



**Vermont Technical College**  
**Institute of Applied Agriculture & Food Systems**  
**Final TAACCCT Grant Evaluation Report**

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# Acknowledgements

The authors of this report would like to acknowledge the participation of students, faculty, and administrators from Vermont Technical College. Their experiences and perspectives shared through surveys and interviews provided valuable insights into the development and implementation of this innovative workforce development programming to support Vermont's agricultural economy.



# About the Center for Rural Studies

The Center for Rural Studies (CRS) is a nonprofit, fee-for-service research organization that addresses social, economic, and resource-based problems of rural people and communities. Based in the College of Agriculture and Life Sciences at the University of Vermont (UVM), CRS provides consulting and research services in Vermont, the United States, and abroad. The research areas are divided into five main areas: Agriculture, Human Services and Education, Program Evaluation, Rural Community and Economic Development, and Vermont Community Data. The mission of CRS is to promote the dissemination of information through teaching, consulting, research, and community outreach. Primary emphasis is placed upon activities that contribute to the search for solutions and alternatives to rural problems and related issues. Bringing decades of experience to its work, CRS recognizes that answers to critical and timely questions often lie within a community or organization.

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# Executive Summary

## 1. TAACCCT Program Description and Activities

Vermont Technical College (VTC) received a \$3.4 million Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the United States Department of Labor in 2012. This grant supported the creation of the Institute of Applied Agriculture and Food Systems to enable VTC to expand innovative training and education opportunities to Vermonters seeking practical knowledge and skills in agriculture, food production, waste disposal, and energy production.

The goal of the Institute was to provide training and educational opportunities in value-added and commercial food systems to build skills and economic independence for those who want to participate in the agricultural economy. The intervention consisted primarily of capacity building at the institution, identifying educational needs in the community and developing partnerships with potential instructors, and marketing and delivering short courses in topics related to applied agriculture. This short course approach was based on a cooperative education learning model (Smith et al., 2009; Blackwell et al., 2001; Crebert et al., 2004; Lave & Wenger, 1991), coupled with embedded remediation (Bailey et al., 2009; Jenkins, 2011; Zedenberg et al., 2010). This represented a paradigm shift for VTC as an institution, which was generally focused on delivering traditional post-secondary education. The intervention was tailored to address the diverse and innovative agricultural niches that Vermont operations reflect and assist VTC in re-imagining its role as an institution in this working landscape to better serve non-traditional students. Broadly defined, the population served is the whole state of Vermont and the greater New England region. The initial targeted population was “adult trade affected learners across the state possessing less than an associate degree as their highest academic attainment,” however the actual population served were primarily adults in Vermont, from a variety of educational and economic backgrounds, as well as several from other states who came for this unique educational opportunity.

This final evaluation report presents findings from a variety of sources related to the implementation of the Applied Agriculture and Food Systems Institute ranging from course evaluations and student institutional data to qualitative interviews with faculty and program leadership. The report also provides insights into how the TAACCCT funding was used to build capacity at VTC throughout the grant cycle.

## 2. Evaluation Design Summary

To evaluate the implementation and outcomes of the TAACCCT grant, researchers from the Center for Rural Studies at the University of Vermont collected qualitative and quantitative data from students as well as program leadership and faculty members. A logical framework found guided the evaluation. The focus of the evaluation effort was placed on capacity building, development of curriculum, student experiences, and partnerships with agricultural economy.

Initially, evaluation was designed as a quasi-experimental cohort comparison and was to be analyzed using a difference in difference model. However, as the intervention was developed, it became clear that a quantitative approach would not be feasible, and that given the emergent design of the intervention, qualitative feedback provided throughout the grant period would yield the best impact on the Institute's intervention. Wage and employment outcomes/impacts were tracked by the Vermont Department of Labor. This data was not included in this evaluation report, due to the small population and privacy concerns. Furthermore, due to the small population, the wage and employment data should be viewed cautiously and not assumed to be representative. This is further complicated by the Institute's focus on agricultural and entrepreneurial ventures, which are often not included or well represented in the Department of Labor data. Other outcomes, such as certificate and future study intentions, and capacity building were studied via a mixed methods approach. This was an ongoing data collection process, collecting student data at the beginning and end of each course, and then collecting data from partners and staff at the grant mid-point and closeout periods. Capacity building questions were framed as follows below and these questions were answered through a combination of qualitative interviews with faculty, VTC leadership and student surveys:

- Were the capacity building investments made?
- Were the capital improvements made available to students?
- Were VTC staff members trained?
- Were new faculty partnerships developed?
- Did students perceive value in the instructors?
- Were new student recruitment mechanisms put in place?
- Have the capacity building efforts been incorporated into the institution?

De-identified institutional data and anonymous course evaluation data were provided by VTC at the completion of grant funding for the Institute during Spring 2016. Interviews were conducted with 15 faculty members and 5 program leadership membership during implementation and close-out phases of the program. Each interview participant was provided a research information sheet that described the purpose of the session as well as details about maintaining confidentiality. In order to best maintain confidentiality, staff and faculty members are referred to as "program leadership" throughout this report.

### 3. Implementation Findings

#### *Building Capacity*

- The Institute sought to enhance opportunities for improving rural livelihoods through various ways: increasing training opportunities for paid employment in agricultural ventures, increasing household economic security through homesteading or hobby operations, or increasing skills and competencies of individuals seeking to launch entrepreneurial activities.
- TAACCCT funding made possible major capital improvements during the grant period that provided both opportunities for students to use state of the art facilities and equipment as well as expand program offerings at VTC. Significant investments were made in the areas of dairy production, vegetable and fruit production, farm management, maple production, farm alternative energy, and welding.
- All of the investment decisions were made in line with agricultural practices and trends in the New England region, thus ensuring that the investments were strategically linked to applied agriculture in Vermont.

#### *Implementation Steps*

- Intervention consisted primarily of capacity building at the institution, identifying educational needs in the community and developing partnerships with potential instructors, and marketing and delivering short courses in topics related to applied agriculture.
- Short course topics were identified by engaging industry and policy leaders from Vermont's agricultural economy through a series of meetings with key stakeholders.
- Three masters' certificates were developed and 70 short courses were implemented.

#### *Partnerships*

- Early efforts to engage industry leaders in conversations about the training needs of agricultural employers and gaps in the landscape were crucial for identifying potential areas of interest to develop short courses.

- VTC strategically engaged industry leaders to identify “expert-practitioners” as potential instructors to design and teach short courses. Of the 28 different instructors that taught in the Institute, the majority were “expert-practitioners” from industry.
- Institute leadership also taught courses directly in partnership with associations like the Northeast Organic Farming Association—Vermont and established relationships with businesses like Grafton Cheese Company who sent current employees for further training.

### *Program Fidelity*

- When asked to describe their intention to complete a Master Certification in Food Production, Meat Cutting, or Agriculture Business Management, the vast majority of students reported no intention of obtaining a Master Certification.
- This is a significant finding that was quickly realized during the early stages of launching the Institute; students were mainly interested in getting specific knowledge and skills in discrete modules rather than working towards a non-degree certificate.

### *Operational Strengths & Weaknesses*

- Strengths: high student satisfaction, strategically linked to existing degree programs, success with new expert-practitioner faculty instructor model, close alignment with needs of Vermont’s diverse agricultural economy.
- Weaknesses: Financial constraints and internal processes slowed momentum of the Institute, a partially developed vision for sustainability beyond grant period.

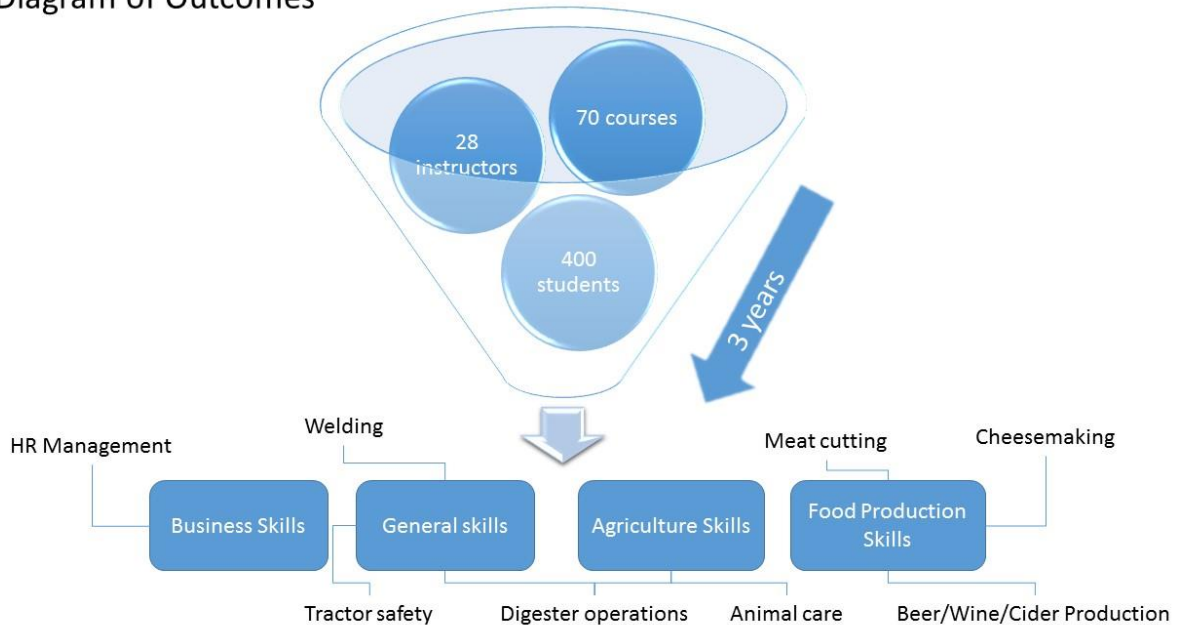
## **4. Participant Impacts and Outcomes**

### *Key Impacts and Outcomes*

- The number of students who enrolled in a short course exceeded the outcome target.
- Participation among TAA eligible students (2.0% of all students) exceeded the rate of TAA eligible in the labor force (0.3%)
- Number of instructors (28) exceeded expectations
- Number of courses taught (70) also exceed expectations

- Incorporated the successful courses into the VTC Continuing Education system for sustainability of the curricula

### Diagram of Outcomes



### Important Limitations

- Only 15% of students planned to complete a certificate
- Most students already had at least an Associate’s degree
- The focus on entrepreneurial agriculture meant that the employment and wage data was not an accurate indicator of success

## 5. Conclusions

TAACCCT funds were strategically invested to enable VTC to build “centers of excellence” within the Institute that reflect the trends in Vermont’s diverse agricultural economy—at a time when VTC and many other institutions of higher education across the country were in financially difficult straits. Whether building new infrastructure, acquiring modern equipment, or cultivating new partnerships, VTC’s capacity was significantly enhanced to better serve the needs of the next generation of Vermont’s agricultural workforce and support rural livelihoods. The following two sections highlight key lessons learned and offer main implications for future workforce development research and policy.



