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Washington Integrated Sector Employment (WISE) TAACCCT Round IV

WISE Program Evaluation Final Report

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I. Executive Summary

I.A. WISE Program Description and Activities

The Washington Integrated Sector Employment (WISE) training program was designed to prepare participants for employment in entry level, pre-apprenticeship and apprenticeship occupations. WISE focused on key growth sectors for Washington State's critical industries of Clean Energy, Construction, and Advanced Manufacturing. The primary purpose of WISE was to meet the unique needs of unemployed (or under-employed) dislocated workers by using innovative strategies and programs. Example of these programmatic innovations included career navigation, soft skills development, redesigned curriculum and certificates, updated training equipment, and investments in faculty.

The WISE grant was administered by a consortium of eight community colleges, supported by the Centers of Excellence for each of these industries, and guided by a statewide collaboration of public workforce system partners. Each of the eight community and technical colleges implemented the WISE grant in alignment with specific programs at each college; accordingly, WISE staff tailored needs and opportunities to deepen student supports and create sustainable infrastructure within the context of these programs. Each college used their budget to advance a common set of WISE goals related to the use of Career Navigators and a focus on soft skills development. Yet each college also adapted its resources to support nuances associated with different certificate and degree programs. As a result, while program outcomes were a joint effort, the colleges contributed differently to each of the DOL defined outcomes that were a focus of this grant. The ensuing variation resulted in interesting and diverse program approaches, yet also created a situation where results are sometimes difficult to compare across colleges.

I.B. Evaluation Design Summary

The plan for the WISE program evaluation consisted of two key components: an implementation evaluation to measure program execution at each college, and an outcomes evaluation to measure progress toward and achievement of the goals of the program. Measurement was based principally on the nine grant measures articulated in the Solicitation for Grant Applications. Among those nine measures the evaluation team delineated an important distinction between outputs, which measure program progress, and outcomes, which measure program results. Said another way, outputs represent the completion of program activities and generally focus on program process or implementation measures, whereas outcomes characterize the overall result or attainment of program goals. Within this context 3SI evaluated DOL Measures 1-5 to assess implementation and DOL Outcome Measures 6-9 to study results. Primary research questions included whether program met enrollment, program, and employment targets, and which program elements contributed to positive (or negative) program results. As a training and employment focused grant, the key outcome measure for the WISE program was participant employment attainment.

The WISE evaluation team used a logic model to identify the key quantitative and qualitative areas for evaluation. The logic model provided guidance to inform the evaluation's continuous quality improvement (CQI) process, which measured quarterly progress on each of the nine DOL-defined performance measures. The evaluation team produced a quarterly dashboard early in the grant to monitor program progress across these key measures, and the grant leadership team encouraged all grant stakeholders to access and analyze these interim results. The evaluation practice catalyzed many critical discussions and decisions, which helped grant administrators and stakeholders solve problems,

share best practices, and focus resources to maximize the impact of the grant for its intended participants.

I.C. Implementation Features & Findings

The grant focused on building program and institutional capacity at each individual college. Highlights of the findings associated with program implementation are:

Career Navigation was a key feature of the grant.

- Navigation was implemented at each college and centrally led and administered through a partnership with the Regional Education Training Center (RETC). Student Education and Career Navigators linked students to support services, education/training coursework, career and industry information, and employment opportunities in support of their career and education goals.
- The grant invested in a sophisticated and detailed navigation best practices guidebook to create a consistent approach and practice of Navigation across the colleges. Each of the eight colleges implemented career navigation at varying levels of resources and with different plans for student access. Most colleges hired a full-time Navigator to support students across the WISE programs, and most colleges will retain their Navigators beyond the grant with alternative funding sources.¹

Soft skills were supported and assessed through the National Career Readiness Certificate (ACT NCRC®).

- The NCRC is a test of soft skill attainment, in which the participant's score signals to potential employers the participant's level of preparedness for the workplace.
- Everett Community College administered and led the implementation of NCRC across the consortium.
- Not every college decided to use the NCRC to validate soft skills attainment, and it was challenging to encourage employers to adopt the NCRC as a recognized credential, both of which resulted in the inconsistent implementation of this program element.
- Despite these limitations, program managers report that awareness of the value of the tool increased among employers.

The grant was used to build institutional capacity to support specific degree programs at each of the eight colleges.

- Guided by the Centers of Excellence and strong relationships with employers, each college used the grant to further develop curriculum, design and implement industry-recognized stacked and latticed certificates, and enhance faculty supports in key areas.
- Colleges aimed to enhance their industry-recognized credentials, provide students with technical skills desired by the market, and highlight student academic achievements to employers. For example, Renton Technical College promoted the fact that students achieved 4.7 credentials on average as a result of the program, which represented a significant increase over pre-grant levels.

Program implementation challenges often revolved around staff recruitment and retention.

¹ One exception was a Navigator shared by Everett Community College and Green River Community College; this arrangement was ultimately unsuccessful, as the initial Navigator vacated the position and recruiting a replacement for the split role proved difficult.

- Colleges that fell short on implementation goals typically suffered from significant staffing challenges that were partly situational, based on college location or needs (part-time and other hard-to-find position qualifications), and partly due to a lack of position redundancy and planning. Attempts to mitigate this problem were variable and localized. For example, Renton Technical College created redundancy across its Data Coordinator, Navigator and Program Manager positions, so when one staff member vacated a position, the two other positions would temporarily backfill the role until a longer-term solution could be identified.
- That said, many of these “solutions” seemed provisional at best; program stakeholders believe that additional investments in redundancy and resiliency training would have helped resolve this pervasive issue on a more fundamental level.

I.D. Program Outcomes & Impacts on Participants

The WISE grant focused on maximizing completion and employment outcomes for participants. While grant teams did not achieve their stated DOL employment outcome goals, most grant stakeholders perceive the grant as a success and believe their efforts will lead to sustainable program innovations and continued positive student outcomes in the future.

The grant surpassed the DOL Goals regarding recruitment of 1,992 students and completion of 1,316 students

- Overall WISE programs attracted large numbers of participants: at the end of the grant the program served 2,977 unique participants.
- Additionally, 1,510 participants completed a TAACCCT-funded Program of Study, (exceeding the DOL Goal of 1,316) and students on average obtained 1.7 degrees or certificates.

As a whole the grant fell short of the primary DOL employment goal of 910 “non-incumbent” (i.e. unemployed prior to entering the program) participants employed within 3 months of completing and exiting a WISE program.

- In total, 565 WISE non-incumbent participants found employment after completing the WISE program. When we relaxed the DOL incumbency requirement, 917 program participants reported employment post-program, which equated to 101% of the DOL goal. The WISE program(s) attracted large numbers of “incumbents” (i.e. employed prior to program participation) who sought either to advance professional growth by seeking additional technical training, or to shift professions by seeking industry-focused training (e.g. military veterans).

The dichotomy of higher participation rates and lower employment outcomes is interesting but lacks a verifiable explanation, primarily due to severe data limitations.

- For example, DOL’s prescribed method of counting excludes certain participant groups, collecting data 3+ months after program participation was challenging, certain datasets were only available for analysis in an aggregated format, etc. For these reasons these results should be treated as directional but not definitive. We explain data limitations in more depth in the body of the report.

Evaluation analysis suggests that Navigation might have contributed to participant success in completion rates as well as employment rates.

- An analysis of navigation touches as they relate to the likelihood of employment suggests that employment rates increase as Navigator touches increase up to eight visits. After eight visits the

likelihood of employment does not appear to be affected, regardless of the number of Navigator touches.

- This result supports the general stakeholder belief that navigation improved employment outcomes but only up to a point, after which there are diminishing returns on continued investment.
- These findings, while positive, are limited in scope and cannot necessarily be extrapolated to the entire WISE program. Only Renton Technical College developed a strong navigation program with complete and accurate data collection on navigation time and uses, so the evaluation team analyzed data exclusively from Renton and was therefore constrained by a limited data sample. Employment outcome data is incomplete and program implementation was extremely variable across colleges (as previously highlighted), so assessing effectiveness of navigators overall would not necessarily be possible even if more data were available. For these myriad reasons results should be interpreted cautiously. Nevertheless, even with these caveats these preliminary findings are encouraging and seem worthy of further study.

Evaluation findings also demonstrate that participants who attempted the NCRC had higher levels of program completion and finding employment.

- Taking the NCRC appears to be positively correlated to both outcomes, and there are several theories to explain this preliminary result. One possibility is that the actual endeavor of attempting the NCRC helped students complete the program and find employment. Another theory is that students who are motivated to complete a WISE program and find a job are also motivated to take the NCRC exam.
- These explanations are not definitive, however, because of the variability and limitations associated with the administration of the NCRC. For example, Renton Technical College did not utilize the NCRC but recorded one of the highest rates of completion and employment. It could be that Renton simply had a larger number of highly motivated students, or it could be that Renton's program participants would have benefited even more by taking the NCRC (or both).

