. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
RACE_ISLAND	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as Native Hawaiian of Other Pacific Islander which includes persons having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
RACE_WHITE	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as White which includes persons having origins in any of the original peoples of Europe, the Middle East or North Africa. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
RACE_HISPANIC	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as Hispanic or Latino which includes persons of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture in origin regardless of race. **Valid Values:** 1 – Yes 2 – No	

	9 – Blank/ Null/ Undetermined	
RACE_MORE THANONE	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This racial category is for anyone who self-identifies as being a member of more than one of the racial categories previously listed. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
SCHOOL_ST ATUS	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** A one character code used to identify the client's enrollment status at the educational institution. Full-time status is defined as enrollment in 12 or more credits hours during the Fall or Spring semester and 6 or more credit hours in the Summer. Anything less is considered Part-time. **Valid Values:** 1 – Full-Time 2 – Part-time 9 – Blank/ Null/ Undetermined	
INCB_WORK ER	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** A one character code used to determine the employment status of the client. Full-time is defined as 40 hours per week. Part-time is less than 40 hours a week. Unemployed is not having a job. **Valid Values:** 1 – Full-Time 2 – Part-time 3 - Unemployed 9 – Blank/ Null/ Undetermined	
VETERAN	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** A one character code used to determine the veteran status of the client. The following are more detailed definitions of the particular categories: 1. Is a person who served on active duty in the armed forces for a period of less than or equal to 180 days, and who was discharged or released from such service under conditions other than dishonorable. 2. Is a person who served on active duty for a period of more than 180 days and was discharged or released with other than a dishonorable discharge; or was discharged or released because of a service connected disability; or as a member of a reserve component under an order to active duty pursuant to section 12301 (a), (d), or, (g), 12302, or 12304 of Title 10, U.S.C., served on active duty during a period of war or in a campaign or expedition for which a campaign badge is authorized and was discharged or released from such duty with other than a dishonorable discharge; or 3. Is a person who is (a) the spouse of any person who died on active duty or of a service-connected disability, (b) the spouse of any member of the Armed Forces serving on active duty who at the time of application for assistance under this part, is listed, pursuant to 38 U.S.C	

	101 and the regulations issued thereunder, by the Secretary concerned, in one or more of the following categories and has been so listed for more than 90 days: (i) missing in action; (ii) captured in the line of duty by a hostile force; or (iii) forcibly detained or interned in the line of duty by a foreign government or power; or (c) the spouse of any person who has a total disability permanent in nature resulting from a service-connected disability or the spouse of a veteran who died while a disability so evaluated was in existence. **Valid Values:** 1 – Yes, ≤180 days of service 2 – Yes, ≥180 days of service 3 – Yes, eligible spouse 4 – Not a veteran 9 – Blank/ Null/ Undetermined	
DISABILITY	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** Select yes if the individual indicates that he/she has any "disability," as defined in Section 3(2)(a) of the Americans with Disabilities Act of 1990 (42 U.S.C. 12102). Under that definition, a "disability" is a physical or mental impairment that substantially limits one or more of the person's major life activities. (For definitions and examples of "physical or mental impairment" and "major life activities," see paragraphs (1) and (2) of the definition of the term "disability" in 29 CFR 37.4, the definition section of the WIA non-discrimination regulations.) **Valid Values:** 1 – Self identify as disabled 2 – Not disabled 9 - Blank/ Null/ Undetermined	
PELL_GRANT	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** A one character code to designate whether a client is eligible to receive assistance under the Federal Pell Grant Program. **Valid Values:** 1 – Yes 2 – No 9 - Blank/ Null/ Undetermined	
TAA	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** A one character code to designate whether a client is eligible to receive benefits or assistance under the Trade Adjustment Assistance Program. **Valid Values:** 1 – Yes 2 – No 9 - Blank/ Null/ Undetermined	
BASIC_SKILLS	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** A one character code used to report those identified as basic skills deficiency. According to this program, basic skills deficient is defined as, “computes or solves problems, reads, writes or speaks English at or below the eighth grade level or is unable to compute of solve problems, read, write or speak English at a level necessary to function on the job, in the individual’s family or in society. In addition,	