### *Key Lessons*

- Early efforts to engage industry leaders in conversations about the training needs of agricultural employers and gaps in the landscape were crucial for identifying potential areas of interest to develop short courses.
- Utilizing expert-practitioners from the respective fields, the Institute was well-positioned to deliver practical, hands-on learning opportunities that were directly relevant to the opportunities in Vermont’s agricultural economy.
- TAACCCT funds were used to create new infrastructure and acquire new equipment as well as make improvements to existing infrastructure to support the diverse range of short courses. Significant investments made in dairy production, vegetable and fruit production, farm management, maple production, farm alternative energy, and welding.
- The Institute posed challenges related to internal processes at VTC—from student registration and hiring of expert-practitioner faculty instructors to navigating the management and compliance processes associated with large federal grants. Improvements to internal processes were made as a result of this experience.
- Having access to low-cost, practical and highly specified training opportunities was seen by students, faculty, and VTC program leadership as a way for students to explore a potential path without committing to a full degree program yet gain more formal experience than a typical internship or apprenticeship may provide.
- At the close of the grant, a clear vision was lacking for how the Institute and the short course format despite mostly positive perspectives regarding the value of such training opportunities and strong fit with VTC’s larger organizational mission and ethos. Given a resource-constrained environment and uncertainty at the institutional level, there are questions about how VTC will be able to continue this innovative model although planning is underway to move programs into the Continuing Education department.

### *Main Implications*

- Given the overall positive experiences reported by students, faculty, and other stakeholders with the short courses delivered by the Institute, there seems to be significant reason to better understand how this innovative approach may continue to be used in agricultural workforce development.
- This model also can be used to cultivate stronger connections between institutions of higher education and agricultural employers as a synergistic opportunity to build more capacity within this important sector.

- There is anecdotal evidence of the impacts on the Vermont labor force, but with so many students planning to work in their own entrepreneurial ventures, it is challenging for current labor data to tell the whole story. Further, many farm operations are not treated as “employers” in the traditional sense, and so their workers may not be reflected in existing labor force data. Wages may not reflect improvements in quality of life.
- Future research that would provide information to guide other workforce development programs with a focus on entrepreneurship, along with job skills, in agricultural economies is valuable to understand longer term impacts of programs like the Institute at VTC.



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# Background

## Background

The Trade Adjustment Assistance Community College and Career Training Grant Program (TAACCCT) provides funding for community colleges and other higher education institutions to provide training programs for workers eligible for trade adjusted assistance (TAA) programs. TAACCCT is derived from the 2009 amendment to the Trade Act of 1974 that was part of the American Recovery and Reinvestment Act. The TAACCCT program was funded on March 30, 2010 when President Barack Obama signed the Health Care and Education Reconciliation Act, which included \$2 billion in funding for TAACCCT over four years (U.S. DOL, 2011a).

TAACCCT provides community colleges and other eligible institutions of higher education grant funding to expand and improve their ability to deliver education and career training programs that meet three criteria (U.S. DOL, 2011a):

- can be completed in two years or less,
- are suited for workers who are eligible for training under the TAA for Workers program, and
- prepare program participants for employment in high-wage, high-skill occupations.

The overarching goal of TAACCCT funding is to ensure that institutions of higher education are helping adults succeed in acquiring the skills, degrees, and credentials needed for high-wage, high-skill employment while also meeting the needs of employers for skilled workers (U.S. DOL, 2011a). Three sub-goals are identified within the greater scope of this TAACCCT goal (Person, A.E., Goble, L., Bruch, J., Mazeika, J., 2015):

1. to increase attainment of degrees, certificates, and other industry-recognized credentials that provide skills for employment in high-wage, high growth fields;
2. to introduce or replicate innovative and effective curricula that improves learning that is relevant to employment; and
3. to improve employment outcomes for participants, especially those eligible for Trade Adjustment Assistance and other economically dislocated and low-skilled adult workers.

The TAACCCT Program is intended to stimulate program development and labor market input at the community college level by engaging community colleges nationwide to partake in program reform, often including career pathways development (Van Noy, M., Heidkamp, M.,

2013). TAACCCT grant applications are evaluated and awarded according to their relevance to one or more of four key priorities (U.S. DOL, 2011b):

1. Accelerating Progress for Low-Skilled and Other Workers
2. Improving Retention and Achievement Rates and/or Reducing Time to Completion
3. Building Programs that Meet Industry Needs, Including Developing Career Pathways
4. Strengthening Online and Technology Enabled Learning

TAACCCT grants were awarded in four fiscal years (2011 - 2014) with total awards of \$500M in 2011 and 2012, \$475M in 2013 and \$450M in 2014. Awards were made to programs in all 50 states, Puerto Rico and the District of Columbia (U.S. DOL, 2014). State policymakers can utilize TAACCCT funding and accountability measures to encourage and/or require community colleges to create career pathway programs for their adult learner and other students. To best fit into the frameworks of TAACCCT programs, community colleges frequently opt to review their program offerings to ensure they relate directly to labor market needs and also to articulate opportunities for further education (Van Noy, M., Heidkamp, M., 2013).

### *Trends in Agricultural Workforce Development*

In 2009 the USDA awarded \$19M for the Beginning Farmer and Rancher Development Program (BFRDP). Along with this influx of federal dollars for agricultural workforce training, there was a need for a better understanding of the scope and effects of agricultural workforce training on participants and the industry as a whole. Niewolny and Lillard (2010) performed a review of existing literature and historical context for new farmer training. Their research was based on a systematic search of scholarly articles and existing initiatives, and was standardized based on the mission, purpose, and justification of existing initiatives.

Niewolny, and Lillard (2010) argue that the beginning farmer phenomenon is helping to build the foundation for an “alternative knowledge system” that functions for the development of sustainable agriculture systems. Based on their research of the beginning farmer initiatives, Niewolny & Lillard propose the following recommendations for practitioners of new farming training and educational programs:

- Incorporate community-based learning strategies to build viable social networks for facilitating successful beginning farmer learning communities. These strategies might include community forums, study circles, focus groups, and collaborative leadership development.

- Implement participatory and experiential learning methods that integrate beginning farmer knowledge with trainer experience. Reduce the amount of lectures and other forms of direct instruction.
- Integrate social media forums to generate and sustain interest in agriculture for the digitally aware beginning farmer audience.
- Integrate new approaches to establish, retain, and expand sustainable agriculture concepts and activities into everyday practice. For example, introduce local and regional food system marketing coursework and social networking, farm-to-fork programming, and scaling-up business incubator programs.

There is increasingly a demand, predominantly among the millennial generation, for sustainable agriculture and food system education and training opportunities<sup>1</sup>. There are a wide variety of skills being demanded ranging from farm management, practical and technical skills such as tractor safety or Quickbooks accounting, and animal husbandry, to organic vegetable farming, backyard homesteading, and permaculture. There is an increasing and unfulfilled need for human resources expertise in managing the influx of labor into growing agricultural enterprises.

#### *Human Resources Management in Agriculture*

Historically agricultural jobs have been relatively low wage and even when categorized as “full-time” many jobs represent “precarious employment” (Dorman 2000). This can result in low economic returns to workers and high individual and social costs, such as poor health and the costs of providing public services. Not only do jobs at the bottom of the employment ladder lack employee benefits but the work-related costs not borne by the employer are shifted to the employee or potentially to the public (Findeis et al. 2005). Human resources management services are scarce for many farm workers and workers are unlikely to receive health care coverage for injury or illness occurring away from the worksite, and less than half are covered by worker’s compensation or unemployment insurance (Findeis et al. 2005). During the 90s, a period of relative prosperity in the U.S., the likelihood of farm workers receiving benefits declined (Findeis, 2005).

A Wisconsin study surveyed 220 producers from 38 counties in Wisconsin and found that the biggest challenges associated with human resource management include; barriers to

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<sup>1</sup> A complete listing of existing sustainable agriculture and new farmer certification programs in the U.S. can be found at: <http://afsic.nal.usda.gov/edtr/sustainable-agriculture-education-directory>

communication, hiring and recruiting, training employees, dealing with employee conflicts, and the legal aspects of human resource management (Gordon, 2014).

When comparing farm outcomes, it has been discovered that technological programs are statistically less likely than human resource programs to generate competitive advantage for farms (Chacker et al. 1997). The resource-based theory posits that a resource must be rare to be a source of competitive advantage (Mugera, 2005). While agricultural labor in general is relatively abundant, dairy farmers reported difficulties in recruiting employees with the requisite skills and knowledge (Hadley, Harsh, and Wolf, 2002). It is these well-trained, skilled workers that bring competitive advantage to farms. Established HRM policies are an effective tool for attracting and retaining these desirable workers.

An examination of human resources management (HRM) on dairy farm profitability found that increasing milk quality is the only variable associated with a significant increase in profitability. The study concludes that therefore profitability may not be the driving force for improving the quality of the labor input. The farmer may wish to improve production efficiency such that fewer employees can be hired and that while hiring fewer but better employees may not, in net, affect the wage bill, it will, however, lower the burden on the manager to oversee employees (Hyde, 2008).

Employees on dairy farms are a non-substitutable resource because dairy farming cannot be fully automated. Even on highly mechanized farms, human resources in the form of trained employees are needed to monitor the herd health, administer treatment, and assist with calving cows (Mugera, 2005).

Interpersonal relationships among employees and between employees and managers can be used as proxies for social complexity. Those relationships are based on kinship and friendship ties and therefore not easy to imitate. Attending training programs on labor management is recommended to increase management skills in this area and attain the skills to use the human resource system as a source of sustained competitive advantage, mobilizing, developing, managing, and retaining employees (Mugera, 2005).

Stup (2006) performed an analysis of successful and profitable dairy farms in Pennsylvania. HRM was categorized as technical (relating to specific work-flow tasks) or strategic (relating to team-building and employee relationships). Technical HRM variables such as implementation of feeding and reproduction SOPs on these farms were not significant predictors of ROA and ROE while strategic variables were, indicating that the efficacy of teams to work together provides greater value than rigorous technical task management.

