



Growing Maine

Final TAACCCT Grant Evaluation Report

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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

Kennebec Valley Community College (KVCC) received a \$2.5 million grant from the United States Department of Labor to support its “Growing Maine” project to develop degree and certificate programs in Sustainable Agriculture and Culinary Arts. The Sustainable Agriculture program has completed its second year, while the Culinary Arts program has completed its first year. Data was collected through course evaluations and student information. Qualitative interviews and focus groups were conducted with key stakeholders including program staff, faculty, students, and advisory board members.

This final evaluation report presents findings from a variety of sources related to the implementation of the Sustainable Agriculture and Culinary Arts programs 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 KVCC 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. 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, KVCC leadership and student surveys:

- Were the capacity building investments made?
- Were the capital improvements made available to students?
- Were KVCC 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 feedback data were provided by KVCC at the completion of grant funding. Interviews were conducted with faculty members and program leadership members 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

TAACCCT grant funding was used to leverage and enhance additional funding enabled the acquisition of the Alford Campus in nearby Hinckley, ME—just ten minutes from the central KVCC campus in Fairfield, ME. As one program leader articulated, “*the TAACCCT grant was used to equip the new assets at the Alford campus.*” For example, while the philanthropic gift was used to purchase the farm, the TAACCCT grant was used to purchase key equipment to support farm operations. The TAACCCT grant was also used to equip the culinary teaching classrooms with commercial kitchen necessities. KVCC leadership envisions a physical space to engage the broader community. As a Community College, KVCC has a mission to serve the whole community and they are navigating with community input how to bring the farm and the culinary facilities (and products) to the broader community.

Implementation Steps

The grant enabled the hiring of a Program Manager, a Farm Manager, and two faculty positions to support the development and implementation of both programs.

Partnerships

Perhaps the strongest evidence of this investment is the sustained enthusiasm shared by the members of the respective Advisory Boards. A program leader reported, *“people are engaged, excited, they know we’re here. They’re spreading the word about us, they’re kind of publicizing information for us, which is great because they see the value in it.”* A member of the Sustainable Agriculture Advisory Board commented, *“some of these people have been with us since we even envisioned having a program so before this grant, and so I think that they have seen this whole thing from just a thought to actually having students graduating this year.”*

Program Fidelity

The Culinary Arts and Sustainable Agriculture programs brought new courses to the KVCC in addition to courses that are taught as part of existing programs at KVCC. The courses developed as part of the TAACCCT grant for each program’s curriculum were intentionally designed to include three main programmatic goals: innovative use of technology, problem-based learning, and alternative delivery methods. These original goals evolved over the course of the three years for both programs.

Operational Strengths & Weaknesses

Providing students with exposure and experience with innovative technology was an important goal in both programs. Faculty members also described how the importance of students having appropriate technology that would mirror what they would be likely to encounter in a range of work environments.

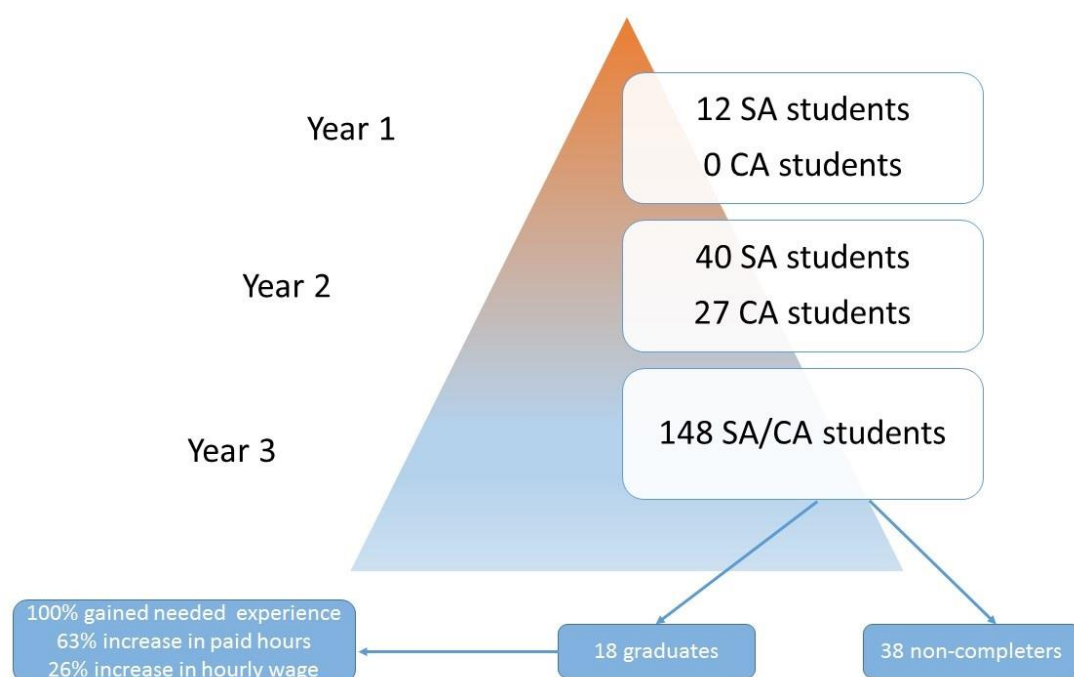
Problem-based learning provided a pedagogical approach to curriculum for both the Culinary Arts and Sustainable Agriculture programs which seemed like a natural fit. Program staff from both Culinary Arts and Sustainable Agriculture programs participated in a two-part problem-based learning workshop led by consultants from the New England Board of Higher Education held in November 2014 and March 2015. They strongly believed in the value of teaching students through applied problem-based learning prior to the workshop, *“my whole curriculum is already problem-based learning; here’s a chicken, go do something with it. It’s not new, I’ve been doing problem-based learning my whole career”* and, *“I do it already in the classroom and I had done multiple problems with the class just in lab or in the classroom. Farming is full of problems that need solutions so that’s what we talk about a lot and I just chose one of the issues that we talked about and wrote it up in their format.”*

This third goal of alternative delivery has room for growth; program leaders shared aspirations for developing online content and short courses but recognized that it was difficult to work on alternative delivery methods while developing and implementing new programs to begin with.

4. Participant Impacts and Outcomes

Key Impacts and Outcomes

Figure 1. Diagram of Outcomes for KVCC Growing Maine 2-year Degree Programs



Important Limitations

It was noted by students, faculty and administrators that some of the equipment purchases and other infrastructure decisions were made without full support or consultation with all involved. Some of these investments met with criticism from program management, faculty and students. For example, some equipment was beyond the needs of the programs and occasionally some considered them “wasteful” or “beyond practical” investments.