	states and grantee have the option of establishing their own definition, which must include the above language. In cases where states of grantees establish such a definition, that definition will be used for basic skills determination". Please refer to TEGL 17-05, Attachments B and C for more guidance and for the scores on the official assessments that correlate to this measure. Documentation is only for those that self-identify or are official designated as Basic Skills Deficient. **Valid Values:** 1 – Yes 2 – No 9 - Blank/ Null/ Undetermined	
DATE_ENROLL	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** This element is used to determine the date the client has been formally enrolled in a C2C program. This value may differ from the Date_Intake. If the date is invalid, the field is set to Null. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined	
DATE_PROJCOMPLETE	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** This element is used to determine the projected date of completion for the enrolled course of study under the C2C program. For example, a client that is enrolled in a 6 month course of study and has an enrollment date of 01/01/13 would have a projected completion date of 06/01/13. If the date is invalid, the field is set to Null. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined	
DATE_ACTCOMPLETE	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** This element is used to report the actual completion date of a course of study in which a client is enrolled. This value may differ from DATE_PROJCOMPLETE is the client is ahead of schedule in their studies or needs to pause their studies. . If the date is invalid, the field is set to Null. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined	
DATE_EXIT	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** This element is the date on which a client formally exits the educational institution either by withdrawal, graduation, expulsion, etc. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined	
CONTINUE_ENROLL_GRANT	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This one character code is used to report if the client was enrolled in either the original C2C program of study or another C2C funded program of study during the reporting period. **Valid Values:** 1 – Yes	

	2 – No 9 – Blank/ Null/ Undetermined	
CONTINUE_ENROLL_OTHER	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This one character code is used to report is the client who did not complete the original C2C funded program of study, yet has subsequently enrolled in another non-C2C funded program of study. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
#CREDIT_HOURS	**Data Type:** Numeric **Size:** 2 **Allow Null:** Yes **Definition:** This 2 digit code reports the total number of C2C funded credits earned by the client during their course of study. **Valid Values:** Digits 0-9 in the form of (##) to report the client's credit hours. 999 – Blank/ Null/ Undetermined	
#CREDENTIALS	**Data Type:** Numeric **Size:** 2 **Allow Null:** Yes **Definition:** This 2 digit code is used to report the total number of C2C funded degrees and/ or certificates earned by the client. **Valid Values:** Digits 0-9 in the form of (##) to report the number of credentials earned by the client. 999 – Blank/ Null/ Undetermined	
CERT_YRLESSONE	**Data Type:** Numeric **Size:** 2 **Allow Null:** Yes **Definition:** This 2 digit code is used to report the number of certificates earned by the client that are designed to be completed in one year or less. **Valid Values:** Digits 0-9 in the form of (##) to report the number of certificates earned by the client. 999 – Blank/ Null/ Undetermined	
CERT_YRMOREONE	**Data Type:** Numeric **Size:** 2 **Allow Null:** Yes **Definition:** This 2 digit code is used to report the number of certificates earned by the client that are designed to be completed in more than one year. **Valid Values:** Digits 0-9 in the form of (##) to report the number of certificates earned by the client. 999 – Blank/ Null/ Undetermined	
DEGREE	**Data Type:** Numeric **Size:** 2 **Allow Null:** Yes **Definition:** This 2 digit code is used to report the number of degrees earned by the client during their enrollment in the C2C program.	

	Valid Values: Digits 0-9 in the form of (##) to report the number of degrees earned by the client. 999 – Blank/ Null/ Undetermined	
ENTER_OTHER_PRGM	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** This one character code is used to report of those that have completed at least one C2C funded program of study (see DATE_ACTCOMPLETE), those that have subsequently enrolled in another program of study, C2C funded or otherwise. **Valid Values:** 1 – Yes 2 – No 9 – Blank/ Null/ Undetermined	
DATE_EMPLOYED	**Data Type:** Numeric **Size:** 8 **Allow Null:** Yes **Definition:** For all enrolled in the program, this is the date they are first reported as employed. For **incumbent workers**, this date will coincidence with their enrollment date. For those **not employed**, this will be a date after their enrollment date. **Valid Values:** (MM/DD/YY) 999 – Blank/ Null/ Undetermined 000-Unemployed	
ENTER_EMPLOYED	**Data Type:** Text **Size: 1** **Allow Null:** Yes **Definition: only** This one character element is only to be reported for those that were not employed at enrollment in a program and completed at least one grant funded program. (i.e INCB_WORKER=3 and DATE_ACTCOMPLETE is any other value than Null). This element is to report those cleints who entered unsubsidized employment in the first quarter after the quarter in which the student exits the educational institution. Exit is defined as being no longer enrolled at the college in any program of study and can include formal withdrawal, expulsion, graduation and other reasons. **Valid Values:** 1 – Full-Time 2 – Part-time 9 – Blank/ Null/ Undetermined	
RETAIN_EMPLOY	**Data Type:** Text **Size:** 1 **Allow Null:** Yes **Definition:** For not incumbent workers in ENTER_EMPLOYED, were they employed in the second and third quarters after exit. Exit is defined as being no longer enrolled at the college in any program of study and can include formal withdrawal, expulsion, graduation and other reasons. **Valid Values:** 1 – No 2 – Yes, in the Second Quarter after exit 3 – Yes, in the Third Quarter after exit 9 – Blank/ Null/ Undetermined	
WAGE_1	**Data Type:** Numeric **Size:** 5	