Human resources in the form of skilled employees can enhance the efficiency of individual activities and the selection of activities performed by all employees on the farm (Yang, 2002). This in turn leads to greater employee productivity by freeing up managerial resources, allowing farms to leverage all their HR assets to achieve maximum profitability. While strong HRM practices can be the difference between success and failure of farm enterprises, there is a scarcity of HR professionals specializing in agriculture. As sustainable agriculture endeavors continue to grow and more and more qualified applicants enter the job market, the need for skilled HR professionals in the field will become greater.

### *State of Applied Agriculture in Vermont*

In Vermont, sustainable agriculture has become a rallying point. In 2009, the Vermont legislature established the Farm to Plate (F2P) Investment Program in order to increase economic development in Vermont's food and farm sector, create jobs in the food and farm economy and improve access to healthy local foods (Farm to plate strategic plan, 2013). The Institute of Applied Agriculture at Vermont Tech fits squarely into the purpose of the Farm to Plate Strategic Plan of encouraging policies and strategic investments that accelerate the movement toward strong local and regional food systems.

In 2013, the F2P estimated that Vermont's agricultural/food product output was \$2.7 billion in 2007 and that a 5% increase in farming and food manufacturing would result in an increase of \$177 million by 2020 as well as an additional 1,500 jobs in the industry. If this is the case, then training workers for these agricultural jobs is a strategic contribution to the economic growth in the state. In its 2015 Annual report, Farm to Plate reported that the number of farm workers increased by 16.6% from 2002 to 2014, and the number of non-farm food system jobs increased by 11.6% (5,300 jobs) during the same time period (Farm to Plate, 2016)<sup>2</sup>.

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<sup>2</sup> These findings are based on data provided by the Vermont Department of Labor and the US Census Bureau.

<http://www.vtfarmtoplate.com/uploads/FY15%20Farm%20to%20Plate%20Annual%20Report.pdf>





# Institute of Applied Agriculture & Food Systems

*“Rooted in the values that all food and fiber production must be science-based and sustainably support the environment over the long term through a full-cycle food system, the Institute provides hands-on learning to students of all ages and backgrounds. Through short, focused courses built around best practices, students are encouraged to develop the skills, knowledge and competency to make an immediate difference as agricultural or food system employees, or as entrepreneurs in those fields.”*

*Mission Statement, 2016*

## Intervention Description and Activities

Vermont Technical College (VTC) received a \$3.4 million Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the United States Department of Labor in 2012. VTC is part of the Vermont State Colleges system and offers certificates, associate’s degrees, and bachelor’s degrees in agriculture, business, engineering technologies, allied health and nursing, and sustainable technology at its two campuses and multiple distance locations around the state. This grant supported the creation of the Applied Agriculture and Food Systems Institute which allowed VTC to expand innovative training and education opportunities to Vermonters seeking practical knowledge and skills in agriculture, food production, waste disposal, and energy production. As of March 2016, more than 400 participants had enrolled in over 69 courses. Additionally, grant funds were used for capacity-building purposes to campus infrastructure and equipment.

This report primarily focuses on the implementation of the Institute Applied Agriculture and Food Systems (referred to as the Institute for the remainder of this report). It summarizes the results from program leadership and faculty member interviews as well as an analysis of the institutional and course evaluation data collected. The report closes with a summary of lessons learned and recommendations for continuing this work into the future at VTC and beyond.

The intervention consisted primarily of capacity building at the institution, identifying educational needs in the community and developing partnerships with potential instructors, and marketing and delivering short courses in topics related to applied agriculture. As one

program leader described, overall the goal was to take, *“time and energy ...to teach students what they want, when they want and when they’re ready to learn it.”* This represented a paradigm shift for the institution, which was generally focused on delivering traditional post-secondary education. As another leader related, the goal was to provide training and educational opportunities in value-added and commercial food systems; workforce training and economic independence for those who want to participate in the agricultural economy. The intervention was tailored to address the diverse and innovative agricultural niches that Vermont operations reflect and assist VTC in re-imagining its role as an institution in this working landscape to better serve non-traditional students in addition to its primary target audience of full-time degree earning students.



As one leader put it, *“In Vermont, so much of the economy is under the radar for agriculture and Vermont’s legacy of entrepreneurship.”* However, there was always some tension in offering an entrepreneurial approach, given that, *“federal expectations were very different from Vermont reality and our focus on rural livelihoods. Our biggest challenge is essentially helping people find rural economic independence.”* As is described later in this report, many of the participants were motivated to participate in the Institute for entrepreneurial or homesteading reasons which were not recognized as part of TAACCCT aims and difficult to measure impact using traditional quantitative measures.

Another administrator described the value of courses in practical, applied agriculture to the rural Vermont community served, stating that *“to offer hands-on, really usable workforce training to as many students as we could serve in the topics of agriculture, and more specifically the food production, food processing, value-added processing, and then other auxiliary areas of agriculture. So, for instance, welding, equipment repair, various metal works type things, farm*

*electrical systems, stuff like that. But basically offer very usable information to them and have them actually do it so that they can recreate this in the workplace making them a more valuable employee.”* Thus, even if there was a perceived difference in federal expectations from what was delivered, the Institute was designed with the needs of the primarily rural, agricultural labor force in mind.

### *Population served*

During the time period of the TAACCCT grant, the Vermont Department of Labor reported that there were under 1,000 (894) TAA eligible workers in the state and just 8 certified trade petitions in Vermont. Though many agricultural positions are informal and/or self-employed, Farming/Ranching is one of the largest categories of jobs in Vermont, with about 6,000 individuals employed in this field in 2015.

Table 1. Growth in selected Applied Agriculture related job categories

	2015	2017	Change	Average Annual Growth Rate
<b>Farmers/Ranchers/Agricultural Managers</b>	5,955	6,081	161	1.1%
<b>Slaughterers/Meat Packers</b>	44	47	3	3.4%
<b>Crop Production</b>	502	527	25	2.5%
<b>Animal Production</b>	1,708	1,804	96	2.8%
<b>Forestry/Logging</b>	223	236	13	2.9%
<b>Support Activities: Agriculture/Forestry</b>	290	295	5	0.9%
<b>Food Manufacturing</b>	5,508	5,758	250	2.2%
<b>Beverage/Tobacco Product Manufacturing</b>	614	727	113	8.8%

Source: Vermont Department of Labor, Economic and Labor Market Information - March 2015

### *Intervention model*

The Institute focused on building capacity for Applied Agriculture education within the Institute, as well as building capacity among its students for working in applied agriculture. The model for building the Institute’s capacity included making strategic capital investments, developing

partnerships with qualified instructors and developing the internal structure for ongoing delivery of these short courses within VTC.

The Institute was purposely focused more on entrepreneurial opportunities than in corporate employment, since *“agriculture [in Vermont] is mostly non-corporate and it’s especially non-corporate in Vermont.”* As a result, *“most of the opportunity is entrepreneurial in Vermont...it’s very difficult to connect people to jobs, it’s much easier to have students that learn a vocation that they want and want to start out on their own.”*

Triangulating on the needs of Vermont’s rural economy and the institutional expertise of VTC, the Institute offered short courses in topics that would support students interested in entrepreneurial, agricultural ventures. Their approach to creating the Institute was that it should be *“a place to find the first course”* and then *“start building a center of excellence”* around the successful courses. This approach *“builds excellence and creates enthusiasm”* though they take a longer time to fully roll out than a more traditional approach of determining the curriculum and needed courses in advance. This approach also provided a learning Institute, making it more adaptable to the needs of the community – for example *“we thought about a stone wall course, and offered it, but no one signed up because there was another group in the state that had a more detailed offering.”* This responsive model is especially important in a small market area maximize the Institute’s address critical training gaps while ensure minimal redundancy with existing programs.

### **Building capacity: Infrastructure and Equipment**

TAACCCT funding made possible major capital improvements during the grant period that provided both opportunities for students to use state of the art facilities and equipment as well as expand program offerings at VTC. Investments were made in the areas of dairy production, vegetable and fruit production, farm management, maple production, farm alternative energy, and welding. Much of the grant budget was dedicated to such purchases and investments. Greater detail about these investments are described later in this report.

### **Building capacity: Partnerships with Stakeholders**

Partnerships with a variety of stakeholder groups were a central focus of the Institute. The short course topics were identified by engaging industry and policy leaders from Vermont’s agricultural economy. VTC strategically looked to industry leaders to identify *“expert practitioners”* as potential instructors to design and teach these short courses. Of the 28 different instructors that taught in the Institute, the majority were *“expert practitioners”* from industry. Institute leadership also taught courses directly in partnership with associations like the Northeast Organic Farming Association—Vermont and established relationships with

businesses like Grafton Cheese Company who sent current employees for farther training. These interactions with industry and policy leaders were important for building VTC's capacity and recognition as an effective conduit of practical, skills-based training opportunities for Vermont's agricultural economy.

### **Building capacity: Internal processes and controls**

Like many institutions of higher education across the country in the past five years, VTC experienced significant financial challenges during the early stages of the TAACCCT-funded programming. Launching a new and innovative program like the Institute during this time period was challenging as VTC staff and faculty were forced to be more efficient despite reductions in human resources. Additionally, receiving a major federal grant required the building of relationships within VTC and the Vermont State College System to ensure that internal processes for grant management and compliance, procurement, and registration systems were in place.

### **Building capacity: Student participants**

One program leader related several anecdotal pieces of evidence of student capacity building. Some were small but necessary pieces of capacity, like one student who took a tomato grafting course *"learned just three new techniques and that was already having an impact on her business."* Another student took a meat-cutting course and *"immediately started raising rabbits and selling the direct [to consumers] this summer."*

One of the ways to build capacity among these entrepreneurial students is to show them examples of someone else doing it. Sometimes those with experience or success in a specific area became instructors in the Institute, other times they hosted field trips. For example, *"visiting [an entrepreneur] with three jerseys [cows] who is making \$100,000 selling yogurt was more powerful than visiting [a large] dairy which is shipping 50 truckloads a week and always looking for employees."*



# Evaluation Design

## Evaluation design

### *Goals of evaluation*

In order to evaluate the VTC implementation of the TAACCCT grant, the CRS researchers collected qualitative and quantitative data from students as well as program leadership and faculty members. The Institutional Review Board at the University of Vermont granted approval of research protocols prior to all data collection and analysis efforts.

