

TAACCCT

Building Illinois' Bio-Economy (BIB) Consortium

Final Evaluation Report

9-30-2018



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Executive Summary

TAACCCT Program/Intervention Description and Activities

This report describes the activities that occurred during the implementation of the Building Illinois' Bio-economy (BIB) consortium, a Round 4 TAACCCT grant funded by the United States Department of Labor (USDOL). BIB is comprised of five higher education institutions: Lewis and Clark Community College (L&C) in Godfrey, Lincoln Land Community College (LLCC) in Springfield, Carl Sandburg College (CSC) in Galesburg, Southeastern Illinois College (SIC) in Harrisburg, and Southern Illinois University Edwardsville (SIUE). The consortium was established to build the workforce for the bio-economy in the south-central part of Illinois. Targeted training programs and career pathways are in the areas of Bioprocessing, Biofuels Technology, Water Management, Restorative Ecology, and Agricultural Watershed Management. Some new programs were created, but largely existing programs were redesigned to better serve students including veterans and TAA eligible workers. Over 40 certificate and degree programs were expected to enroll a targeted 1,316 unique participants.

The consortium has adopted five programmatic or interventional strategies:

- 1) Accelerate credential completion through the use of Prior Learning Assessment and redesigned developmental education instruction.
- 2) Implement new models of instruction to improve student learning and completion.
- 3) Strengthen on-line and technology enabled learning.
- 4) Increase student persistence and completion through student supports.
- 5) Increase employer engagement.

Strategy 1: Accelerate credential completion. BIB colleges will adopt a more standardized, comprehensive approach to Prior Learning Assessment (PLA) through a partnership with the Council for Adult and Experiential Learning (CAEL). New approaches to basic skills instruction will be employed including directly enrolling underprepared students in college level classes with basic skills support provided via tutoring, and imbedding basic skills instruction into college level classes, using the IBEST model. Figure 1 depicts the logic model for Strategy 1.

Strategy 2: Implement new models of instruction. This includes applied hands on learning; internships; competency-based learning; and career pathways, the sequencing and stacking of education and training credentials to align with industry job needs and career ladders. Figure 2 depicts the logic model for Strategy 2.

Strategy 3: Strengthen online and technology enabled learning. Simulations and game design will be used as instructional tools in on-line and hybrid classes which will be included in the curricula of targeted training programs. Figure 2 depicts the logic model for Strategy 3.

Strategy 4: Increase student persistence and completion through student supports. Key features include rolling enrollment, and the incorporation of various approaches for providing intrusive student support services. BIB colleges will make deliberate connections with local WIB and workforce centers to help recruit students (especially TAA eligible workers) and connect students to important workforce center resources that can support their learning and transition into employment. The use of innovative technology, the Student Success Portal (SSP), will be used to better track students, provide early alerts when students need help (particularly academically), and coordinate the provision of the various support services available to students both academic and non-academic. BIB colleges will have access to

EMSI's Career Coach tool, which connects students to updated information about careers and jobs, including job openings, so that students can not only make better choices about careers but be better supported to get a job after graduation. Figure 2 depicts the logic model for Strategy 4.

Strategy 5: Increase employer engagement. This strategy supports the other four strategies, as it the mechanism by which education and training can be better aligned with industry needs to better serve both businesses and students. Employers provide invaluable input into course curriculum content and credentials needed. Employers provide internships and other opportunities to learn through working, and job and career opportunities. The BIB colleges intend to work with Corporation for a Skilled Workforce (CSW) to build new and deepen existing employer relationships within the bio-economy sector in Illinois. Figure 3 depicts the logic model for Strategy 5.

Evaluation Design Summary

Goals of the Evaluation

- The implementation evaluation has two overall goals: (1) to assess fidelity to the original proposal's intent, and (2) to identify factors affecting outcomes.
- The primary goal of the Impact Evaluation was to determine the impacts of the targeted training programs at the participating BIB consortium colleges on participant certificate completion, credit attainment, and job attainment and retention.

Implementation Study Design

1. Implementation Research Questions: Broadly, the implementation evaluation sought the following:
 - What is being implemented, and how is it theorized to drive impacts?
 - Has implementation occurred on time and as intended?
 - Is there fidelity to the model? When variation exists, is it effective and consistent with project outcomes?
 - What activities and factors affect the effectiveness of the project?
 - What contributions did each of the partners and other key stakeholders make.
2. Conceptual framework of implementation study: The implementation evaluation is organized around the conceptual framework depicted in the logic models below.
3. Conceptual framework informs the analysis: Inquiries were organized to investigate key topics depicted in the logic models. These include program design models, employer engagement, and college benefits and sustainability.
4. Implementation data and methods: Evaluation activities involved communicating with local project staff and instructors, students, and/or employers and included: (1) interviews, (2) focus groups, (3) surveys, and (4) on-site visits. Assessment of progress measures or benchmarks required in the original grant proposal or established BIB consortium leadership are embedded in the activities.
5. Measurement of capacity: Capacity was defined in terms of new capabilities at the BIB consortium colleges to educate or train students and meet the needs of employers. Additionally, capacity considered new or deepened relationships developed resulting from sector partnerships.

Impact Study Design

1. Impact Analysis Research Questions: The outcomes/impact research questions incorporate the DOL reporting requirements for the Annual Performance Report. For each question listed, we are comparing grant participants in the BIB consortium-affected programs of study to comparison group individuals:

- a. How many unique participants/comparisons have been served?
 - b. How many individuals have completed a grant/comparison program of study?
 - i. Of those, how many are incumbent workers?
 - c. How many individuals are still retained in their program of study (or other grant-funded program)?
 - d. How many individuals are retained in other education programs?
 - e. How many credit hours have been completed?
 - i. How many students have completed credit hours?
 - f. How many credentials have been earned by participants/ comparisons?
 - i. How many students have earned certificates (<1 year)?
 - ii. How many students have earned certificates (>1 year)?
 - iii. How many students have earned degrees?
 - g. How many students are pursuing further education after program of study completion?
 - h. How many participants/comparisons are employed after program of study completion?
 - i. How many participants/ comparisons are retained in employment for three quarters after program of study completion?
 - j. What are the wages of participants/ comparisons relative to before enrollment?
 - i. How many of those employed at enrollment received a wage increase post-enrollment?
2. Design Methodology: A random-assignment research design was impractical for the proposed program. Randomly assigning students to either a treatment or control group is resource-intensive and would jeopardize the successful implementation of the programs. Thus, a quasi-experimental approach was deemed the most practical way to assess the impacts of the intervention. The evaluation was constructed by collecting and analyzing data for each grant-affected program of the BIB consortium colleges. In addition, each grant-affected program was compared to a similar comparison program, which ran in parallel to the grant-affected program during the grant period. Comparability of the comparison program to the grant program is based on similarities in program structure (such as department, credit/non-credit status, and program size and duration) and student demographics (such as race, gender, and age). In addition, to account for remaining dissimilarity between participants and comparison individuals, propensity score methodology is used to refine the estimates of the treatment effects.
3. Data Used and Its Reliability: Data comes from different sources:
- a. College Student Information System:
 - i. On an ongoing basis, BIB colleges submitted data on their students, including information such as completions.
 - ii. Once per student, BIB colleges submitted data on their students that did not change over time, such as gender, race, and date of birth.
 - b. Post-Completion Surveys were distributed to participants after completion of a grant-affected program inquiring about changes in employment and wages pre-, during, and post-program completion.
 - c. Employment and wage information was collected from the state wage agency, the Illinois Department of Employment Security.

Data was collected from each source as it became available on a rolling basis. BIB consortium colleges collected data on participant and comparison individuals two times per year – once in the fall reflecting the previous summer and spring terms, once in the spring reflecting the previous fall term. State wage data was collected as needed and encompass the quarters that are available from the state agency at

the time of the data pull. The data included in this report has been collected based on research questions referenced above. The data is considered reliable. College data is part of the ongoing business of an institution of higher learning, and given the relatively simple nature of the college data required, this data also is considered reliable. Lastly, there is no reason to believe there are systematic inaccuracies in state wage data.

Implementation Findings

What is being implemented and how is it theorized to drive impacts?

The BIB consortium was designed to address several identified workforce gaps: 1) lack of bio-economy industry input in skills, curriculum and career pathways, 2) the region's education system not being able to meet the industry's needs for skills, curriculum and career pathways, and 3) improve student success in available bio-economy training programs through new instructional strategies. To address these gaps, the BIB consortium created some new training programs and modified other programs to address the aforementioned gaps. To drive completion of training programs by participants and help completers enter employment in the bio-economy industry, several strategies were employed by BIB consortium colleges: prior learning assessment; remedial instruction redesign; employer engagement, hands-on learning and internships; on-line instruction; student supports. Logic models of the strategies are provided below and offer more details on how these strategies are theorized to drive impact to address the project's identified gaps.

Did implementation occur on time and as intended?

Implementation largely occurred as expected without delays. There were some delays reported with regard to training program creation or modification that required institutional and Illinois Community College Board (ICCB) approval. Such approvals took considerable time, delaying the availability of certain targeted training programs for project participants.

Despite some delays, in the end implementation occurred mostly as intended. Colleges accomplished aligning training program curriculum with bio-economy employer demands by using a sector strategy. The colleges expanded their local employer partnerships and leveraged these partnerships in the curriculum building process to create a strong pipeline between education and jobs. The grant allowed the colleges to create new courses or otherwise change the curriculum for existing programs and add certificate programs depending on the institution to meet bio-economy industry workforce needs.

Is there fidelity to the model?

In the process of developing training programs to better meet the needs of bio-economy employers, the colleges largely followed the strategies outlined in the project proposal. The colleges reported adopting a more comprehensive approach to PLA, allowing for more opportunities to earn credit for prior experience and increase student completion rates. The colleges developed contextualized instruction or other new approaches to help underprepared students build basic skills, but not all colleges engaged in these activities. Expansion and development of new work-based learning opportunities was a consortium-wide priority. All colleges indicated efforts to establish and strengthen partnerships with local businesses around new internships and project-based learning opportunities. These activities relied on and strengthened the sector strategy that was a key component of the project.

Colleges purchased new updated equipment, and hired more faculty and staff to deliver the targeted training programs. A common usage of grant funds for technology were for the purchase of new technical equipment and the incorporation of online coursework. All five colleges (Carl Sandburg, Lewis & Clark, Lincoln Land, Southeastern Illinois, and Southern Illinois University- Edwardsville) were offering

online or hybrid classes, in many cases, and the flexible hours of online and hybrid courses are enabling working students to complete programs based on their own schedules.

All of these curricular changes, made the targeted training programs of the BIB consortium better aligned with bio-economy industry worker skill needs, and expanded student access to these training opportunities especially for adults and other targeted participant populations.

In terms of student support services, the colleges did not indicate any new student support services being implemented, although the Student Success Portal and Career Coach technologies were utilized to support student success and facilitate job placement. Many of the project student support strategies were already being implemented at the colleges prior to the project.

Factors affecting project success and lessons learned.

Each college faced different implementation challenges. Some shared challenges among some colleges were low student enrollment and delayed implementation.

For some programs, the workplace contextualized curricula were helpful for some students, but may have resulted in low student enrollment. This came from the fact that for some students their geographical location had a small job market in the targeted field, and thus students with limits on relocating knowingly were subject to less job opportunities after graduation.

Many of the program coordinators found that three grant years was not long enough for developing and implementing new programs. Adding new curriculum took two years because it required several processes to go through the Illinois Community College Board, therefore some programs were not ready for marketing until the program was finally approved. This contributed to lower student enrollment if the programs were approved late into the academic year. There was shared sentiment among all colleges that an extra year would have allowed for significant student enrollments allowing the participants to exceed student enrollment numbers.

Some of the program coordinators and instructors suggested that providing instructors and staff with more opportunities for professional development symposia or workshops at the beginning of the grant would have been helpful. Areas identified as needing support included, how to initiate new partnerships, how to engage with partners at the beginning of the grant, learning how to utilize resources, and understanding and meeting reporting guidelines.

Finally, one college struggled with project staff turnover that affected project implementation and outcomes for the institution.

Contributions of Business and Other Partners

The goals for both colleges and business partners for this grant were increasing students' skills to make them strong candidates as employees, filling the skills gap, and making programs responsive to current job trends in the field. To achieve these goals, the business partners were deeply engaged with the curriculum modification process, and delivering the programs to students. Business partners advised on updating curriculum, purchasing new equipment, and providing internship opportunities, site visits, and donating equipment. They also invited the colleges to larger scale meetings and introduced the programs to other industry partners. The business partners were also very active in sending the colleges new job openings, and updated skill requirement information for new employees. As one of the program coordinators emphasized, the business partners also have listened to the instructors' feedback

regarding current student's nature, qualifications, and limitations, which helped employers to understand the new employees' skills and other needs for the working environment. Respectively, the business partnerships impacted positively student outcomes. Students reported that the programs they participated in were highly useful, and highlighted how the class activities and their jobs or internship experience were closely connected. The majority of the students agreed that the program provided strong skill sets and background for non-experienced students. Partnerships with local workforce investment boards and workforce centers were improved under the project. In some cases workforce center staff worked on college campuses to coordinate services for participants including career coaching and job placement services. Workforce centers also helped market BIB consortium training programs and even participated in program curricular modifications. Colleges reported these partnerships were a positive experience of the project and expect collaborations to continue.

Participant Impacts & Outcomes

The impact research questions are based on the DOL reporting requirements for the annual performance report. Given the limitations in data availability some questions were answerable to a greater or lesser extent. Here are direct answers to the questions posed in the evaluation plan. Further analysis is included in the Impact Evaluation section later in the report.

1. How many unique participants have been served?
In total, 1,231 individuals were served by the grant.
2. How many individuals have completed a grant program of study?
 - a. Of those, how many are incumbent workers?
Over the course of the grant, 815 participants completed a grant-affected program of study (609 of whom were incumbent workers). The completion rate for participants was generally similar to, or greater than, the completion rate for comparison individuals on a program-by-program basis.
3. How many individuals are still retained in their program of study (or other grant-funded program)?
222 participants were still continuing with their grant-affected program of study at the completion of the grant.
4. How many individuals are retained in other education programs?
7 participants were retained in other education programs.
5. How many credit hours have been completed?
 - a. How many students have completed credit hours?
In total, 11,446.5 credit hours were completed by 666 participants. Other participants engaged in non-credit programs.
6. How many credentials have been earned by participants/ comparisons?
 - a. How many students have earned certificates (<1 year)?
 - b. How many students have earned certificates (>1 year)?
 - c. How many students have earned degrees?
Participants earned 908 certificates or degrees over the course of the grant. 506 students earned short-term certificates, 66 earned long-term certificates, and 292 earned degrees.
7. How many students are pursuing further education after program of study completion?
Information on post-completion and employment and wage information are included in a separate "Employment Results" report.
8. How many participants are employed after program of study completion?

Information on post-completion and employment and wage information are included in a separate “Employment Results” report.

9. How many participants are retained in employment for three quarters after program of study completion?

Information on post-completion and employment and wage information are included in a separate “Employment Results” report.

10. What are the earnings of participants relative to before enrollment?

- a. How many of those employed at enrollment received a wage increase post-enrollment?

Information on post-completion and employment and wage information are included in a separate “Employment Results” report.

11. What is the time-to-completion of participants?

The time-to-completion for participants was generally similar to the time-to-completion for comparison individuals on a program-by-program basis.

12. What is the geographic range of participants served?

The standard distance for the consortium is 2.39, comparatively large due to the geographic diversity of students from SIUE and SIC.

Conclusions

The BIB consortium and the training programs developed had a strong impact on curriculum alignment with the bio-economy industry needs in southern Illinois, and being more reflective of what industry is looking for in terms of a skilled workforce. Some new training programs were created and others modified in the areas of Bioprocessing, Biofuels Technology, Water Management, Restorative Ecology, and Agricultural Watershed Management to meet the needs of the bio-economy industry. Strong career pathways including stacked credentials aligned to jobs in the bio-economy industry were established. These programs were redesigned using various instructional strategies to better serve students and improve program completion, including for veterans and TAA eligible workers.

AWE4CCR encountered some implementation delays and challenges with participant enrollment. Delays were mainly due to getting approval for training program modifications through internal processes at the colleges and Illinois Community College Board. Enrollment challenges were mainly due to limited job opportunities in some regions for which training programs targeted and students being bound to those locations post-completion. Marketing of programs could have been more robust as well, and done earlier in the project implementation.

Despite these challenges, in the end the BIB consortium enrolled 1231 participants, almost achieving the 1316 participant goal. Of the 1231 total participants, 815 (68%) completed a grant-affected program of study. The majority of participants earned credentials at the short-term level (506), followed by degrees (292). Other participant outcomes also were close to expectations. Veterans and TAA eligible workers participated in the project. Veterans were 8% of project participants, and TAA eligible workers were 3%.

In developing the training programs targeted by BIB consortium colleges, there was strong fidelity to the project strategies. Credential completion was accelerated through the use of Prior Learning Assessment and redesigned developmental education instruction. Hands-on learning, internships and career pathways were employed. Instruction incorporated more on-line and technology enabled learning. Students supports were provided and partnerships with local workforce centers were established to enhance career services and job placement services for participants.

In implementing many of these strategies, employers were engaged. In fact, one of the most impressive and lasting impacts of the project has been renewed employer engagement and subsequently a robust sector partnership between bio-economy employers and BIB consortium colleges. Employers were involved in curricular content development and alignment, and even instruction in some cases. Employers provided internships and helped develop other hands-on learning opportunities. Employers of course hired participants who completed training. Interviewed students emphasized the quality of the educational experience. Several students reported that they were now well-trained and knowledgeable in a new field and that by attending a BIB consortium program for a year or less they were prepared for the new employment opportunities they were encountering. The BIB consortium aggressively engaged employers and succeeded in getting meaningful contributions from employers, building the foundations for a lasting sector strategy.

Introduction to TAACCCT

Through the Trade Adjustment Assistance Community College Career Training (TAACCCT) program, the United States Department of Labor (USDOL), in partnership with the Department of Education, assisted the nation's institutions of higher education in helping adults succeed by acquiring the skills, degrees, and credentials needed for high-wage, high-skill employment while also meeting the demands of employers for skilled workers. TAACCCT provides eligible institutions of higher education with multi-year grants to expand and improve their ability to deliver education and career training programs that 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 Building Illinois' Bio-economy (BIB) consortium was awarded a TAACCCT grant in the Fall of 2014 to train 1,316 workers for jobs in the bio-economy in south central part of Illinois for a performance period October 1 of 2014 to March 31 of 2018. The following pages describe the project as envisioned, its implementation, and impact.

Project Description

The Building Illinois' Bio-economy (BIB) consortium is comprised of five higher education institutions spanning the state of Illinois: Lewis and Clark Community College (L&C) in Godfrey, Lincoln Land Community College (LLCC) in Springfield, Carl Sandburg College (CSC) in Galesburg, Southeastern Illinois College (SIC) in Harrisburg, and Southern Illinois University Edwardsville (SIUE). SIUE is the lead college of this consortium.