I.E. Conclusions

- The WISE program formed industry-focused partnerships between educators and employers to design educational programs to close skill gaps and prepare workers for entry level jobs in the clean energy, advanced manufacturing, and construction sectors.
- Important elements of the program design included enhancement of curriculum, certificates and credentials, career navigation, and use of the NCRC to demonstrate soft-skill attainment to employers. The project enabled the WISE team to invest in building and sustaining institutional capacity to support the role of navigation at the colleges, the use and promotion of the NCRC, and the application of curriculum and industry certificates to further strengthen Washington Community and Technical College programs.
- Students and employers generally reported satisfaction with the program.
- Key performance indicators for the WISE program suggest encouraging, albeit preliminary, results. Attributes linked to employment appear to be student demographics, employment prior to enrollment in a WISE program, WISE program completion and exiting from the program, Navigator support, and attempting the NCRC. Identification of the relationship between these attributes with employment outcomes suggests future opportunities to further test and validate assumptions regarding what specifically drives employment opportunities for students.
- The most significant key lessons (and implications for further research) relate to the challenges associated with data collection, availability, security, sharing, and measurement. If the evaluation

design is more prescriptive (i.e. primary outcome measures are defined in detail prior to the engagement of the local evaluator), then major design elements should be aligned with data availability and sharing arrangements in order to maximize grant evaluation efforts.

II. Description of the WISE Intervention

II.A. Background & Structure

Funded through a grant from the US Department of Labor, Employment and Training Administration, Washington Integrated Sector Employment (WISE) supported a statewide collaboration of public workforce system partners engaged in the Washington State critical industries of Clean Energy, Construction, and Advanced Manufacturing (Customer Service was introduced in support of these sectors). These partners came together with the goal of improving workforce readiness in these three industries central to Washington State's economy, which were selected based on a skill gap in the labor pool and the potential for employment growth. WISE focused on preparing displaced workers, including Trade Area Assistance (TAA) eligible workers and veterans, for new careers in industries with significant potential for growth.

Included in the WISE partnership were 8 community and technical colleges, 5 workforce investment boards, the State's TAA coordinating agency, the Washington State Labor Council, Centers of Excellence in Clean Energy, Aerospace & Advanced Manufacturing, and Construction, and 15 major employers. The participating Centers of Excellence led a WISE consortium of the colleges in administering the WISE training program.

WISE was the first federal grant application jointly from three Washington State Centers of Excellence and demonstrated that Washington's Centers of Excellence have become a national model as a sector-based strategy for workforce development. The Centers of Excellence continued to provide leadership through the 4 years of the grant and will be instrumental in carrying the grant investments forward and building sustained institutional capacity. Leadership from the Washington State Centers of Excellence was a differentiator for the WISE grant and a source of sustained development of institutional capacity. Below are descriptions of the three Centers of Excellence.

Center of Excellence for Clean Energy (Centralia College) provides leadership for a growing alliance of energy industry and college partners. Together, industry and educational partnerships provide comprehensive degree and certificate programs, online courses and regional classroom training opportunities that focus on the future of the energy industry.

Center of Excellence for Aerospace and Advanced Manufacturing (Everett Community College) provides leadership and resources to support economic growth for Washington State, focusing on aerospace and advanced manufacturing. Working strategically with industry partners and educational institutions, the Center assists in developing the talent pipeline for the next generation of future workers within the aerospace and advanced manufacturing industry sectors.

Center of Excellence for Construction (Renton Technical College) is a national model in developing partnerships among business, industry, labor and education for the purpose of enhancing economic and workforce development initiatives to meet the current and future needs of the construction industry.

Participating colleges included:

- Bates Technical College (Bates)
- Renton Technical College (Renton)

- Centralia College (Centralia)
- Everett Community College (Everett)
- Green River Community College (Green River)
- Shoreline Community College (Shoreline)
- South Seattle College
- Walla Walla Community College (Walla Walla)

An Executive Leadership Team comprised of members from participating industries, organized labor, and workforce development met quarterly and provided general oversight for the WISE program as well as strategic guidance to the WISE consortium. (See Appendix A for a detailed list of participating industry experts.)

Support for the WISE consortium also included Governor Jay Inslee, Senator Patty Murray, Senator Maria Cantwell, the advisory boards of the three Centers of Excellence, and industry partners such as Absher Construction, Avista, City of Seattle, CIMtech, Pacific Tool, PTI Machining & Manufacturing, Puget Sound Energy, Royelle Manufacturing, Spokane Homebuilders Association, Tacoma Power, Washington State Labor Council AFL-CIO, and others.

II.B. Program Overview

During the course of the 4-year grant period, October 1, 2014 through September 30, 2018, the WISE program built institutional capacity at the 8 community and technical colleges of the consortium. Core elements across the colleges included:

Enhancing educational programs. Colleges expanded student opportunities/job readiness both by creating new curriculum and strengthening existing programs within the clean energy, advanced manufacturing, and construction programs. Each college increased its ability to serve students through enhanced stacked and latticed credentials and improved curriculum based on employer’s needs. Other enhancements included online course development and delivery, additional software, establishment of a process for credit for prior learning², computer labs, and hands-on training equipment.

Offering Career Navigation. A central feature of the grant, Career Navigators linked students to support services, education/training coursework, career and industry information, and employment opportunities in advancement of student career and education goals. Navigation services were intended to improve the colleges’ ability to retain, promote, and place students in employment within their field of study. (See below for more detail on implementation.)

Adopting and promoting the National Career Readiness Certificate (NCRC). WISE established Everett as a lead, and partner colleges as testing sites, for ACT NCRC® – a nationally recognized credential that validates a skilled labor workforce within the community. To support Work Ready Washington, WISE invested in expanding employer acceptance of the NCRC as an indicator of a potential employee’s soft skills development and readiness for work. (See below for more detail on implementation.)

² A process for credit for prior learning was developed among the consortium to support the Washington state legislature’s goals of facilitating credit for prior learning (RCW 28B.77.230). WISE identified past training and education using placement exams, military training, work experience, apprenticeship, and industry credentials to accelerate participants through the training pipeline.

Strengthening partnerships among the colleges and with employers and labor. Through WISE, colleges increased the depth of relationships with existing employer partners and new relationships were formed. Leveraging these relationships, consortium members addressed employer needs through industry recognized certification, curriculum, specialized training equipment, and faculty training. The colleges, employers, and unions worked together to ensure that the training and credentialing provided created a prepared workforce. Building more robust relationships among the colleges allowed them to serve students more effectively by standardizing services and credentials and sharing resources and information.

Building pathways to apprenticeship in focus industries. Apprenticeship was recognized as a proven pathway for workers to enter living wage careers. WISE identified apprenticeship pathways into fields with key opportunity indicators³ and aligned with clean energy, advanced manufacturing, and construction. Consortium colleges supported programs that provided a certification or degree pathway directly related to trade specific technical skills obtained through a rigorous apprenticeship program. Programs resulted in graduates earning certifications and associate's degrees that made them strongly competitive for selection into apprenticeship fields.

Partnering with Veteran Alignment Programs. Specifically, the grant provided outreach, navigation, and online curriculum resources to better serve veterans and accelerate them into careers.

II.C. Navigation

Each participating community and technical college within the WISE program employed some level of Career Navigation programming to provide students with assistance in their educational and employment-seeking activities. Incorporating this element into WISE aligned well with research suggesting career navigation practices and models result in better education and employment outcomes for students.⁴ Navigator-provided support services started at the intake processes as students enrolled and were identified as qualified candidates for the WISE program. Navigators both responded to student requests and reached out to WISE program students with support and information related to: financial aid, coursework selection, completing certificates/credentials, tutoring, job search practices, resume writing, job interviewing, housing, career and industry information, and targeted employment opportunities. Additionally, Navigators assisted with WISE program administration and data collection.

³ WISE identified apprenticeship pathways with one or more of the following opportunity indicators: 1. Strong growth trades demanding large numbers of new workers due to demand-side factors (i.e. industry growth, emerging technologies); 2. Rising entry standards requiring more highly trained first-year apprentices; 3. Trades experiencing significant retirements or other shortages requiring increasing the size of the apprenticeship pipeline.

⁴ According to Seattle Jobs Initiative (http://www.wtb.wa.gov/Documents/SJI_CareerNav_Report_FEB2015.pdf), a literature review on career navigation practices and models highlighted evidence that students who receive career navigation-like services achieve better education and employment outcomes. Specifically, the Seattle Jobs Initiative study of community college students who received career navigation services concluded that higher percentages of participants "completed their educational programs, obtained employment, and earned higher wages than they did prior to receiving services." Evidence also supported the conclusion that community college participants continued to do well in their education/employment experiences after the career navigation services ended.

Each participating college and its WISE participants had access to a Navigator, although students at Green River and Everett shared a Navigator. Anecdotal evidence suggests this approach was insufficient to address student needs.

The WISE program contracted with Regional Education Training Center (RETC) to develop a training and employee guidebook for Navigators in an effort to make navigation more consistent across the colleges and provide newly hired Navigators with a framework for their work with students. The guidebook documented and reported on the “best practices” and value-added methods for assisting and mentoring WISE participant job seekers. Also included in the guidebook were robust tools for preparing resumes, cover letters, interviewing, and networking to expand students’ opportunities. This emphasis reflects the overall focus of the WISE grant on preparing students for employment.

The guidebook can be found [here](#) and will be available as member of the WISE consortium continue to support navigation. The Centers of Excellence and WISE partners will also share the guidebook with other institutions to help the field build institutional capacity in navigation services. Already, the guidebook has expanded institutional capacity for the WISE consortium members.