### *Implementation of study design*

Initially, evaluation was designed as a quasi-experimental cohort comparison and was to be analyzed using a difference in difference model. However, as the intervention was developed, it became clear that a quantitative approach would not be feasible, and that given the emergent design of the intervention, qualitative feedback provided throughout the grant period would yield the best impact on the Institute's intervention.

De-identified institutional data and anonymous course evaluation data were provided by VTC at the completion of grant funding for the Institute during Spring 2016. Interviews were conducted with 15 faculty members and program leadership during implementation and close-out phases of the program. Each interview participant was provided a research information sheet that described the purpose of the session as well as details about maintaining confidentiality. In order to best maintain confidentiality, staff and faculty members are referred to as "program leadership" throughout this report.

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# Implementation Findings

## Implementation findings

### *How grant increased capacity*

#### **Building Capacity: Infrastructure and Equipment Investments**

A major portion of the TAACCCT funds were used to build capacity by investing in infrastructure and equipment at both VTC's main campus in Randolph as well as at the recently acquired Norwich Farms, located approximately one half-hour from the main campus. These funds were deployed in ways that either expanded existing capacity or enabled the creation of new areas of focus in dairy, vegetable and fruit production, maple production, farm alternative energy, and welding. All of the investment decisions were made in line with agricultural practices and trends in the New England region, thus ensuring that the investments were strategically linked to applied agriculture in Vermont. This section highlights a few key investments that are later referenced in the evaluation findings from interviews with program staff.

#### *Norwich Farms*

Norwich Farms was a generous gift to the college in 2015. The farm, with 350 acres of agricultural land and dairy operations, combined with the TAACCCT funding is well-positioned to be a "living classroom" for sustainable dairy and value-added production. TAACCCT funds enabled the purchase of milk processing equipment such as cheese vats and bottling equipment as well as drag line equipment for effectively and accurately applying nutrients to farm fields. The facility and the equipment is used to provide students with hands-on learning and training opportunities relevant to the demands in the Vermont's agriculture economy. Specific to the activities supported through TAACCCT, Norwich Farms has hosted the popular cheesemaking and yogurt production courses.

#### *Fruit and Vegetable Production*

Diversified agriculture has grown significantly over the past decade within the state of Vermont and the New England region as a whole. VTC launched a bachelor's degree program in this field in 2009. TAACCCT funds were employed to increase cultivation and management capacities at the Market Garden and the Orchard by purchasing two new tractors and a high tunnel

greenhouse. These resources were incorporated in the TAACCCT-funded diversified agriculture and tractor safety courses and support VTC's existing dairy operations.

### *Maple Production*

As the maple sugaring industry continues to incorporate more innovative technologies into common practice, VTC has responded by using TAACCCT funds to acquire a reverse osmosis machine for its 100-year old sugarhouse. This important upgrade to VTC's maple production capacity expands hands-on learning opportunities that mirrors trends in the larger industry. The Institute has utilized the new technology in a popular maple installation course—providing students with valuable experiences that reflect current practice in the field.

### *Farm Alternative Energy*

In 2014, VTC constructed an anaerobic digester operation at the existing dairy farm using the latest technology available to produce renewable electricity for Green Mountain Power, renewable heat for the campus, and recycle nutrients for use on the farm. This type of farm alternative energy production is innovative and training workers to use this technology is important as the Vermont Legislature passed Act 148, which bans all organic waste materials from being sent to landfills by 2020. TAACCCT funds were used to purchase a manure truck which is used to transport manure from the dairy farm to the digester. In addition to supporting the educational and training activities for the digester itself, the truck is also used to support VTC's Diesel Education Program.

### *Welding Laboratory*

Today's agricultural operations require a variety of equipment for production and management. Welding was identified by VTC as a critical skillset to deliver to farmers and farmworkers seeking to improve self-sufficiency on the farm and employability. TAACCCT funds were used to create a welding laboratory that supported both introductory and advanced welding short courses taught in the Institute. For students seeking professional certification, there are opportunities for those courses to attain national pre-certification through those short courses. In addition to supporting the welding short courses, the welding laboratory supports the welding certificate program associated with VTC's existing Mechanical Engineering Technology associate degree program.

### *Steps taken to create and run the program*

#### **Building Capacity: Internal Processes and Controls**

While VTC already had a useful traditional website, the Institute was focused on non-traditional stakeholders driven by the needs of the industry, taught by professionals in the field, and



designed to educate non-traditional need students. The Institute sought to build capacity in communication. In order to reach industry stakeholders, *“we did several publications targeted towards specifically cheese magazines or brewers’ magazines.”* Student recruitment was another area of communication that benefitted from TAACCCT investment, *“We always had...a hard time figuring out the best ways to reach perspective students who this stuff could actually really benefit them, and that they would want to do if they somehow knew about it. So finding those avenues to reach our target markets.”* In addition, *“we developed a whole spreadsheet of various agricultural producers in the state...so we sent out a physical mailing...which I think for our target market is probably one of the better methods.”*

New students were reached in several ways including *“7 Days, the radio...given whatever sort of course it was we targeted certain magazines or publications for those specific courses”* as well as Front Porch Forum and Facebook. Also, VTC stated, *“We had a newsletter that went out every month and that newsletter consisted of people who had already taken courses through the ag institute or signed up to get our newsletter or we also created our sort of own contact list of people in the industry for Vermont and surrounding area.”*

### *Important partnerships*

#### **Building Capacity: Partnerships with Industry & Organizational Leaders**

Before the TAACCCT grant was even in place, VTC hosted a gathering of key agricultural economy stakeholders for a day-long Ground Works Conference to set the stage for the building connections and developing an understanding of opportunities and gaps for agricultural workforce development. *“We invited industry people and all the different organizations and all the associations were there. That was really to make them aware of what our goals would be with this grant and just get them into it.”* The conference consisted of industry owners, agriculture and food system organizations, educational institutions, and farm owner-operators.

Following this large conference, Institute program leadership then held a smaller meeting with industry leaders to discuss the findings from the Vermont Farm to Plate Workforce Gap Study to brainstorm and identify certificates, trainings and short courses that would be offered through the Institute. Key players that were involved included: Black River Produce (meat-cutting), Dunc’s Mill (distilling), Commonwealth Dairy (yogurt and dairy), Shelburne Vineyards (viticulture).



Having industry partnerships not only helped VTC know what to offer to meet workforce development needs, but also helped to develop partnerships with industries so that they know what students with such credentials could do upon completion of the short courses or master certificates. *“We, as ag specialists, pinpointed some areas in the State that we thought could use certificate educational programs to train technical skills. We made that list and then we reached out to people in those industry areas and then we held a miniature Ground Works conference where it was just us and those industry folks.”*

Employers were looking for a credential that could help differentiate serious employees. For example, we learned that *“we’re starting to get to becoming well known for our cheese making educational program.”* Organizations, such as the Northeast Organic Farming Association, have also been critical partners. As one program leader related, *“Our other organization we really partnered with is NOFA Vermont and we did some series with them focused on beginning farmers...it made sense to partner so we did some NOFA series with them around equipment repair and welding and those were well attended and then we also did human resources series with them and a nutrient management series with them.”*

Rather than go deeply into any one industry sector, VTC chose to serve the widest range of students by offering a variety of introductory short courses. As one program leader described, *“With a team of five staff, we could have created one single program, like yogurt production, and impact 20 entrepreneurs...or we could do [short courses] in 30 or 40 different aspects of entrepreneurial agriculture.”* It was also critical that the short courses provide tangible outcomes for the students that they wouldn’t be able to obtain through farm labor or internships for no cost. As one program leader summarized, *“everyone is willing to give students free work [as on the job training] so we had to communicate the return on investment in this sort of program is bigger.”*

### **Building Capacity: Partnerships with Instructors**

Partnering with industry professionals to teach the short courses not only helped ensure that students learned skills needed in the industry, but some students were drawn to the courses for an opportunity to connect with the specific instructors. As one program leader described, *“we’d get one really good distilling instructor and then start building a center of excellence around distilling.”* However, partnering with faculty not traditionally employed by VTC posed challenges as well. Fits and starts were hard for instructors and the contracting process was difficult. The enrollment process for short courses was not as simple as planned. VTC processes were not designed for the nimble needs of the short course format. However, lessons were learned, processes were developed, and expectations were set.



With 28 unique instructors teaching 70 short courses, the Institute formed partnerships all over the state of Vermont and across a broad spectrum of topics in Applied Agriculture. Many of these partnerships, and courses, are expected to be offered by the Vermont Tech Continuing Education and Workforce Development program beyond the TAACCCT-funded programming.

## *Program implementation Fidelity, Strengths and Weaknesses*

### **Fidelity: Master Certificates vs. Short Courses**

When asked to describe their intention to complete a Master Certification in Food Production, Meat Cutting, or Agriculture Business Management, the vast majority of students reported no intention of obtaining a Master Certification. This is a significant finding that was quickly realized during the early stages of launching the Institute; students were mainly interested in getting specific knowledge and skills in discrete modules rather than working towards a non-degree certificate. That said, 15.6% of participants reported intent to complete a master certificate in their respective field.

Table 2. Student Intention toward Master Certificates

<b>Intend to complete Master Certification (n=250)</b>	
<b>Food Production</b>	4.4%
<b>Meat Cutting</b>	5.2%
<b>Agriculture Business Management</b>	6.0%

### *Course Learning Objectives*

The short course format challenged faculty members to organize their courses around very specific learning objectives. The content and context of the learning objectives were tailored for the specific courses, as one instructor said, *“the students are looking for knowledge and skills that they can take home today that are going to make them operate differently and make or save money tomorrow.”* Common themes across the reported learning objectives featured

- awareness
- safety
- practical skill development
- access to resources

Most courses featured a blend of classroom time and practical application or skill development. One course featured more traditional academic assignments such as a research paper in addition to field-based activities.

The interviewees discussed the challenges of working with students with a varied background in these topics. One faculty interviewee described using a pre and post self-evaluation to gain insights into where the students started in comparison to each other and where they ended up compared to what they started with as individuals.

In addition, faculty described other outcomes for students who participated in their courses:

- Opportunity to discover interests in pursuing a more intensive commitment
- Improve advancement opportunities for currently employed workers
- Improved profitability for owners; enhanced success and sustainability
- Enhancing skills with the ultimate goal of contributing to growing and sustaining vibrant agricultural businesses in the state of Vermont.
- Starting own entrepreneurial or hobby farm activities

The intention of converting students from a single short course to completing a master certificate was always the intention of the Institute. Due to a variety of factors, including the needs of the agriculture industry, the needs and expectations of the students and the time to move students through a variety of courses without the structure of a semester, the program leaders were disappointed in the lack of Master Certificate completers. At the same time, they noted that the capital investments have been made “all of the welding equipment” has been purchased, “we started with one course, and then another and [realized] this can be a fabrication [master certificate].”