The consortium has adopted five programmatic or interventional strategies:

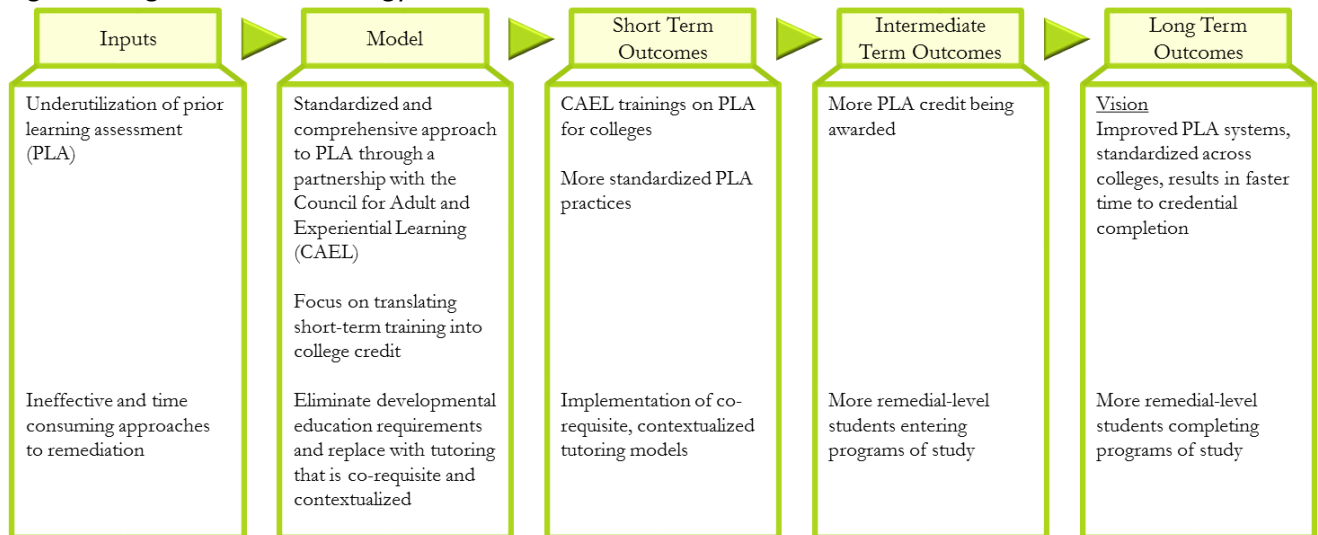
- 1) Accelerate credential completion through the use of Prior Learning Assessment and redesigned developmental education instruction.
- 2) Implement new models of instruction to improve student learning and completion.
- 3) Strengthen on-line and technology enabled learning.
- 4) Increase student persistence and completion through student supports.
- 5) Increase employer engagement.

Programs and pathways are in the areas of Bioprocessing, Biofuels Technology, Water Management, Restorative Ecology, and Agricultural Watershed Management. Some new programs are being created, but largely existing programs are being redesigned to better serve students including veterans and TAA eligible workers. Enrollment in targeted pathways will define grant participation. Enrollment is determined based on declaration of a targeted program of study or enrollment in a core course. Within the BIB consortium, there are 48 certificate and degree programs that are expected to enroll a targeted 1,316 unique participants.

Strategy 1: Accelerate credential completion using PLA and accelerated, contextualized developmental education instruction. This strategy responds to the reality that many older students, including veterans and TAA eligible workers, have significant work and life experiences when they enter college. Colleges often do not maximize the opportunity to translate these experiences into postsecondary credit hours through Prior Learning Assessment (PLA), thereby helping more students to complete their degrees and do so in less time. BIB colleges will be adopting a more standardized, comprehensive approach to PLA through a partnership with the Council for Adult and Experiential

Learning (CAEL). Strategy 1 also responds to the reality that many students, including veterans and TAA eligible workers, come to college with reading, writing and math skills below college level standards. BIB colleges will be employing several proven methods for improving and accelerating the acquisition of basic skills among targeted students, which in turn will increase student retention and completion of credentials. Students will be directly enrolled in college level classes with basic skills support provided via tutoring. The other approach will be to imbed basic skills instruction into college level classes, using the IBEST model.

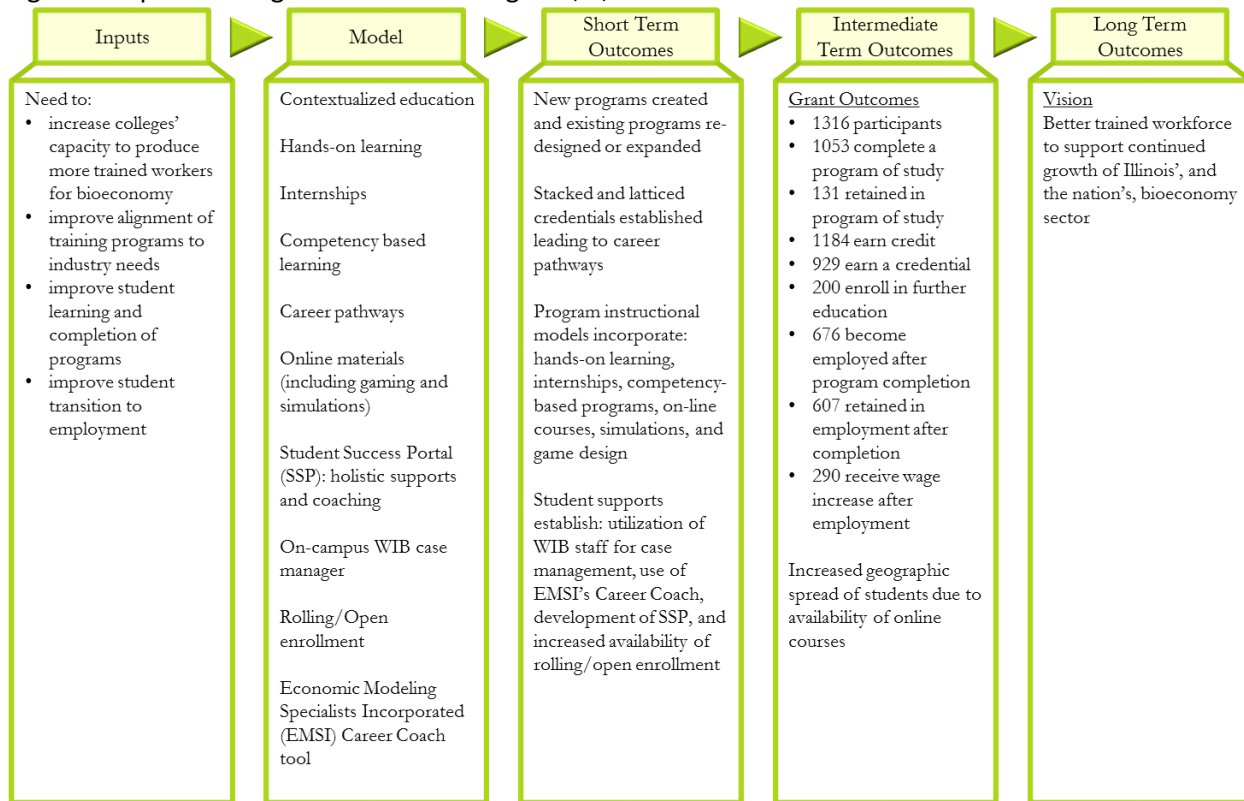
Figure 1: Logic Model for Strategy 1



Strategy 2: Implement new models of instruction to enhance learning. This strategy responds to a need to build, update and enhance postsecondary programs to better prepare more students to meet needs of the bio-economy in southern Illinois. Specific enhancements include:

- Applied hands on learning; studies have shown that students taught theoretical principles, processes and skills in isolation without practice do not transfer these skills and knowledge as well to real life situations.
- Internships; studies have shown that internships increase employment rates of students, and improve job relevant learning and skills development.
- Competency-based learning; competency based instruction enables better alignment of student learning with industry skill needs, and evidence is emerging that competency based instruction improves learning.
- Career pathways; sequencing and stacking education and training credentials, including improving transferability of credentials, creates a more manageable and clearer career pathway for students, and allows for better alignment of education and training with industry job needs and career ladders.

Figure 2 depicts the logic model for Strategies 2, 3, and 4.



Strategy 3: Strengthen online and technology enabled learning

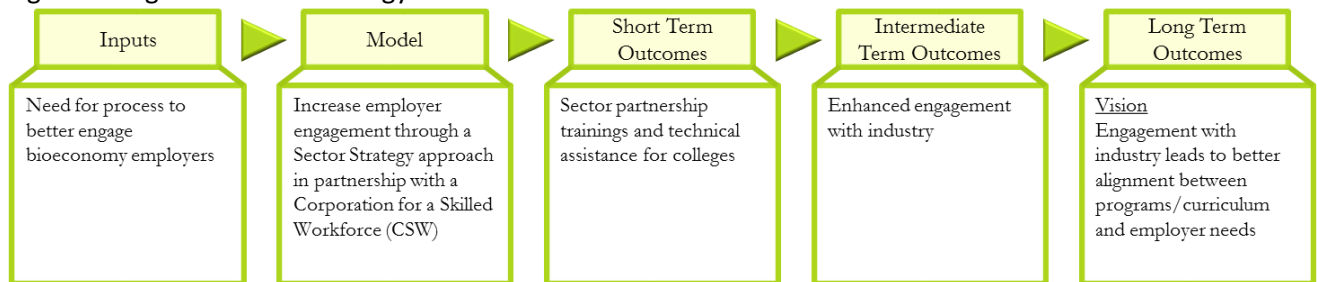
Similar to strategy two, this strategy is aimed at making learning more engaging for students and better connected to the world of work, through the use of simulations and game design as instructional tools in on-line and hybrid classes. Strategy three, however, is also aimed at providing greater accessibility and flexibility for students to learn. More online and hybrid classes, the other component to this strategy, means students do not have to be in class at a certain time, and can pursue their learning at times that better fit their schedules and at a pace that better fits their abilities, which in turn makes classes much more accessible and credit accumulation easier.

Strategy 4: Increase student persistence and completion through student supports. This strategy responds to a need to enhance student support service practices that further improve student enrollment, retention and completion within targeted programs. Key features include rolling enrollment, and the incorporation of various approaches for providing intrusive student support services. Rolling enrollment in programs allows greater flexibility for students to start taking classes as soon as possible, which in turn expedites completion. BIB colleges will make deliberate connections with local WIB and workforce centers, to help recruit students (especially TAA eligible workers) and connect students to important workforce center resources that can support their learning and transition into employment. The use of innovative technology, the Student Success Portal (SSP), will be available to BIB colleges to better track students, provide early alerts when students need help (particularly academically), and coordinate the provision of the various support services available to students both academic and non-academic. In addition to the WIB and workforce center career services, BIB colleges will have access to EMSI's Career Coach tool, which connects students to updated information about careers and jobs,

including job openings, so that students can not only make better choices about careers but be better supported to get a job after graduation.

Strategy 5: Increase employer engagement. This strategy responds to the need for more robust employer input regarding skills, curriculum and career pathways, and the need for better alignment of skills and curriculum to better meet the needs of the bio-economy industry in southern Illinois. This strategy supports the other four strategies, as it the mechanism by which education and training can be better aligned with industry needs to better serve both businesses and students. Employers provide invaluable input into course curriculum content, for both on-line and traditional classes, including identifying specific competencies and skills. Employers are invaluable in the development of credentials recognized by a given industry, and in designing hands-on learning experiences, simulations and gaming activities. Employers provide internships and other opportunities to learn through working, and employers provide job and career opportunities, the ultimate goals of the BIB consortium and the TAACCT program. The BIB colleges intend to work with Corporation for a Skilled Workforce (CSW) to build new and deepen existing employer relationships within the bio-economy sector in Illinois. Figure 3 depicts the logic model for Strategy 5.

Figure 3: Logic Model for Strategy 5.



It is not expected that each BIB college and each targeted program will adopt all of these strategies or adopt them with equal rigor. Thus, the evaluation approach relies on the implementation evaluation to capture and determine the specifics of on-the-ground implementation. Ultimately these strategies are intended to lead to improved student learning and the completion of more and a greater variety of needed postsecondary credentials. They are also intended to make learning better connected to actual jobs and career advancement and thus produce better rates of employment and retention among credential completers. Thus, outcomes related to student enrollment, retention, completion, continuing education and employment are incorporated into the evaluation plan.

Evaluation Research Design and Methodologies

There are two parts to the evaluation: (1) an implementation evaluation that captures the details of project implementation and the extent to which the colleges implemented according to the original blueprint of the project; and (2) an impact evaluation that captures the impacts of grant activities on participant earnings, job attainment, employment intensity, wages, and likelihood of working in a job that offers benefits (e.g., health insurance) along with program retention and completion using a comparison approach.

Implementation Analysis Design

The implementation evaluation has two goals: (1) to assess fidelity to the intent, and (2) to identify factors affecting outcomes. Implementation evaluation activities involve communicating with local project staff and instructors, consortium leadership, students, and/or employers and include: (1) interviews, (2) focus groups, (3) surveys, and (4) on-site visits. Assessment of progress measures or benchmarks required in the original grant proposal or established by BIB leadership are embedded in the activities. The specific instruments and content of inquiry activities are being determined as the evaluation develops.

Implementation Analysis Research Questions

Broadly, the implementation evaluation will capture the following:

- What is being implemented, and how is it theorized to drive impacts?
- Has implementation occurred on time and as intended?
- Is there fidelity to the model? When variation exists, is it effective and consistent with project outcomes?
- Have colleges in the consortium accomplished the intended grant outcomes? What factors have enabled or hindered each college's ability to accomplish its outcomes?
- What factors enabled or hindered the following: participant enrollment, program credit hours accumulated, retention, completion, credential completion, continuing education, job attainment, job retention, and earnings?

Specific questions pertaining to each grant strategy are posed, as follows:

Strategy 1:

- Has CAEL conducted trainings for the BIB colleges? Are PLA practices becoming more utilized and standardized across the BIB colleges?
- Are BIB colleges eliminating traditional remedial courses and instead putting students in college level classes supported by tutoring? Are BIB colleges contextualizing basic skills instruction by integrating basic skills instruction into programmatic courses? What courses are being integrated, and for which programs? How well are students doing in these redesigned courses?
- What factors have enabled or hindered each college's ability to implement PLA and accelerated and contextualized remedial instruction?
- What factors enabled or hindered the following: student credit hour accumulation, retention and completion in targeted programs?

Strategy 2:

- To what extent have BIB colleges implemented new models of instruction?
- What hands-on learning activities have been implemented, and for which programs?
- What internships have been implemented, and for which programs?
- What competency-based programs have been implemented?

- What are the specific stackable credential pathways that have been implemented? What programs within such pathways are new?
- What preliminary evidence exists that students are more engaged and learning as result of the new models of instruction being implemented?
- What factors have enabled or hindered each college's ability to implement the new models of instruction.

Strategy 3:

- To what extent have BIB colleges strengthened on-line learning? What has been done to accomplish this goal?
- What new on-line courses have been created, and for which programs?
- What simulation and gaming activities have been implemented, and for which programs?
- What preliminary evidence exists that students are more engaged and learning as result of the instruction changes being implemented?
- What factors have enabled or hindered each college's ability to strengthen on-line learning?

Strategy 4:

- Are BIB colleges implementing rolling enrollment practices? What is the nature of these practices, and which programs are being targeted?
- Did grantees use Career Coach or otherwise conduct an in-depth assessment of participant's abilities, skills, and interests to select participants into the grant program? What assessment tools and processes were used? Who conducted the assessment? How were the assessment results used? Were the assessment results useful in determining the appropriate program and course sequence for participants?
- Did grantees use the Student Success Portal or otherwise employ technology to track student progress, provide early alerts, and coordinate support service provision for students?
- What support services and other services were offered by each college? Who was involved in procuring these services?
- Have BIB colleges hired a case manager or otherwise implemented a strategy to better connect students to local WIB and workforce center support services. What are the details of such a strategy? Are WIB connections leading to the recruitment of TAA eligible workers, veterans or other participants?
- What factors have enabled or hindered each college's ability to implement student support services?

Strategy 5:

- Have BIB colleges received training and coaching on how to establish better partnerships with businesses? Have partnership meetings been held? How many and with which employers?
- What contributions have employer partners made in terms of: 1) identifying skills and competencies, 2) program design, 3) curriculum development, 4) credential development, 5) career pathways development, 6) hands-on learning activities, 7) internships, 8) simulation and gaming activities, 9) job placement.
- Which contributions from employer partners were most critical to the success of the grant program? Which contributions from employer partners had less of an impact?
- What factors have enabled or hindered each college's ability to implement employer partnerships?

Impact Evaluation Design

A primary goal of the impact evaluation was to determine the impacts of BIB grant-affected programs on participant certificate completion, credit attainment, and job attainment and retention. Multiple comparison programs were established within each college. Then, within each comparison program, the comparability of individuals to program individuals was established.

A random-assignment research design was impractical for the proposed programs. BIB comprises open-access community colleges with limited resources to serve students in targeted programs. Randomly assigning those students to different systems of programs and services is resource-intensive and would jeopardize the successful implementation of the programs. Thus, a quasi-experimental approach was deemed the most practical way to assess the impacts of the intervention.

Outcomes/Impact Analysis Research Questions

The outcomes/impact research questions incorporate the DOL reporting requirements for the Annual Performance Report. For each question listed, we are comparing grant participants in the grant-affected programs of study to comparison group participants (for strategy for selecting comparison groups, see below):

13. How many unique participants/comparisons have been served?
14. How many individuals have completed a grant/comparison program of study?
 - a. Of those, how many are incumbent workers?
15. How many individuals are still retained in their program of study (or other grant-funded program)?
16. How many individuals are retained in other education programs?
17. How many credit hours have been completed?
 - a. How many students have completed credit hours?
18. How many credentials have been earned by participants/ comparisons?
 - a. How many students have earned certificates (<1 year)?
 - b. How many students have earned certificates (>1 year)?
 - c. How many students have earned degrees?
19. How many students are pursuing further education after program of study completion?
20. How many participants/comparisons are employed after program of study completion?
21. How many participants/ comparisons are retained in employment for three quarters after program of study completion?
22. What are the earnings of participants/ comparisons relative to before enrollment?
 - a. How many of those employed at enrollment received a wage increase post-enrollment?
23. What is the time-to-completion of participants / comparisons?
24. What is the geographic range of participants / comparisons served?

For each research question, a metric was defined that was used to answer that question. The definitions given are from the point of view of the grant-affected programs (the “treatment group”). Corresponding definitions are used for the comparison programs (the “comparison group”) and are not repeated here for brevity. For the outcomes that correspond to one of the 9 DOL outcomes, that DOL outcome number is noted.

Table 1: Outcomes Definitions

Outcome	Definition
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Participants	Number of individuals who enroll in a grant-affected program of study. (DOL#1)
Completion Rate	Number of students who complete / participants (DOL#2)
Incumbent Completion Rate	Number of students who complete / participants (numerator and denominator restricted to incumbents)
Retention Rate	Number of students who are retained in their program of study (or other grant program) / participants per reporting period (DOL#3)
Other Retention Rate	Number of students who are retained in another program of study (non-grant) / participants
Credit Hour Completion Amount	Number of credit hours earned per student
Credit Hour Completion Rate	Number of students who complete a credit hour / participants (DOL#4)
Credential Amount	Number of credentials earned per student
Short-Term Credential Rate	Number of students who earn a credential (<=1y) / participants
Long-Term Credential Rate	Number of students who earn a credential (>1y) / participants
Degree Rate	Number of students who earn a degree / participants (DOL#5 = 'a' or 'b' or 'c')
Time-to-completion	The time elapsed from enrollment until program completion
Geographic range	The standard distance (one standard deviation level) of students' location (via address)
Further Education Rate	Number of students entering further education program after completion / completers (DOL#6)
Employment Rate	Number of students employed / completers (numerator and denominator restricted to non-incumbents) (DOL#7)
Retain Employment Rate	Number of students retained in employment for 2nd and 3rd quarters after completion / completers (numerator and denominator restricted to non-incumbents) (DOL#8)
Wage Increase Amount	Average wage increase after program completion
Wage Increase Rate	Number of students who received quarterly wage increase after enrollment relative to prior to program entry / participants (numerator and denominator restricted to incumbents) (DOL#9)

For each outcome, the rate (or average) in the treatment group was compared to the rate (or average) in the control group. The outcomes were measured continuously as the data became available. For example, for data coming from the schools, data was collected two times per year – once in the fall reflecting the previous summer term and spring enrollments, once in the spring reflecting the previous fall term enrollments.

Non-Experimental Design

Each program was included in an impact analysis comparing it to at least one comparison group. Every grant program was matched to one comparison program that was different but comparable to the grant program and housed at the same school and followed in parallel during the grant period. Comparability of the comparison program to the grant program was based on a) same department, b) same credit/non-credit status of program, c) similar duration of program, and d) similar demographics of individuals entering program. It was not expected that a comparison program will be identifiable that matches perfectly on all 4 qualities, but rather the best match overall was used.

If a parallel option was not possible, grant programs were matched to other comparison programs. First, if the grant program was an established program prior to the grant (for at least 3 years) then the grant program itself served as its own comparison program (historical comparison). Second, if another college in the consortium had a grant program that was the same as the grant program and was an established program prior to the grant (for at least 3 years) then the other college's same program may be used as a comparison program (again, historical comparison).

At the conclusion of the comparison program selection process, each grant program had a parallel comparison program similar to it and drawn from the same college, or a historical comparison program that was the same program, and was either drawn from the same college or from another college in the consortium.