In addition to developing the guidebook, the team from RETC provided training directly to Navigators, supported Navigators in position, developed tools, and shared best practices. This administrative support across the grant was designed to improve continuity of this key grant service and create specific assets to leverage with other programs in the future.

II.D. National Career Readiness Certification (NCRC)

WISE built institutional capacity by establishing and validating the use the ACT’s evidence-based NCRC as a tool for the program and a signal of employment readiness. Used across all sectors of the economy, NCRC verifies cognitive skills such as: problem solving; critical thinking; reading and using work-related text; applying information from workplace documents to solve problems; applying mathematical reasoning to work-related problems; setting-up and performing work-related mathematical calculations; and comparing, summarizing, and analyzing information presented in multiple related graphics. NCRC, along with certificates that are cross-walked to actual employer positions, allowed employers to feel confident about the work readiness and soft-skills of WISE program participants.

Potential benefits of earning a NCRC certification include:

- Confidence that foundational skills meet the needs of local employers
- Ranking above other job applicants lacking an NCRC
- Better understanding of employers’ requirements for job performance
- Determining skill improvements and training opportunities
- Realizing opportunities for career advancement and promotions
- Demonstrating on a resume an understanding of skills employers want
- Additional employee insight into applicant qualifications
- Demonstration of willingness and ability to prove the skills important to today’s workplace

To earn an NCRC, WISE participants had to successfully complete ACT WorkKeys assessments in Applied Mathematics, Locating Information, and Reading for Information. As described by ACT, WorkKeys assessments measure “real world” skills that employers believe are critical to job success using test

questions based on situations in the everyday work world.⁵ The NCRC certification was awarded based on a participant's score on the WorkKeys assessment. If participants did not achieve their desired score, they were offered supplemental training through the WISE program and/or the KeyTrain™ online training.

The WISE grant supported costs associated with taking the NCRC exam and Everett managed the certification. The team at Everett also led efforts to build demand for the certification in the employer community. Within WA there is limited awareness and acceptance of the NCRC as a predictor of an employee's future success. Throughout the grant period the Everett team met with key WA employers within the targeted industries but few meetings resulted in commitments to recognizing the certification for new hires.

II.E. Program Implementation at Individual Colleges

Each of the eight community and technical colleges in the WISE consortium implemented the grant differently, based on their particular needs and opportunities. The following summaries describe each college's program investments, drawing on a variety of information sources including. Through the WISE evaluation questionnaire, colleges provided structured input on investments they made through the WISE grant, how programs were implemented, faculty and staff hired to support the grant, and efforts to create sustainable programs after the grant funding ended. Basic budget information and the evaluators' tracking of degree programs supplemented the information from the colleges. The descriptions also reflect information drawn from program descriptions in the interim report, the Navigation Guidebook, and additional sources where available.

The evaluation team strove to provide similar and comparable information about each participating college without sacrificing details useful in contextualizing evaluation results. Ultimately, differences in the nature and completeness of information provided by individual colleges resulted in varied levels of detail in the descriptions below. At the extreme, two colleges did not provide input via the evaluation questionnaire – Shoreline and South Seattle Community Colleges – therefore their program descriptions lack input on forward looking sustainability and other details about their program implementations. A reader may be inclined to conclude differences in depth of detail reflect degree of program implementation but, in fact, it is more likely they reflect challenges in capturing and sharing data attributable to a variety of factors.

Bates Technical College

Bates was given a budget of \$1,138,642, which funded three degree programs within the WISE grant: Diesel Mechanics, Electrical Construction, and a Construction Pre-Apprenticeship Program. Bates offered the NCRC and heavily promoted the benefit of participation through class presentations at the beginning of each quarter, flyers and additional Q & A sessions as requested by participants.

A short description of each Bates program:

Diesel and Heavy Equipment Technology Program enhanced their curriculum by fully incorporating seven new courses and five revised stackable certificates into the Associates in Applied Science (AAS) program of study which prepared individuals for employment in the diesel and heavy equipment industry. Local industry training partnerships provided practical experience that enhanced student instruction. Graduates found employment as technicians in diesel and heavy-duty

⁵ <http://www.act.org/content/act/en/products-and-services/workkeys-for-employers/assessments.html>

apprenticeships, working with highway trucks, construction equipment, hydraulics, material handling equipment, agricultural equipment, power generation equipment, marine diesel applications, and utilities.

Articulation Agreements were established for Diesel and Heavy Equipment Technology AAS to Bachelors in Applied Sciences (BAS) Articulations to Montana State University and Centralia College. Additionally, through the WISE program, Bates resourced future I-BEST instruction in the Diesel and Heavy Equipment Technology program.

Electrical Construction Program fully incorporated two new courses and one revised stackable certificate into the AAS program of study. This program ran nine academic quarters and was designed to prepare students for positions in electrical construction requiring licensure as an electrician through the Washington Department of Labor and Industries (L&I) with whom agreements for electricians' licensure hours credit are now firmly in place.

Construction Pre-Apprenticeship Program was developed by the TOOL Center Consortium, which included representation from registered apprenticeship programs and building trades industry partners. Based on the Building Trades Multi-Craft Core Curriculum, it ran 12 weeks and incorporated sections of coursework offered at Bates. The program taught skill basics and occupational standards for trades including carpenter, mason, ironworker, laborer, painter, plumber, sheet metal worker, operating engineer, and electrician. The program also taught essential soft skills including communication, time management, customer service, team building and leadership. The program was recognized as a pre-apprenticeship training program by the Washington Department of Labor and Industries.

Beyond program enhancements, Bates used the WISE grant to fund both a Career Navigator and a Coordinator. The Navigator served as primary support and guidance to WISE participants as well as outreach to employers, staff and other partners. The Coordinator managed data collection, file management and provided secondary support to WISE participants. For approximately 9 months during the first year of the WISE grant the Bates WISE team lacked a Navigator due to hiring/personnel health challenges. This greatly inhibited the Bates WISE team's ability to get systems, tools, processes and programs into place.

Other supports offered by the WISE team included:

- Women in Non-Traditional Trades programming to address the unique challenges women face in non-traditional fields with activities including speakers, luncheons and conference participation;
- Employment preparation support such as mock interview panels, workshops on resume preparation and presentations from employers in industry;
- Quarterly credential awards events that celebrated the achievements of students who earned short, long or degree credentials each quarter and served as mini-graduations with speakers where individual students were recognized by instructors;
- Funding support through troubleshooting/researching financial aid challenges and options, and serving as a liaison to various funding programs and administrators;
- Program progress monitoring and transcript review (and course work advising) to insure students were on track;
- Facilitation of Joint Transcript review for Veterans to insure prior learning credit was awarded for relevant military work experience

- Establishment of partner relationships with industry employers to help connect students to work-based learning and post-graduation employment opportunities;
- Coordination of student tours at employer facilities; and
- Coordination of presentations and tours at partner schools that offered BA in a student's program of study.

Centralia College

Centralia was given a budget of \$1,848,383 to fund three degree programs within the WISE grant: Bachelors of Applied Science in Applied Management (BASM), Energy Technology, and a Lean Six Sigma program for veterans. Along with implementing their own programming, Centralia served as coordinator for the entire WISE consortium. As such, Centralia's budget paid for grant-wide management/support, leaving a subset of funding for new programs. The majority of that funding paid for a contract with the RETC to provide navigation services to the Energy Technology Program and the Veterans Lean Six Sigma White Belt. Centralia offered the NCRC as well. One Navigator supported students in both these programs, an arrangement which appears to have been sufficient.

Through the WISE grant, Centralia introduced curriculum enhancements as well as a new a hydro-power course to their programs. Curriculum development was based on a Centralia funded and sponsored Skills "DACUM"⁶ with experts from the utility industry and the field of instructor curriculum development.

A short description of each Centralia program:

BA in in Applied Management Program was designed to build on a participant's associate degrees and provide a path to the baccalaureate level. The BASM program provided graduates the training they needed to succeed in management positions in a wide range of businesses and industries. Participants learned the skills needed to run a small business or entrepreneurial venture, or to apply for graduate programs at colleges and universities. The program was designed to be flexible for working adults and therefore attracted incumbent workers (employed at the time of entering the WISE program). All courses were offered as hybrid with evening class hours and online learning to reduce classroom time. The program also served the coursework needs for students from other degree programs resulting in smaller numbers of completers and exiters to be counted toward outcome measures such as employment.

Energy Technology Program offered coursework in traditional sources of power generation as well as renewable energy and energy efficiency. The Centralia team worked closely with employers, unions and other industry partners in utilities to create the curriculum and program elements.

The program prepared students for entry level positions such as power plant assistant control operator, technician, and other high voltage apprenticeships. As the designated Washington State Center of Excellence for Energy Technology, Centralia received support from statewide energy industry and labor leaders.

⁶ DACUM is an acronym for Developing a Curriculum. Developing a Curriculum (DACUM) is a process that incorporates the use of a focus group in a facilitated storyboarding process to capture the major duties and related tasks included in an occupation, as well as, the necessary knowledge, skills, and traits.

Centralia also offered a Power Operations AAS Degree program preparing students to compete for employment in the Power Generation Industry. The AAS program culminated in the AAS degree without specific industry recognized certificates offered.