The short course format *“was a successful way to go because it allowed us to experiment more quickly”* and this short course format enabled us to *“teach students what they want, when they want and when they’re ready to learn it – it’s a complete change in terms of how and where people can get access to information.”*

### **Fidelity: Student Participants**

#### *Background and Qualifications*

Beyond being enrolled in the Institute, more than one third of the respondents indicated that this was their first experience being enrolled in any program of study. Nearly 42% indicated that they had been enrolled at a different institution in the past, while approximately an additional 16% of respondents were either previously or currently enrolled at VTC and 5% were currently enrolled at a different college or university.

Table 3. Student enrollment status

<b>Enrollment Status (n=253)</b>	
<b>I have been enrolled at another college or university</b>	43.4%
<b>I have not been enrolled in any other program of study</b>	38.9%
<b>I have been enrolled at VTC in a different program of study</b>	9.9%
<b>I am currently enrolled at VTC in a different program of study</b>	7.5%
<b>I am currently enrolled at another college or university</b>	5.5%

When asked to describe their employment status, students were to select the categories they felt best described their situation relative to their program of study at the Institute. Approximately 30% indicated that they were currently working in a field unrelated to their program of study.

*Nearly 30% reported that they or someone in their family is in the agricultural field.*

Table 4. Student employment status

<b>Employment Status (n=253)</b>	
<b>Working full-time in a related field</b>	32.4%
<b>Working full-time in an unrelated field</b>	20.9%
<b>Working part-time in a related field</b>	11.1%
<b>Working part-time in an unrelated field</b>	8.0%
<b>Unpaid work in a related field</b>	5.2%
<b>Unpaid work in an unrelated field</b>	1.2%
<b>I am self-employed</b>	14.7%
<b>I am not working at this time</b>	9.5%

*\*Respondents were allowed to report multiple employment statuses so total does not equal 100%*

The TAACCCT grants were provided with trade-adjustment eligible workers in mind. According to the US Department of Labor Trade Adjustment Assistance for Workers Program Report for

Fiscal Year 2014, there were an estimated 894 TAA eligible workers out of 330,000 labor force participants in Vermont in 2014, thus the number enrolled in an Institute course represented about 0.3% of those eligible for the program.

Table 5. Student eligibility for federal programs

Student background/eligibility	
<b>TAA eligible (n=336)</b>	2.1%
<b>Pell eligible (n=336)</b>	8.9%
<b>Veteran status (n=330)</b>	4%
<b>Disability (n=302)</b>	3%
<b>1<sup>st</sup> generation college student (n=336)</b>	42%

### **Fidelity: Faculty Qualifications**

#### *Faculty Background*

Existing VTC faculty participants brought significant experience developing and teaching traditionally formatted courses as well as applied agricultural experiences and connections to the local and regional agricultural community. The course topics were very diverse, ranging from farm equipment operation, gathering wild edibles, and livestock management. Several instructors were already employed by VTC; the other six interviewees ranged from having no prior experience to considerable teaching experience at other Vermont educational institutions and leading on farm workshops before their participation in the Institute. One faculty specifically commented that they felt the blend of educators and practitioners was a real strength of the Institute program—offering students valuable opportunities to learn directly from the farmers and producers themselves.

#### *Faculty Prior Teaching Experience*

Existing VTC faculty participants brought significant experience developing and teaching traditionally formatted courses as well as applied agricultural experiences and connections to the local and regional agricultural community. The six other interviewees ranged from having no prior experience to considerable teaching experience at other Vermont educational institutions and leading on farm workshops before their participation in the Institute. One faculty specifically commented that they felt the blend of educators and practitioners was a real

strength of the Institute program—offering students valuable opportunities to learn directly from the farmers and producers themselves. Faculty members were asked to describe how they became involved with the Institute. Several faculty members were already employed by VTC, some in a teaching capacity. The other instructors are practitioners in their respective fields and had existing connections to Institute program leaders when they were asked to develop a course.



## Participant Impacts and Outcomes

### *Student Program Experience*

Nearly one third (29.6%) of the respondents indicated that they have individuals dependent on them for care. Most students indicated that the barriers “did not apply” to their personal situation, personal issues and transportation costs were noted by several students as being “significant” or “somewhat significant” challenges.

*The median distance travelled to participate in a course was 57 miles (60 minutes), while the average distance was 167 miles (89 minutes), indicating that these courses have local and regional interest.*



Table 6. Student barriers

Students reporting “very significant, significant or somewhat significant” barrier (n=234)	
<b>Personal issues</b>	7.7%
<b>Transportation costs</b>	23.5%
<b>Transportation reliability</b>	10.9%
<b>Childcare or dependent care challenges</b>	23.0%
<b>Health conditions</b>	3.4%
<b>Disability challenges</b>	2.6%

### Faculty Insights on Students

Faculty described their students as “eager to learn” and “people who wanted to be here.” While they “possessed a wide range of experience” they “were there to get specific education and knew the value of what they were getting.”

The wide range of student experience, however, meant that it was challenging to keep all students learning at the same pace. As one instructor related “if everybody was at a closer level we could have covered more, faster.” The students were willing to try whatever their instructor asked them to and “nobody ever pushed back and wouldn’t do something...they took it seriously.” However, as one instructor noted, “on the technical side it was easy, on the book side it was much more difficult.” The more traditional aspects of the program was outside of the students’ comfort, though “they still got a lot out of it.” Some students were “surprised and hadn’t thought about [biology and chemistry] since high school.”



Most faculty expect that students will put their new skills to use on an existing farm or business. “Most of them were going to go back home and work on a family farm” reported one instructor, while another described “emails from several students who had successfully [used their new skills].” The skills developed in the short courses were also of interest to “people interested in starting their own [venture].”

#### *Student Interest*

Students were presented with a list of various methods that they could have learned about the VTC Institute for Applied Agriculture and Food Systems and were able to select as many as applied to their situation. The three primary methods were through the VTC website, social media and community listserves, and relevant professional organizations such as the Northeast Organic Farming Association-Vermont and the Vermont Cheese Council.

Table 7. Students first learned of program

<b>How did you first hear of this program? (n=299)</b>	
<b>VTC Website</b>	24.7%
<b>Social Media &amp; Community Listserves</b>	16.4%
<b>Professional Organizations</b>	15.1%
<b>VTC Faculty &amp; Instructors</b>	10.4%
<b>Newspaper Publication</b>	7.0%
<b>Employers &amp; Colleagues</b>	6.0%
<b>Former VTC Student</b>	5.4%
<b>Brochures/Fliers/Posters</b>	4.7%
<b>Family &amp; Friends</b>	4.0%
<b>Current VTC Student</b>	3.3%
<b>Radio</b>	1.7%
<b>Information Session</b>	1.0%
<b>High School Guidance Counselor</b>	0.3%

Students selected their top two reasons for selecting to participate in the Institute. Gaining practical experience, the uniqueness of the program, opportunities to expand careers, and interest in starting a small business were the top four reasons. This is congruent with themes that emerged during instructor interviews regarding content and learning objectives for their courses, which included awareness, safety, practical skill development, and access to resources.

Table 8. Students' Top 2 Reasons for Choosing Program

<b>What were your top two reasons for choosing this program? (n=251)</b>	
<b>Gain practical experience in this area</b>	60.1%
<b>Unique program/curriculum</b>	37.7%
<b>Expand my career opportunities</b>	30.6%
<b>Interest in starting my own business</b>	25.5%
<b>Convenient Location</b>	10.8%
<b>VTC Faculty</b>	3.2%
<b>Classes fit in my schedule</b>	9.2%
<b>Recommendation from High School Teacher or Guidance Counselor</b>	0.4%
<b>Recommendation from current VTC student</b>	0.4%

- *Note: Students could select up to two reasons*

Students were asked to indicate if they had any of the following questions prior to enrolling in the Institute. Respondents were asked to indicate “yes, no, or does not apply” to 8 different questions and the table below shows the respondents indicating “yes” as percentage of those with valid responses. More than forty percent responded that they had questions about whether the skills they learned would help them get a job, while 39% had questions about being able to make a better wage. Having sufficient time to study was expressed a question by one quarter of respondents, and being able to afford the courses was also expressed by approximately one quarter of the respondents. When asked if their questions had been answered before beginning the program, 61.2% of the respondents replied that all of their questions were answered while 22.0% said some of their questions were answered.

Table 9. Student questions prior to enrollment

<b>Questions about the program prior to enrollment (n = 219)</b>	
<b>Will the skills I learn help me get a job?</b>	44.1%
<b>Will I be able to make a better wage?</b>	39.0%
<b>Can I afford to go back to school?</b>	24.8%
<b>Will I have enough time to study?</b>	25.0%
<b>Are my high school skills strong enough?</b>	22.5%
<b>Will I have enough time to meet new people and spend time with peers?</b>	34.0%
<b>Have I been out of school too long to be academically successful?</b>	9.3%
<b>Will the classes help me prepare to transfer to a 4-year program?</b>	5.4%

*\*Note: Respondents could select multiple questions*

Students rated a list of 15 factors as “very important, important, moderately important, slightly important, or not important” relative to how they contributed to their success as a student at VTC. The table below provides results for those responding as “very important and important” combined. Having knowledgeable faculty, access to appropriate technology, hands-on experience, helpful and approachable staff, and appropriate class sizes were the most often mentioned important factors that contributed to successful student experiences.

Table 10. Factors contributing to student success

Factors to student success (n=267)	Important	Satisfied
<b>VTC faculty are knowledgeable</b>	94.7%	93.4%
<b>Appropriate technology is available</b>	83.6%	95.5%
<b>Program requires hands-on field experiences</b>	86.6%	86.2%
<b>VTC staff are helpful and approachable</b>	87.6%	95.5%
<b>Class sizes are appropriate to be academically successful</b>	85.8%	86.5%
<b>VTC is responsive to student needs</b>	78.5%	83.0%
<b>Labs have adequate facilities</b>	70.4%	65.9%
<b>VTC administrators are responsive to student needs</b>	63.1%	58.4%
<b>Classrooms have the latest technology for me to use</b>	57.3%	64.1%
<b>Classes are academically rigorous</b>	67.0%	86.5%
<b>Peer support</b>	43.6%	62.7%
<b>Access to employment opportunities</b>	46.1%	39.8%
<b>Financial aid counselors are helpful</b>	39.2%	31.3%
<b>Opportunities to participate in extracurricular activities and VTC community</b>	21.2%	32.9%

Students also rated their satisfaction with these factors as “very satisfied, satisfied, not satisfied, and very unsatisfied”. Nearly all respondents indicated that they were very satisfied or satisfied with VTC faculty (93%) and staff members (96%) as well as the class sizes (87%). Satisfaction was also high with academic rigor (87%), hands-on experiences (86%), responsiveness to student needs (83%), and access to appropriate technology (76%).