Implementation Evaluation Report

This section of the report details findings from the implementation evaluation. Results are presented in four sections:

- (1) Implementation inquires,
- (2) Emerging themes from the implementation evaluation,
- (3) Implementation of grant strategies and fidelity to model
- (4) Implementation evaluation limitations and topics of future inquiry

Implementation Inquiries to-Date

The implementation evaluation sought to assess fidelity to the intent of the grant, and identify factors potentially affecting the grant outcomes. Interview protocols for inquiries were designed to explore specific stages in the grant implementation and by theme. The findings detailed in this section are based on themed implementation evaluation inquires conducted each semester. The inquiries included six rounds of telephone interviews with Project coordinators, grant staff, and consortium leaders at each college. Additional inquiries included one on-site visit facility tour with four of the five colleges. During each site visit separate interviews with students and instructors were conducted. Details of the implementation evaluation inquires conducted are provided below:

Inquiry Date	Theme	Type
Fall 2015	Planning stage reflection a. Local vision, b. Budget, c. Grant models	Telephone interview
Spring 2016	Program structure and content a. Program vision and objective, b. Major project activities and expenditure c. Project organizational structure and staffing d. Student flow e. External partnership f. Grant administration	Telephone interview
Fall 2016	Program implementation and updates a. Program vision and objective b. Braided funding and other source of funding c. Major project activities and expenditure d. Students flow e. External partnership f. Grant administration	Telephone interview
Spring 2017	External partnerships a. Vision and goals for external partnerships b. BIB grant and BIB consortium Impacts on external partnerships c. The current nature of the external partnership, roles, and the communication with staff	Telephone interview
Fall 2017	Implementation impact a. Curriculum b. Partnerships with industry and consortium c. Student d. Challenges	Site visit
Spring 2018	Program sustainability a. Final updates on projects b. Future plans	Telephone interview

	c. Lesson learned	
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Table 1. Schedule of Implementation Inquires

Themes from the implementation Evaluation

Sustained interaction with colleges in the BIB Consortium (Consortium) allowed for insights into how programs were implemented, challenges in implementation, and successes throughout the grant period. Several themes emerged during the implementation evaluation.

Theme 1: Working as a Consortium resulted in collective benefits and helped to foster support between colleges

Consortium members shared the primary goal of creating a better-trained workforce for the bio-economy in Illinois and around the United States. All colleges worked towards implementing their programs as outlined by the proposal. While the nature of the BIB programs at each institution was different and direct sharing of curriculum was challenging, the Consortium leadership worked to create an environment in which participating colleges shared information and experiences that heavily impacted the expansion of opportunities with external partners, reputations, and sharing resources. Early communication among Consortium members were focused on establishing grant expectations, working with budgets to begin program implementation, and establishing report. By Year 2 of the grant, there appeared to be a high level of communication between the Principal Investigator (PI) and individual colleges, as well as between all members of the Consortium. The standing monthly teleconferences enhanced the group dynamic and encouraged cross fertilization of ideas. All colleges expressed satisfaction with the Consortium leadership. There was a general sentiment that leadership clearly communicated requirements, assignments, and deadlines and provided adequate reminders. In addition, the marketing and conceptualization support from the technical assistance providers in the Consortium has been very useful.

More than one college expressed the opinion that Consortium partners were learning from each other and benefitted from the collective insights of the group. A specific example of this was assistance offered between colleges in creating articulation agreements for degree programs that lead from community colleges to 4-year universities. Some of the colleges were not as familiar with how to create and implement articulation agreements and were able to receive considerable insights that led directly to establishing new articulation agreements. Four colleges indicated that participation in the Consortium had been beneficial in supporting the curriculum development process because it has created opportunities to collaborate with program designers at other colleges. There was an explicit sense that the colleges were becoming more collaborative, which created hope that future collaborative projects could occur as an outcome of the grant.

Particularly in the Spring 2017 interview, interviewees reported that not only did the BIB grant impact the nature of the college’s external partnerships, they described the collaborative and resource sharing benefits of the BIB Consortium. One college recognized opportunities being made available as a function of participating in the Consortium when they were invited to the statewide meeting to showcase an example of developing new curricula (not just the modification of existing) as a result of the BIB Consortium. Colleges also reported that their connections grew stronger within their own teams and with other Consortium colleges, and were able to create networks that expanded pathways leading students to higher degrees that further facilitated student ability to connect with other related fields.

Another important Consortium outcome was an enhanced sense of community engagement. In one such Consortium activity, SIUE invited Head Start program parents to the college to introduce programs

available and create pathways to degree programs. There was also a dedicated symposium to identify ways to sustain grant-created programs longer through regional support. The new relationship with community-based agencies was built by participating in job fairs, resource fairs, and community-based events. Program coordinators reported that in Fall 2017 interviews, this grant not only allowed them to have a built-in internship (with two different industries) and hands-on activities in their course, but also helped them to focus on discovering potential support for their institution and partner colleges. The cooperation between consortium colleges ultimately helped program sustainability through statewide financial challenges.

Theme 2: Colleges overcame regional and logistic challenges to deliver successful BIB outcomes.

Each institution had their own challenges for implementing this grant, but there are some common aspects which had the potential to delay the implementation and inhibit student enrollment.

- **Regional challenges:** For some courses, instructors agreed that the lack of student enrollment was a challenge to program success. Low student enrollment sometimes resulted in limited diverse class activities and discussions. Low enrollment in some courses can be attributed to the job market for a particular certificate or degree being smaller than originally anticipated or when comparing one region to other regions. Another regional factor is the lack of mobility for students who prefer to remain in a particular region. While training and education can support such students, jobs that are available in other regions that require leaving the area are highly undesirable.
- **Logistic challenges:** One of the program coordinators reported that the process of adding a new curriculum to the program took two years because it required several additional processes to go through the Illinois Community College Board (ICCB) for approval and certification. This resulted in a delay in marketing efforts until long after the development phase. These delays impacted student ability to receive financial aid for participation and having financial aid was a critical issue for enrollment of traditional students. Thus the timing between implementation and marketing the program contributed to low enrollment. A similar case was found in a different institution. The coordinator expressed that creating a new program took longer time than it was initially assumed and having no clear reporting structure within the college delayed the implementation. In addition, colleges would have been better served if they had a greater understanding of the limitations, policies of the institution, and the reporting structures in terms of creating new curricula and/or courses.

Theme 3: Program implementation lessons learned highlight mechanisms for improving current and future programs.

As a function of the BIB grant, each institution learned what types of items could have helped implementation at earlier stages. Discussions among Consortium members, leadership coordinators, instructors, and students have provided insights into ways in which program success can be further refined and can be used when developing or improving programs in the future.

- **Modifying the curriculum:** The main goal of the curriculum development by college was to provide more varied content allied with what the current employers are looking for, focusing on reaching out to more students, and receiving more employment opportunities. The online nature of courses developed is a distinct advantage that allows for approachable curriculum and increased accessibility for more audiences in more diverse regions. Simple actions, such as changing the name of a course from 'Biofuels' to 'Bio-economy', could provide future students with greater understanding of course content and other aligned industries for which such a course would

provide suitable training. Another institution learned that adding integrated studies and incumbent worker training to the curriculum enables employed students go forward and advance their careers through the relationship with external partners.

- **Understanding and developing target audiences:** At least one institution developed curriculum that attempted to be applicable to too many audiences. Instructor and student feedback suggests that the program covered too many topics and targets too wide a range of subjects to be an effective career pathways developing program. Further, the lack of a target audience hindered the implementation and impacted enrollment. By focusing ahead of program development and implementation, colleges can ensure that programs are made to fit for student and industry needs.
- **Support:** Two out of the five institutions reported that it would have been useful if there was additional support for program marketing early in the program. In some cases, they felt that they did not have enough time remaining in the grant to promote programs after developing courses. Marketing was not available until the program was completely developed, and there was not enough manpower which could focus only on marketing for the rest of the grant year. Several program coordinators pointed out that it would have been beneficial if they have had extra staff who could mainly focus on program marketing. To overcome this challenge, SIUE was highly responsive and engaged a marketing firm to work with Consortium partners and facilitated collective marketing concepts that each individual college was able to deploy for specific programs and circumstances.
- **Knowledge and information sharing:** Some colleges thought that more opportunities for symposiums or workshops with external partners could result in better external partnership interactions. For example, it was suggested that taking more time to learn about utilizing opportunities and ways to communicate with partners at the beginning of the grant would have provided greater interaction and results.

Theme 4: The BIB grant resulted in positive student outcomes.

Although some of the programs had lower enrollment rates than initially targeted because of implementation challenges and regional issues, the majority of the students who were in BIB programs and/or completed a program emphasized the quality of the educational experience. Several students reported that they were now well-trained and knowledgeable in a new field and that by attending this program for a year or less they were prepared for the new employment opportunities they were encountering.

Quality education and curricula were accomplished in many ways. For example, use of Prior Learning Assessment (PLA) facilitated by the Council for Adult and Experiential Learning (CAEL), helped one student was able to receive credits for a course in combustion which the student (he was a firefighter) had already taken. Students reported that instructors were very knowledgeable and provided them with a positive learning experience by sharing real life experiences in real job situations. In one particular program, since the instructor's former occupation was as an engineer in the field being taught, the instructor was able to bring perspectives to the students about prospective jobs and broaden students' view of the field. All instructors were very open to the personalized discussions depending on the students' needs and learning abilities.

Students greatly benefited from hands-on learning. One student attributed positive impacts on his career by gaining additional hands-on experience through BIB coursework. The inclusion of the

community's contextualized elements was specifically noted. All of the students interviewed agreed that the courses they took would positively affect their career plans or/and their current professions.

Students both with previous experience and with no experience found BIB programs to be highly useful and expressed that it helped them to establish strong logical backgrounds, and to add skillsets at their daily jobs. Students were also able to verify how the education they received and working in the field are tightly connected. Students specifically reported that the internship experience was extremely valuable for preparing for a real job by having hands-on experience.

Theme 5: Colleges engaged with employers to build strong connections and mobilize resources.

Colleges actively expanded and deepened relationships with partnering organizations via a sector strategy approach. Some colleges were more successful in this area than others. As a result of the BIB grant, pre-existing partnerships with employers expanded and strengthened and new external partnerships have been developed. While the outcomes vary depending on the institution, the majority of colleges have been working closely with employers to create a robust pipeline from training program directly to jobs. For example, some of the colleges hired instructors who have long industry backgrounds so that instructors were able to utilize their networking resources. Instructors communicated often with their colleagues to update their curricula and invited current employers to their classroom as guest speakers. One instructor reported working closely with the employers in various locations both near and far to enhance student employee opportunities and will be ready for future large employee turnover associate with an aging workforce.

Another good example of business sector engagement is with employers that invited Consortium colleges to participate in large-scale meetings and associations to help create relationships with other organizations, and promote the BIB programs to other related fields.

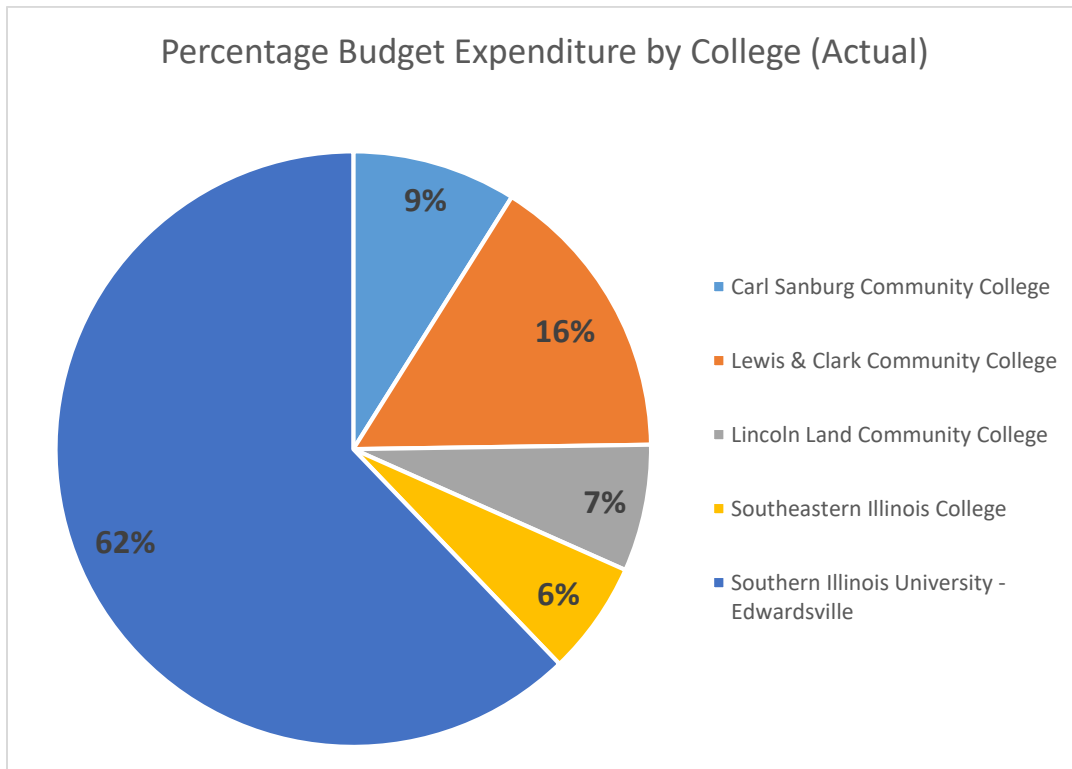
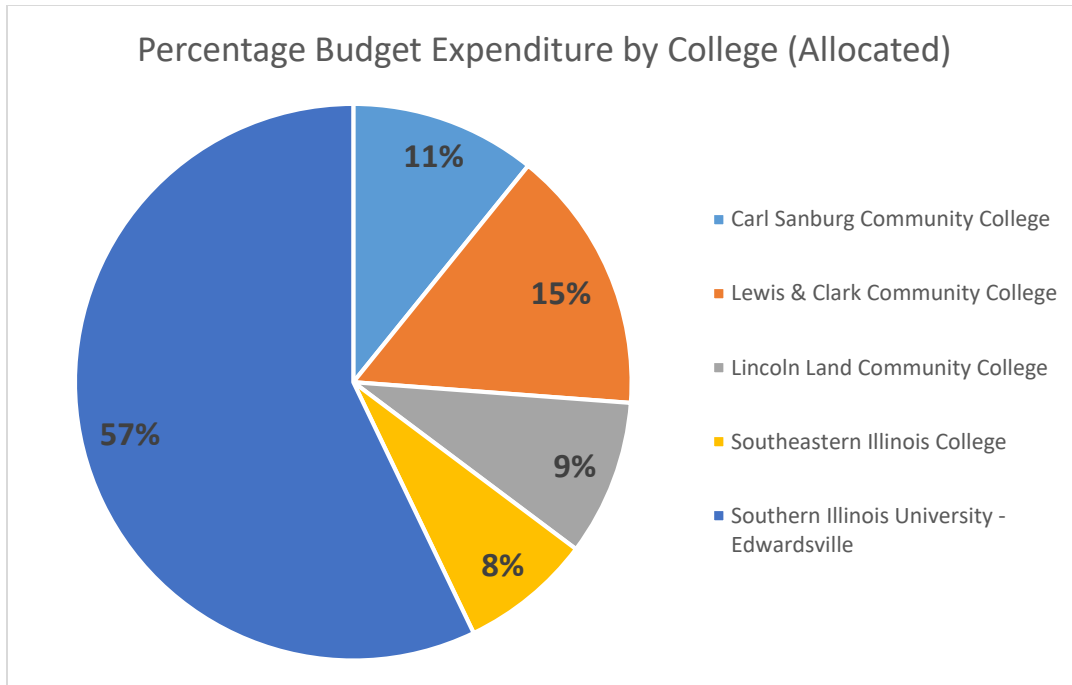
Implementation of Grant Strategies and Fidelity to Model

This section discusses how resource allocation differed at each college as well as the implementation and fidelity to model of each grant strategy.

Colleges vary within the range of resources received under the grant. Budget allocations range from approximately \$560,000 to \$1.4 million. The Consortium lead university budget was substantially larger and included subawards to community colleges, operating costs for SIUE BIB program development and implementation, and contractual services funding for PLA provider, marketing expertise, and other support functions for the Consortium. The charts below show the funds allocated by college, the budgeted and actual spending by grant category as of 06/30/2018.

Allocation of Grant Funds by College

The figure below illustrates each college's share of the total consortium budget as allocated and actual expenditures.



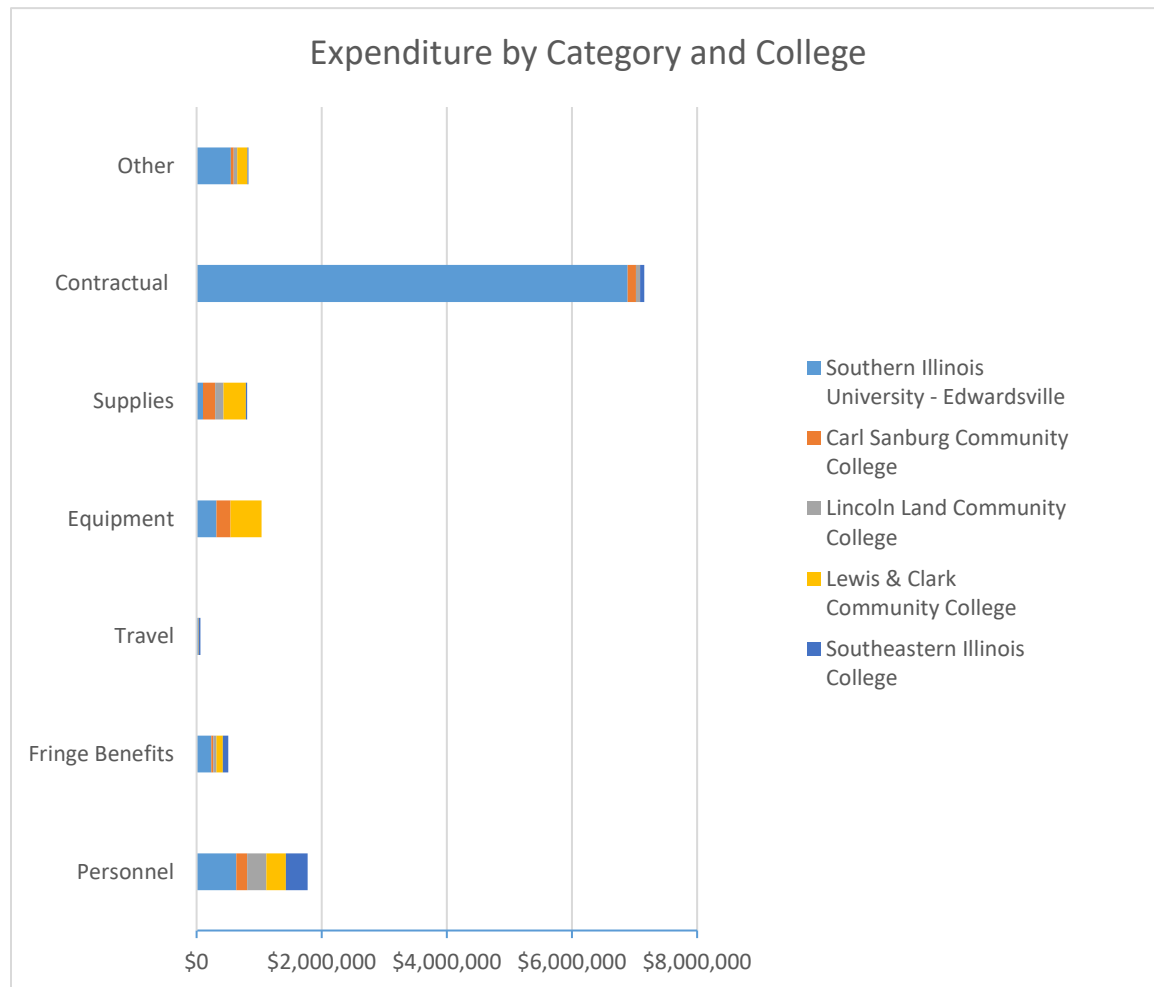
Allocated Grant Funds by Category and College

The figure below illustrates the expenditure of grant funds in each of the SF-424 budget categories per the USDOL. Each budget category is also broken down by college to illustrate the differences in

allocation by budget category on a college level. As seen below, each college expended their funds differently.