Most of these decisions came early in the grant, when roles and responsibilities were not clearly established and communication protocols were still emerging. In some cases, the short-term concerns were addressed over the course of the grant, and in most cases, it was

constructive criticism of how decisions or investments could have been made better or could be made better in future.

5. Conclusions

The Growing Maine program has proven to be a highly beneficial asset not only for Farm to Table education within KVCC's Sustainable Agriculture and Culinary Arts degree programs but to local businesses and industry, the rural Maine workforce, and the community. This would not have been possible without the significant investments made possible by the TAACCCT II grant.

Key Lessons

Despite some initial challenges, the infrastructure, curriculum, and personnel investments that were made possible by the TAACCCT grant have positioned *Growing Maine* to continue to support the delivery of Farm-to-Table education as well as positively impact workforce development and economic growth in the greater geographic region. The TAACCCT funds were, *"Money well spent... this is a community that needs help, there needs to be some economic stimulus and this is a traditionally agriculturally rich area. I think that we can capitalize on that with a whole new generation of farmers that think a little bit more holistically."*

Main Implications

Workforce development programs take time to show impact. Even with the best training, entry into a new career often means starting at the bottom of the ladder. Longitudinal research into the size and profitability of the agricultural and food production sectors, as well as what lessons graduates put most to use, could show the real impact of the TAACCCT II grants on the individuals who participated and the local economies.



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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 opportunities¹. 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.

Farm to Plate Movement in Maine

Maine's agricultural economy has experienced a resurgence in recent years as the farm-to-table

movement has infused new energy into rural economies. A 2015 report from the Harvard Kennedy School found that the state's food and beverage industry cluster is a large employer and has the potential for growth with over 21,000 Maine residents employed in farming, food processing, fishing and aquaculture while another approximately 29,000 residents work in local food industry businesses such as restaurants and grocery stores. To promote growth in this arena, the Maine Food Strategy Framework (2016) is

Table 1. Maine Food Strategy Framework Goals (2016)

Goal 1: Global and in-state market share of foods farmed, fished, foraged, and/or processed in Maine show measureable annual increases
Goal 2: Improve the ability of businesses across the food production supply chain to manage growth and change in the marketplace
Goal 3: Improve incomes and benefits
Goal 4: State and local policies are supportive of farms, fisheries, and other food supply chain businesses
Goal 5: Food insecure individuals and communities in Maine have access to resources that address their needs

¹ 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>

based on the Collective Impact model engages organizations from across sectors in defining a shared agenda, measures, and priority areas for action in terms of how to position the state to create a healthy, productive, and viable food system. This group of organization and institutions has identified five goals as a path forward for growing Maine’s food system—which includes training and education sub-goals to develop a stronger Farm-to-Table workforce.



Growing Maine at KVCC

“The Center for Farm-to-Table Innovation at KVCC educates students in sustainable food production, processing and preparation and serves as a resource to support local food systems.”

Mission Statement, 2014

Intervention Description and Activities

Kennebec Valley Community College (KVCC) received a \$2.5 million grant from the United States Department of Labor to support its “Growing Maine” project to develop degree and certificate programs in the areas of Sustainable Agriculture and Culinary Arts. These two programs address a critical gap in educational offerings for individuals interested in pursuing employment in the growing “farm to table” industry in Maine. Since their launch, 227 students have participated in Culinary Arts and Sustainable Agriculture two-year degree programs. Eighteen students have completed while 92 are still retained in their programs as November 2016.

The 2013-2014 academic year saw the launching of the Sustainable Agriculture program—welcoming 12 students in its first cohort. These students were drawn to the program for a variety of reasons including desires to become entrepreneurs and homesteaders, in addition to being traditionally employed in the regional agricultural industry. The value and need for such a program in the KVCC region was reiterated in conversations with a range of stakeholders. In the initial year several classes received “excellent” ratings and students spoke highly of courses and instructors. As would be expected in any new program, some challenges were encountered that were sources of frustration to students and other stakeholders. Most of these challenges stemmed from communication difficulties and staffing transitions.

The 2014-2015 academic year saw the launch of the Culinary Arts program in January 2015, enrolling a full cohort of students from a variety of backgrounds and interests in the culinary field. A new full-time faculty member developed the curriculum and oversaw the outfitting of the new culinary teaching facilities. Advisory Boards for both programs were active in facilitating community connections and informing curriculum decisions as well as advocating for the importance of both programs in the regional food system. Additionally, program leadership was stabilized and students reported experiencing effective support from faculty and staff members. The final year of grant support during the 2015-2016 academic year brought new

cohorts of students for each of the programs. Program leadership continued to develop community connections and faculty members refined curricula.

In addition to developing these academic programs, KVCC acquired an ideal property to house both programs in close proximity to its main campus through a generous donation from the Harold Alfond Foundation. Construction of the KVCC Farm and state-of-the-art culinary teaching facilities began during the 2013-2014 academic year and continued in the 2014-2015 academic year. The third and final year of TAACCT-supported activities during the 2015-2016 academic year focused on equipping the newly constructed and renovated facilities.