#### *Short Course Format*

The Institute’s short course delivery format was the key innovative feature of this intervention. Students rated each of the following learning venues as to whether they would be an ideal way

to study the topic of interest to them. Students did not agree on an ideal duration for these short courses. When asked what the ideal duration of a course would be, half (52.0%) indicated several full days as their preference. Though nearly one quarter of respondents specifically indicated long weekends as an ideal time to hold classes, generally most respondents (64.0%) indicated that daytime hours were preferred. Most courses featured a blend of classroom time and practical application or skill development. One course featured more traditional academic assignments such as a research paper in addition to field-based activities. Faculty interviewees generally reported satisfaction with developing and teaching in the short course format. Faculty described finding students easy to motivate in the short course format—perhaps due to the more tangible, practical nature of the courses. Most importantly, faculty members spoke of how this format allows students a low-risk opportunity to engage in this education opportunity without making significant financial or time commitments. The intensive format allows individuals to maintain full-time positions or take advantage of other opportunities while increasing their skills. Program leadership observed that summer months were not ideal for filling courses; the highest enrollments were in classes held in early spring, late fall, and winter.

All students indicated (strongly agree and agree) that their instructors were well prepared for the class and provided hands-on learning opportunities. It is particularly noteworthy that all students strongly agreed or agreed that the instructors were competent in their respective fields. The table below illustrates the percent of students indicating that they “strongly agreed” with the following descriptions of their instructors. It should be noted that overall, students were quite satisfied with their instructors across the various courses.

*When asked if they would recommend the VTC Institute for Applied Agriculture and Food Systems to someone else interested in this field, 96.4% reported yes and 3.6% were unsure.*

Table 11. Student description of faculty

	Strongly Agree	Agree & Strongly Agree
<b>Instructors are confident in their field</b>	79.7%	97.5%
<b>Instructors are competent in their field</b>	79.8%	100.0%
<b>Instructors provide hands-on learning opportunities</b>	75.1%	93.8%
<b>Instructors are well-prepared for class</b>	68.0%	92.5%

### Faculty Feedback

Those faculty members who felt they knew enough about the program described the format as *“in theory the idea of offering multiple short course format courses is a great idea...the jury is still out.”* Similarly, *“I think it’s a great idea and a great concept that needs to grow; it needs momentum; it has the potential to really change education and maybe we can really make lifelong learning.”* In general, all faculty members were very supportive of the concept and indicated that they saw the Institute meeting needs for Vermont’s agricultural workforce.

However, the program is still new. One faculty member said *“I don’t have a lot of experience with it. I had a couple of contacts who were very professional.”* Another commented that *“this grant gave us just enough money to get everybody’s hopes up, but there’s not enough funding necessary to do follow up.”* Another faculty member commented that they have *“seen it evolve in a good direction...Continuing Ed [Continuing Education Department] needs to be adaptive.”*

One cause for optimism for the program’s sustainability is the program leadership. In the words of two different instructors, *“it’s kind of a collaborative effort and it worked well”* and *“they are willing to take risks, they are dynamic and committed to what they do.”* As the public face of the program, the director was singled out *“I find the director to be really flexible, really trusting, dynamic, full of energy, very respectful...That’s an ideal person to work with; not that he doesn’t care, but that he trusts people to do the work.”* Another staff member was described as *“incredibly responsive and responsible. Flexible but also is really clear about availability and capacity.”* Generally, faculty felt the experience was *“positive and effective [with open communication], everybody doing their best, which is pretty good.”*



Faculty feel the need in the community is there *“getting more people interested and more competent and more confident and the skills that can be utilized is a great idea.”* Both the program and course content can contribute to the Vermont economy, as related by one instructor *“If you teach people what they want to learn at the moment that they are ready to learn it, it makes a big deal. As far as agriculture in general, I think this is gonna be a great way to develop the economy ...we can create an engine that allows people to become agricultural entrepreneurs, confidence and competence.”*

### *Complementary Courses*

Faculty interviewees were asked if they expected students in their courses to need additional courses in order to make the best use of their newly developed skills. All faculty emphasized the importance of practical hands-on experience to enhance their learning. A few faculty interviewees did suggest certain pre-requisites for their courses (e.g. botany, math, science background). Several interviewees provided ideas for expanding offerings to include either more foundational or advanced courses.

Additional courses that were suggested include:

- courses for a variety of farm equipment
- driving and maintenance skills
- young stock care
- milk quality
- general herd management
- human resource management
- accounting skills
- job preparation course
- farm financial management
- farm technology skills

### *Short Course Format Advantages*

One of the innovative aspects of the Institute is the unitization of the short course format. These intensive, often two-three days in length, courses offer students a focused experience on a particular topic or skillset. Faculty interviewees generally reported satisfaction with developing and teaching in the short course format. Faculty described finding students easy to motivate in the short course format—perhaps due to the more tangible, practical nature of the courses. Many felt that they were able to deliver a lot of information in a relatively short timeframe. One faculty member efficiently summarized that, *“short courses can be more practical, based in developing practical skills.”*

Most importantly, faculty members spoke of how this format allows students a low-risk opportunity to engage in this education opportunity without making significant financial or time commitments. One faculty member summarized the format as allowing, *“students (young and old alike) afraid of making a full commitment the opportunity for a quick introduction and deliver a practical set of skills through an educated introduction.”* The intensive format allowed individuals to maintain full-time positions or take advantage of other opportunities while increasing their skills. Commenting on the advantage for VTC compared to its traditional



educational offerings, *“I think it’s fabulous because you attract non-traditional students for a mid-career correction.”*

In terms of the type of students whom faculty have to excel in this format, they discussed that it worked particularly well for more self-directed, mature adult learners. Faculty described this format as being very appealing for that type of learner, *“I think it’s appropriate for any mature learner, someone who is highly personally motivated is a good fit.”*

#### *Short Course Format Disadvantages*

The short course format does present faculty with some unique challenges. The primary instructional challenge that faculty most frequently reported relates to the time constraints, which make it critical to design these with very specific learning objectives. The ability for students, many of which have not been in a classroom environment for a significant amount of time, to absorb material was a concern. Several faculty members commented upon the challenges of aligning the short course offerings with existing institutional processes at VTC, specifically in regards to student recruitment and curriculum design. This intensive delivery mechanism led to conversations among VTC full-time faculty about standards for one credit courses. A faculty member described this as, *“TAACCCT is allowing us to explore and figure this out. Education is evolving and how we motivate students to engage needs to change. It is not a simple process to change the way the ship is moving...short courses have led to enormous amounts of discussion which is healthy in the long run.”*

One recommendation that stood out from the faculty interviews focused primarily on supporting the faculty in terms of providing best practices for teaching successful short course in this innovative format. One area that was specifically mentioned was understanding how to teach effectively in this format for all types of learners, perhaps incorporating *Universal Design for Learning* principles. This recommendation seems to be especially relevant given the diverse types of students enrolling in these courses.

#### *Meeting Program Goals*

The Institute’s funding from the Department of Labor seeks to help trade-adjusted workers develop new skills that will enable them to rejoin the workforce. The dearth of trade-adjusted workers in the state of Vermont posed a challenge for the Institute in terms of meeting this particular metric. One staff member articulated that while there was a seeming disconnect with TAA-workers given the demographics of the region, the Institute was focused on meeting the goal of delivering practical, hands-on courses with the opportunity to have students pursue master certificates in areas that agricultural employers were seeking skilled workers. Program leaders also acknowledged that their approach was “unique” when compared to other TAACCCT-funded programs developed for sectors like manufacturing and healthcare. The

Institute developed at VTC was designed to meet the needs of the state's rural workforce. One program leader reflected that, *"Vermont is very different, a small state, and the word that we keyed in was "diversified" [agriculture]. In the beginning we were thinking about certain courses and realized that people wanted to get some training and then go back to the farm to apply it right away."*

Faculty members described how they thought their course contributed towards this goal. As might be expected given the relatively small number of TAA-designated individuals in Vermont, faculty interviewees were not entirely certain of differentiating how their course specifically served TAA-workers relative to other students seeking to advance their skills. However, all faculty interviewees felt strongly that no matter the students' motivation for enrolling in the course, the students gained important knowledge and skills that would serve them well if interviewing for a position or planning their own entrepreneurial ventures. One interviewee commented that they felt, *"positive that [the Institute] could help someone move from \$0 to a higher salary."* Another interviewee described that they felt that the course demonstrated to its students that folks could make a comfortable living with the knowledge and skills gained from their course. In fact, shortly after the completion of the tractor safety course, a young person (less than 16 years of age) was hired by a local farm due to the qualifications earned through this course.