Colleges were interviewed early in grant performance regarding interpretation of grant proposal vision, local priorities, and connection to implementation. Interviewees were asked to reflect on the connection between the overall objectives for the project as presented in the grant proposal and local college priorities. Colleges effectively indicated an understanding of the vision articulated in the grant proposal. When asked about their institution’s primary goal or objective, every response reflected improving programs to serve students and businesses. Project goals and priorities did not change during the grant; no models were added or removed from the strategies described in the grant proposal.

Budgets and plans shifted throughout the project. Challenges were faced due to lag time on implementation of programs, approval by ICCB, and delays due to state budget challenges. In general contractual services (which included college budgets, marketing, PLA/CAEL, and expert curriculum development services) and personnel costs (including fringe benefits) were the largest budget categories. Only 3 colleges purchased equipment. Most colleges used funded industry expert instructors to develop and/or improve dedicated BIB curriculum.



Business Engagement Process

The development of external partnerships, especially with business, has been a primary focus across the Consortium. The form of the partnerships took different shapes across the institutions.

Project coordinators were specifically interviewed about their college's business engagement resource and processes for developing and maintaining business relationships during the Spring 2015 interviews. Interviews were conducted with project coordinators. As a prelude, project coordinators were asked to briefly describe the state of external partnerships and activities planned for enhancement under the grant. At the outset of each conversation, interviewees were asked to describe their college's approach to business engagement and what makes their college unique relative to engagement, the services available to business, staffing of business engagement processes, and relationships with other organizations in their community involved in mitigating the workforce challenges of business:

- The Consortium was built on existing partnerships and relationships, some through previous TACCCT or similar grants. The main objectives for participation seems to be to create a better trained workforce, improve/enhance existing programs, to better prepare students for finding jobs, development of articulation agreements, and finding career pathways between colleges.
- Each college developed their advisory committees to best compliment their grant programs in both the public and private sectors. In some cases, advisory committees are made up of local manufacturing companies and in other cases they are associations relevant to the field of study, or government/regulatory agencies (i.e. Illinois Soybean Associations, Nebraska/Illinois Corn Growers, Association, Fertilizer/Chemical Associations, Illinois EPA, Illinois Department of Agriculture, etc.).
- Consortium management has indicated that some of the original set of employers that provided support letters to the grant proposal are not engaged in this project. As a result, some had to recruit a new set of business partners for this project. The term "employer fatigue" was used to describe the over-reliance on a smaller set of employer partners in projects leading to this turnover. This new employer engagement effort may indicate the development of new relationships emerging due to this grant.
- Some interviews cited that the main challenges of developing new partnership were staff turnover, and insufficient time to engage with employers.

a. Initiation

Interviewees were asked to describe how their college identified and made initial connections with new business partners. Colleges discussed methods of outreach, targeting of potential new partners, and the development of new business partnerships under BIB grant.

- The most common way colleges reported finding new partnerships was through personal connections in the community. While colleges are also involved in local economic and workforce development organizations, connections often develop informally.
- Some of the colleges report utilizing labor market data (such as EMSI: Economic Modeling Services International) to check for job openings and to determine what other programs exist in their region and the nature of the current workforces (current employees' wage level, average age, education level, etc.) This data allows these colleges to approach a potential or existing partner with information about the hiring needs in the region and what types of training are needed to fill the skills gap.

- Colleges also uses their job posting board strategically to increase employer involvement. When an employer reaches out to post a job, colleges give a plug to their internship program, advisory committees, and any other way the employer who reached out could be engaged.
- Several schools noted that they target employers with whom they would like to engage. Colleges prioritize which employer relationships to invest time and resources in based on how they treat their employees. Factors such as turnover, bonuses, and professional development training, and employee recognition are important in their assessment.
- One of the colleges cited social media as a prominent source for finding new business partners.
- Several colleges reported that they found new business partners through the BIB consortium or reached out to other community colleges in further regions. One of the colleges reported that they were invited to the state-wide meeting to showcase an example of developing new curricular as a result of BIB and it helped them to find new business partners in further regions.
- One of the college reported that joining Authorization Reciprocity Agreement (NC-SARA) helped the program to reach out to Kentucky, Indiana, Ohio, and Iowa where the ethanol plants are and helped to reach partners in further regions.
- One college reported that participating local job fairs helped them expand partnerships with local industries.
- The business partners spread the word about the colleges to promote the programs and invited the colleges in larger meetings to help with creating relationships with other organizations.

b. Discovery

Discovery is the process of engaging with businesses to understand their workforce challenges and causes of those challenges. Interviewees were asked to describe how they work with businesses to surface and assess needs. Colleges discussed whom they included in the process, relevant tools, and keys to surfacing root causes of workforce problems.

Generally, colleges did not have formal tools or scripts to guide the discovery process with businesses. All of the schools emphasized the importance of active communication. A few anecdotes are listed below:

- All colleges who discussed their hiring process for business engagement staff looked for similar traits when reviewing candidates: good soft skills, work experience, and network in the industry they will be working was cited by colleges as priority skillsets for this role.
- One of the instructors emphasized the ‘two-way communication’ regarding the discovery phase. Not only did the business partners share their needs with the program coordinators, but also the coordinators provided partners with feedback regarding their required qualification of the new job openings. The coordinators shared the current students’ nature, limitations, and qualification.
- All colleges report that businesses are generally helpful and open during the discovery process. Businesses readily engage in a variety of discussions around skills gaps, hiring forecasts, and opportunities to collaborate on internships or co-ops.

c. Performance Management

Performance management is the process by which colleges manage their ongoing relationships with business partners. Interviewees were asked to reflect on how they maintain and grow partnerships over time. Colleges discussed follow-up procedures with businesses and former students after a program ends and strategies for continued business engagement. Notes from conversations on performance management are distilled below:

- Generally, colleges assess their own performance in work with business partners by continued engagement with and contributions from those partners. Colleges assume that businesses that continue to participate in advisory committee meetings, engage in internship or co-op programs, and contribute donations of time or equipment are satisfied with the service they are providing.
- Colleges value accepting the business partners' suggestions and opinions and showed them how their opinions were reflected in the implementation of the program. One college reported that the industry partners' suggestions have led to the development of a new processing technology program for instrumentation and control.
- Most colleges conduct some sort of program evaluation for customized training programs. Typically, colleges solicit employer feedback for for-credit programs informally or at advisory council meetings.

Contribution of Business

All colleges were asked about their formal goals or vision regarding what they would like to accomplish in their partnerships with the business partners. Most of them indicated that while they do not have a formal write-up of their common goals or vision for external partners, targets are clear between them and cooperation based on these agreements have been working smoothly.

While the goals can vary depending on the type of the partner, the goal with industry partners (e.g. Valero, Phillips 66, American Gas, Eastman Chemical, etc.) includes 1) increase students' skills (not only technical skills, but also general skills as an employee such as a job interviewing, writing resumes. etc.), 2) make program responsive to current trends in the field which can strengthen its nationwide sustainability and economic status, 3) enable students to be strong candidates as employees after graduation, and 4) reach out to the community to provide diversity in the workforce.

- The pre-existing partnerships have been either expanded and/or strengthened. Several new partnerships have been established through the BIB consortium. One of the colleges reported that the BIB grant resulted in adapting their existing program by adding a new partnership. The existing program was focused on the traditional production agriculture targeting local high school students, and not necessarily focused on the statewide strategy. By developing a new partnership stemming from different associations and departments, the program was able to add new employers, a career-oriented component, and the state strategy into the curriculum. The upgraded program is now more at the state association level and able to look at different audiences such as farmers in addition to the inbound students.
- As an external partner, the State of Illinois presented challenges due to a two year lag in approving the state budget. This impacted Consortium colleges' ability to support grant activities; while grant funding was available in some cases support for administrative needs was delayed. Additional challenges were presented by the process of getting curricula approved through the Illinois Community College Board, which prevented some of the planned programs and cooperation with partners from taking place.

- Instructors described how they are fully using the practical industry experience to actively lead discussions in the classroom. Instructors reported that they were able to use their pre-industry related experience as resources for the classes. For example, the guest speakers were invited to the classes and the most updated information and content from the industry partner were used as class resources.

Description and Roles of Employer Partner

Colleges were asked to describe the relationships with external partnerships under BIB. The colleges have close communication with external partners on a regular basis. Some of the colleges reported that they have been communicating with employers on a weekly basis, while others indicated that they have formal meetings twice a year. Most of the colleges said they have adequate number of staff who are working at the advisory committees of the external partnerships and the roles are clear and well divided between them.

The structures of employer partnerships or advisory committees vary by college and program. While not all programs have a formal advisory committee, each program has at least one employer partner.

Typically, the responsibilities for cultivating employer relationships are shared between project coordinators, instructors, and deans. It should be noted that the range of staff time dedicated to BIB varies by college.

- While it is sometimes challenging to find time for these meetings, the colleges all reported having regular meetings with the advisory committees which serves to enrich the relationships between the colleges and their partners.
- One college collects and stores information about employer needs in their database.
- Several colleges limit their formal interaction with employer partners to once or twice a year, but have frequent one-off contact to keep in-tune with their needs.

a. Roles of Employer Partners

Employer roles in grant programs fell into two categories: advising or program delivery support. Themes are summarized below.

Advising

Employer roles during the grant's planning stage differed based on each college's scope of work and the extent to which the college had a pre-existing history with the employer. For BIB programs undergoing renovations and/or purchasing equipment, employer partners were consulted to ensure that equipment and renovations specifications were in-keeping with industry standards. Colleges also engaged employer partners on writing and updating program curricula. The level of engagement in curriculum development varies by partner and program, and depends largely on program history. For programs existing prior to the grant, employers reviewed and revised existing curricula. In the case of new program development, employers collaborated to write a new curriculum. At most colleges, employer advisory committees meet regularly and have the opportunity to review any tweaks or changes to curricula. In the case of new curricula, colleges received feedback from employer partners.

Program Delivery Support

Many employers were involved in supporting the delivery of programs. Roles have included ongoing curriculum review, student site visits, internships, and the provision of instructors, equipment, or space for training. A few noted examples of employer contributions to program delivery are listed below:

- Internships were noted frequently as popular with employer partners, and often directly lead to jobs for students upon graduation. One of the colleges reported that most students in their program are already employed through the internship opportunities.
- One of the colleges elaborated how their reputation and roles have changed with external partnerships. Prior to the grant, their college had strong relationships with pre-existing partners and the partners mostly focused on providing research experiences rather than training or hiring opportunities. With the BIB grant, this college was able to develop a strong relationship with new (e.g. Phillips 66) and pre-existing partners which mainly focused on providing the students with internships, solid work experience, and training opportunities.
- One college reported that the Industrial partners such as ICM, Cardinal Ethanol, sent the students to take the course.
- Some of the colleges reported the difficulties of finding employment opportunities for students from some of the programs because of regional issues. Their region has small job markets, and students who are not able to relocate have much less employment opportunities.
- Instructors pointed out that external partners are very active at donating their equipment and providing feedback on purchasing new equipment based on what they are currently using in the fields.

In general, programs that know where they fit as a solution provider in a business' or sector's workforce strategy noted stronger business engagement. Also, programs that offered more than just a source of candidates tended to have stronger business engagement.

Workforce Investment Board and Other Partnerships

In addition to employers, colleges partnered with Workforce Investment Boards and workforce development centers. The grant was flexible in allowing colleges to select additional partners that add value to the initiative. A few anecdotes on WIB and other partnerships from colleges are included below:

- The career coaching program was mentioned by one of the coordinators as a successful aspect of this grant, since it had been created by the Workforce Development Center in the college as a part of this grant implementation and has since been blended with the college orientation with all new students going through this program when they start the college.
- One of the colleges reported that a staff member who is employed by Madison County Employment and Training is working at the campus to meet students and help with referrals.
- One college invited Head Start program parents to the college to introduce the program as supporting the effort of expanding partnership with other organizations.
- Through the partnership with the Wonderlic, online self-paced soft skill sessions were available to all colleges.
- Program coordinators reported that the Hawthorn Group and CSW helped with the program marketing by supporting with creating flyers, promoting materials, presentation slides to other organizations.

- Adding new certificate to the existing program required cooperation from partners such as non-governmental agencies and governmental agency associations. These partners opened new careers to the traditional students who were aspiring to develop their careers through the Agriculture program.
- a. Implementation of New Models to Support Students

Early Stage

During the first 18 months of program, program coordinators were asked to describe local progress or plans for the use of grant funds. Specific inquiries were built around the activities listed in the logic model. There is consensus among the colleges around the importance of aligning manufacturing programs with employer demands using sector strategy approach: specific goals and activities within each college are more diffuse. There was variation between colleges on which of the grant activities were implemented or not; Table 1 shows the description of the early phase of the program. The most common usage of grant funds for technology were for the purchase of new technical equipment and the incorporation of online coursework. All five colleges (Carl Sandburg, Lewis & Clark, Lincoln Land, Southeastern Illinois, and Southern Illinois University- Edwardsville) were offering online or hybrid classes, in many cases, the flexible hours of online and hybrid courses are intended to enable working students to complete programs based on their own schedules. Updated manufacturing equipment is the bulk of new technical equipment purchased. Expansion and development of new work-based learning opportunities was a consortium-wide priority at early stage of the program. All colleges have indicated effort to establish and strengthen partnerships with local business around new internships and project-based learning opportunities: Two colleges were able to cite tangible work being done under the grant. The rollout of for-credit internships was occurring at one college. A majority of colleges indicated that internships were generally popular with business partners and hoped to expand their use under this grant.

Accelerated credential completing using PLA and accelerated, contextualized development education instruction

Modification based on performance of external partners (specifically related to PLA and/or CSW) proved necessary due to unanticipated changes between the time the grant proposal was written and grant funding awarded. Colleges in the Consortium were accomplishing intended outcomes and were preparing to improve and execute programs as planned and proposed at very early stage of the program. As Table 1 shows, by Spring 2016 (grant year 2), three out of five colleges were using 'Standardized and comprehensive approach to PLA through a partnership with the Council for Adult and Experimental Learning (CAEL)'. The colleges reported adopting a more comprehensive approach to PLA, allowing for more opportunities to earn credit for prior experience and increase completion rates. Through collaborations with the BIB consortium, the coordinators reported that the Hawthorn Group helped with the marketing while CAEL helped with rebuilding the assessment for the program in the PLA mapping process.

At the site visit interviews in Fall 2017, one of the program coordinators cited concrete examples of how they applied PLA through a partnership with the CAEL. Some students who came in with pre-experience in related fields had individual counseling with either program managers or faculty to adjust their starting points. This helped the students who would need focused specific courses to save time and money. Frequent communication with external partners enhanced two-way communication to adjust employee requirements in the job postings and updates in course content. Also, one of the students reported that he was able to receive credits for the course in combustion which the student (he was a firefighter) had already taken.

	TOTAL COLLEGES
Standardized and comprehensive approach to PLA through a partnership with the Council for Adult and Experimental Learning (CAEL)	3
Focus on translating short-term training into college credit	5
Eliminate developmental education requirements and replace with tutoring that is co-requisite and contextualized	2
Contextualized education	5
Hands-on learning	4
Internships	5
Competency based learning	3
Career pathways	5
Online materials (including gaming and simulations)	5
Student Success Portal (SSP): holistic supports and coaching	3
On-campus WIB case manager	4
Rolling/Open enrollment	1
Economic Modeling Specialists Incorporated (EMSI) Career Coach tool	5
Increase employer engagement through a Sector Strategy approach in partnership with a Corporation for a skilled Workforce (CSW).	5

Table 1. Education Model used by consortium members

Impact of using education model

Overall, as a result of this grant, new courses were added to existing certificate programs. One example is Watershed and Horticulture at Lincoln Land Community College, which added a new course to cover urban waters in addition to the originally intended courses. This process also impacted collaborative relations with other departments in the institution since this program had been only in the Agriculture Department previously. By developing the course together between the Workforce Development Center and Agriculture Department, it enabled the bridging of workforce and academia.

At another institution, the BIB grant had a significant impact on adding new courses, providing hands-on learning experiences, purchasing equipment, hiring more faculty, connecting the program with other institutions, and adding internship opportunities. The instructors at this institution agreed that this grant allowed them to modify the curriculum, add new textbooks/hands-on projects, and purchase equipment. The purchased equipment enabled the students to learn more visually with identical equipment that they would be using at work once they are employed. This equipment also served other programs and leveraged the grant into other programs. In another example, adding a simulator that mimicked operational functions of a pilot plant allowed for doubling the operation and training opportunities without the expense of running the plant for student internships and classroom activities.

The BIB grant had a strong impact on curriculum alignment with industry needs, and being more reflective of what industry is looking for. For example, some coordinators focused on developing integrated studies such as Bioprocess Science, Bioprocess Management, and Industrial Bioprocessing which could be taken in any community college, enabling the students to the higher-level science courses without any other pre-requisites. This especially helps adult learners who left school for a long time to resume science courses with minimal barriers. The 'career ladders', outlining the students' progression after the program, have been created to offer students concrete examples and possibilities of eventual career pathways. The 'career ladder' shows the progress of the degrees (from AS degree to Bachelor degree) after the students place in their first job in order to increase their wages and develop their careers future.

A staff member who is employed by Madison County Employment and Training is working at the campus to meet students and help with referrals. The institution is conducting research with the external employers (e.g. Philips, Siemens, and Metropolitan St. Louis Sewer District) as a result of this grant.

One of the coordinators described this experience as a rewarding experience. The grant allowed this coordinator to focus on marketing the program to the wider audience since the program in the beginning was mostly introduced where major plants were located (e.g. Valero, ICM, POET, etc.) and then the career pathway started expanding out of the region through the National Council for State Authorization reciprocity Agreement (NC-SARA). Joining the NC-SARA helped this program to reach out to Kentucky, Indiana, Ohio, and Iowa where the ethanol plants are. Using social media was a cost-effective approach to promoting the program as well. This coordinator tried to consider what was going on in this field in a bigger context and incorporated current issues into the program. Publishing papers and presenting at national level conferences, utilizing benefits from the relationship with external partners (e.g. American Oil Chemists' Society) added to the reputation of the program and to the institution as a small community college. This grant became a model for other grants on the campus. As another good example for marketing the program, one program coordinator elaborated that the students' blog enabled promoting the program to prospective student applicants. The grant also enabled the integration of the Two Plus Two course with Southern Illinois University Edwardsville (SIUE) so that students were able to pursue their career plans without a bachelor's degree in this field.

Student Flow

During the interviews in Fall 2016, the themed discussion focused on student flow. Specifically, the issues were centered on recruitment, screening and student readiness/preparation for programs, training, student supportive services to support completions, job placement, and post-placement job retention. This inquiry captured how colleges were tapping into existing programs and services to support the grant.

- Recruitment: In addressing student flow and recruitment, each Consortium member college reported to being actively involved in development of a targeted marketing strategy for student recruitment. Consortium members recognized the importance of marketing for recruiting students and were developing marketing strategies internally and with the assistance of the Hawthorne Group. Recruitment for one college was adversely affected by timing because the course was not approved by the ICCB until June – so they could not promote the courses to high school students. The colleges were using similar strategies including leveraging business partnerships and advisory members, market segmentation and targeted marketing, working with the Workforce Investment Board, career/job fairs, presentations to high school counselors, principals, teachers as well as students, open houses, and traditional advertising. Several colleges were using targeted marketing to appeal directly to the intended audiences for their program (veterans, displaced workers, farmers, high school students, minorities, partner companies, etc.).

One college was also taking the unique approach of working with a local Head Start program to identify at-risk families and work with them to funnel students to the program. Another college was using non-traditional strategies including social media (Facebook and twitter) to promote their program. All colleges felt confident in their ability to market the new programs.

- Screening: Consortium members largely relied on basic placement testing standard to colleges. However, many colleges reported the use of indirect screening through personal meetings and conversations with prospective students. Only one college was beginning to engage in student screening due to the security/safety nature of work in refineries. In this

case, they were working with the employers to familiarize themselves with the corporate screening protocols to ensure they were sending employable people there. At least one college did screen students for eligibility for any federal job training programs such as WIOA.