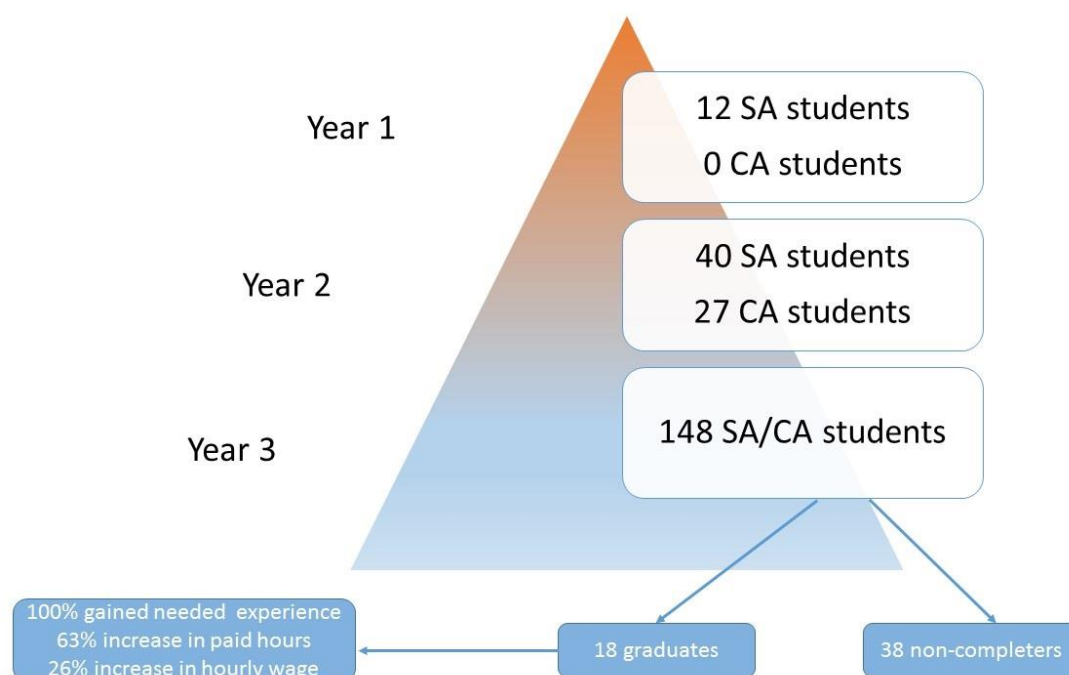


Figure 1. Growing Maine Program at Kennebec Valley Community College.

About the Programs

Both the Culinary Arts and Sustainable Agriculture programs fill important niches in educational opportunities to support Maine's growing "farm to table" industry. In fact, KVCC offers the state's only two-year Associates degree program for Sustainable Agriculture. Prior to this program, an on-farm apprenticeship or a four-year degree program were the only post-secondary options for developing new agricultural professionals. KVCC's Culinary Arts program is well-positioned to be a leader in promoting farm to table dining in the New England region.

The curricula developed for both the Culinary Arts and Sustainable Agriculture programs have been intentionally designed to provide students with a solid knowledge base within their

respective fields while engaging them in real world problem-solving and exposing them to professional pathways. The learning objectives included in the course syllabi reflect these elements as knowledge, application, and exposure are critical to student success. Hands-on learning through lab-based sessions and experiential opportunities are woven into courses within both programs. Table 2 presents the expected outcomes for each of the programs upon completion. The programs of study for each program can be found in the Appendix.

Table 2. Expected outcomes for KVCC's Culinary Arts and Sustainable Agriculture Programs.

Culinary Arts Outcomes	Sustainable Agriculture Outcomes
Demonstrate the ability to work in a professional kitchen as a cook.	Possess the knowledge and skills necessary for a successful career in agriculture.
Apply the concepts and techniques of sanitation to a food service environment.	Identify, develop, and practice traditional and alternative agricultural methods.
Demonstrate the use of proper purchasing, storage, and costing techniques to profitably operate a food service establishment.	Use technical and learned knowledge to collaborate and solve complex agricultural problems.
Participate in activities that support a sustainable food system	Demonstrate effective communication skills.

Population served

The average age of students in the Growing Maine program was 30 years, with just over half of the students being women. Consistent with the overall demographics of the state, 96% of the students in the program were White/Caucasian. Most of the students were eligible for Pell grants, though just 5% were eligible for trade adjustment assistance.

Table 3. Demographic description of Growing Maine students, n=148

	Number	Percent
Male	70	47%
Female	78	53%
White	142	96%
Hispanic/Latino	1	<1%
Asian	1	<1%
More than 1 race	4	3%
Pell grant eligible	98	66%
Trade Adjustment Assistance eligible	8	5%
Disability	15	10%
Average age	30 years	

Building capacity: Partnerships with Stakeholders

The Growing Maine program has been well served by its Advisory Committees. These Committees provide a connection with businesses and organizations in the community. It allows for strategic input from external stakeholders. Some of these partners have included local farms and farmers, Johnny's Seeds, local hospital food service, Maine Grain Alliance, MOGFA, among others.

Building capacity: Student participants

Twelve percent of the total student participants have graduated from their program of study, while one in four did not complete their program. A sizable minority were enrolled part-time.

Table 4. Student participants in Growing Maine, n=148

	Number	Percent
Enrolled full-time	89	60%
Enrolled part-time	59	40%
Program graduates	18	12%
Current participants	92	62%
Non-completers	38	26%
Total credit hours completed	2858	--

Evaluation Design

Evaluation design

Goals of evaluation

To evaluate the KVCC implementation of the Department of Labor TAACCCT Round 2 grant, the Center for Rural Studies at the University of Vermont collected qualitative and quantitative data from students enrolled in both degree programs as well as stakeholders, including members of the advisory committee, faculty members, and program staff members (Table 1). The Institutional Review Board at the University of Vermont granted approval of research protocols prior to all data collection and analysis efforts.

Table 5. Summary of data collection methods and audiences

	Course Feedback	Institutional Data	Student Survey	Discussion Group/Key Informant Interview
Sustainable agriculture students/graduates	x	x	x	x
Culinary arts students/graduates	x	x	x	x
KVCC faculty				x
KVCC administrators				x
Advisory committee members				x

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 feedback data were provided by KVCC at the completion of grant funding. Interviews were conducted with 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.



Implementation Findings

Implementation findings

How grant increased capacity

Building Capacity: Infrastructure and Equipment Investments

TAACCCT grant funding was used to leverage and enhance additional funding enabled the acquisition of the Alford Campus in nearby Hinckley, ME—just ten minutes from the central KVCC campus in Fairfield, ME. A \$10.85 million gift from the Harold Alford Foundation in 2012 purchased the 600-acre campus that was formerly the private Good Will-Hinckley School. The property also contained the 120-acre Good Will-Hinckley Farm. As one program leader articulated, *“the TAACCCT grant was used to equip the new assets at the Alford campus.”* For example, while the philanthropic gift was used to purchase the farm, the TAACCCT grant was used to purchase key equipment to support farm operations. Similarly, the TAACCCT grant was also used to equip the culinary teaching classrooms with commercial kitchen necessities. However, some of the equipment purchases and other infrastructure decisions met with criticism from program management, faculty and students. For example, some equipment was beyond the needs of the programs and occasionally some considered them “wasteful” or “beyond practical” investments.

While the proximal beneficiaries of these investments are the students who are enrolled in the Sustainable Agriculture or Culinary Arts programs, KVCC leadership envisions a physical space to engage the broader community. As a Community College, KVCC has a mission to serve the whole community and they are navigating with community input how to bring the farm and the culinary facilities (and products) to the broader community.