Yet another course enabled an older student to identify their interests in changing academic programs from Allied Health Sciences to a STEM degree program after discovering their interests and opportunities through the short course format. The faculty member who related this felt that the ability to gain exposure to a variety of professions in a low-risk manner (both in terms of time commitment and financial cost) was a particularly valuable aspect of the Institute. Reflecting on the body of courses offered as part of the Institute, a faculty interviewee commented, *"the courses that actually ran are extremely rooted in practical skills. And practical skills are what is needed in the workplace. We're not talking about theory but actually how to get from point A to point B. I think that is critical in the workplace."*

As far as how well the course content matches with available job opportunities, the faculty were more reluctant to agree. As one instructor summarized, *"I don't know. Finding a job in Vermont is extremely difficult. We live in a rural state with not a lot of places you can get hired. It's great if you want to work for yourself."* Faculty were pragmatic and honest in their assessment of job opportunities, with one noting that *"farming and job is a tough match and driven by passion not to make money and jobs. Definitely of a piece of the Vermont economy and ties into tourism."*

As another faculty related, *"we have to have student interest"* and some classes that might be a good match for job opportunities have been cancelled due to lack of interest. Also, there was

acknowledgement that a single short course might not be enough to qualify someone for a job in the field, but there needs to be a way to “*get people interested in the longer course [master certificate].*” As one faculty related, “*it seems like it’s part of this groundswell of food systems education and education shifting to be more flexible, rather than institutionally driven. [It] Broadens access to education, it’s not like the path of education moves in a chronological direction. It’s a good move toward education and actual community being more intertwined.*”

The biggest challenge, then, for the program seems to be attracting sufficient students to take advantage of these courses that could help them qualify for new positions. One faculty member speculated, “*I wonder about their marketing capacity and how that could be improved...if you own a business, producing products is easy, marketing is hard.*” It also seems that the utilizing partnerships (with UVM Extension, with NOFA-VT, other adjunct faculty) to offer courses has led to some success and might be leveraged for additional courses in future. As one faculty stated, “*use our names on flyers, promote those teaching the courses.*”

Table 12. Number of students enrolled, by subject area

<b>Subject Area</b>	<b># of Students</b>
<b>Meat cutting</b>	25
<b>Dairy</b>	25
<b>Welding</b>	72
<b>Brewing, Distilling, Viticulture, Hops, Grapes, Berries</b>	85
<b>Cheesemaking/Yogurt</b>	57
<b>Animal care</b>	6
<b>Business</b>	12
<b>Maple</b>	16
<b>Diversified vegetable</b>	22
<b>Wild edibles</b>	27
<b>Tractor/driving</b>	18
<b>Digester operations</b>	9
<b>Other</b>	13
<b>Total</b>	<b>387</b>

Table 13. Student characteristics

	Yes (%)	No (%)
<b>Pell Grant Eligible</b>	12.6%	88.4%
<b>TAA Eligible</b>	1.0%	99.0%
<b>Ag Family</b>	39.0%	61.0%
<b>Dependents</b>	24.7%	75.3%

Students were invited to share comments about their participation in the VTC Institute for Applied Agriculture and Food Systems. These comments summarized their experience in the Institute, and were resoundingly positive:

- *Love these courses! Keep it up!*
- *Awesome!*
- *The "Essential Principles & Practices of Cheesemaking" is an excellent in-depth overview of cheesemaking. I would love to see more of these programs for cheesemaking (different aspects, more in-depth for particular cheese varieties, root cause analysis of issues, etc...)-Would attend, in the spirit of "continuing education".*
- *It was a great experience and a good way to learn about new stuff*
- *Great course, very well presented, good mix of classroom and hands-on*
- *VTC is a nice centralized location to hold courses*
- *More grants to pay for materials*
- *I had a lot of fun, learned a great deal and hope to apply all that I learned throughout life*

Faculty were also asked to share concluding comments. Faculty indicated that the Institute is a program that fills a need in the community, has great potential, but the connection between the students and employment opportunities was still somewhat vague. Demonstrated success may help students make a commitment to the longer course commitment required for the master certificate.

In the words of the faculty instructors:

*The potential is there, but it seems like this is a book needing a next chapter...everyone got excited that we had the opportunity to teach as many people wanted to but I'm disappointed that there doesn't seem to be a mechanism to continue.*

*Based on the money [DOL] put in and what was developed, how many of the students have made this into a career? I think some of the shortcomings are that people need to make a livable wage, these people are probably stuck in that 30-50k range, which is not money you can support a family on. The lower level pay scales are why people are in the position they're in now. Get people to start their own business, new industries – I think it's a great thing – not just jobs picking lettuce. These classes are getting people thinking – how many people have started their own businesses, gotten jobs in industry – these are not just \$12-15 jobs, but they are qualified for better jobs than that.*

*Working with the state college is working with bureaucracy. If I have one big frustration, the amount of extraneous effort [required], some of it from the US DOL [some of it from VTC]. If we really want to be successful, we need improved freedoms and trusts in the delivery.*

*This program can be an important part of a larger scale effort to create sustainable jobs in Vermont, but standing alone is not enough. Creating jobs requires strategic investment.*

*Connecting students with education and ...creating shorter, stackable forms of education is the wave of the future. Apprenticeships [could be] chunked so students can get something without making long term commitment.*

*It's encouraging to see the flexibility of format with short courses, and farming and food systems with the Department of Labor. I don't know if this is already involved, but I would like support to figure out youth job training.*





## Conclusion

### Conclusion

The experiences and results of VTC's Institute for Applied Agriculture and Food Systems yielded important learning for the institution, Vermont's agricultural economy stakeholders, and the broader workforce development sector. As Vermont's technical college, VTC was already invested in agriculture through delivering both two and four-year degree programs prior to receiving the TAACCCT grant. A program leader summarized the institution's dedication to applied agriculture as, *"As a college, agriculture been a significant part of our mission for a long time and the legacy of the dairy industry in Vermont is a big part of who we are as an institution. Before even we were a technical college we were the agricultural institute and so it's a big part of the ethos of the college."*

Effective TAACCCT-funded programming in a small, rural state such as Vermont needs to address the workforce development issues that are relevant to supporting rural livelihoods. In a state with relatively few TAA-designated workers, VTC leadership viewed this grant as an opportunity to build capacity to support a vibrant rural economy as a whole, *"to provide training and educational opportunities, value-added agriculture, and commercial agriculture and commercial food systems in the state of Vermont so VTC can be an active part of workforce education and training to help drive economic development and economic independence for people who want to participate in the food system economy."* The Institute, as envisioned and as implemented, sought to enhance opportunities for improving rural livelihoods through various ways: increasing training opportunities for paid employment in agricultural ventures, increasing household economic security through homesteading or hobby operations, or increasing skills and competencies of individuals seeking to launch entrepreneurial activities.

TAACCCT funds were strategically invested to enable VTC to build "centers of excellence" that reflect the trends in Vermont's diverse agricultural economy—at a time when VTC and many other institutions of higher education across the country were in financially difficult straits. Whether building new infrastructure, acquiring modern equipment, or cultivating new partnerships, VTC's capacity was significantly enhanced to better serve the needs of the next generation of Vermont's agricultural workforce and support rural livelihoods. The following two sections highlight key lessons learned and offer main implications for future workforce development research and policy.

## *Key Lessons Learned*

### **Workforce Development for Applied Agriculture**

Insights gathered from students, faculty, and program leadership illustrate how the Institute met gaps in the agricultural training and workforce development landscape in Vermont and beyond. Using the innovative short course format that can build towards a Master's Certificate or connect students potentially to degree programs, VTC pioneered a dynamic approach that was building momentum by the end of the grant period.

Utilizing expert-practitioners from the respective fields, the Institute was well-positioned to deliver practical, hands-on learning opportunities that were directly relevant to the opportunities in Vermont's agricultural economy. One program leader characterized the experience of having faculty instructors from diverse backgrounds as, *"I think it was really wonderful for us to have those kind of professionals in their fields engaging and advising on the actual practical side on any one of these short courses because that's the brand of the college as a whole, this sort of applied technical learning...so who better to teach that than someone who's doing it professionally."* Students rated the instructors highly in terms of being a positive attribute of their experiences in the Institute and the expert-practitioner faculty model was a noted strength of the program.

### **Capacity Building**

This unique TAACCCT grant built capacity in three different dimensions at VTC: partnerships, physical infrastructure, and internal processes. As a whole, the grant offered VTC an opportunity to reflect on its role in providing workforce development as the state's technical college for those interested in applied agriculture and food systems. A leader characterized this as being a way for VTC to "reimagine" itself in Vermont's working landscape, which was particularly important as the institution was undergoing significant changes in a resource-constrained environment. The TAACCCT was a vehicle for innovation that otherwise would likely not have been possible without the significant resources from USDOL.

### *Partnerships*

Early efforts to engage industry leaders in conversations about the training needs of agricultural employers and gaps in the landscape were crucial for identifying potential areas of interest to develop short courses. The Ground Works Conference and subsequent smaller meetings with industry partners were noted by program leaders to be especially important for developing valuable partnerships for VTC as an institutional actor as well as the students. Having strong partnerships with industry as it relates to employment opportunities for students, a program leader shared, *"our mission is the career opportunity of our students and that means we need to*

*stay relevant—keeping those employer relationships fresh.*” The Institute was able to leverage these partnerships for several purposes beyond simply identifying important training gaps: recruited industry leaders as faculty instructors, visited local and regional businesses as field trips, and employers would send employees for specific training needs.” Additionally, engaging industry partners enabled those employers to recognize the value of the credentials that participants were gaining from the Institute. As an added benefit, program leaders also felt that beyond the TAACCCT-funded Institute, these partnerships also benefitted VTC’s existing degree programs in similar fields serving to reinforce VTC’s reputation as a relevant provider of technical education.

### *Physical Infrastructure*

TAACCCT funds were used to create new infrastructure and acquire new equipment as well as make improvements to existing infrastructure to support the diverse range of short courses. Significant investments made in dairy production, vegetable and fruit production, farm management, maple production, farm alternative energy, and welding. It is important to note that without TAACCCT funding it is likely that many if not all of these investments would not have happened given the financially risk-adverse climate at VTC during the grant timeframe. Furthermore, these investments were made strategically to enhance both new and existing areas of excellence more broadly at VTC. One program leader described, *“VTC was financially strapped at the time but TAACCCT really set the college up to move in many different directions. All the welding equipment is able to connect with mechanical engineering and diesel and automotive technologies. All of the [agriculture] stuff directly sits with the Diversified Agriculture program. We did greatly move the college so that it would have the ability to provide short term, on time education only focused on the things that VTC does best.”*

### *Internal processes*

The Institute, as a new approach delivering short courses compared to traditional academic programs, posed challenges related to internal processes at VTC—from student registration and hiring of expert-practitioner faculty instructors to navigating the management and compliance processes associated with large federal grants. With the relatively short timeframe for launching such an innovative program, several program leaders alluded to the challenges of establishing new processes within the institution’s pre-existing systems. The new target audience of the Institute required an adaptive approach to marketing and outreach efforts that differed from the existing student body. *“Early on, we always had...a hard time figuring out the best ways to reach perspective students who this stuff could actually really benefit them [sic], and that they would want to do if they somehow knew about it.”* Additionally, the financial challenges that reduced and affected human resources in units across the campus were a challenge as well as program leadership had to create processes with doing more with less



resources. For example, because the student participants were not receiving credit for the short courses, the Institute program staff handled registration and hiring of faculty instructors. In retrospect, numerous program leaders acknowledged that the Continuing Education Department would have the more efficient unit to handle such matters.