Veterans Lean Six Sigma White Belt Program was a short certificate program offered to veterans. The program was designed and managed by RETC.

Beyond these curricular and programming elements, Centralia provided the following additional supports:

- Online learning platform for Clean Energy
- NTER open-source learning management system for sharing curricula
- Used apprenticeship as credit for prior learning

Everett Community College

Everett was given a budget of \$1,415,775 to fund four degree programs within the WISE grant: Pre-Employment, Machining, Washington Association of Building Officials (WABO) Welding Program, and Technical Customer Service Representative (TCSR) program. Everett used grant funds to partially fund faculty in these programs, develop curriculum, purchase equipment, offer the NCRC and support Navigation. Through the involvement of the Center of Excellence for Aerospace & Advanced Manufacturing, the use of best practices from across the country were promoted and introduced into Everett's programs.

A short description of each Everett program:

Technical Customer Service Representative (TCSR) Program reflected relationship building with industry partners to develop and promote the TCSR program and resulted in a well-designed program with significant job opportunities and advancement for graduates. As part of the Business Technology program, the TCSR career pathway provided opportunities to develop introductory skills through a three-quarter/nine-month certificate program. Courses fostered learning in computer fundamentals, software applications, business communications, business math, interpersonal and team development skills, and customer relations. This certificate program prepared students for technology support positions in a wide variety of technical customer service settings. With curriculum developed, vetted and promoted through local industry partners, students gained training in skills seen as vital to these growing industry-specific positions.

Welding Program enhancements included the addition of three classes in metallurgy, increases in the number of faculty and students receiving nationally recognized industry certifications through the National Institute of Metalworking Skills (NIMS) and ACT (NCRC), and solidification of the pre-apprenticeship agreement between Everett and the sheet metal workers. The NIMS certifications will continue and has already been extended to machining students while the three metallurgy courses have already been embedded into the welding program and will continue to be required for various certificates and for the degree.

In addition to work on its own programs, Everett functioned as sponsor and manager of the NCRC program for the WISE grant overall. While the Everett team tried to build industry adoption and employer awareness of the NCRC, they struggled with low adoption. Renton did not use the NCRC

because they didn't see it as an industry standard; other colleges made it available but did little to promote it. At Everett the NCRC was offered through the pre-employment program.

While Everett employed a Navigator, ultimately it was only a .2 position. Originally Everett planned to share a Navigator with another consortium college and so anticipated a .5 Navigator. When they lost their Navigator, they found it impossible to fill a shared position. The Customer Service program utilized the .2 Navigator but, as a new program, it would probably have substantially benefited from a full-time Navigator.

Green River Community College

Green River was given a budget of \$1,193,417 to fund three degree programs within the WISE grant: Maintenance Mechatronics AAS, Customer Service Representative, and Marketing and Entrepreneurship BAS. Within those programs, Green River created two unique certificate programs: the Customer Service Representative (CSR) Certificate in the Business Marketing and Entrepreneurship Division and the Maintenance Mechatronics (MTX) Certificate in the Trades Division.

A short description of each Green program:

MTX Program evolved from the Aerospace and Advanced Manufacturing Program to four stackable certificates each of which were 13-credit, one-quarter programs. MTX coursework focuses on teaching students to safely and efficiently manage the complex maintenance needs of industry. It serves as an example of a new field developing in response to industries' changing technologies. MTX certificates could also apply towards the MTX Applied Associates of Science (AAS) Degree.

CSR Certificate Program provided a short-term (three quarter) training program designed for students interested both in working with people to solve problems in a positive way and gaining a solid foundation in business marketing and entrepreneurship. Education professionals and a community advisory board of specialists from industry, government, and the nonprofit sectors participated in the program design. Several classes applied toward the AA or BAS degree. The program also offered opportunities to associate with industry professionals and gain hands-on experience with the latest technology in the field.

The Green River WISE program planned for a part-time Navigator shared with Everett. The part-time Navigator was hired at a level too low to be effective and then left the position and was not replaced. Towards the end of the WISE grant Green River lost a significant portion of the WISE grant team including the Program Manager, Navigator, Data Entry, and the Outreach Coordinator. This created challenges in terms of ensuring that all of the program requirements and outcomes were being maintained/pursued as well as providing critical support to students working toward employment. Green River offered the NCRC.

Renton Technical College

Renton was given a budget of \$1,267,165 to fund five degree programs within the WISE grant: Construction Management, Welding, Major Appliance and Refrigeration Technology (MART), Commercial Building Engineering, and Construction Management. RTC also improved student employment opportunities by developing and offering a short-term Leadership in the Trades certificate. Renton offered the NCRC.

A cornerstone of RTCs program is the relationship they developed with the Tulalip Tribes TERO and Casa Latina to offer CTP curriculum for tribal and Spanish-speaking populations. The school is investing in and expanding the CTP curriculum to serve other programs, including Mechatronics. CBE simulators and computer lab equipment will be sustained indefinitely. Relationships including articulation agreement between RTC/South Seattle and Tulalip Tribes will continue indefinitely. RTC had strong relationships with employers and leveraged those relationships for Advisory Committees and student tours.

A short description of each Renton program:

Construction Management Program serves as the entry point for the Welding and MART programs. This program was offered at Renton and also through a collaborative program agreement with South Seattle College and the Tulalip Native American Tribe. It satisfied elective credits for the Commercial Building and Construction Management programs. Additionally, students gained skills for apprenticeship or entry-level employment in construction, manufacturing, maintenance, and related industries. Courses incorporated theory and hands-on application in a variety of trades including electrical, plumbing, carpentry, masonry, and sustainable building practices. Course work also included safety standards training, trades math, writing a resume, cover letters, and preparing for job interviews. One of the program's goals was to train a diverse workforce, increasing the number of women and people of color who were ready to enter apprenticeships, construction-related professional-technical programs, and trades positions. Each student received a certificate of completion aligned with his or her program intent.

Welding Program prepared welders for job entry in most phases of the welding industry. The certifications in this program were progressively sequenced for multiple completion points, and with students taking certification in order, unless prior learning was deemed satisfactory. Classroom and practical experience were offered in the seven most common manual and semi-automatic welding processes. Previous experience determined a student's starting point. WABO (Washington Association of Building Officials) Welder Certification is available in six of the arc welding processes. This program articulated with Tech Prep programs through the Puget Sound Dual Credit Career Consortium.

MART program offered practical technical training in the repair and troubleshooting of all major appliances including refrigeration and laundry appliances. Instruction was designed to duplicate conditions and requirements experienced by a technician working in the field. Emphasis was placed on developing a thorough understanding of electrical, mechanical, and refrigeration theory through classroom experiences and practical application. Proficiency was developed by using test equipment to improve diagnostic and repair techniques. Students were introduced to all aspects of the industry including parts procurement, work order/parts development, and industrial communications. This program was approved as an electrical specialty training school for Appliance Repair (07D) by the Washington State Department of Labor and Industries, Electrical Section. This program is accredited by the Professional Service Association, a national appliance industry organization.

Commercial Building Engineering Program featured a flexible structure for students who continue working while receiving advanced training. Instruction areas included refrigeration and building systems, boiler operations, hazardous waste management, electrical, refrigeration, boiler operations, basic welding, brazing and pipe sweating, programmable logic controls, mechanical maintenance, generators, and turbines used in large buildings to supply heat, air

conditioning, ventilation or power. Students learned to regulate and maintain heating, cooling, and ventilation systems for commercial buildings. Students also learn to maintain, troubleshoot and repair equipment for industrial environments such as bakeries, breweries, and candy companies. An emphasis was placed on practical experience and hands-on training whenever possible. This program was a recognized “School of Technology” by the cities of Seattle and Tacoma advisory boards.

Construction Management Program helped students prepare for careers in construction management as a project manager, superintendent, estimator, safety officer, and other administrators. Students learned estimating, scheduling, project management, human resources management, and other skills that are critical in the construction management field. Students could enroll on a part-time or full-time basis.

As part of WISE, Renton funded a full Navigator position shared by 4 individuals. Navigators provided both group and individual Navigation throughout a student’s engagement in a program. Support from Navigators covered not only career-related issues but student retention (financial Navigation, social services Navigation, and interdepartmental Navigation). Note, Tulalip provided their own Navigator, training center, supplies and student travel expenses. Because Renton also employed a Coordinator with primary responsibility for data-related activities, the Navigators were able to handle the Navigation-only workload associated with all 5 programs. When the office was fully staffed (Manager, Navigator & Coordinator), this resource level was sufficient. However, staff turnover was a significant problem for Renton (and many other colleges).

Shoreline Community College

Shoreline was given a budget of \$1,223,141 to fund three degree programs within the WISE grant: Computer Numerical Control (CNC) Machinist, Energy Systems, and Energy Technology.

A short description of each Shoreline program:

CNC Machinist Program was a nationally accredited, intensive program designed to prepare qualified individuals for entry into the job market as a Computer Numerical Control (CNC) Machinist. Instruction covered programming and basic set-up and operation of CNC machines, blueprint reading, shop mathematics, machine tool theory, inspection, surface plate techniques, and Statistical Process Control. The program had two instructors in the same classroom (known as the I-BEST model); one to teach technical skills, and one to teach basic skills like English or math.