The KVCC Farm

The KVCC Farm is a critical asset to both the Sustainable Agriculture and Culinary Arts Programs. At the time KVCC acquired the Alford Campus, the farm was in much need of improvements. The TAACCCT grant has supported various improvements at the Farm including but not limited to: farm equipment purchases including a farm tractor and vegetable production tractor

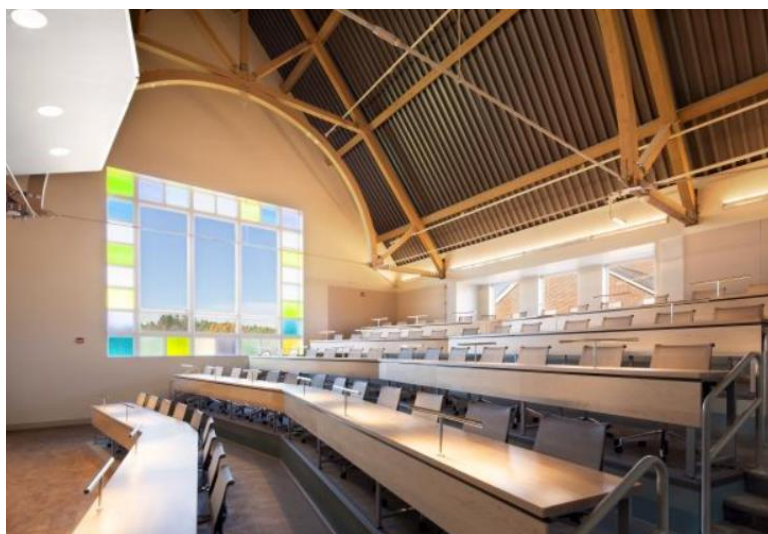
implements, high tunnel greenhouse construction, and fencing. These funds blended with the initial large gift have enabled the farm to become, over the past three years, a distinctive feature of the two programs. The Portland Press Herald described this distinction as, “*the first community college to have its own certified organic farm and a two-degree program in sustainable agriculture*” ([Goad, 2015](#)). Over the course of the grant period, the farm has undergone a transformation and has been further integrated into the curricula of both programs. Program leaders described how the role of the farm as a teaching facility is integrated into the agriculture courses so students understand the learning objectives related to all farm experiences within their coursework.



Photo Credit: KVCC Center for Farm to Table Innovation

Alfond Campus Teaching Facilities

The teaching facilities constructed in 2013 at the Alfond Campus that house the Culinary Arts and Sustainable Agriculture programs are significant investments in KVCC’s capacity for supporting a vibrant food system. Two new buildings, the Averill Building and the KVCC Center for Science and Agriculture incorporate technology to improve teaching and learning experiences. The large lecture hall in



the Science and Agriculture building features multiple smart boards, multiple screens, and whiteboard walls to facilitate engaged learning in an impressive atmosphere. Smart boards and online course technology such as Blackboard help students who may have to miss classes for

personal or family reasons. Additionally, the two academic programs incorporate technology specific to their respective fields to expose students to the newest and most common technology in the field. Students and faculty alike in both programs emphasized the balance between incorporating exposure to high-end, innovative technology as well as simple, low-cost technology that local farms and kitchens are likely to have.

Culinary Arts Teaching Facilities

The teaching kitchen in the Averill Building features new kitchen technology along with the technical capability to facilitate long distance online instruction or demonstration. The kitchen is well-stocked with an impressive collection of commercial kitchen appliances and utensils. As is fairly typical with most infrastructure investments, the kitchen



facilities initially had some challenges getting set up, most notably some unexpected challenges installing the gas tanks to fuel the cooking facilities which unfortunately interrupted planned curriculum in the first year of the program's operations. By the 2015-2016 academic year, the facilities were much improved with the support of the TAACCCT funds making possible critical equipment purchases and improvements to workflow. Students in the Culinary Arts program will continue to benefit from the TAACCCT investments in these facilities beyond the grant period.

TAACCCT grant funding was used to leverage and enhance additional funding enabled the acquisition of the Alford Campus in nearby Hinckley, ME—just ten minutes from the central KVCC campus in Fairfield, ME. A \$10.85 million gift from the Harold Alford Foundation in 2012 purchased the 600-acre campus that was formerly the private Good Will-Hinckley School. The property also contained the 120-acre Good Will-Hinckley Farm. As one program leader articulated, *"the TAACCCT grant was used to equip the new assets at the Alford campus."* For example, while the philanthropic gift was used to purchase the farm, the TAACCCT grant was used to purchase key equipment to support farm operations. Similarly, the TAACCCT grant was also used to equip the culinary teaching classrooms with commercial kitchen necessities.

Steps taken to create and run the program

Building Capacity: Program Leadership & Faculty Development

The grant enabled the hiring of a Program Manager, a Farm Manager, and two faculty positions to support the development and implementation of both programs. Over the three years of TAACCCT funding, there were several staff transitions in the roles of Program Manager, Farm Manager, and the Sustainable Agriculture faculty position. While the changes at the time were difficult, the programs have continued to improve as a result. The departure of the initial Program Manager during the first year of the grant enabled the hiring of the Program Manager who brought organization and relationship-building to this pivotal position. The Farm Manager role has evolved from initially being an operations-focused position to a more hybrid operations and education-focused position—reflecting the transformation of the KVCC Farm’s mission. The Sustainable Agriculture faculty position has also undergone several transitions. Students in the first cohort were emotionally affected by the initial transition due to miscommunications and frustrations with a perceived lack of transparency. Stability in this position is important moving forward to provide steady leadership for the program.

The Culinary Arts program was started a year after the Sustainable Agriculture program and perhaps as a result did not experience the same turnover in staff. One full-time and one part-time faculty member were hired for the Culinary Arts program and both are considered to be invaluable to the program.

Building Capacity: Internal Processes and Controls

The Growing Maine program met with several challenges within the realm of internal organization at the infrastructure and beginning planning stages. These were most intense at the beginning of the grant period and many have been overcome. For the Sustainable Agriculture program, one of these included the lack of a clear infrastructure implementation and budget spending timeline, causing there to be delays in construction or installation of various aspects or equipment at, or for, the farm laboratory. This phenomenon also extended to the Culinary Arts program, as the gas for stoves was not available before students were in the classroom. The Culinary program did have the advantage of starting a year later than the Sustainable Agriculture program. This allowed for more planning and less interruption due to essential equipment readiness and less program staff turnover.

Some of the other holistic internal challenges that had a trickle-down effect from the start of the grant include lack of a shared vision, and communication challenges regarding roles and responsibility. Grant-funded programs often experience challenges getting started, as the time between application and approval, and the uncertainty of funding often means that staffing

availability may have changed. These issues had some trickle-down effects that can be seen by the lack of clear timelines budgetarily and infrastructure- and implementation-wise.