- **Supportive Services:** Colleges did not indicate any new student support services being implemented or planned. Grant participants were eligible to receive student services offered by colleges. Colleges have excellent systems in place, which programs utilize (financial aid advising, academic advising, tutoring and intrusive advising for flagged students at-risk). Consortium staff stayed engaged with students to monitor progress. Personal interaction with students and attention to their issues and questions was an important way the Consortium members provide support services. Tracking programs such as Star Fish are being employed to enhance services.
- **Transition to Work:** There were few career services resources strictly dedicated to job placement in this consortium. However, there was a variety of activity intended to promote employment among participants. All colleges indicated they were working with employer partners to enhance curricula that would deliver high-demand skills. The belief was that developing skill sets that align with business needs would enable participants to obtain jobs and/or increase earnings. Internships were noted frequently as popular with employer partners, and often led students to be employed. One college reported that most of the students in their programs were already either employed or received job offers.
- **Retention Support:** There were no job retention services being implemented in the Consortium, nor were they offered at any of the colleges in the standard array of services available to students. The prevailing belief is that preparing individuals trained with the employer-demanded skills will drive job retention. In responding to this question most of the colleges chose to speak to retention support for current student.

Implementation Evaluation Limitation and Topics of Future Inquiry

The findings presented in this implementation evaluation report are based on interviews and observation of site visits, and document review. While all interviews were conducted in good faith and information was across referenced to documentation or consortium leadership, interviews are nonetheless given by individuals with differing opinions and depth of knowledge.

Site visits were conducted at four of the five colleges and included staff interviews, student focus groups, and tours of grant affected facilities. In addition to these site visits, New Growth conducted a final interview with project coordinators at each college on innovations arising from the project, sustainability of the programs, and the consortium.

It should be noted here that Carl Sandburg College experienced significant staff changes throughout the course of the project. These shifts in personnel created discontinuity from when the grant was written to the implementation stages described for other colleges. While this college participated in Consortium activities and worked to develop curriculum, student interface was impacted as a result of changing programmatic focus.

Impact Evaluation Report

Impact Evaluation Summary

The primary goal of the Impact Analysis was to determine the overall effect of the TAACCCT Round 4 grant on students who were involved in BIB grant activities. This goal was achieved by collecting and analyzing data for each BIB grant-affected program. In addition, each grant-affected program was compared to one of the following types of comparison programs:

- A parallel comparison program, where a program was selected that ran at the same time as the grant-affected program, and had similarities in program structure (such as department, credit/non-credit status, and program size and duration) and student demographics (such as race, gender, and age)
- A historical comparison program, where the grant-affected program was active prior to receiving grant funds, and had data available for analysis

The data included in this report was collected based on research questions referenced in the methodologies portion of this report. The research questions were based on a combination of previously established Department of Labor outcomes, as well as strategies identified by the consortium in the Statement of Work.

Impact Analysis Limitations

It is important to understand the caveats and limitations for the evaluation, such as evaluation design, sample size concerns, and data gap possibilities. Below is a list of caveats that should be acknowledged:

- A random-assignment research design is impractical for the grant-affected programs. BIB is comprised of open-access community colleges with limited resources to serve students in targeted programs. Randomly assigning those students to different systems of programs and services is resource-intensive and would hinder the success of the program. Therefore, a quasi-experimental evaluation was chosen for this evaluation.
- Small sample sizes may result for a select few programs, especially when evaluating more restrictive grant outcomes.
- Gaps in the data due to missing elements from college databases, incomplete Participant Intake Forms, or mismatched data between data templates are probable throughout the evaluation. Efforts have been made to fill the gaps through using more than one data source for information, where possible.

Impact Evaluation Data Collection Procedure

The majority of data was captured through existing systems. First, each BIB partner college's database includes student demographic, enrollment, course, and program data in the form of One-Time (OT) and On-Going (OG) data forms. The OT form collects information that does not change over time, such as name, race, and gender. As the name implies, the OT form is only collected once per student. The OG form collects information that changes from semester to semester, and is submitted for each student every semester they are enrolled. Second, quarterly earnings data is collected for each participant through each state's employment data system. Two primary data sources are also being used in the evaluation as a mechanism to capture any missing data elements. Participant Intake forms (PIF) are given to each participant, which capture any key baseline data elements that are not found in a college's database. In addition, post-completion surveys are distributed to each participant who completes a grant-affected program. Specific data elements that are not expected to be available from other

sources, which are gathered from the survey, are: occupation of employment, intensity of employment, hourly wage, and presence of benefits. The survey also allows for additional visibility/confirmation of data elements gathered from institutional sources.

Data was collected from each source as it became available on a rolling basis. Colleges collected data on participant and comparison individuals two times per year – once in the fall reflecting the previous summer and spring terms, once in the spring reflecting the previous fall term. State wage data was collected at the end of the project, and encompassed all of the relevant quarters for the TAACCCT grant. It should be noted that all state wage-related impact data is featured in a separate “Employment Results Report”, and is not included in this report for brevity.

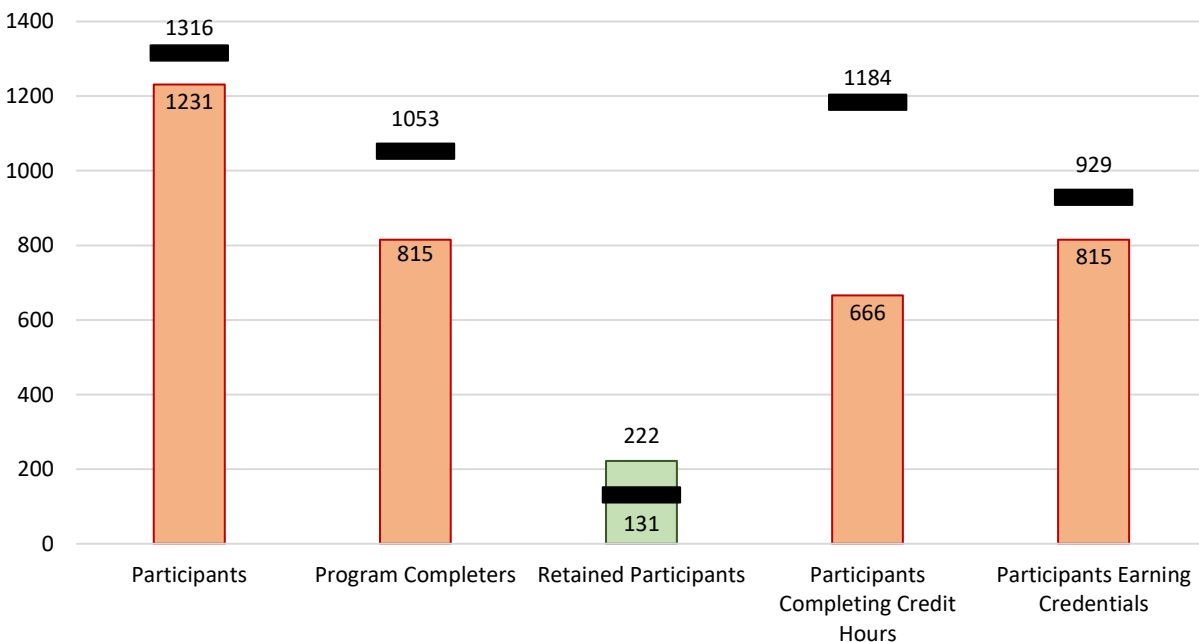
Impact Evaluation Data Analysis

The following portion of the report describes the data for each BIB partner college for the duration of the grant. Each college has a table that includes descriptive statistics of participants and comparison persons, a map that displays standard distance of participants, as well as a chart which breaks down the credential information of the participant and comparison groups by credential type. It should be noted that not all grant-affected participants are included in some of the sub-analyses. However, they are all counted in the consortium outcomes summary numbers.

Consortium Outcomes Summary

At the start of the grant, the DOL required the BIB consortium to establish grant goals, which are referenced each year for Annual Performance Reporting. The figure below is a comparison of the grant goals to actual grant numbers achieved by the consortium. In the figure, the black line indicates each grant goal, and a green or red bar indicates if the consortium achieved or fell short of the goal, respectively.

Table 2: Cincinnati State Grant Numbers vs. Grant Goals



The consortium surpassed grant goals for retained participants, and was slightly behind grant goals for participant counts and credential attainment. The lower than projected numbers may be a result of the slow start of a handful of grant-affected programs, which have ripple effects for outcomes.

The table below details the demographics and grant outcomes for all participants and comparison persons within the BIB consortium. It should be noted that subsequent tables detailing college and program analyses will not add up to the total seen in the outcomes table below. Some small grant-affected programs were omitted from the impact evaluation due to small sample size and comparison group issues.

Table 3: BIB Consortium Summary Outcomes Table

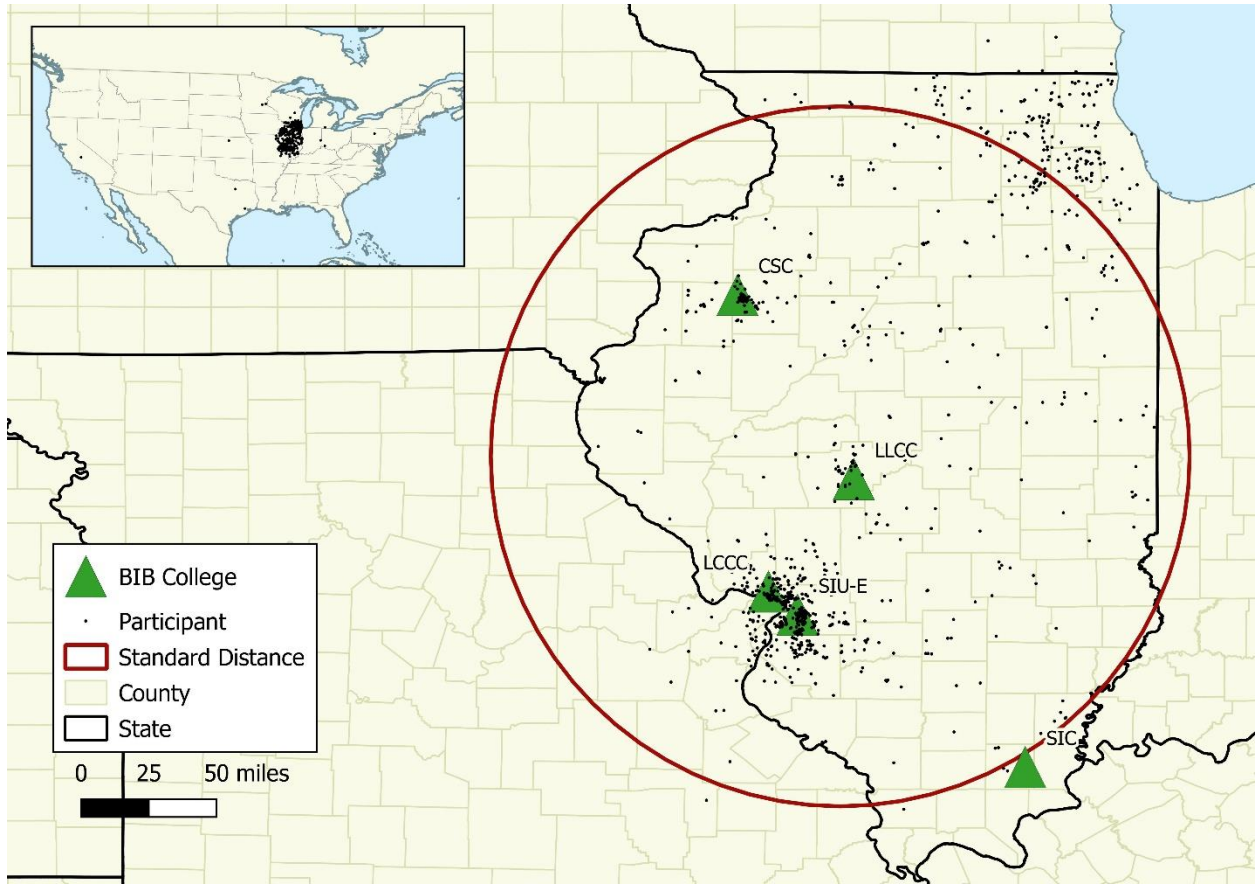
Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	1231	1231	571	571
Demographics				
Age	30.6 ± 11.7	1145	28.5 ± 11.7	571
Female	161 (13%)	1229	72 (13%)	570
White	1080 (89%)	1207	505 (90%)	562
Black	92 (8%)	1207	45 (8%)	562
Other/More than One Race	35 (3%)	1207	12 (2%)	562
Hispanic/Latino	36 (3%)	1105	12 (2%)	567
Full-Time	561 (57%)	983	NA	NA
Part-Time	422 (43%)	983	NA	NA
Incumbent Worker	808 (70%)	1162	56 (12%)	451
Eligible Veteran	93 (8%)	1183	40 (7%)	571
Disabled	24 (2%)	1160	18 (3%)	571
Pell Eligible	205 (18%)	1166	77 (14%)	557
TAA Eligible	34 (3%)	1149	0 (0%)	449
Outcomes				
Program Completers	815 (68%)	1203	52 (9%)	571
Credentials Earned	908	1203	85	571
Students Earning Certificates (<=1 year)	506 (42%)	1203	43 (8%)	571
Students Earning Certificates (>1 year)	66 (5%)	1203	1 (0%)	571
Students Earning Degrees	292 (24%)	1203	8 (1%)	571
Credit Hours Completed	11446.5	1203	11364	571
Retained in Other Education Program	7 (2%)	416	0 (0%)	519

Of the 1231 total participants, 815 (68%) completed a grant-affected program of study. The majority of participants earned credentials at the short-term level (506), followed by degrees (292). About half of all participants (666) earned at least one credit hour, with the average participant earning 10 credit hours.

The average age of participants is 31, similar to the average age of comparison persons, 29. 13% of both the participant and comparison groups identify as female. The majority of participants (89%) identify as white. 70% of participants (808) were incumbent workers, drastically larger than the share of comparison persons who were incumbent workers (12%).

The figure below shows the geographic range of participants for all of the consortium colleges who provided addresses through the duration of the grant. The circle represents the standard distance of the consortium, which measures the dispersion of participants. A low standard distance indicates participants clustered close to the mean, and a high standard distance indicated participants that are dispersed. The standard distance for the consortium is 2.39, which is comparatively large due to the large geographic diversity of students from SIUE and SIC.

Figure 1: Geographic Range of BIB Participants



Source: U.S. Census Bureau

Carl Sandburg College Outcomes

The participant group for Carl Sandburg College (CSC) includes one program stack, Welding, which includes five short-term certificates leading to an AAS in Industrial Welding Technology. The historical comparison group consists of students who were enrolled in, or taking coursework in, Welding prior to the usage of grant funds. Data collected from the Fall of 2016 through March 31st, 2018 represent grant-affected students. Data collected for the Fall 2014 through the Spring 2016 semester represent students in the historical comparison group.

Table 4: Grant-Affected and Comparison Programs, CSC

Program	Certificate Name	Certificate Length	Comparison
Welding	Gas Shielded Arc Welding Specialist	2 Semesters	Historical
	Industrial Welding Technology – Mig Option/Gas Metal Arc	2 Semesters	
	Industrial Welding Technology – Tig Option/Gas Metal Arc	2 Semesters	
	Pipe Welder Specialist	2 Semesters	
	American Welding Society	2 Years	
	Industrial Welding Technology AAS	2 Years	

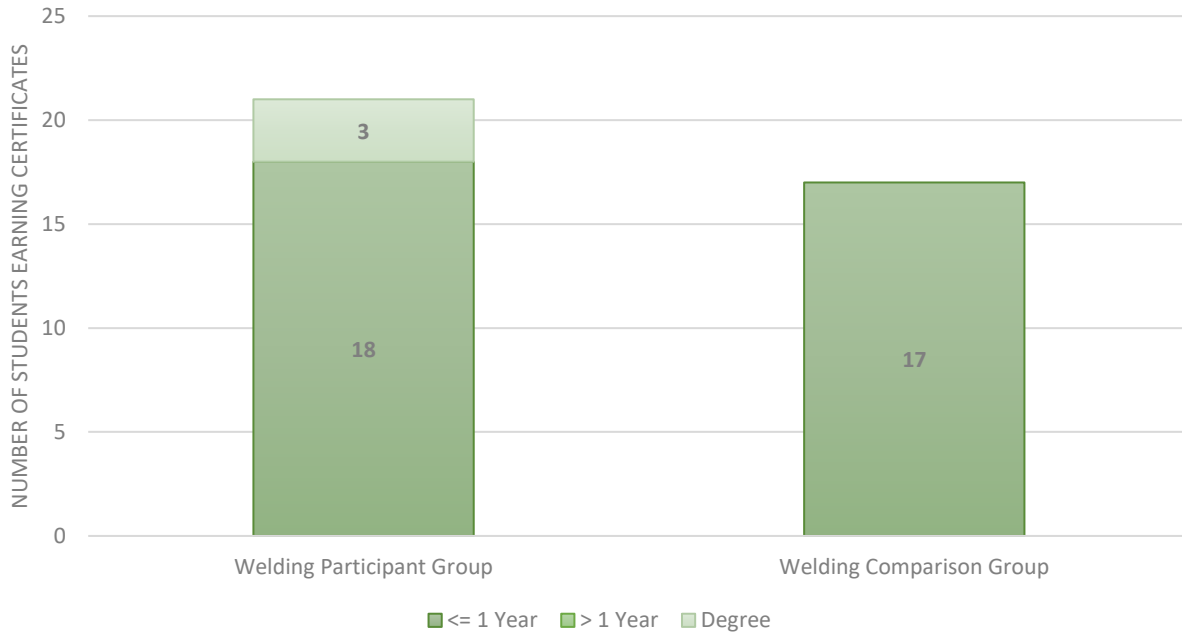
The table below details the demographics and grant outcomes for the participant and comparison groups at CSC. The data within the table includes aggregate information from the Fall of 2014 through the end of the grant.

Table 5: CSC Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	93	93	77	77
Demographics				
Age	20 ± 6	93	26 ± 10	77
Female	2 (2%)	92	5 (6%)	77
White	84 (94%)	89	67 (88%)	76
Black	2 (2%)	89	8 (11%)	76
Other/More than One Race	3 (3%)	89	1 (1%)	76
Hispanic/Latino	4 (4%)	92	2 (3%)	77
Full-Time	39 (42%)	93	NA	NA
Part-Time	54 (58%)	93	NA	NA
Incumbent Worker	43 (50%)	86	49 (69%)	71
Eligible Veteran	5 (5%)	91	7 (9%)	77
Disabled	7 (8%)	92	7 (9%)	77
Pell Eligible	30 (33%)	92	49 (64%)	77
TAA Eligible	0 (0%)	92	0 (0%)	76
Outcomes				
Program Completers	18 (19%)	93	17 (22%)	77
Credentials Earned	34	93	38	77
Students Earning Certificates (<=1 year)	18 (19%)	93	17 (22%)	77
Students Earning Certificates (>1 year)	0 (0%)	93	0 (0%)	77
Students Earning Degrees	3 (3%)	93	0 (0%)	77
Time-to-Completion	110 ± 29	34	111 ± 20	38
Certificates (<=1 year)	111 ± 30	31	111 ± 20	38
Certificates (>1 year)	0	NA	0	NA
Degrees	100 ± 0	3	0	NA
Credit Hours Completed	1282	93	1261	77
Incumbent Worker Completer	7 (19%)	36	11 (22%)	49
Retained in Other Education Program	3 (4%)	75	0 (0%)	60

Of the 93 participants, 19% (18 participants) completed a grant-affected program of study. This is slightly lower than the comparison group completion rate of 22%. The majority of completions occurred at the short-term level for both groups. The average number of credit hours earned for participants is 14, slightly lower than the average credit hours earned by comparison persons, at 16.