	Allow Null: Yes **Definition:** This 5 digit code is used to report the initial quarterly wage of incumbent workers as they enter the program, (i.e INCB_WORKER= 1 or 2 and DATE_EMPLOYED is any other value than Null). **Valid Values:** The form of the identifier is as followings (00000) 999 – Blank/ Null/ Undetermined	
WAGE_2	**Data Type:** Numeric **Size:** 5 **Allow Null:** Yes **Definition:** This 5 digit code is used to report the quarterly wages for both incumbent workers and those that were unemployed at their enrollment in a program of study. **Valid Values:** The form of the identifier is as followings (00000) 999 – Blank/ Null/ Undetermined	

Appendix B

ACC-RMC Data Sharing Agreement 7-18-14

Ref: UTA14-000743

DATA SHARING AGREEMENT

BY AND BETWEEN

Austin Community College
and
The University of Texas at Austin,
Ray Marshall Center for the Study of Human Resources

Austin Community College (ACC) agrees to provide confidential student level data to The University of Texas at Austin, on behalf of its Ray Marshall Center for the Study of Human Resources, hereafter referred to as "RMC", for the purpose of conducting a study of the **Austin Community College's Health Professions Academy (HPA).**

The ACC Health Professions Academy evaluation is designed to answer the following key research questions:

- What are the demographic, personal, and labor market characteristics of HPA participants?
- What are the services received by Capital IDEA students over the course of the program?
- Which demographic, personal, and labor market characteristics significantly impact participants' income?
- What is the persistence rate of ACC students through the HPA and what student characteristics or Capital IDEA interventions best predict persistence?
- Which Capital IDEA services, if any, have a significant impact on participants' income?
- What are the labor market outcomes (e.g., quarterly income and industry of employment) for HPA participants and how do the outcomes compare to the participants' labor market history?

ACC will authorize a study exemption in accordance with Family Educational Rights and Privacy Act (FERPA) guidelines to RMC for the ACC HPA Project for the purpose of helping ACC improve instruction.

This contract shall be valid from **June 1, 2014 - December 31, 2015** and shall have the option to be mutually renewable for additional years.

The following identifiable student data will be provided for all students, beginning with the **Fall 2013** academic year through the **Fall 2015** academic year:

1. Survey data gathered for HPA enrolled students:
    - Student demographics which includes age (ranges), gender, ethnicity, marital status, number of children, children's ages (ranges), ADA disabled, veteran's status

Ref: UT-OSP# 201400544-001 Rev. 06-26

Ref: UTA1 4-000743

- Student program information which includes student identification number, Capital IDEA student (Y/N), credit hours each semester, earnings per hour each semester, eligible for Pell Grant or other financial aid, first time in college **(Y/N),** pre- and post-test scores, grades for each semester,

2. Social Security Number, and
3. Any other automated student records that **Austin Community College** and **RMC** jointly agree would enhance the quality of this research effort.

Austin Community College will maintain a record of the fact that **RMC** has gained access to students' records under its authority, and **Austin Community College** will record for what legitimate purpose RMC has gained access to the students' records.

RMC assures that as soon as identifiers linking individual students to data are no longer needed for the study, the links will be destroyed. The University of Texas record retentions requirements specify that all research project data be kept for a period of seven (7) years after the official end of the study. **RMC** also assures that data, in all reports, electronic or otherwise and derived from information made available under this agreement, will be aggregated in such a way that no individual will be identified either directly or by deduction.

While in possession of these data, only persons authorized to analyze the data for the research purposes stated will be granted access. The only persons authorized to view student data will be employees of **RMC.** Data will be stored in a secure area at **RMC** and subject to the provisions of **RMC's** procedures for use and protection of confidential data. A copy of these procedures is included as Attachment A to this agreement.

All persons authorized to have access to the data have certified their understanding that they will be held individually liable for any and all criminal and civil penalties imposed for breach of confidentiality.

SIGNATURES

Austin Community College

Alice Sessions 7/15/14
Date

Dr. Alice Sessions,Professor of Biology Adjunct Instructor *in* Education

7/18/14
Date

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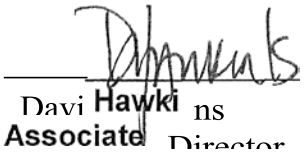
S o --Merz Vi - re ctiveness & Accountability Austin Community College

The University of Texas at Austin, on behalf of its



Davi Hawki ns
Associate Director
Ray Marshall Center for the Study of Huma_n Resources

Office of Sponsored Projects

i/l1/kt4)
Date

Ref: UT-OSP# 20I400544-001 Rev. 06-26