When looking at the financial sustainability side there was a perceived lack of guidance as to the shared vision for the future. There was a quick buildup of infrastructure and personnel and then dropped on program staff to continue. KVCC leadership encouraged program staff and faculty to figure out how to make these two programs financially sound instead of implementing a plan or planning committee to assist with this.

The consensus from program leaders was that almost all of these internal challenges could have been, or can be, addressed with more time spent on planning and mapping out timelines for everything from infrastructure installation to budgets and personnel. Personnel could benefit from a clearer plan for post-grant leadership, financial sustainability, and program direction.

Important partnerships

Building Capacity: Partnerships with Industry & Organizational Leaders

There is strong community investment in both the Culinary Arts and Sustainable Agriculture programs. Perhaps the strongest evidence of this investment is the sustained enthusiasm shared by the members of the respective Advisory Boards. A program leader reported, *“people are engaged, excited, they know we’re here. They’re spreading the word about us, they’re kind of publicizing information for us, which is great because they see the value in it.”* A member of the Sustainable Agriculture Advisory Board commented, *“some of these people have been with us since we even envisioned having a program so before this grant, and so I think that they have seen this whole thing from just a thought to actually having students graduating this year.”* The Advisory Boards have identified important skills that agriculture and food industry employers are looking for in the workplace, ranging from the latest food safety and integrated pest management protocols to marketing and critical thinking skills. Advisory board member participation was increased during the 2014-2015 academic year compared to the first year. A program staff member summarized, *“Our advisory board members are very involved. They want to know what we’re doing, they want to keep up, they want to be involved in some of the decision-making...People are engaged, excited, they know we’re here. They’re spreading the word about us.”*

KVCC program staff have been regularly participating in the Maine Agricultural Council to provide monthly updates about the program to regional and statewide agricultural stakeholders from industry, state agencies, and non-profit organizations. A staff member commented that, *“It’s been a little easier going with the ag community just because I think they’re engaged and we’re a little more embedded now. With the culinary [program] we’re trying still to drag them along to meetings but I think that will change and the interest is coming*

now...People are very interested and excited to hear what we're doing, typically chatting with people after at length about what we're doing at the farm. It's how I've engaged a lot of people to come speak." Additionally, program leadership and faculty members have developed strong connections with regional employers (such as Johnny's Seeds and the regional hospital), University of Maine Extension, Maine Grain Alliance, and Maine Organic Farmers and Growers Association. These valuable partnerships keep program leaders aware of regional employment trends and needs of area employers while also providing direct linkages for students to potential employers.

With the completion of the new facilities at the Alford Campus, KVCC has invited community stakeholders to use the new lecture hall and strives to make this campus part of the fabric of the regional agricultural community. One program member described this opportunity as follows, *"There's a whole lot of agricultural kinds of things that go on that maybe they'll start having them here. That will be good for us because then that will give us a good interface between adult organizations in the agricultural community and the students."* The sharing of these campus facilities for hosting community events is an effective strategy for engaging stakeholders and even promoting its programs to potential students in the greater region and beyond.

Program Implementation Fidelity, Strengths and Weaknesses

Fidelity: Original Curriculum Goals

The Culinary Arts and Sustainable Agriculture programs brought new courses to the KVCC in addition to courses that are taught as part of existing programs at KVCC. The courses developed as part of the TAACCCT grant for each program's curriculum were intentionally designed to include three main programmatic goals: innovative use of technology, problem-based learning, and alternative delivery methods. These original goals evolved over the course of the three years for both programs.

- **Innovative use of technology**—Providing students with exposure and experience with innovative technology was an important goal in both programs. Faculty members also described how the importance of students having appropriate technology that would mirror what they would be likely to encounter in a range of work environments.

The Culinary Arts program sought to ensure that students have mastered foundational skills before using more advanced technology or tools as, *"in our industry if you're too busy using technology that means you don't have the skills to use your own hands and your own knives."* There is an intentional progression guiding how the students use technology in their cooking. One student commented, *"you start with the basics, and as*

time goes on you get to play with better, more expensive things.” The students appreciate that they are exposed to a variety of kitchen technology. One student expressed gaining confidence in her job prospects, “with the items we have it should make us well-rounded and be able to use everything from the fryers and stoves to the salamander, so when you do get into industry you have the experience in every section.”

The Sustainable Agriculture program incorporates innovative technology in the students’ learning experiences in the classroom and at the KVCC Farm. Students continue to have exposure to technology such as Vernier soil probes and GIS mapping. One student commented that they would like to have further exposure to these tools, *“it would be cool to do that [GIS] or to see how it might run, like if you were on a big farm, say up north? And drone technology, what’s going on with that?”* Another student commented they find great value in having hands-on experiences with different technology at the farm to inform their own decision-making processes, *“I actually purchased the same equipment that we use here for the rotational pasture for my farm. I have the solar charger, the exact one here from the same company because I saw that I was like, ‘That’s awesome, that’s what I want.’”*

One program member feels that the diversity of student experience levels requires a thoughtful approach to integrating agricultural technology summarized, *“as far as technology goes, I think we’re still kind of at the basics. We have such a diverse student population, some come in who already have a farm or are pretty close to having a farm, and then some come in who, their experience with livestock is, they have a cat.”* As the farm facility continues to be improved, Sustainable Agriculture students will have increased access to agricultural technologies such as high tunnels and greenhouses. A program staff member described the new additions at the farm as being innovative and provide a firsthand opportunity for students to gain experience, *“Out at the farm one area that we’re growing in, our rolling high tunnels. They’re certainly not new but new to a lot of people. That’s a relatively innovative technology that we’re sharing with students. Our greenhouse is fairly state-of-the-art with a lot of different systems that people can pick and choose if they were to start their own thing, we’re kind of showing them the whole gamut and makes a really nice space to work in. They can see what their options are and see how the technology in the greenhouse operates, and what it costs and all of that.”*