Additive Manufacturing (3-D Printing) Program taught 3-D printing and rapid prototyping, including the processing of suitable CAD models, current rapid prototyping fabrication techniques, secondary processing, and the impact of 3D printing technologies on society.

Machine Maintenance Program taught maintenance practices, including: safety, plan development and implementation, technical documents, machine systems, measurement, alignment, coolants and lubricants, conduct and documentation of periodic checks, inspection, troubleshooting, and monitoring of machine operation.

Shoreline introduced hybrid offerings with machining including Machine Maintenance, Quality Assurance, and 3D printing and metrology. Shoreline invested in a full-time Navigator to support WISE students and offered the NCRC to participants.

South Seattle Community College

South Seattle was given a budget of \$687,664 to fund five degree programs within the WISE grant: Industrial Manufacturing Academy (MA), Pre-employment, Computer Numerical Control (CNC) Machinist, Washington Association of Building Officials (WABO), and a Pre-Apprenticeship program.

Only a description of the MA was provided by South Seattle. See below:

MA was a short-term training program designed for entry-level and reentering professionals wanting to update and expand their skill set in the world of diversified and advanced manufacturing. With manufacturing on the rise, this short-term professional technical certificate supported introductory skill building in new and traditional manufacturing techniques. Through a combination of industry recognized certifications, college credits, applied learning, and job readiness training, the MA successfully placed graduates into living wage jobs or further education.

The goal of this program was to build a 21st century workforce to fill entry-level manufacturing positions, to provide long-term family wage employment, and to support educational and career ladders for graduates in the diverse world of manufacturing. Curriculum content was developed in partnership with the Aerospace Joint Apprenticeship Committee (AJAC), and local employers, ensuring it was relevant, met industry needs, and aligned with state standards for manufacturing. Students had the opportunity to interact with employers throughout the program, including entry interviews, industry tours, and a job fair where invested employers offer employment upon graduation. In addition, the MA provided students a pathway to enter into apprenticeship or continue their education within the state's community and technical college system. Credits earned in this program transferred into other industrial educational pathways in the Seattle Community College District and other colleges in the state, including welding, composites, and HVAC. Successful completion of the MA also satisfied the minimum requirements for entry into the Aerospace Joint Apprenticeship Committee's programs.

South Seattle Community College invested in a full-time Navigator to support WISE students and the WISE program and offered the NCRC to students in the MA program but not the other programs.

Walla Walla Community College (WWCC)

Walla Walla was given a budget of \$1,220,667 to fund three degree programs within the WISE grant: Welding (AA/AS Degree and Certificate in Welding Technology), Carpentry Program (AAAS Degree and Certificate in Carpentry Technology), and Energy Systems Technology (AA/AS Degree and Certificate in Energy Systems AA/AS and Certificate in Wind Technology). As part of the WISE program, Walla Walla set goals of increasing participation in their Energy Systems programs, re-establishing their Carpentry program, and enhancing their Industrial Maintenance and welding programs at their Clarkston campus. The NCRC was offered but Walla Walla got off to a late start, and had limited computer lab access to administer the tests.

A short description of each Walla Walla program:

Energy Systems Technology Program (EST) Walla Walla re-engineered its EST Department consolidating the many degrees offered and featuring a single AA/AS degree program. In the past, Walla Walla had separate degrees in Refrigeration, Electrical, Wind Technology, Plant Operations, Industrial Maintenance, Precision Agriculture, and Irrigation. The demand for

technicians and operators who maintain robust electrical, mechanical, and bio-chemical skills and are interested in lifelong learning is a common need among employers in the Pacific Northwest. Walla Walla integrated the identified degree tracks into one degree program to: a) act on feedback from advisory boards and industry partners; b) provide students more effective academic advising; c) improve the coordination and efficient delivery of vital financial and social support services; d) reinforce the quality of courses and program offerings; e) integrate recommendations from research and practice on stacked and latticed credentials; f) strengthen job security for instructors; and g) reduce and/or eliminate orphaned courses serving single degree tracks.

In the revised configuration, EST students completed an electrical core certificate of 52.4 credits in year one. This “year one” core, i.e., a certificate in electrical systems, was a pre-requisite for a range of “year two” certificates. When a student completed the core electrical certificate, followed by completion of the course requirements for one or more “year two” certificates, the student completed an AAS degree in Energy Systems Technology with concentration in one or more specified training areas. Latticed credentials made it easier for students to earn multiple formal endorsements, certifications, and/or degrees in often seemingly unaligned disciplines. As students completed courses for the EST concentrations listed, they also completed requirements for a secondary certificate or degree program in addition to their primary credential of focus.

Graduates entered the workforce having gained experience and possessing the tools to calculate, measure, and process a variety of materials to generate high value products, including: electricity, bioproducts, treated water, crops, foods and beverages, paper products, and renewable energy

The WISE grant also supported instructor training and professional development, and enabled the purchase of more than \$300,000 worth of technical teaching aids and equipment used in the shop to enhance delivery of course content.

Carpentry Program allowed students a comprehensive educational experience using current industry standards applied to the carpentry curriculum to allow students the most hands-on experience with a wide variety of tasks to gain a widespread knowledge of carpentry and complete construction of a house. Students earned an AAAS Degree in Carpentry upon completion of the two-year program of study. This degree prepares students to take the journeyman carpenter examination. A Carpentry Certificate was available upon completion of the first year of study in the program.

Along with supporting significant program redesign, Walla Walla used its WISE grant to hire a Career Navigator and a Program Director who worked closely with all of the students. Although Walla Walla employed one Navigator for the WISE Grant, the college overall had 3 Navigators during the WISE grant reporting period. Navigators connected to students, made classroom visits to share campus resources, and offered general support. Despite a few gaps in providing Navigation, a WISE Navigator was hired in October 2016 and is still employed at Walla Walla through other funding sources.

Walla Walla established strong relationships with local employers, union reps, training coordinators and other industry representatives who serve on all of their advisory committees for their Workforce programs. The Navigator was also a member of the advisory committee for EST, Carpentry and Welding during the WISE grant. Curriculum was reviewed during advisory meetings and employers provided

tours of their facilities, were frequently guest speakers, volunteered for mock interviews, and talked to students about job openings. Employers also donated equipment and materials.

II.F. Summary and Conclusions

The WISE grant brought together stakeholders from throughout Washington State to collaboratively design and support programs that would improve workforce readiness in key state industries. Led by Centers in Excellence for Clean Energy, Advanced Manufacturing and Construction, a consortium of 8 community and technical colleges implemented program elements including: enhanced programming in sectors connected to employer needs and critical skill gaps; Career Navigation support; and NCRC certification. While individual colleges adopted different approaches to these program elements, all worked toward the same overall goals of increasing employability and employment for participants.

In developing and implementing programs under this grant, participating colleges established relationships with each other and external stakeholders, including industry leaders, that have the potential to provide benefits even as the grant concludes. Further, in reporting on their activities, many of the colleges noted programs, agreements, resources, and supports put in place through the WISE grant that will remain in place moving forward, with the ability to provide ongoing benefit. Details of grant funded activities shed light on challenges the colleges faced and will need to address in the future as they consider ways to continue to support workforce readiness in targeted industries.

III. Introduction to the WISE Initiative Program Evaluation Design

The US Department of Labor’s Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program invested \$2 billion to improve the capacity of community and technical colleges to offer workforce education and training that increases the skills and employment of adults. One of the goals of this investment was to use results and lessons from the grant projects to inform policymakers and practitioners in higher education and public workforce systems, and to support innovative training and education. Third-party evaluations serve as a key component of the Departments’ efforts to document, assess, and share the experiences of the TAACCCT grantees and the results of their projects.

The WISE initiative evaluation aimed to provide a consistent, meaningful way to assess the effectiveness of the program model overall and of key program elements specifically. The evaluation was designed to provide accountability to funding sources and inform the development of future programs. With these objectives in mind, third-party evaluator Third Sector Intelligence (3SI) designed an independent and comprehensive evaluation of WISE including an assessment of both program implementation and of program outcomes. Along with analysis of the program’s ultimate impact, the evaluation invested critical effort in building a framework for on-going, formative program evaluation and program improvement.

Evaluation Design Overview

3SI took a utilization-focused approach⁷ to developing the WISE evaluation, explicitly recognizing the importance of engaging key stakeholders in the design and execution of the evaluation to ensure its ultimate relevance and usefulness. The final evaluation plan reflected participation from a variety of stakeholders, principally the WISE Lead Grant Manager and leaders from the Centers of Excellence. Implementation of the evaluation relied on a strong relationship with the WISE Lead Grant Manager, the Principal Investigator and other program leaders from Centralia as well as Program Managers and, in some instances, Navigators from each of the colleges, and the Centers of Excellence. Note, even and perhaps especially within a utilization-focused approach, the evaluator maintains independence in order to ensure an evaluation plan that will hold the program team accountable to grant goals.

The design for the WISE program evaluation consisted of two key components:

1. **An Implementation Evaluation** to assess the development of degree programs, and the success of the programs in enrolling students and supporting their progress as measured by numbers of certificates, credits and credentials earned.
2. **An Outcomes Evaluation** to measure achievement of the goals of the program including student employment, wage increases, and job retention.

Research questions – laid out in sections IV, V, and VI – guided the specific details of the Implementation and Outcome Evaluations.