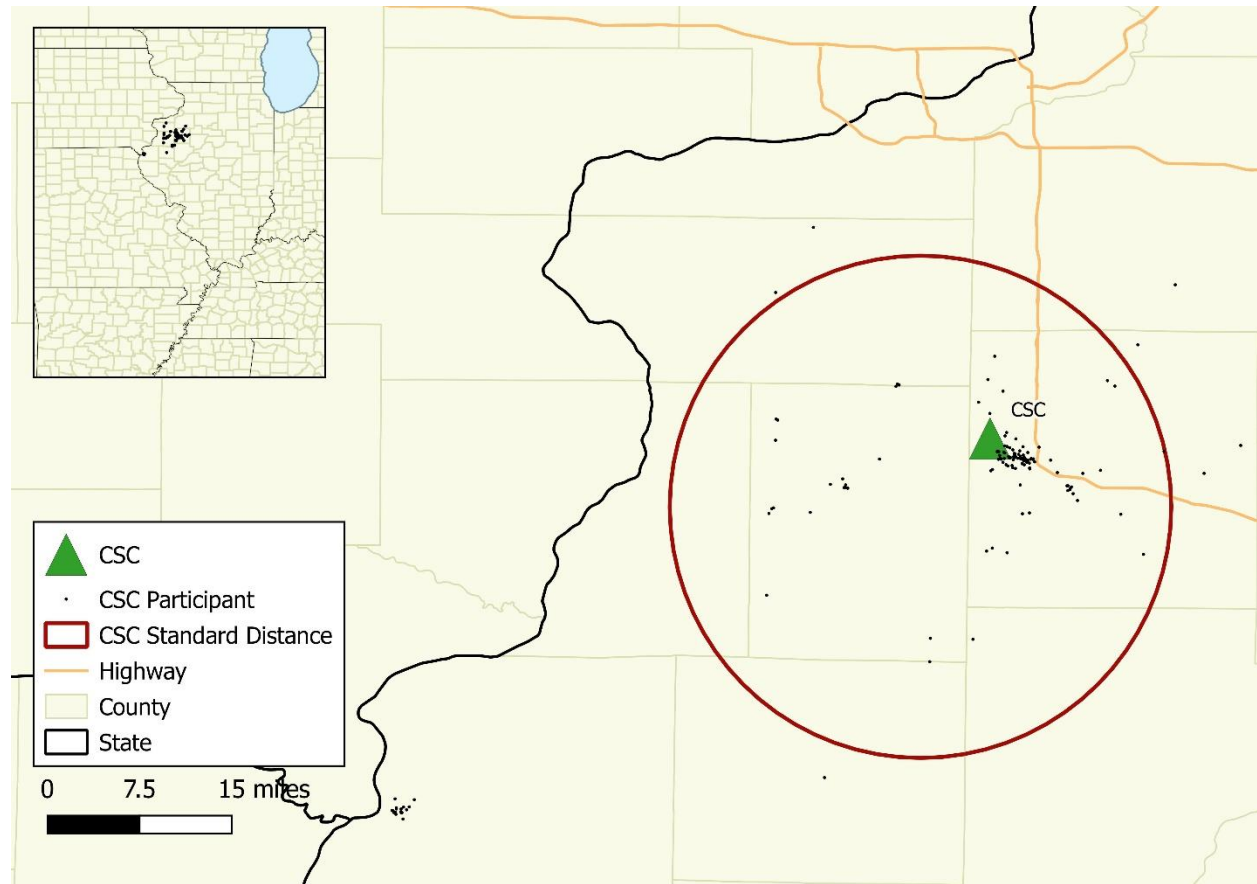
Figure 2: CSC Number of Students Earning Certificates by Program Group



The average age for participants at CDC is 20, indicating that most participants likely enroll immediately after high school. Broadly, the participant group is less diverse than the comparison group, with 94% of participants identifying as White, and 98% of participants identifying as male. Half of all participants are incumbent workers, and 33% of participants are pell-eligible.

The figure below shows the geographic range of participants at CSC who provided addresses through the duration of the grant. The circle represents the standard distance of the CSC, which measures the dispersion of participants. CSC had a standard distance of 0.40, indicating that participants were somewhat clustered around a common location.

Figure 3: Geographic Range of CSC Participants



Source: U.S. Census Bureau

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 6: CSC Completion Rates by Demographics

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	22%	19%
Gender = Male	22%	20%
Gender = Female	20%	0%
Age < 19	22%	7%
Age >= 19	22%	38%
Non-White	10%	0%
White	24%	21%
Less than high school education	22%	19%
At least high school education	32%	27%
Full time	29%	44%
Part time	7%	36%
Non-incumbent worker	27%	26%
Incumbent worker	22%	16%
Non-veteran	21%	17%
Veteran	29%	60%
Non-disabled	21%	20%
Disabled	29%	14%
Non-Pell grant eligible	14%	18%
Pell grant eligible	27%	23%

Non-TAA eligible	22%	19%
TAA eligible	ID	ID

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for CSC

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 0.8 (p=0.66). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, education attainment, full/part time status, incumbency, veteran status, disabled status, and Pell grant eligibility. The propensity score adjusted odds ratio is 0.8 (p=0.59).

Lewis & Clark Community College Outcomes

The participant group for Lewis & Clark Community College (LCCC) includes two program stacks: Process Operations Technology, which includes a Certificate of Proficiency leading to AAS options in either Biochemicals or Petroleum, and Restoration Ecology, which short-term certificates leading to an AAS in Restoration Ecology. Both program stacks are using Computer Network Security & Administration as a comparison group, which includes a Certificates of Completion leading to an AAS.

LCCC also implemented a Water Quality/Wastewater Technology program in collaboration with SIUE. Information on Water Quality/Wastewater Technology students can be found in the Southern Illinois University-Edwardsville portion of this report.

Table 7: Grant-Affected and Comparison Programs, LCCC

Program	Certificate Name	Certificate Length	Comparison	Comparison Certificate Name	Certificate Length
Process Operations Technology	Process Operations Technology CP	3 Semesters	Computer Network Security & Administration	PC Servicing CC	1 Semester
	Process Operations Technology - Petroleum AAS	2 Years		Computer System Technology	1 Semester
	Process Operations Technology - Biochemical AAS	2 Years		Computer Network Security & Administration AAS	2 Years
Restoration Ecology	Sustainable Urban Horticulture CC	1 Semester	Computer Network Security & Administration	PC Servicing CC	1 Semester
	Restoration Ecology CP	3 Semesters		Computer System Technology	1 Semester
	Restoration Ecology AAS	2 Years		Computer Network Security & Administration AAS	2 Years

The table below details the demographics and grant outcomes for the participant and comparison groups at LCCC. The data within the table includes aggregate information from the Fall of 2014 through the end of the grant.

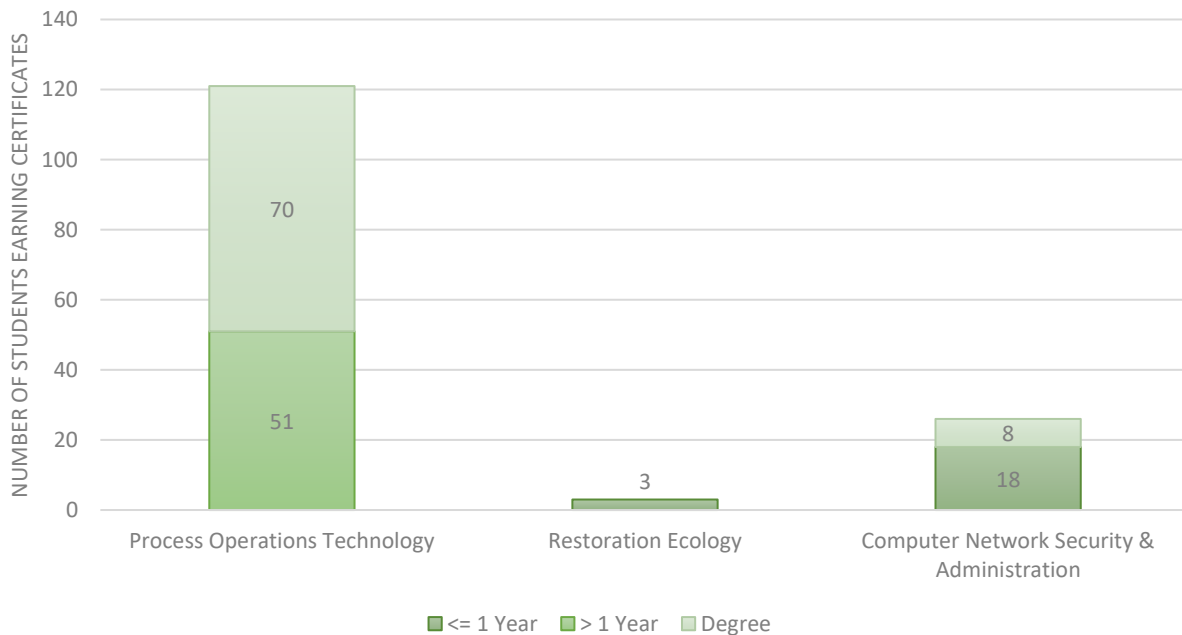
Table 8: LCCC Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	293	293	256	256
Demographics				
Age	28.5 ± 10.2	293	27.7 ± 11.8	256
Female	35 (12%)	293	35 (14%)	256
White	265 (90%)	293	235 (92%)	256
Black	24 (8%)	293	17 (7%)	256
Other/More than One Race	4 (1%)	293	4 (2%)	256
Hispanic/Latino	3 (1%)	266	4 (2%)	256
Full-Time	192 (73%)	262	NA	NA
Part-Time	70 (27%)	262	NA	NA
Incumbent Worker	124 (50%)	249	0 (0%)	256
Eligible Veteran	31 (11%)	293	24 (9%)	256
Disabled	4 (1%)	268	0 (0%)	256
Pell Eligible	74 (27%)	272	0 (0%)	256
TAA Eligible	15 (6%)	260	0 (0%)	256
Outcomes				
Program Completers	82 (28%)	293	26 (10%)	256
Credentials Earned	130	293	38	256
Students Earning Certificates (<=1 year)	3 (1%)	293	18 (7%)	256
Students Earning Certificates (>1 year)	51 (17%)	293	0 (0%)	256

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Students Earning Degrees	70 (24%)	293	8 (3%)	256
Time-to-Completion	105 ± 15	130	100 ± 0	38
Certificates (<=1 year)	100 ± 0	3	100 ± 0	18
Certificates (>1 year)	112 ± 22	51	NA	0
Degrees	101 ± 6	70	100 ± 0	8
Credit Hours Completed	8163	293	5703	256
Incumbent Worker Completer	44 (35%)	124	0 (0%)	NA
Retained in Other Education Program	4 (2%)	211	0 (0%)	230

Of the 293 participants, 28% (82) completed a grant-affected program of study. This completion rate is reasonably higher than the comparison group, which had a completion rate of 10%. LCCC participants earned credentials of various durations, with the majority of completions occurring at the degree-level (70 students earning degrees). To contrast, most completions for the comparison group occurred at the short-term level (18 students earning short-term certificates). The average number of credit hours earned by participants was 28, while the comparison group had an average earned credit hours of 22.

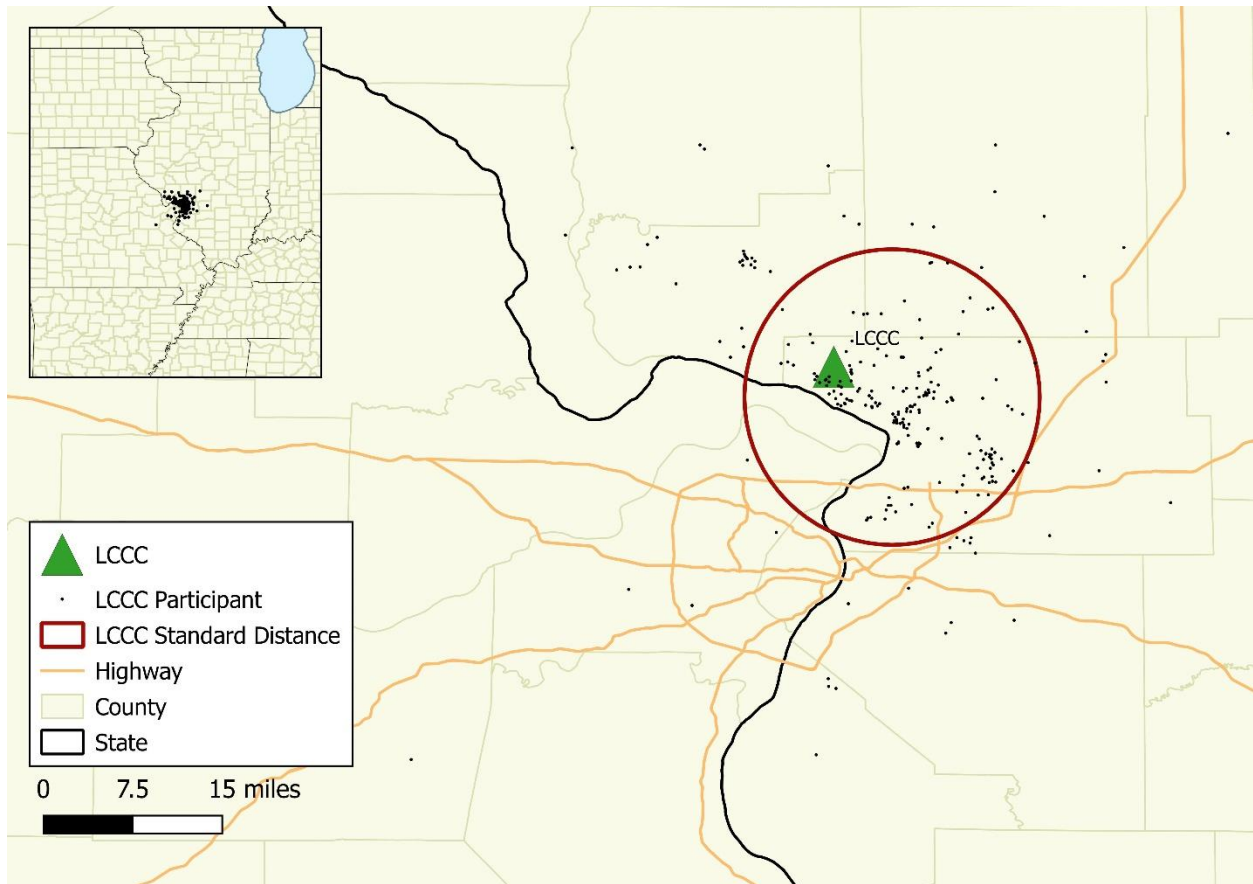
Figure 4: LCCC Number of Students Earning Certificates by Program Group



The average age of both participant and comparison groups is in the mid-20s. Both groups also had similar racial and gender compositions, with over 90% White and less than 15% female populations. 50% of participants were incumbent workers, and 27% were pell-eligible.

The figure below shows the geographic range of participants at LCCC who provided addresses through the duration of the grant. The circle represents the standard distance of the LCCC, which measures the dispersion of participants. LCCC had a standard distance of 0.23, the smallest of all five consortium colleges. This indicates that the majority of participants were very tightly clustered.

Figure 5: Geographic Range of LCCC Participants



Source: U.S. Census Bureau

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 9: LCCC Completion Rates by Demographics

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	10%	28%
Gender = Male	9%	28%
Gender = Female	20%	26%
Age < 24	6%	21%
Age >= 24	15%	34%
Non-White	10%	25%
White	10%	28%
Full time	ID	28%
Part time	ID	33%
Non-incumbent worker	10%	26%
Incumbent worker	ID	35%
Non-veteran	10%	28%
Veteran	12%	29%
Non-disabled	10%	29%
Disabled	ID	50%
Non-Pell grant eligible	10%	33%
Pell grant eligible	ID	18%
Non-TAA eligible	10%	29%
TAA eligible	ID	47%

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for LCCC

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 3.4 ($p < 0.01$). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, and veteran status. The propensity score adjusted odds ratio is 3.4 ($p < 0.01$).

The table below details the demographics and grant outcomes for the Process Operations Technology Program group and Computer Network Security & Administration comparison group at LCCC. The data within the table includes aggregate information from the Fall of 2014 through the end of the grant.

Table 10: LCCC Process Operations Technology vs. Computer Network Security & Administration

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	250	250	256	256
Demographics				
Age	28.8 ± 10.0	250	27.7 ± 11.8	256
Female	15 (6%)	250	35 (14%)	256
White	224 (90%)	250	235 (92%)	256
Black	24 (10%)	250	17 (7%)	256
Other/More than One Race	2 (1%)	250	4 (2%)	256
Hispanic/Latino	3 (1%)	227	4 (2%)	256
Full-Time	169 (73%)	230	NA	NA
Part-Time	61 (27%)	230	NA	NA
Incumbent Worker	109 (50%)	218	0 (0%)	256
Eligible Veteran	29 (12%)	250	24 (9%)	256
Disabled	3 (1%)	232	0 (0%)	256
Pell Eligible	60 (26%)	235	0 (0%)	256
TAA Eligible	15 (7%)	227	0 (0%)	256
Outcomes				
Program Completers	79 (32%)	250	26 (10%)	256
Credentials Earned	127	250	38	256
Students Earning Certificates (<=1 year)	0 (0%)	250	18 (7%)	256
Students Earning Certificates (>1 year)	51 (20%)	250	0 (0%)	256
Students Earning Degrees	70 (28%)	250	8 (3%)	256
Time-to-Completion	105 ± 15	127	100 ± 0	38
Certificates (<=1 year)	NA	0	100 ± 0	18
Certificates (>1 year)	112 ± 22	51	NA	0
Degrees	101 ± 6	70	100 ± 0	8
Credit Hours Completed	7466	250	5703	256
Incumbent Worker Completer	41 (38%)	109	0 (0%)	NA
Retained in Other Education Program	4 (2%)	171	0 (0%)	230

Of the 250 participants, 32% (79) completed a grant-affected program of study, over three times as many completions as the comparison group. Most participants earned either long-term certificates or degrees, while comparison persons were more likely to earn short-term certificates. On average, participants earned 30 credit hours, while comparison persons averaged only 22 credit hours. Both groups had students earning certificates quickly, though the comparison group had time-to-completions of 100% across all credentials.

Demographics were similar between both the participant and comparison group in regards to age, race, gender, and ethnicity. Students were typically White males in their late twenties, though it should be noted that the comparison group had over twice as many females in their program (14% vs. just 6% in the participant group).

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 11: LCCC Completion Rates by Demographics for Process Operations Technology

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	10%	32%
Gender = Male	9%	31%
Gender = Female	20%	47%
Age < 24	6%	24%
Age >= 24	15%	38%
Non-White	10%	27%
White	10%	32%
Full time	ID	31%
Part time	ID	34%
Non-incumbent worker	10%	30%
Incumbent worker	ID	38%
Non-veteran	10%	32%
Veteran	12%	31%
Non-disabled	10%	32%
Disabled	ID	67%
Non-Pell grant eligible	10%	36%
Pell grant eligible	ID	20%
Non-TAA eligible	10%	32%
TAA eligible	ID	47%

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for LCCC for Process Operations Technology

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 4.1 ($p < 0.01$). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, and veteran status. The propensity score adjusted odds ratio is 4.3 ($p < 0.01$).

The table below details the demographics and grant outcomes for the Restoration Ecology participant group and Computer Network Security & Administration comparison group at LCCC.

Table 12: LCCC Restoration Ecology vs. Computer Network Security & Administration

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	43	43	256	256
Demographics				
Age	26.8 ± 11.3	43	27.7 ± 11.8	256
Female	20 (47%)	43	35 (14%)	256
White	41 (95%)	43	235 (92%)	256
Black	0 (0%)	43	17 (7%)	256
Other/More than One Race	2 (5%)	43	4 (2%)	256
Hispanic/Latino	0 (0%)	39	4 (2%)	256
Full-Time	23 (72%)	32	NA	NA
Part-Time	9 (28%)	32	NA	NA
Incumbent Worker	15 (48%)	31	0 (0%)	256
Eligible Veteran	2 (5%)	43	24 (9%)	256
Disabled	1 (3%)	36	0 (0%)	256
Pell Eligible	14 (38%)	37	0 (0%)	256
TAA Eligible	0 (0%)	33	0 (0%)	256
Outcomes				
Program Completers	3 (7%)	43	26 (10%)	256

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Credentials Earned	3	43	38	256
Students Earning Certificates (<=1 year)	3 (7%)	43	18 (7%)	256
Students Earning Certificates (>1 year)	0 (0%)	43	0 (0%)	256
Students Earning Degrees	0 (0%)	43	8 (3%)	256
Time-to-Completion	100 ± 0	3	100 ± 0	38
Certificates (<=1 year)	100 ± 0	3	100 ± 0	18
Certificates (>1 year)	NA	0	NA	0
Degrees	NA	0	100 ± 0	8
Credit Hours Completed	697	43	5703	256
Incumbent Worker Completer	3 (20%)	15	0 (0%)	NA
Retained in Other Education Program	0 (0%)	40	0 (0%)	230

Of the 43 participants, only 7% completed a grant-funded program of study. The comparison group, though much larger at 256 comparison persons, also had a low completion rate (10%). On average, participants earned 16 credit hours, and comparison persons earned 22 credit hours.