- **Problem-based learning**—This pedagogical approach to curriculum for both the Culinary Arts and Sustainable Agriculture programs seemed like a natural fit. Program staff from both Culinary Arts and Sustainable Agriculture programs participated in a two-part

problem-based learning workshop led by consultants from the New England Board of Higher Education held in November 2014 and March 2015. They strongly believed in the value of teaching students through applied problem-based learning prior to the workshop, *“my whole curriculum is already problem-based learning; here’s a chicken, go do something with it. It’s not new, I’ve been doing problem-based learning my whole career”* and, *“I do it already in the classroom and I had done multiple problems with the class just in lab or in the classroom. Farming is full of problems that need solutions so that’s what we talk about a lot and I just chose one of the issues that we talked about and wrote it up in their format.”* Some felt that the formal approach used in the workshops was not especially valuable or effective, *“our students tend to be hands-on oriented anyway and that’s sort of what our program requires so problem-based learning is a natural fit for the program and we don’t need to put a label on it and jump through the hoop of writing it up.”* Still some found the preparation of the workshop documentation to be a useful process in organizing their teaching materials, *“if I were to present these problems again I’d have more materials I could hand out to these students now...and it’s a maybe more polished lesson than I gave the first time around so that’s a positive.”*

Students reported mixed results about the “problem-based learning activities” created through the workshop during the 2015-2016 academic year. Students noted that some of the activities felt artificial compared to the more organic problem-based learning that they encounter in “everyday” situations in the kitchen or on the farm. For example, one student commented that *“we’ve had to build our facilities in the barn but I think that they could give that to one of the classes to try to redesign the inside of that barn and actually let them design the inside of that barn.”* Students suggested taking a more pragmatic approach to problem-based learning by developing their inquiry skills, *“we could have more exposure to things and more exposure to situations where we might—you know, I have this situation, where do I go? Who do I call? Where do I get the information?”*

Moving forward, program leaders indicated that while hands-on, problem-based learning remains an important facet of the curricula, they are seeking opportunities for more “organic” problem-based learning—whether on the farm or in the kitchen. For example, a program leader described wanting to develop a project-based final for the farm infrastructure course where students select a property to visit in real life with the *“expectation that they will take all these parts: how to contact utility companies, and read tax code and start creating a vision and a plan for a farm they will actually want to*

manage...to give a picture of the possibilities of how a piece of property could be used as agricultural business.”

- **Alternative delivery methods**—Culinary Arts and Sustainable Agriculture are dynamic fields to be offering coursework given the rise of the farm-to-table movement locally, regionally, and beyond the KVCC campus. Incorporating alternative delivery methods of content could potentially broaden the reach of the programs—whether within the traditional classroom, supplementing classroom experiences or reaching new audiences beyond matriculated students.

The Culinary Arts program currently has 1.5 FTE faculty members; alternative delivery methods via the innovative technology would allow students to learn from a variety of professionals through guest cooking demonstrations or guest speakers via Skype. A student remarked, *“I think it would be good to have other chefs in other fields come in and teach us specialty things. When we get into sushi, which is next semester, to have somebody come in who works at a sushi restaurant and knows the techniques to actually come in and show us the different ways of doing it, and what works the best and fastest. Just to give us those different skills. I’m sure Chef has her experiences with it, but to see somebody that does this for a living and not just once a year.”*

Program members have reservations about moving cooking courses online given the hands-on nature of the subject and the lack of experience gained from working alongside others in a kitchen setting. One member commented, *“some courses that would lend itself very well to an online format with discussions so there probably will be some components that you can do that with, but some of them they just need to be in the classroom sharing with each other.”* In addition, there was some concern expressed that making courses available online would conflict with efforts to increase enrollment.

Sustainable Agriculture students remarked that webinars would be a valuable addition to their learning at the KVCC Farm. Specifically integrating guest speakers via webinars in the KVCC Farm to Table Innovation Center’s classroom was identified as another method for expanding learning opportunities. A student commented, *“webinars would be fantastic and that new lecture hall is the most perfect learning environment I’ve ever been in—we’ve only been in there once. If we could utilize a space like that, not only to have classes there physically but to incorporate webinars so the instructors actually filmed during the class, so that people that missed the class can dial in or look at it later.”* With the considerable infrastructure and technological improvements at the

Alfond Campus, the opportunity is there to take full advantage of various alternative delivery methods that could extend students' learning beyond the KVCC facilities.

This third goal has room for growth; program leaders shared aspirations for developing online content and short courses but recognized that it was difficult to work on alternative delivery methods while developing and implementing new programs to begin with.

Fidelity: Student Participants

Background and Qualifications

In the original Sustainable Agriculture cohort, student interests were focused on homesteading endeavors and entrepreneurship. In subsequent cohorts of both programs, half of students are looking to continue onto further education and these students have come from a variety of previous experiences. Some of the students have been looking for career changes, one student was a military veteran.

Other students have sought to increase their formal education to complement their existing professional experience, such as one young entrepreneurial student who already had a 2-acre cucurbit (cucumber) production operation and was considering expanding another 2-acres in strawberry and asparagus. In addition, there have been several cross-over students studying both culinary and sustainable agriculture. Some dual enrollment high school student. One student was laid off from an unrelated field.

However, many had challenges with adequate preparedness for some of the more traditional academics including math and English, and some were not prepared for the academic rigors required. A certificate program is being approved that would help give students not ready, or interested, in a two-year degree the opportunity to gain the same workforce-ready skills without going through the requirements for a two-year degree, such as math and English.

Student Recruitment

Over the course of the grant period, program leadership experimented with a variety of recruitment methods beyond the typical admissions process for the college as a whole. Each program has their own pages on the KVCC website and there is a "Center for Farm-to-Table



Innovation at Kennebec Valley Community College” Facebook page that has been fairly active, promoting events, students in action, and relevant news stories.

For the Sustainable Agriculture program, personal connections proved to be the most valuable recruiting tool. Fifteen to twenty percent of the second cohort was connected to the first cohort either by way of family, friends and acquaintances, community connections, or other positive word of mouth regarding the program according to one program leader. For the Culinary Arts program, traditional recruitment techniques used by the Admissions department yielded plenty of participants. Additionally, program faculty and students promoted the program at regional cooking competitions and trade shows.

It should be noted that the Culinary Arts program has limited capacity for enrollment and that program leaders from both programs agree that there is likely an ideal number of students per cohort that satisfies financial sustainability while remaining small enough to maximize student educational opportunity. As is the case with many state and/or community colleges, limited budgets affect the extent of marketing. For both programs, industry-specific trade shows were a fairly low-cost but effective method of recruitment.