The evaluation design planned for implementation and outcomes measures to be presented in an on-going Continuous Quality Improvement format (CQI). Utilizing quarterly dashboards and annual reports

⁷ Utilization-focused program evaluation is evaluation done for and with specific intended primary users and for specific, intended uses. Source: Patton, Utilization-Focused Evaluation [International Handbook of Educational Evaluation](#) Section 3 page 224

program leadership repeated access to the data and analytics, and supported the creation of a culture of data utilization and continuous improvement. The CQI framework was based on the following methodology:

1. Establish goals (with input from stakeholders)
2. Measure and assess progress
3. Analyze and interpret results
4. Make recommendations to implement improvements and course corrections

The evaluation team worked to align the appropriate assessment and evaluation activities with the stages of the program. Initially, the evaluation focused on implementation evaluation as WISE executed on the training program plan, including developing curriculum, purchasing key equipment, hiring faculty and other staff, and enrolling students. Over time, the evaluation shifted to assessment of program impact and longitudinal data analysis as participants completed certificates and coursework and student outcomes data became available.

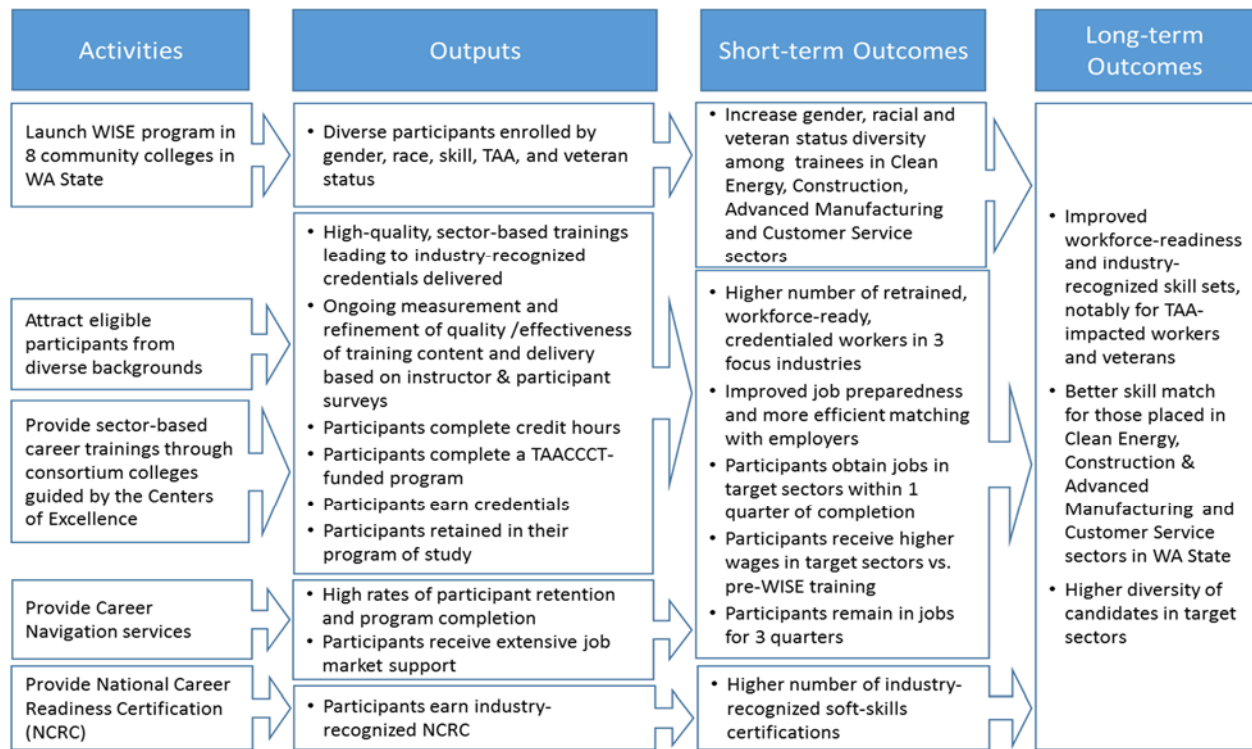
The evaluation design included a quasi-experimental component with analysis of program outcomes specifically looking at South Seattle's Manufacturing Academy as a treatment group and Bates' Manufacturing Academy Program as a control group. Both colleges administered the same credential programming for MA students and are within 30 miles of each other. In many ways the populations of students at both colleges were similar, an important factor intended to isolate the effects of the WISE grant on the program outcomes of employment and completion rates at South Seattle.

This analysis began as a quasi-experimental design, which primarily focused on the effects of the WISE Grant on employment outcomes. Ultimately, changes and limitations on data sharing made such analysis impossible and required the evaluation team to develop an alternative. More about the quasi-experimental evaluation design and the data sharing limitations can be found in Section VI.

Evaluation Measures

The framework for the WISE evaluation followed a logic model for program impact. Laid out in the logic model were key WISE program activities intended to drive outputs which, in-turn, would drive outcomes and impact. The WISE evaluation team used this logic model to identify the key quantitative and qualitative areas for evaluation as well as assumptions and questions that could be addressed or validated through the evaluation. Following the WISE logic model, the evaluation measured the degree to which the WISE consortium fully implemented the program, students enrolled and trained, and, ultimately, programs attained outcome goals. In addition to providing guiding principles which focused the evaluation, the logic model also informed identification of issues and challenges early through a CQI cycle.

Figure 1: Program Logic Model



In establishing evaluation measures, the evaluation team drew an important distinction between program outputs and outcomes. Outputs are the completion of program activities and generally focus on process or implementation measures while outcomes are considered to be the result or attainment of program goals.

The outputs on which the evaluation focused included those specified in the Solicitation for Grant Applications as well as additional measures of key program elements such as participants earning the NCRC and participants utilizing Navigation support. Measured outputs also included satisfaction with or perceived value of the training programs. Outcomes focused primarily on measures specified in the Solicitation for Grant Applications.

Where possible the evaluation analyzed each of these output and outcome factors by participant demographics (such as race, ethnicity, gender, veteran status, etc.) and program factors (college, degree program, number of trainings or categories of trainings completed, NCRC certificate completion and score, level of use of Navigator resources, etc.) This gave us the ability to compare across program factors to better understand the drivers of program trends and apparent levels of success.

The table below provides a detailed list of the outputs and outcomes specified in the Solicitation for Grant Applications with goals approved by the U.S. Department of Labor, along with a brief description of how and when these were measured as part of the evaluation. Definitions for these metrics were determined by DOL and goals associated with each measure were established as part of the grant application process, prior to the involvement of the evaluation team. Each of these measures was subdivided into a goal for each of the eight colleges (individual college goals are not reported here but can be found in Appendix B).

Table 1: WISE grant outputs and outcomes with measurements

Outcome Measures		Goals	How/when they were measured
Outputs - Program metrics related to implementation performance			
1.	Total unique participants served	Total: 1,992	Enrollment and completion data maintained on an ongoing basis by colleges. Evaluator worked with each college to access trainees' program attendance and completion data.
2.	Total number of participants completing a TAACCCT-funded program of study	Total: 1,316	
3.	Total number of participants still retained in their program of study or other TAACCCT-funded program	Total: 277	
4.	Total number of participants completing credit hours	Total: 1,336	
5.	Total number of participants earning credentials ⁸	Total: 2,085	
Outcomes- Post-completion employment and earnings metrics			
6.	Total number of participants enrolled in further education	Total: 655	Participant post-completion activities and job status data maintained from ESD and WSLC. Successive rounds of surveys administered by career navigators at the following times: 1. Trainees' completion of the program 2. three months after completion 3. six months after completion
7.	Total number of participants employed after TAACCCT-funded program of study completion (<i>job attainment</i>)	Total: 910	
8.	Total number of participants retained in employment after program of study completion (<i>job retention</i>)	Total: 678	
9.	Total number of those participants employed at enrollment who received a wage increase post-enrollment completion (<i>wage increase</i>)	Total: 721	
9a.	Total number of participants employed at enrollment in a non-target sector job who gained employment in the target sector of their training post-completion (<i>employment in-sector job enhancement</i>)	Outcome 9 is divided into two distinct sub-groups, 9a and 9b. While the grant did not make this distinction, the	

⁸ This measure refers to the total number of credentials earned by program participants. Note that the target for this measure exceeds the number of unique participants served because it is possible for participants to earn more than one credential.

Outcome Measures		Goals	How/when they were measured
9b.	Total number of participants employed at enrollment in their target sectors job who received a wage increase post-completion within the same sector (<i>wage enhancement promotions</i>)	program proposes to track and report these two sub-groups separately to provide a more fine-grained assessment of program impact.	4. nine months after completion

III.A. Data Strategies to Support Analysis

III.A.i. Overview

Each of the evaluation components included measurements and analysis that drew on multiple sources of data including meeting attendance, interviews, surveys, student level data collection, program data, program observations, and document review. Incorporating varied data allowed the evaluation team to develop a more complete and nuanced picture of both program implementation and impact. The evaluation team worked first with the WISE Grant Manager and eventually with the WISE Data Manager, hired in mid-2016, to develop and implement strategies for accessing, cleaning and integrating the data from multiple sources. Where possible, the evaluation team leveraged extant systems to collect data about students in an effort to minimize the burden on participants and program administrators.