Nearly half of all participants (47%) identified as female, drastically higher than other grant-affected programs in the consortium. Both groups had over 90% of the population identifying as White. Nearly half (48%) of participants were incumbent workers.

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 13: LCCC Completion Rates by Demographics for Restoration Ecology

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	10%	7%
Gender = Male	9%	4%
Gender = Female	20%	10%
Age < 22	6%	9%
Age >= 22	14%	5%
Non-White	10%	0%
White	10%	7%
Full time	ID	5%
Part time	ID	22%
Non-incumbent worker	10%	0%
Incumbent worker	ID	20%
Non-veteran	10%	7%
Veteran	12%	0%
Non-disabled	10%	9%
Disabled	ID	0%
Non-Pell grant eligible	10%	9%
Pell grant eligible	ID	7%
Non-TAA eligible	10%	9%
TAA eligible	ID	0%

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for LCCC for Restoration Ecology

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 0.7 (p=0.52). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, and veteran status. The propensity score adjusted odds ratio is 0.5 (p=0.29).

Lincoln Land Community College Outcomes

The participant group for Lincoln Land Community College (LLCC) includes two program stacks: Agricultural Watershed, which includes two short-term certificates, and Horticulture, which includes a short-term certificate leading to an AAS. Data for both program and comparison groups were collected from the Fall of 2016 through March 31st, 2018. These programs are compared to two different parallel programs, shown in the table below.

Table 14: Grant-Affected and Comparison Programs, LLCC

Program	Certificate Name	Certificate Length	Comparison	Comparison Certificate Name	Certificate Length
Agricultural Watershed	Agricultural Watershed Certificate of Achievement – Tech I	1 Semester	Fertilizer	Fertilizer Certificate of Completion	2 Semesters
	Agricultural Watershed Certificate of Achievement – Tech II	2 Semesters			
Horticulture	Turf Management/Landscape Design Certificate of Completion	2 Semesters	Architecture and Construction	Architecture and Construction Certificate of Achievement	2 Semesters
	Horticulture AAS	2 Years			

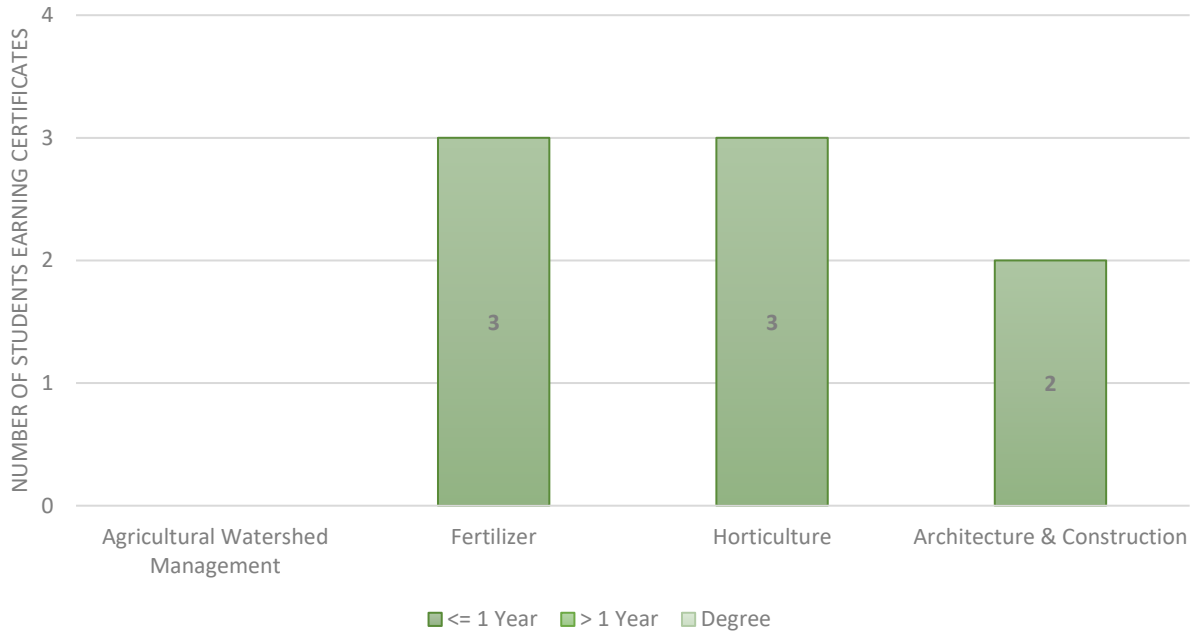
The table below details the demographics and grant outcomes for the participant and comparison groups at LLCC.

Table 15: LLCC Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	35	35	107	107
Demographics				
Age	33 ± 16	35	26 ± 12	107
Female	8 (23%)	35	19 (18%)	106
White	21 (60%)	35	89 (90%)	99
Black	14 (40%)	35	4 (4%)	99
Other/More than One Race	0 (0%)	35	6 (6%)	99
Hispanic/Latino	1 (4%)	28	3 (3%)	103
Full-Time	4 (11%)	35	NA	NA
Part-Time	31 (89%)	35	NA	NA
Incumbent Worker	21 (62%)	34	NA	NA
Eligible Veteran	1 (3%)	33	7 (7%)	107
Disabled	3 (9%)	33	11 (10%)	107
Pell Eligible	2 (7%)	30	28 (26%)	107
TAA Eligible	0 (0%)	28	NA	0
Outcomes				
Program Completers	3 (9%)	35	5 (5%)	107
Credentials Earned	3	35	5	107
Students Earning Certificates (<=1 year)	3 (9%)	35	5 (5%)	107
Students Earning Certificates (>1 year)	0 (0%)	35	0 (0%)	107
Students Earning Degrees	0 (0%)	35	0 (0%)	107
Time-to-Completion	100 ± 0	3	100 ± 0	5
Certificates (<=1 year)	100 ± 0	3	100 ± 0	5
Certificates (>1 year)	NA	0	NA	0
Degrees	NA	0	NA	0
Credit Hours Completed	293	35	2229	107
Incumbent Worker Completer	1 (5%)	21	NA	NA
Retained in Other Education Program	0	NA	0	NA

Of the 35 participants, 9% completed a grant-affected program of study. Although the comparison group had higher enrollments (107), the completion rate was lower, at just 5%. Both groups had perfect time-to-completions, at 100%. Participants earned, on average, 8 credit hours, while comparison persons averaged over 20 credit hours.

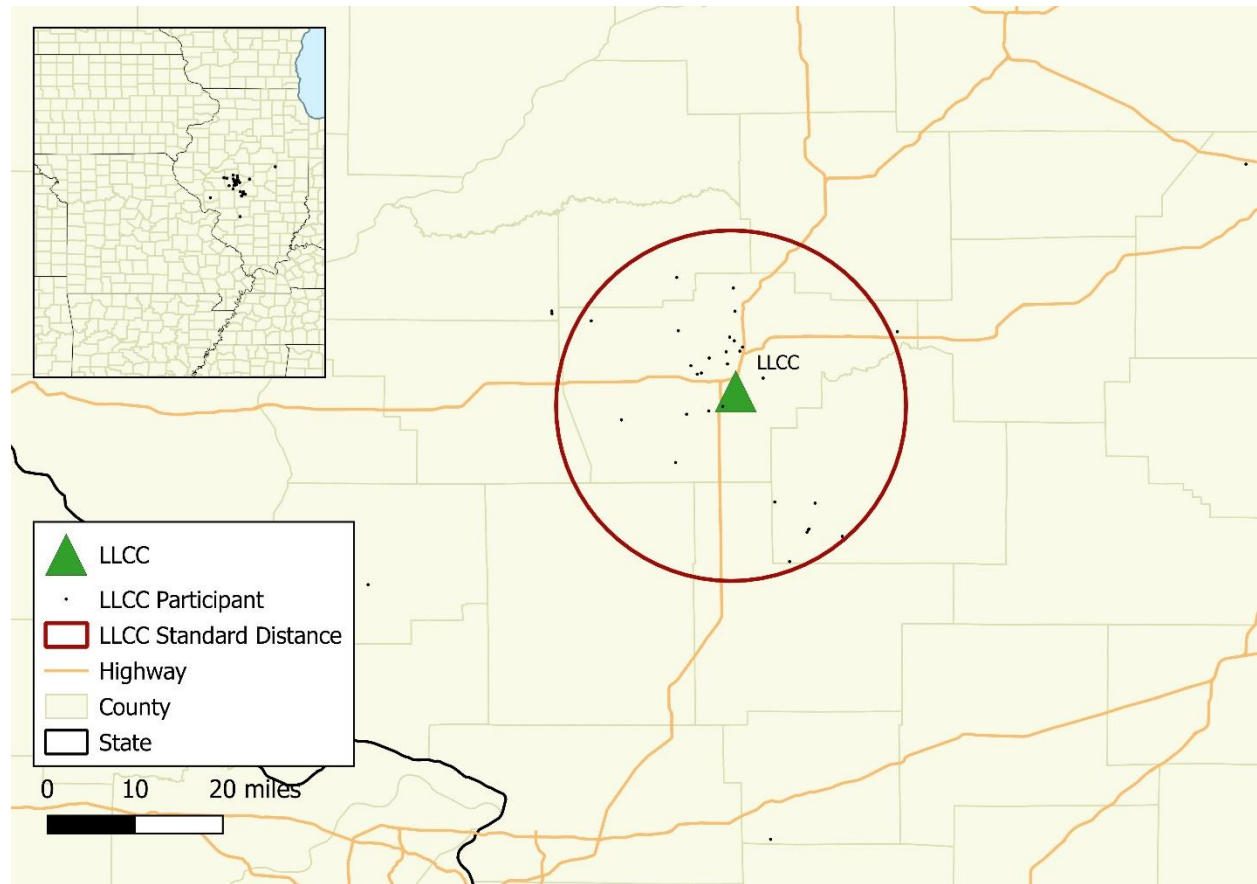
Figure 6: LLCC Number of Students Earning Certificates by Program Group



The racial composition of the participant group is more diverse than the comparison group, with 40% of participants identifying as Black/African American. The participant group is also older than the comparison group, with an average age of 33. 62% of participants are incumbent workers.

The figure below shows the geographic range of participants at LLCC who provided addresses through the duration of the grant. The circle represents the standard distance of the LLCC, which measures the dispersion of participants. LLCC had a standard distance of 0.38, indicating a tight cluster of participants centered around the college.

Figure 7: Geographic Range of LLCC Participants



Source: U.S. Census Bureau

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 16: LLCC Completion Rates by Demographics

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	5%	9%
Gender = Male	6%	11%
Gender = Female	0%	0%
Age < 21	3%	0%
Age >= 21	6%	14%
Non-White	7%	14%
White	3%	5%
Less than high school education	4%	0%
At least high school education	8%	14%
Full time	7%	0%
Part time	0%	10%
Non-incumbent worker	ID	15%
Incumbent worker		5%
Non-veteran	4%	9%
Veteran	14%	0%
Non-disabled	4%	3%
Disabled	9%	67%
Non-Pell grant eligible	5%	9%
Pell grant eligible	4%	0%

Non-TAA eligible	ID	ID
TAA eligible		

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for LLCC

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 1.9 ($p=0.39$). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, education attainment, enrollment status, veteran status, disability status, and Pell grant eligibility. The propensity score adjusted odds ratio is 1.9 ($p=0.48$).

The table below details the demographics and grant outcomes for the Agricultural Watershed Management participant group and Fertilizer comparison group at LLCC.

Table 17: LLCC Agricultural Watershed Management vs. Fertilizer

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	8	8	55	55
Demographics				
Age	34 ± 13	8	21 ± 5	55
Female	2 (25%)	8	14 (25%)	55
White	8 (100%)	8	47 (94%)	50
Black	0 (0%)	8	1 (2%)	50
Other/More than One Race	0 (0%)	8	2 (4%)	50
Hispanic/Latino	0 (0%)	8	0 (0%)	52
Full-Time	2 (25%)	8	NA	NA
Part-Time	6 (75%)	8	NA	NA
Incumbent Worker	7 (88%)	8	NA	NA
Eligible Veteran	0 (0%)	8	2 (4%)	55
Disabled	0 (0%)	8	7 (13%)	55
Pell Eligible	1 (12%)	8	10 (18%)	55
TAA Eligible	0 (0%)	8	NA	NA
Outcomes				
Program Completers	0 (0%)	8	3 (5%)	55
Credentials Earned	0	8	3	55
Students Earning Certificates (<=1 year)	0 (0%)	8	3 (5%)	55
Students Earning Certificates (>1 year)	0 (0%)	8	0 (0%)	55
Students Earning Degrees	0 (0%)	8	0 (0%)	55
Time-to-Completion	NA	0	100 ± 0	3
Certificates (<=1 year)	NA	0	100 ± 0	3
Certificates (>1 year)	NA	0	NA	0
Degrees	NA	0	NA	0
Credit Hours Completed	57	8	1475	55
Incumbent Worker Completer	0 (0%)	7	NA	NA
Retained in Other Education Program	0	NA	0	NA

The Agricultural Watershed Management program had 8 participants, each earning an average of 7 credit hours. None of the participants completed a grant-funded program. All participants identified as White. 88% of participants were incumbent workers.

There were no program completers for the Agricultural Watershed Management program, therefore a more in-depth analysis of completion rates between the program and completion group is not available.

The table below details the demographics and grant outcomes for the Horticulture participant group and Architecture & Construction comparison group at LLCC.

Table 18: LLCC Horticulture vs. Architecture & Construction

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	27	27	52	52
Demographics				
Age	32 ± 16	27	31 ± 14	52
Female	6 (22%)	27	5 (10%)	51
White	13 (48%)	27	42 (86%)	49
Black	14 (52%)	27	3 (6%)	49
Other/More than One Race	0 (0%)	27	4 (8%)	49
Hispanic/Latino	1 (5%)	20	3 (6%)	51
Full-Time	2 (7%)	27	NA	NA
Part-Time	25 (93%)	27	NA	NA
Incumbent Worker	14 (54%)	26	NA	NA
Eligible Veteran	1 (4%)	25	5 (10%)	52
Disabled	3 (12%)	25	4 (8%)	52
Pell Eligible	1 (5%)	22	18 (35%)	52
TAA Eligible	0 (0%)	20	NA	NA
Outcomes				
Program Completers	3 (11%)	27	2 (4%)	52
Credentials Earned	3	27	2	52
Students Earning Certificates (<=1 year)	3 (11%)	27	2 (4%)	52
Students Earning Certificates (>1 year)	0 (0%)	27	0 (0%)	52
Students Earning Degrees	0 (0%)	27	0 (0%)	52
Time-to-Completion	100 ± 0	3	100 ± 0	2
Certificates (<=1 year)	100 ± 0	3	100 ± 0	2
Certificates (>1 year)	NA	0	NA	0
Degrees	NA	0	NA	0
Credit Hours Completed	236	27	754	52
Incumbent Worker Completer	1 (7%)	14	0 (NA%)	NA
Retained in Other Education Program	0	NA	0	NA

Of the 27 participants, 11% (3) completed a grant-affected program of study. The average number of credit hours earned per person for the participant group was 9, while the average number of credit hours earned per person for the comparison group was 15.

Both the participant and comparison group had an average age of students in the early thirties. In addition, both groups had less than 1/4th of students identifying as female. The participant group was more diverse, with 52% of students identifying as Black/African American, compared to only 6% of comparison persons.

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 19: LLCC Completion Rates by Demographics for Horticulture

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	4%	11%
Gender = Male	4%	14%
Gender = Female	0%	0%
Age < 24	0%	7%
Age >= 24	7%	15%
Non-White	0%	14%
White	5%	8%
Less than high school education	4%	0%
At least high school education	6%	19%

Full time	8%	0%
Part time	0%	13%
Non-incumbent worker	ID	17%
Incumbent worker		7%
Non-veteran	2%	12%
Veteran	20%	0%
Non-disabled	4%	5%
Disabled	0%	67%
Non-Pell grant eligible	3%	12%
Pell grant eligible	6%	0%
Non-TAA eligible	ID	ID
TAA eligible		

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for LLCC for Horticulture

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 3.1 (p=0.23). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, education attainment, enrollment status, veteran status, disability status, and Pell grant eligibility. The propensity score adjusted odds ratio is 3.7 (p=0.24).

Southeastern Illinois College Outcomes

The participant group for Southeastern Illinois College (SIC) includes one program stack, Biofuels & Sustainability, which includes five short-term certificates leading to an AAS. The historical comparison group consists of students who were enrolled in, or taking coursework in, Biofuels & Sustainability prior to the usage of grant funds. Data collected from the Fall of 2014 through March 31st, 2018 are for grant-affected students. Data collected for the Fall 2011 through the Summer 2014 semester are for students in the historical comparison group.

Table 20: Grant-Affected and Comparison Programs, SIC

Program	Certificate Name	Certificate Length	Comparison
Biofuels & Sustainability	Biofuels & Sustainability Certificate	2 Semesters	Historical
	Biodiesel Production Certificate	2 Semesters	
	Bioenergy Production Certificate	2 Semesters	
	Biofuels Fast Track Certificate	2 Semesters	
	Ethanol Production	2 Semesters	
	Biofuels & Sustainability AAS	2 Years	

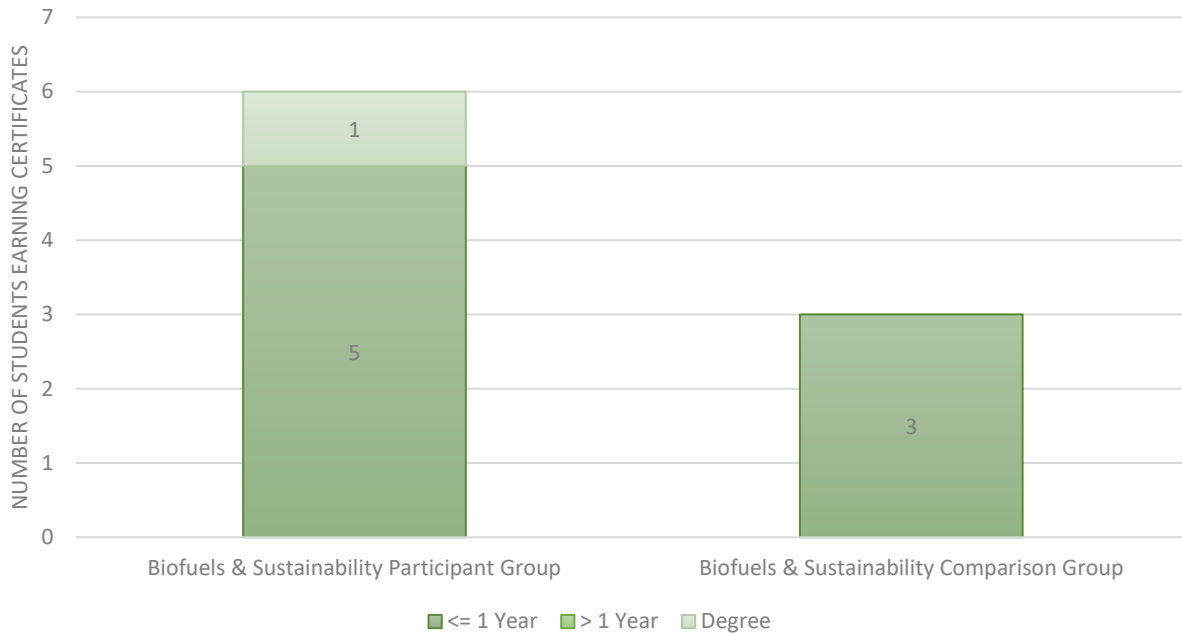
The table below details the demographics and grant outcomes for the participant and comparison groups at SIC.