Participant Impacts and Outcomes

Student Program Experience

A student survey was conducted and the following info is based on those survey results. 100 percent of respondents were graduates of the program. 83% of program completers surveyed stated that the program met or exceeded their original expectations. The top three reasons that students chose either the Sustainable Agriculture or Culinary Arts programs at KVCC were: Topic of Study, Educational Affordability and Proximity to Home. As one Sustainable Agriculture graduate related, *“It was a new program at KVCC and it's close to home. When I met the instructor...[they] seemed well versed and ready for this awesome experience.”* A Culinary Arts graduate shared that, *“I think the farm to table aspect was amazing. The program was a great study and very insightful. I'm glad that I took the program due to what it has taught me and prepared me for.”*

As the table of hours and wages shows, however, program graduates have not always experienced an increase in hourly wages. As has been noted by program staff and faculty, many Sustainable Agriculture students are motivated by a desire for entrepreneurship, self-employment or self-sufficiency, not by an hourly wage. Though even with a decrease in hourly wage, the graduates still experienced an increase in gross wages, as a result of working more hours. Average income for respondents for FY 2015 was \$15,166.

Table 6. Student Employment Averages

Student Employment Averages: Hours & Wages			
Description	Sust. Ag. n=5	Cul. Arts n=2	Overall n=7
Avg. hours per week employed, at time of enrollment	14	15	14.3
Avg. hours per week employed, after program completion	22	27	23.4
Avg. hourly wage, at time of enrollment (\$)	4	5	4.3
Avg. hourly wage, after program completion (\$)	2.6	9.5	5.4

Graduates all agree that they gained the experience they needed in the Growing Maine program. Most also agreed that the curriculum, instructors and staff met their needs.

Table 7. Student Satisfaction

Student Satisfaction with Program of Study Post Graduation (%) n=7			
Statement	Somewhat/ Strongly Agree	Neither Agree/Disagree	Somewhat/ Strongly Disagree
Program curriculum met my needs	71.4	14.2	14.2
Instructor met my needs	85.7	0	14.2
Program staff met my needs	83.3	0	16.6
I learned what I needed	85.7	0	14.2
I gained experience that I needed	100	0	0

Most graduates engaged in some type of work for experience while they were enrolled in the Growing Maine program. Internships were the most common work experience. Some students also took advantage of employer connections through KVCC.

Tables 8 & 9. Student Participation in Work for Experience and Career Placement Activities.

Work for Experience While Enrolled (%)		Student Participation in Career Placement or Job Search Activities at KVCC (%)	
Internship (paid or unpaid)	57	Resume/cover letter writing	0
Apprenticeship	0	Internship	43
Unpaid Labor	0	Job search databases	0
Paid Labor	14	Interview skills	0
No work for experience	29	Alumni connections	0
		Employer connections	29
		None	28

Student Readiness

The Growing Maine Program provides an essential stepping stone for most program participants. It gives them a baseline education in their course of study, but also acts as a springboard for their future endeavors whether that is entrepreneurship, further education, or workforce readiness. As one program leader summarized in regard to the Sustainable Agriculture program, *“Students are prepared to figure it out...prepared to be thinkers, and to not necessarily know everything but be able to figure it out, and that also means utilizing community networks to solve a problem.”*

Even the initial infrastructure challenges provided an opportunity. Program leaders were able to integrate some of the initial infrastructure challenges into problem solving lessons for students that emulated real-world situations. For culinary students, this included last minute menu improvising when gas for stoves wasn’t available or there was a crop failure that limited the supply of a particular ingredient.

The small, close knit nature of both the Agriculture and Culinary cohorts provides opportunity for essential interpersonal and professional skills development. This extends to how to bridge the farm to table gap between food ethics and budgets. According to one program leader students are forced to answer, *“How do we take our ideals out into the real world where...whoever is paying the bill is your boss and you need to do what you’re told but there needs to be a critical thinking piece on how to close loop between what you [the student] learned and what is in reality out in the working world.”*

Students are living the farm to table experience as they learn their curriculum. As one program leader described *“American regional, French Cuisine class, and International cuisine classes, we’re still doing Central Maine food in an international style using local ingredients as opposed to buying food from France.”* And in another example of how the two programs do more than just co-exist, *“Not only farm to table but we are table to farm, so our gourmet garbage goes back to the farm as compost or pig feed.”*



Student Interest

Upon entry into the Sustainable Agriculture program many students' interests were focused on homesteading endeavors rather than agriculture as a business. Nearing the end of program, roughly half of students were looking to continue onto further education. Others want to pursue entrepreneurship, work in the field or industry, or specialize in a particular area of agriculture.

In a post-graduation student survey that was conducted, students were asked: Which of the following paths are/were you most interested in pursuing after completing your program of study? The following table shows that the majority of students, post-graduation now have entrepreneurial interests. Faculty members also described especially the Sustainable Agriculture students as having entrepreneurial interests.

Table 10. Student Post-Graduation Aspirations

Student Aspirations Post-Graduation (%), (n=7)	
Operate your own small business	71.4
Operate your own homestead or in home kitchen	14.2
Full-time employment in the field	14.2

Meeting Program Goals

The following graphs were derived from course feedback from year 3 of the TAACCCT Grant. There was a total of 278 responses, 80.9% from the Culinary Arts program, 19.1% of responses came from Sustainable Agriculture participants. Of total respondents, 39.9% were in their first year of the program and 65.1% were in their second year of study. Overall, the course feedback data reflect students having positive experiences in their coursework within the Culinary Arts and Sustainable Agriculture programs.

Table 11. KVCC Course Feedback Findings

KVCC Student Course Feedback for Culinary Arts & Sustainable Agriculture Programs (n=278)			
Statement	Strongly Agree (%)	Agree (%)	Not Sure (%)
Would recommend this course	52.7	42.2	5.1
Syllabus clearly stated Course Objectives, Grading, & Course Requirements	51.1	43.5	5.4
Course Content was consistent with Course Objectives	47.1	45.7	7.2
Course Content was presented in a manner that helped student learn	47.3	47.3	5.4
Instructor's in-class explanations helped clarify course material	54.7	40.3	5
Course was well organized	40.3	50.3	9.4
Course activities & assignments helped student learn	45.1	49.5	5.5
Textbook/course materials contributed to student understanding of the course	41.3	51.8	6.9
Course improved my understanding of concepts in this field	43.7	49.7	7.2

Table 12. Overall Course Ratings

Overall Course Rating by KVCC Sustainable Agriculture & Culinary Arts Students (%) (n=278)		
Excellent	Good	Poor
51.8	40.3	7.9



Conclusions

Conclusion

TAACCCT funds enabled KVCC to create two new programs that reflect the trends in Maine’s resurging agricultural economy and Farm-to-Table movement—filling important niches in the region’s educational offerings. Whether building new infrastructure, acquiring modern equipment, or cultivating new partnerships, KVCC’s capacity was significantly enhanced to better serve the needs of the next generation of Maine’s agricultural and culinary workforce to support a more sustainable food system and boost 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 Farm to Table

The Growing Maine program has proven to be a highly beneficial asset not only for Farm to Table education within KVCC’s Sustainable Agriculture and Culinary Arts degree programs but to local businesses and industry, the rural Maine workforce, and the community. This would not have been possible without the significant investments made possible by the TAACCCT II grant.