III.A.ii. Data Sources and Uses

The evaluation team used the following systems and types of data in their analyses:

Student Management Information Systems (SMIS): The 8 Community Colleges participating in the WISE program all utilized SMIS, which collects demographic data about each student. SMIS data was paired with student intake forms to collect data about student demographics (such as race, ethnicity, gender, bilingual status, etc.), educational background, TAA eligibility, and employment status from date of enrollment. This demographic data was used to determine a picture of who was served by the program.

Washington State Employment Services Department (ESD): ESD collects employment and wage data for all TAA non-union impacted jobs. It serves as a database for current employment and wage data and holds contact data and mailing lists. The WISE Data Manager at Centralia requested participant data from ESD using student social security numbers. Requested data included employment status, wage rates, etc. prior to, and following participation in, the WISE program. The WISE Data Manager cleaned and integrated the data, passing it on to the evaluation team without student identifiers.

Tracking of Navigator/Participant Engagement: Colleges collected data on the navigation sessions between Navigators and WISE participants. These data included the number of sessions between a student and Navigator, the type of session, the length of the session, and the date of the session.

Navigator Input: Additional input on students' program and employment attainment came from Navigator interviews with program participants as well as evaluator interviews with instructors and employers. Records on enrollment, credits earned, certificates awarded, and other student participation details were pulled using Student IDs from the "Student Intake Template".

Student, Faculty and Employer Surveys: Surveys with students and faculty supplemented program participant level data. WISE program Navigators administered student surveys and conducted interviews when students completed trainings, and again at three, six and nine months after completion. Surveys addressed student satisfaction with the program, perceptions of preparedness in job acquisition, and satisfaction with key-skills attainment. Students could complete surveys via a written format as well as verbally or face-to-face.

Program Managers and Navigators also administered surveys of WISE faculty designed to provide critical information about the program's ability to build capacity within and across the 8 Community Colleges included in the grant. Lastly, Program Managers and Navigators administered surveys to employers who hired WISE participants to assess the employer's perspectives on the WISE program's effectiveness in preparing students for employment. (More detail on survey design and implementation is included in Section IV.)

The evaluation relied on secondary data sources for participant information (e.g., Washington State ESD data on wage and employment information) to offset the challenges posed by program attrition and the difficulty in remaining in contact with participants who leave the program. The FERPA informed consent/release of information form explicitly outlined access to participant information from secondary sources (and any risks involved therein).

Navigators supported program participants' education and employment efforts as well as collected survey input, creating the potential for influence of program staff on participant data collection and surveys. The training provided to the staff worked to ensure data collection procedures, service provision, and assessments remained valid and unbiased. The program and evaluation teams determined that the improved response to surveys and insider knowledge Navigators collected was worthwhile despite the potential for bias in data collection.

The data collection process was not without obstacles. Challenges encountered by the evaluators and colleges affected the ability to collect data reliability and consistently over the four-year term of the grant. Below are selected examples of challenges faced throughout the project.

- Some problems related to collection methods themselves. For example, phone calls represented one method in which colleges collected data on incumbent wage increases, employment, and employment retention at 3-, 6-, and 9-months following a WISE participant's exit from the WISE program. However, reliable collection of data over the phone was challenging. The data collection approach was laborious and difficult to administer consistently. This was the case especially at colleges with high turnover in staffing.
- Sensitive data like employment information were difficult to collect. Given the highly personal nature of employment data, it's possible that students may not have been forthcoming in responding to questions that sought to collect these data.
- No clear, strong incentives existed for students to exit the WISE program. As a result, students may not have officially exited from WISE or delayed exiting until long after completing a WISE program. This had the potential to affect both reporting and results.

III.A.iii. Data Sharing Agreements & Limitation

The evaluation team worked with the WISE team and college faculty to develop a set of protocols and procedures to govern the implementation of all surveys and analysis, and ensure both the external and internal validity of the research. These protocols directed elements of the evaluation including enrollment, data collection and data management processes, and development of a data-sharing agreement. Working under these agreed upon procedures, the evaluation team received informed consent and a FERPA release from participants for the use of their personal information. Participant identities were kept confidential, and any reporting on participant characteristics and outcomes was done in an aggregated, non-identifiable manner.

As of July 2017, the WISE Data Manager and grant leadership determined the evaluation team could not use ESD data given data sharing restrictions and limitations externally imposed by the Washington Employment Security Department (ESD) and Washington State Board for Community and Technical Colleges. As a result, in mid-2017, the WISE Data Manager could no longer share ESD data with 3SI (as described above). Prior to this decision 3SI received the full data set including ESD data quarterly for 10 quarters and had in place a comprehensive data sharing agreement with ESD stating that ESD data could be used for the purposes of evaluation of the WISE grant by an independent third-party evaluator.

In December 2017, the ESD data sharing restrictions were further extended to apply to the comparison cohort analysis (See Section VI for more detail). Specifically, ESD employment data for non-WISE participants in the Bates MA (who are not part of WISE) could not be disclosed or used in WISE analysis. Again, these externally imposed data sharing restrictions nullified and reversed a separate data sharing agreement in place and signed by ESD and Institutional Research at Bates Technical College via Mike Brandstetter, the Bates Program Manager, to cover the non-WISE Bates MA data. The WISE Data Manager and grant leadership took the position that they were not comfortable using ESD data for non-WISE analysis per their interpretation of ESD rules on data sharing.

III.A.iv. Impacts of Data Strategies on Evaluation

The decision to reverse and severely restrict data sharing agreements that were already operational resulted in a cascade of consequences, some of which impacted the evaluation in pivotal ways. The change in interpretation immediately made the intended comparison cohort analysis plan impossible and necessitated a new quasi-experimental design be developed, submitted, and executed.

Changes to data sharing agreements also affected the evaluation team's ability to execute analyses on disaggregated participant-level employment data. The team identified a partial workaround to allow continued analyses on participant-level data in a limited fashion. This process involved the evaluators writing code to conduct an analysis, after which the WISE Data Manager would independently execute the code and then share the analysis output with the evaluation team. The workaround was an ersatz approach to running the analyses (though still regarded as adequate), and scarified a level of thoroughness only possible through iterative development of a statistical analysis and access to observation-level data.

Finally, the externally imposed restrictions on data sharing affected data quality assurance. Without access to participant-level ESD data, the evaluation team could no longer perform quality assurance on these data. The evaluation team therefore deferred to the WISE Data Manager to ensure data quality as possible. Cases in which the evaluation team identified possible quality issues were reported to the Data Manager.

For all of the aforementioned reasons the results of this evaluation should not be considered definitive and should be interpreted cautiously. The evaluation team did not have adequate control of the data to verify data quality and accuracy, and therefore evaluation results were not possible to conclusively validate given these limitations. Even with these caveats, however, the evaluation team believes that the results still materially informed program practice, established a clear pattern of achievement, and suggested interesting and useful directions for future study.

IV. Implementation Evaluation

The WISE program evaluation included two components: implementation evaluation and outcomes evaluation. The implementation evaluation, detailed here, assessed the WISE consortium members' effectiveness in administering programs, processes, and systems as planned. Over the course of the grant period, the evaluation team provided the WISE program team with ongoing feedback and real-time data on program implementation, strengths, and areas for improvement through a CQI dashboard. The following reports on the WISE programs' final progress against output goals set during in the application stage of WISE and, ultimately, the programs' ability to provide the educational opportunities to drive employment in the targeted sectors.

IV.A. Implementation Evaluation Research Questions

A set of key research questions guided the design, analysis, and conclusions in the implementation evaluation. These questions address programmatic implementation, participants' ability to complete certificates, courses, and other aspects of the training. A list of the salient research questions is provided below.

- Did the programs meet enrollment targets? Why or why not?
- What were the certificate completion and credential rates among participants? What factors led to these rates?
- Was the program at each college implemented as planned? Was staff hired on schedule? If not, what were the challenges?
- What observations can be made about how each college implemented the WISE program?
- How were programs and program designs improved or expanded?
 - What certificates were offered? Were certificates stacked?
 - Was Navigation, NCRC and other support services offered? What was the level of support offered (i.e., how much Navigation time)?
- What contributions did Centers of Excellence and each of the partners (employers, unions, workforce system, educators, and others as applicable) make in terms of: 1) program design, 2) curriculum development, 3) recruitment, 4) training, 5) placement, 6) program management, 7) leveraging of resources, and 8) commitment to program sustainability?

IV.B. Implementation Evaluation Measures & Considerations

As detailed in Section III, the evaluation team developed a quantitative approach to measure program implementation against goals set by the WISE program in their initial grant application for metrics established and defined by DOL (See Section III, Table 1 for a complete list of output measures and goals and Section III.A.ii. for data sources).⁹

The following four metrics, established by DOL, were central to that approach and are discussed below:

⁹ Implementation-related output goals were set by WISE in their initial grant application, prior to the engagement of 3SI as the evaluation team and the design of the evaluation plan. Metrics, as noted, were designated and defined by DOL.