Table 21: SIC Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	14	14	14	14
Demographics				
Age	35 ± 10	13	43 ± 10	14
Female	3 (21%)	14	6 (43%)	14
White	11 (85%)	13	13 (93%)	14
Black	0 (0%)	13	1 (7%)	14
Other/More than One Race	2 (15%)	13	0 (0%)	14
Hispanic/Latino	1 (7%)	14	0 (0%)	14
Full-Time	5 (42%)	12	NA	NA
Part-Time	7 (58%)	12	NA	NA
Incumbent Worker	10 (91%)	11	7 (100%)	7
Eligible Veteran	3 (21%)	14	0 (0%)	14
Disabled	0 (0%)	14	0 (0%)	14
Pell Eligible	5 (36%)	14	0 (0%)	0
TAA Eligible	1 (7%)	14	0 (0%)	0
Outcomes				
Program Completers	5 (36%)	14	3 (21%)	14
Credentials Earned	12	14	3	14
Students Earning Certificates (<=1 year)	5 (36%)	14	3 (21%)	14
Students Earning Certificates (>1 year)	0 (0%)	14	0 (0%)	14
Students Earning Degrees	1 (7%)	14	0 (0%)	14
Time-to-Completion	129 ± 43	5	117 ± 24	3
Certificates (<=1 year)	132 ± 44	5	117 ± 24	3
Certificates (>1 year)	NA	0	NA	0
Degrees	100 ± 0	1	NA	0
Credit Hours Completed	242	14	70	14
Incumbent Worker Completer	3 (60%)	5	3 (100%)	3
Retained in Other Education Program	0 (0%)	9	0 (0%)	11

Of the 14 participants, 36% (5) completed a grant-affected program of study. The majority of completions occurred at the short-term credential level. The average number of credit hours earned per participant was 17, while comparison persons earned an average of only 5 credit hours.

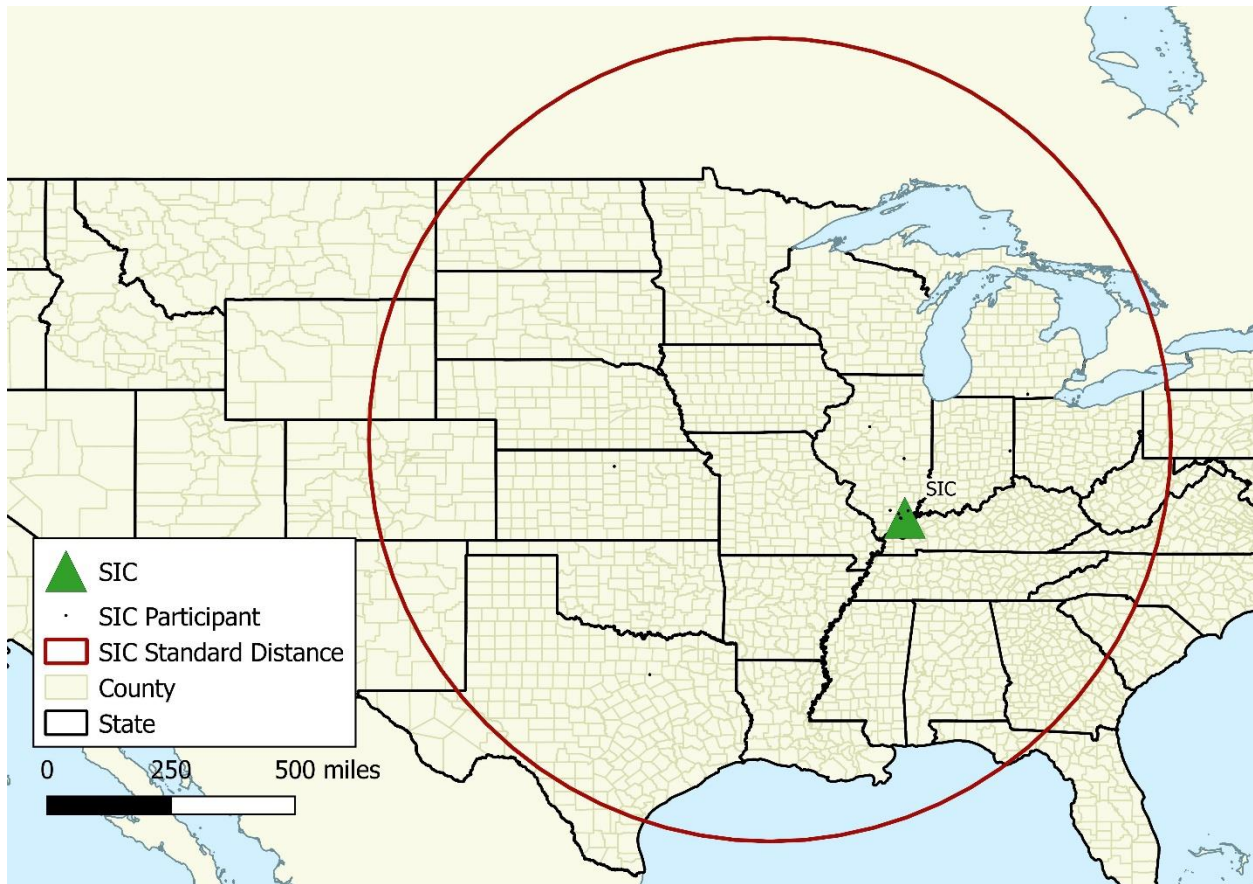
Figure 8: SIC Number of Students Earning Certificates by Program Group



Both participant and comparison groups had students that were older, with the average age of participants and comparison persons at 35 and 43, respectively. The share of female participants was higher than most consortium programs (21%), but not as high as the comparison group (43%).

The figure below shows the geographic range of participants at SIC who provided addresses through the duration of the grant. The circle represents the standard distance of the SIC, which measures the dispersion of participants. Though having the smallest participant group, SIC had the largest geographic range (13.35), likely due to the online nature of the program.

Figure 9: Geographic Range of SIC Participants



Source: U.S. Census Bureau

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 22: SIC Completion Rates by Demographics

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	21%	36%
Gender = Male	12%	36%
Gender = Female	33%	33%
Age < 43	20%	38%
Age >= 43	22%	20%
Non-White	0%	0%
White	23%	45%
Less than high school education	0%	100%
At least high school education	27%	31%
Full time	ID	17%
Part time	21%	50%
Non-incumbent worker	ID	100%
Incumbent worker	ID	30%
Non-veteran	21%	27%
Veteran	ID	67%
Non-disabled	21%	36%
Disabled	ID	ID
Non-Pell grant eligible	ID	33%
Pell grant eligible	ID	40%

Non-TAA eligible	ID	31%
TAA eligible		100%

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for SIC

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is 2.0 (p=0.41). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, education attainment, full/part time status, and veteran status. The propensity score adjusted odds ratio is 5.5 (p=0.14).

Southern Illinois University-Edwardsville Outcomes

The participant group for Southern Illinois University-Edwardsville (SIUE) includes one program stack, Water Quality/Wastewater Technology, which includes short-term certificates in Basic Water Treatment, leading up to a Bachelor's Degree in Integrative Studies with a focus in Bioprocess Science, Industrial Bioprocess, or Bioprocess Management. The program is in collaboration with Lewis & Clark Community College. Due to the collaborative nature of the program, paired with the limited options of short-term programs housed at SIUE, a comparison program was established at Lewis & Clark Community College.

Table 23: Grant-Affected and Comparison Programs, SIUE

Program	Certificate	Comparison
Water Quality/Wastewater Technology	Basic Water Treatment Specialist (Short-Term Certificate) Water Treatment Specialist (Short-Term Certificate) Advanced Water Treatment (Short-Term Certificate) Basic-Intermediate Wastewater (Short-Term Certificate) Advanced Wastewater and Biological Nutrient Removal (Short-Term Certificate) Water Quality/Wastewater Technology (AAS) Best Practices in Stormwater Management (Short-Term Certificate) Integrative Studies, Focus Areas in Bioprocess Science, Industrial Bioprocess, and Bioprocess Management (BA/BS) NCERC Internship (Short-Term Certificate)	Construction Labor Certificate of Proficiency (Long-Term Certificate) Construction Labor (AAS)

The table below details the demographics and grant outcomes for the participant group at SIUE and the comparison group at LCCC.

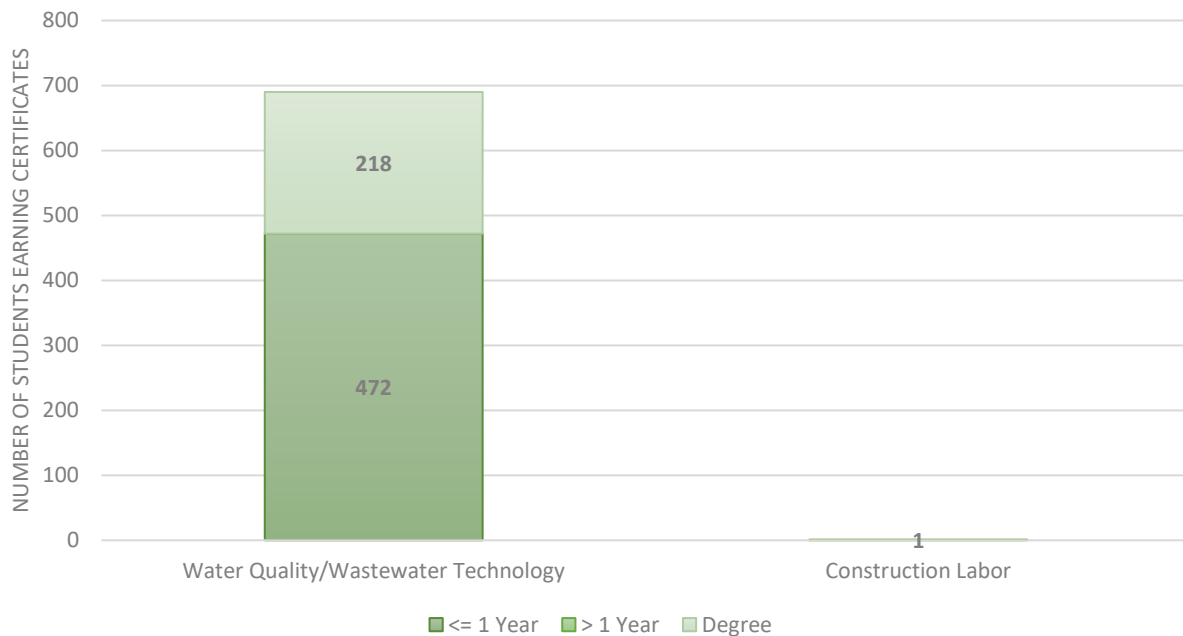
Table 24: SIUE Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	728	728	117	117
Demographics				
Age	33 ± 12	644	33 ± 10	117
Female	110 (15%)	727	7 (6%)	117
White	639 (90%)	710	101 (86%)	117
Black	47 (7%)	710	15 (13%)	117
Other/More than One Race	24 (3%)	710	1 (1%)	117
Hispanic/Latino	24 (4%)	639	3 (3%)	117
Full-Time	285 (56%)	512	NA	NA
Part-Time	227 (44%)	512	NA	NA
Incumbent Worker	589 (82%)	719	0 (0%)	117
Eligible Veteran	51 (7%)	684	2 (2%)	117
Disabled	8 (1%)	685	0 (0%)	117
Pell Eligible	66 (10%)	686	0 (0%)	117
TAA Eligible	17 (2%)	686	0 (0%)	117
Outcomes				
Program Completers	687 (94%)	728	1 (1%)	117
Credentials Earned	709	728	1	117
Students Earning Certificates (<=1 year)	472 (65%)	728	0 (0%)	117
Students Earning Certificates (>1 year)	0 (0%)	728	1 (1%)	117
Students Earning Degrees	218 (30%)	728	0 (0%)	117
Time-to-Completion	100 ± 0	709	100 ± 0	1
Certificates (<=1 year)	100 ± 0	491	NA	0
Certificates (>1 year)	NA	0	100 ± 0	1
Degrees	100 ± 0	218	NA	0
Credit Hours Completed	576	728	2101	117

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Incumbent Worker Completer	550 (93%)	589	NA	0
Retained in Other Education Program	0 (0%)	41	0 (0%)	116

Of the 728 participants, 94% (687) completed a grant-affected program of study. All participants earned credentials at a time-to-completion of 100%. Most participants earned certificates at the short-term level (472). The average credit hours earned per participant is lower than other programs (less than 1 credit hour per person), however many of the programs at SIUE are non-credit.

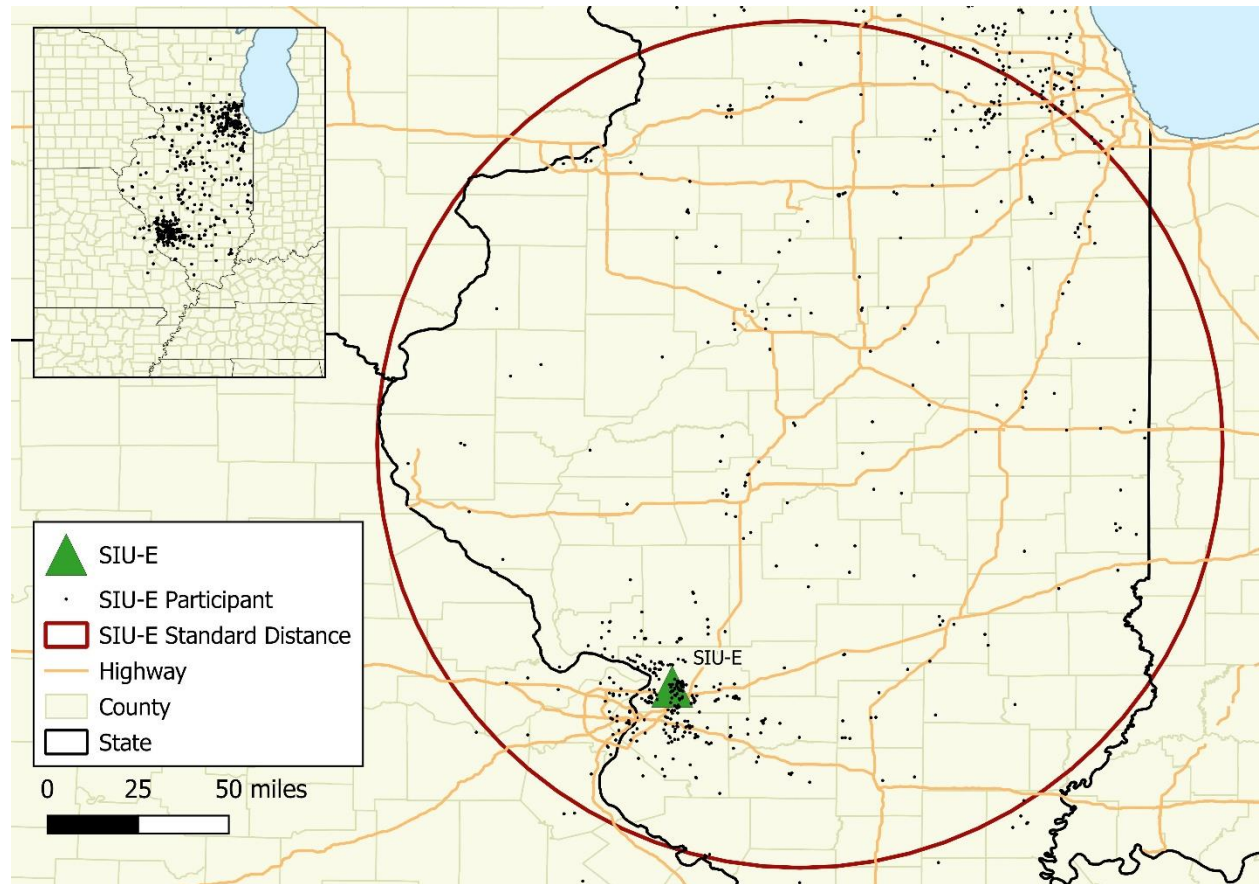
Figure 10: SIUE Number of Students Earning Certificates by Program Group



The average age of both participant and comparison groups was 33, indicating that most students were not enrolling directly from high school. 51 participants (7%) were eligible veterans. 15% of participants identified as female, higher than the share of females in the comparison group (6%). 90% of participants identified as White, a similar racial composition to the comparison group.

The figure below shows the geographic range of participants at SIUE who provided addresses through the duration of the grant. The circle represents the standard distance of the SIUE, which measures the dispersion of participants. SIUE had a standard distance of 2.19, larger than most consortium colleges. High enrollments from students outside of Chicago caused the mean center to shift to the center of the state, even though the college is located closer towards Missouri.

Figure 11: Geographic Range of SIUE Participants



Source: U.S. Census Bureau

The table below offers details on the key outcome of program completion rates. Completion rates were calculated for individuals pursuing programs of similar duration over similar lengths of time.

Table 25: SIUE Completion Rates by Demographics

Variable	Completion Rate in Comparison Group	Completion Rate in Participant Group
Overall	1%	94%
Gender = Male	1%	94%
Gender = Female	0%	99%
Age < 31	0%	96%
Age >= 31	2%	96%
Non-White	6%	96%
White	0%	94%
Less than high school education	ID	92%
At least high school education	ID	95%
Full time	ID	100%
Part time	ID	99%
Non-incumbent worker	1%	99%
Incumbent worker	ID	93%
Non-veteran	1%	94%
Veteran	0%	94%
Non-disabled	1%	94%
Disabled	ID	100%
Non-Pell grant eligible	1%	94%

Pell grant eligible	ID	97%
Non-TAA eligible	1%	94%
TAA eligible	ID	100%

ID: Insufficient Data to give a reliable completion rate due to missing demographic values

Estimation of Completion Rate Treatment Effect for SIUE

The crude, unadjusted odds ratio (the odds of completion in the participant group relative to the odds in the comparison group) is greater than 100 ($p < 0.01$). A propensity score model (estimating the probability of being a member of the participant group) is fit using gender, age, race, incumbency, and veteran status. The propensity score adjusted odds ratio is greater than 100 ($p < 0.01$).

Conclusion

The BIB consortium and the training programs developed had a strong impact on curriculum alignment with the bio-economy industry needs in southern Illinois, and on being more reflective of what industry is looking for in terms of a skilled workforce. Some new training programs were created and others modified in the areas of Bioprocessing, Biofuels Technology, Water Management, Restorative Ecology, and Agricultural Watershed Management to meet the needs of the bio-economy industry. Strong career pathways including stacked credentials aligned to jobs in the bio-economy industry were established. These programs were redesigned to better serve students and improve student completion, including for veterans and TAA eligible workers.

AWE4CCR encountered some implementation delays and challenges with participant enrollment. Delays were mainly due to getting approval for training program modifications through internal processes at the colleges and Illinois Community College Board. Enrollment challenges were mainly due to limited job opportunities in some regions for which training programs targeted and students being bound to those locations post-completion. Marketing of programs could have been more robust as well, and done earlier in the project implementation.

Despite these challenges, in the end the BIB consortium enrolled 1231 participants, almost achieving the 1316 participant goal. Of the 1231 total participants, 815 (68%) completed a grant-affected program of study. The majority of participants earned credentials at the short-term level (506), followed by degrees (292). Other participant outcomes also were close to expectations. Veterans and TAA eligible workers participated in the project. Veterans were 8% of project participants, and TAA eligible workers were 3%.

In developing the training programs targeted by BIB consortium colleges, there was strong fidelity to the project strategies. Credential completion was accelerated through the use of Prior Learning Assessment and redesigned developmental education instruction. Hands-on learning, internships and career pathways were employed as described. Instruction incorporated more on-line and technology enabled learning as also described. Students supports were provided and partnerships with local workforce centers were established to enhance career services and job placement services for participants.

In implementing many of these strategies, employers were engaged. In fact, one of the most impressive and lasting impacts of the project has been renewed employer engagement and subsequently a robust sector partnership between bio-economy employers and BIB consortium colleges. Employers were involved curricular content development and alignment, and even instruction in some cases. Employers provided internships and helped other hands-on learning opportunities. Employers of course hired participants who completed training. Interviewed students emphasized the quality of the educational experience. Several students reported that they were now well-trained and knowledgeable in a new

field and that by attending a BIB consortium program for a year or less they were prepared for the new employment opportunities they were encountering. The BIB consortium aggressively engaged employers and succeeded in getting meaningful contributions from employers, building the foundations for a lasting sector strategy.