Despite some initial challenges, the infrastructure, curriculum, and personnel investments that were made possible by the TAACCCT grant have positioned *Growing Maine* to continue to support the delivery of Farm-to-Table education as well as positively impact workforce development and economic growth in the greater geographic region. One program leader, referencing the Culinary Arts cohort, stated that, *“Students have a better grasp on sustainability than most culinary students would... There is a disconnect between our guests and their food but we are seeing less of that [disconnect].”* According to another program leader, the TAACCCT funds were, *“Money well spent... this is a community that needs help, there needs to be some economic stimulus and this is a traditionally agriculturally rich area. I think that we can capitalize on that with a whole new generation of farmers that think a little bit more holistically.”*

Capacity Building

Partnerships

The accomplishments of the Growing Maine program can be furthered by continuing to build and foster strategic partnerships with other institutions of higher learning, industry businesses and organizations, as well as various community groups. Those groups extend to both internal and external to KVCC and the regional community and include faculty, staff, and students.

Physical Infrastructure

The hands-on, experiential delivery method of the *Growing Maine* program makes innovative and appropriate technology and facilities integral to delivering high quality Farm-to-Table education. Without the TAACCCT grant, financing the physical infrastructure component would have proven to be cost prohibitive or forced the upgrades to be implemented over the course of a much longer amount of time. One program leader referred to the value that the grant has offered KVCC and the greater rural Maine community, *“If it weren’t for the grant... this program would absolutely not be here.”*

Internal processes

There is great opportunity for students’ holistic understanding of the start to finish process by which their food, and the food served to their customers, is produced, processed, and prepared by continuing to build synergies where possible between the Sustainable Agriculture and Culinary Arts programs. There is also opportunity and need for refinement of the mission of the KVCC Farm in terms of its role or purpose in regard to education versus production. It will be beneficial to both students and program staff and faculty for clarity of that mission.

Sustainability

With the close of the TAACCCT II grant, KVCC had to strategically plan for the reduction in external funds in order to continue building and sustaining these programs that have been shown to meet community needs. Stakeholders were united in their view that the two programs provide a much-needed educational opportunity, in the right place at the right time. As there is uncertainty about the programs’ long-term futures, several sustainability strategies emerged in the stakeholder discussions:

- Draw upon expertise and networks of Advisory Board members to identify other external funding sources to support both programs;

- Consider entrepreneurial/fee-for-service activities to generate additional funds that complement the hands-on learning aspects of the programs without entering into direct competition with local and regional producers; potential of partnering with industry leaders to create customized training programs for their employees;
- Continue marketing, promotion and student recruitment activities to increase enrollment in both programs; emphasize unique synergies that exist between programs.

Main Implications for Future Research

Workforce development programs take time to show impact. Even with the best training, entry into a new career often means starting at the bottom of the ladder. Longitudinal research into the size and profitability of the agricultural and food production sectors, as well as what lessons graduates put most to use, could show the real impact of the TAACCCT II grants on the individuals who participated and the local economies.

Agricultural and Culinary Workforce Development

An agricultural workforce that is knowledgeable about sustainable practices may be key to growth in the agricultural sector. As the last generation of farmers retires, young farmers are needed. These farmers may need to use innovative methods to differentiate themselves and to make a profit, especially with the high cost of land acquisition likely meaning that they have a high breakeven point.

Future research could show the connection between the Growing Maine curriculum and future agricultural business practices. The curriculum and infrastructure investments were both informed by what the agricultural and food service communities believed to be needed for future workforce. However, with such innovative curricular offerings, future research could show what learning was applied in the workforce and what learning proved less relevant to the next generation of food production.

Preparing for Entrepreneurship & Rural Livelihoods

In a rural economy, especially, small businesses and entrepreneurial ventures are critical to a healthy economy. While the TAACCCT II grant was primarily interested in increasing wages and employment, the *Growing Maine* program attracted many students who sought tools and resources to develop their own enterprise. Future research could consider the question not just of how wages may have changed in the agriculture and food production sectors, but also how

the number of establishments and/or size of the sector has changed since the first cohorts graduated.

Appendix

Appendix A. Culinary Arts Program of Study

The Culinary Arts program offers students an Associate in Applied Science Degree for a total of 67 credits:

First Semester:

- CUL 101: Introduction to Culinary Arts
- CUL 111: Food Safety and Sanitation
- CUL 121: Culinary Arts I
- FYE 125: First Year Seminar
- MAT 113: Elements of Mathematics

Second Semester:

- COM 105: Interpersonal Communication
- CUL 122: Culinary Arts II
- CUL 132: Food and Beverage Purchasing
- ENG 101: College Composition
- _____: Social Science Elective

Summer Semester:

- CUL 200: Culinary Externship

Third Semester:

- CUL 201: Sustainable Food Systems
- CUL 221: Garde Manger
- CUL 231: Classical Cuisine
- _____: Humanities Elective

Fourth Semester:

- CUL 236: Dining Room Operations
- CUL 232: International Cuisine
- CUL 242: Food Service Management
- FSN 211: Human Nutrition
- _____: Arts/Humanities/Social Services Electives

Appendix

Appendix B. Sustainable Agriculture Program of Study

The Sustainable Agriculture program offers students an Associate in Applied Science Degree for a total of 64 credits:

First Semester:

- AGR 101: Principles of Sustainable Agriculture
- BIO 107: Animal Science
- BIO 108: Plant Science
- ENG 101: College Composition
- FYE 125: First Year Seminar

Second Semester:

- AGR 110: Soil Science
- AGR 112: Pest Management
- COM 104: Introduction to Communication OR COM 105: Interpersonal Communication
- MAT 114: Technical Math

Summer Semester:

- AGR 116: Basic Farm Maintenance
- AGR 124: Summer Internship

Third Semester:

- ACC 111: Principles of Accounting I
- AGR 221: Advanced Crop Production
- AGR 225: Farm Infrastructure
- BUS 115: Principles of Management
- _____: Social Sciences Elective

Fourth Semester:

- AGR 230: Sustainable Livestock Management
- BUS 232: Agricultural Marketing
- BUS 234: Agribusiness
- _____: Humanities Elective

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