One member of the program leadership team felt the effort in implementing the Institute has positioned VTC to continue with this innovative programming; *“we’ve created a better set-up here at VTC for offering this type of education as well as developing infrastructure here that will benefit students for years to come.”* Procurement was another area that program leaders invested time in communication with USDOL to ensure compliance with grant requirements. There were some challenges noted with the how long it could take to make equipment purchases leading to some frustrations with having not having all new equipment in place for certain courses to take full advantage earlier in the Institute’s offerings. One program leader summarized the experience as, *“we have definitely experienced some stresses and difficulty trying to adapt to what USDOL required but the adaptations were necessary and positive. They will be lasting changes.”*

### **Short Course Format**

The Institute’s intensive, often two-three days in length, short courses offered students a focused experience on a particular topic or skillset. Program leaders experimented with different types of formats for the short courses and found students preferred, *“a shorter period of time as most of them, they’re working...so for them to take three weeks off is a little bit challenging. So in general, the shorter the course. The better...as long as you could fully cover all the information necessary.”* One finding that was somewhat unexpected was the relatively low number of students completing master’s certificates. There was some debate as to whether this was due to lack of available financial aid or whether it reflected the interests of the students to *“get what they needed and use it immediately”*. Perhaps with more time and more targeted outreach to employers to develop a cost-share mechanism the number of master’s certificates would have been greater.

Students overwhelmingly reported high satisfaction with the short courses with more than 95% of participants said they would recommend taking an Institute short course to someone else. Faculty interviewees also generally reported satisfaction with developing and teaching in the short course format. Faculty described finding students easy to motivate in the short course format—perhaps due to the more tangible, practical nature of the courses. Having access to low-cost, practical and highly specified training opportunities was seen by students, faculty, and VTC program leadership as a way for students to explore a potential path without committing to a full degree program yet gain more formal experience than a typical internship or apprenticeship may provide.

One program leader described the approach as, *“we created for ourselves, for potential instructors and potential students, a place to get started, a place to find the first course so we were essentially an aggregator of expertise... and that’s highly transportable because we’ve done in a small, module format.”* VTC as an institution was able to experiment with developing expertise and capacity in new areas with relatively low risk compared to launched a traditional two or four-year program. However, institutions of higher education interested in exploring such a model should be cautious about how offering such courses may require different internal processes. Faculty may also benefit from professional development opportunities to package their material into the intensive format to ensure maximum student learning.

### **Sustainability**

With the end of TAACCCT-funding, sustainability of the Institute emerged as a critical concern amongst students, faculty, and program leaders. At the close of the grant, a clear vision was lacking for how the Institute and the short course format despite mostly positive perspectives regarding the value of such training opportunities and strong fit with VTC’s larger organizational mission and ethos. Given a resource-constrained environment and uncertainty at the institutional level, there are questions about how VTC will be able to continue this innovative model. A program leader described this as, *“It’s not knowing what’s going to be sustainable over time, so it’s sort of the question of, ‘is the college going to be able to keep up its commitment to innovative programs and sustain that’...that uncertainty is a challenge.”* Program leaders involved in the closeout period suggested that sustainability be incorporated into planning much earlier in the grant timeframe than during the six-month closeout process. One program leader expressed that three years, *“is such a little amount of time to really create something that is moving and going. Need to focus on sustainability early on and sustainability of the positions of those working under the grant for the future so that when the grant ends it’s not hard to know how the college will it take on staff and programming.”* At the time of completing this report, there was discussion about creating one staff position in the VTC Continuing Education Department to continue portions of the Institute’s activities going forward.

One partnership opportunity that may have been underutilized could be direct partnerships with area employers who need trained workers. There was some limited success in this, as one program leader described that *“Grafton Cheese sent workers for training programs to benefit their existing businesses. Distilling courses sent numerous.”* For long term sustainability of these courses, forging these sorts of ongoing partnerships with industry, not only to inform the curricula, teach the courses, but to also send their current workers, VTC would be able to continue to invest in delivery of existing courses and development of new ones.

## *Main Implications for Future Research*

### **Potential of “Just in Time” Training & Education Opportunities**

Given the overall positive experiences reported by students, faculty, and other stakeholders with the short courses delivered by the Institute, there seems to be significant reason to better understand how this innovative approach may continue to be used in agricultural workforce development. Program leaders were emphatic in their beliefs that this approach could be applied across the country and the potential to have a considerable impact on rural economies particularly in the applied agricultural and food systems realm. One such leader explained it as, *“many of these topics could go to Iowa and do the same thing. I think there’s tremendous impact for the economy and for lot of these [agriculture-related] industries. And I believe that food, in general, is limitless, I mean there could be a successful brewery in every town. Successful yogurt, cheese and bread makers, and welding fabricator shops.”* This model also can be used to cultivate stronger connections between institutions of higher education and agricultural employers as a synergistic opportunity to build more capacity within this important sector.

### **Agricultural Workforce Development**

The existing literature focused on supporting new farmers’ highlights strategies that provide students with practical learning opportunities and the ability to develop partnerships with industry leaders. The Institute as implemented at VTC functioned well in these regards, drawing students from a variety of backgrounds and interests in the food system to provide them with hands-on learning guided by expert-practitioner instructors. Program leadership at VTC recognized that agricultural workforce development functions differently than traditional workforce development for manufacturing. One program leader said, *“I think the [agricultural] industry is meaningfully different enough than technology or manufacturing. You’re going to always have a mix of students in [agriculture] who are who are self-interested and I think that’s a harder market to start from scratch with.”*

There is anecdotal evidence of the impacts on the Vermont labor force, but with so many students planning to work in their own entrepreneurial ventures, it is challenging for current labor data to tell the whole story. Further, many farm operations are not treated as “employers” in the traditional sense, and so their workers may not be reflected in existing labor force data. Wages may not reflect improvements in quality of life. This area represents an area for future research that would provide information to guide other workforce development programs that may focus on entrepreneurship, along with job skills.

## Preparing for Entrepreneurship & Rural Livelihoods

Another area for future research is the study of entrepreneurship and rural livelihoods, and particularly the skills needed in both of those pursuits. *“In Vermont there’s so much of the economy that is under the radar for lack of a better description. There are people that have their jobs and they get their benefits and they have their employer but there’s all this stuff they do outside of that...and so an interesting piece of that, my view, is also the cost avoidance of purchased food...it’s an interesting economic impact that’s valuable to someone who’s on the margins.”*

Conducting research to better understand the role of rural livelihoods and entrepreneurs in the economy of a small town or small state would provide evidence for making investments to support the parts of the economy that will make a difference to that individual and their community. By helping someone pursue a rural livelihood, or start their own venture, they have more than just a job. *“If somebody comes out and has the skills and inspiration to pursue their own business venture, whether it’s their primary source of income or an insularly one I think that’s an economic positive for that individual and it’s a strong thing for the state of Vermont because it keeps more of the landscape open and allows someone to be economically independent in a rural area which is really tough to do right now.”* However, currently, the role of these pursuits in the economy is not well understood, and particularly, what skills would be needed and what the likely outcomes would be if educational opportunities were available to obtain those skills.



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# Appendix

Appendix A: Evaluation Logic Model.

## VTC TAACCT Evaluation Logic Model

	Inputs	Throughputs	Outputs/ Process Outcomes	Outcomes	Impacts
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>Current campus</li> <li>Current faculty</li> </ul>	<ul style="list-style-type: none"> <li>Project staff hired</li> </ul>	<ul style="list-style-type: none"> <li>Implementation plan for VTC food processing facility</li> <li>Implementation plan for food hub</li> </ul>	<ul style="list-style-type: none"> <li>Food hub facility available</li> <li>Food processing facility available</li> </ul>	<ul style="list-style-type: none"> <li>New opportunities/resources for Vermont agriculture, waste and energy businesses</li> <li>New jobs in agriculture, waste and energy enterprises</li> </ul>
<b>Curricula</b>	<ul style="list-style-type: none"> <li>Experienced faculty/staff</li> </ul>	<ul style="list-style-type: none"> <li>Appoint Advisory Board</li> <li>Business partnerships established</li> <li>Cooperative education partner curriculum workshops</li> <li>Course maps created</li> </ul>	<ul style="list-style-type: none"> <li>Establish proposed curriculum</li> <li>Faculty contract policy defined</li> <li>Pathways developed to AA and BA degree programs</li> </ul>	<ul style="list-style-type: none"> <li>Curriculum in place for each program</li> <li>Instructors assigned to each course</li> <li>Courses delivered</li> </ul>	<ul style="list-style-type: none"> <li>Student retention</li> <li>Path to higher education (2 yr/4 yr degree)</li> <li>Job placement</li> </ul>
<b>Recruitment</b>	<ul style="list-style-type: none"> <li>VT DOL</li> <li>VTC</li> </ul>	<ul style="list-style-type: none"> <li>1<sup>st</sup> and 2<sup>nd</sup> cohort identified</li> </ul>	<ul style="list-style-type: none"> <li>Articulation agreements implemented</li> </ul>	<ul style="list-style-type: none"> <li>75 1<sup>st</sup> cohort enrolled</li> <li>75 2<sup>nd</sup> cohort enrolled</li> </ul>	<ul style="list-style-type: none"> <li>Better skilled workforce</li> </ul>
<b>Retention</b>	<ul style="list-style-type: none"> <li>Student services</li> </ul>	<ul style="list-style-type: none"> <li>Life credits assigned to 1<sup>st</sup> &amp; 2<sup>nd</sup> cohort</li> <li>Career readiness remediation</li> <li>Higher education pathway counseling</li> <li>Training partnerships activated</li> </ul>	<ul style="list-style-type: none"> <li>Cooperative training available</li> <li>Summer Institutes</li> </ul>	<ul style="list-style-type: none"> <li>Cohorts complete training and certification</li> <li>Semester completion rates/success</li> <li>Fall to fall retention</li> <li>Degree completion rate</li> </ul>	<ul style="list-style-type: none"> <li>Better skilled workforce</li> <li>Path to higher education</li> </ul>
<b>Placement</b>	<ul style="list-style-type: none"> <li>Career services</li> <li>VT DOL</li> </ul>	<ul style="list-style-type: none"> <li>Participation of industry</li> <li>Develop internship sites</li> </ul>	<ul style="list-style-type: none"> <li>Internship sites established</li> <li># of industry partners</li> <li># of articulation partners</li> <li>Career services</li> </ul>	<ul style="list-style-type: none"> <li>Participants apply for employment</li> <li>Participants placed</li> </ul>	<ul style="list-style-type: none"> <li>Lower unemployment for targeted workers and in target sectors</li> <li>Skilled workers for agriculture, waste and energy employers</li> </ul>