- Total Unique Participants Served
- Total Number of Participants Completing a TAACCCT-funded Program of Study
- Total Number of Participants still Retained in their Program of Study or Other TAACCCT-funded Program
- Total Number of Participants Completing Credit Hours

Within the findings that follow, the methodologies for these metrics strictly adhere to DOL defined and mandated logic for their recording and calculation, which used independent sets of conditions for counting participants. (See Appendix C for the DOL definitions.) These methodologies were not designed so that evaluators or readers of the evaluation could analyze the interaction between multiple metrics. For example, Total Unique Participants Served only counts discrete individuals, while Total Number of Participants Completing Credit Hours can count an individual more than once. Consequently, these metrics cannot be understood as comparable.

To further articulate this challenge, a reader might want intuitively to equate Total Unique Participants Served with the Total Number of Participants Completing Credit Hours; if the program served 10 unique participants, then 10 participants also completed credit hours. But DOL's mandated definition results in different counts. The Total Unique Participants Served metric counts each participant once while for other implementation metrics, a participant can be counted multiple times. In other words, the program can serve 10 unique participants, yet count 15 participants who completed credit hours (because the program must count participants twice in certain situations). This illustration is intended to exemplify the difficulty of analyzing multiple metrics at once within DOL's overall methodological design. Not only must a participant be counted multiple times toward a single metric (up to four times, once in each year of the grant), a participant must be counted toward two seemingly mutually independent metrics in the same year (as well as different years).

DOL mandated definitions for key outputs were also vulnerable to double counting due to time-related factors. For example, within a single academic year, a participant could be retained, and counted as such, in one quarter and then employed, and counted as such, in the following quarter. Again, this results in counting a participant toward two distinct metrics in the same year.

Given the DOL-mandated design and its vulnerabilities, this evaluation primarily analyzes one metric at a time and does not attempt to analyze interactions between metrics (with a few exceptions, some of which we note above). This approach helps avoid confusion caused by differences in counting methodologies. We have, however, explored the interaction between two or more metrics where able to do so in limited ways. In cases where we explore the interaction between metrics, we note the challenges inherent in doing so. For example, this evaluation will divide the number of participants retained in a TAACCCT-fund program at a college by the total number of unique participants at a college. Intuition suggests that the total number of unique students should equal or exceed the number of students retained in a program, resulting in a percentage less than or equal to 100%. But because the program retention and unique participants metrics are calculated using unrelated sets of conditions, some percentages exceed 100% in some cases.

In addition to measuring progress against the original grant goals related to DOL metrics and established in the WISE application, the evaluation team collected forecasts from college Program Managers annually after the spring quarter, generally aligned with the WISE Lead Grant Manager's annual review of each college's programs. These revised estimates allowed evaluators to assess the team's expectations for performance against output and outcome measures and identify areas where the original program goals were at risk. The assessment of forecasts provided a launching point for

discussion over the summer on program progress and areas for potential improvement. Collecting this information after the spring quarter allowed program leaders to design and implement important changes to the program over the summer for the fall school start.

To supplement and provide context for DOL metrics, the evaluation team designed and implemented surveys to capture data on various stakeholder experience with and perceptions of the program. Results from these surveys add context to the DOL metrics.

As noted previously, the primary tool developed for sharing implementation evaluation results during the grant period was the WISE program CQI dashboard. This dashboard was used to monitor the implementation of the grant over time and measure progress. 3SI developed the dashboard with input from WISE leadership to ensure it was useful (and used). Designing and populating the dashboard and performing related analysis early in the grant cycle allowed stakeholders to develop perspectives on program implementation, determine indicators of success, and address program challenges. The dashboard included key measurable program indicators such as numbers of unique participants, numbers of students who completed programs, numbers of employed students, and numbers of incumbents with higher wages.

The quarterly program dashboard created a platform for the WISE grant leadership to engage the college Program Managers as well as Deans, Faculty, and Navigators to discuss observed progress relative to annual DOL goals. The dashboard included three pages of interactive dynamic content that allowed the user to filter on college, program, academic period, and demographic variables to assess implementation measures for specific subgroups. The dashboard was updated quarterly and hosted online starting early in 2017. College Program Managers and other WISE program stakeholders accessed the dashboard through the WISE website to track progress of WISE program elements of interest at any time. The dashboard can be found [here](#).

The evaluation team conducted *a la carte* analyses to complement and further investigate measures in the quarterly dashboard.

Qualitative research augmented the data collection and assessment described above. The activities listed below provided context for output metrics as well direction for recommendations on program implementation and opportunities to enhance services. Insights gathered from these activities are referenced in the reporting that follows.

- Bi-weekly check-ins and planning sessions with Program Managers for each of the 8 colleges to share successes, challenges and best practices.
- Ad-hoc discussions with the Lead WISE Grant Manager and college Program Managers around the planned roll-out of program elements relative to program goals and characteristics of the population being served
- Ad-hoc meetings with program staff (Program Managers, Navigators and Coordinators) to understand how the program model was designed, staffed, managed and funded in order to develop an assessment of program effectiveness and sustainability
- Recording of details on program design, participant recruitment, staffing, delivery methods, implementation of Navigation, administration of the NCRC certification, administrative structure, assessment tools and resource utilization to accurately capture program elements for descriptive statistics and use in multivariate modeling.

- Annual reviews of DOL goals and forecasts for program performance with Program Managers (conducted with the WISE Lead Grant Manager) to assess whether they were on-track to meet each of the DOL goals and if not why not.

Each Program Manager was asked to provide a specific quantitative forecast for their programs. Forecasts were used to determine whether the WISE program in aggregate would reach DOL goals and to suggest best practices where colleges or programs were forecasting under/over-performing or to reallocate resources to improve the likelihood that the grant would meet DOL goals.

- Additional qualitative interviews and attendance at regular team meetings to assess how services were delivered in practice, which services were most effective, clarified gaps in services and monitored the project scope to highlight opportunities to focus the program or broaden the scope if appropriate

IV.C. Implementation Evaluation Findings

IV.C.i. Continuous Quality Improvement (CQI) Assessment of the WISE DOL Outcomes Reported in the CQI Dashboard

Total Unique Participants Served

Definition and Goal for Metric

This implementation metric measured the number of unique students who enrolled in 1 or more WISE programs. The implementation goal submitted to DOL was 1,992 WISE students across the eight community and technical colleges. Participation reflected the WISE programs' success attracting and enrolling students.

Assessment and Conclusions

The WISE program over-performed relative to the *Total Unique Participants Served* DOL goal. In total 2,977 students enrolled in WISE programs between 2014 and 2018. Four of the eight community and technical colleges (Renton, Bates, Walla Walla, and Green River) accounted for 68% of the WISE participants and on their own exceed the program goal.

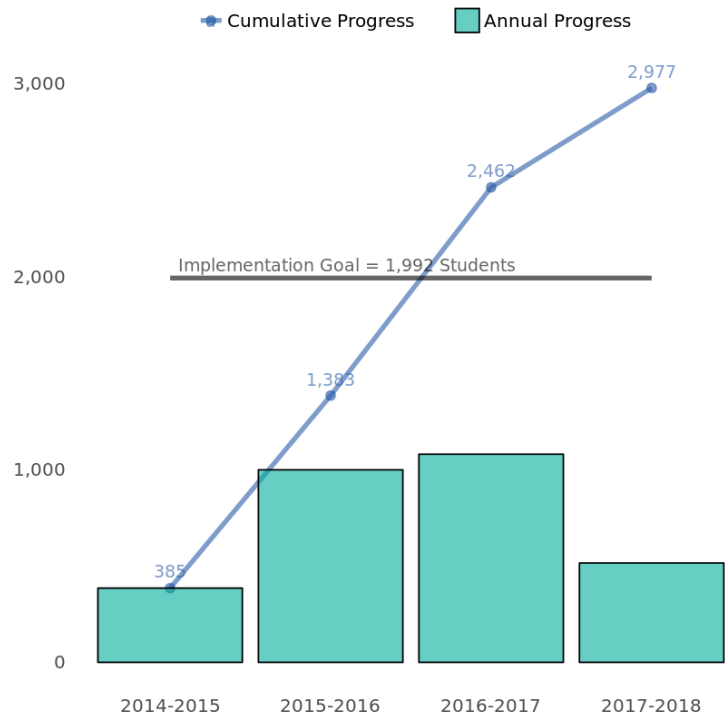
The strong enrollment of participants across all eight WISE community and technical colleges likely reflects sound program execution as well as exogenous economic factors. The principal program-related factor driving strong enrollment in the WISE programs appears to have been the successful alignment of offerings with student demand and employment opportunities. The Centers of Excellence in Washington State leveraged ongoing engagement of consortium colleges, the State Board of Technical and Community Colleges, workforce training and education associations, and the business community to effectively identify critical employer needs.

Other factors that may have driven higher participant numbers include effective college recruitment practices and the relative weakness of the economy in the early years of the grant, which limited opportunities in the job market likely made education a more compelling option.

Collectively the colleges exceeded the goal for total unique participants by nearly 50%. However, a few colleges with new specialized programs did not enroll at expected levels. For example:

- The Customer Service programs at Everett and Green River faced challenges with negative perceptions among potential students of the Customer Support role and the training necessary to fulfill that role. Both colleges had challenges attracting students to the degree despite the finding that there was significant demand among employers for this training.
- The Centralia Energy Tech AAS program had low participant rates relative to other grant programs, but the program was established prior to the grant and continues to serve a key employer need even with those rates.
- As part of WISE, the Walla Walla Carpentry program was reengineered but not yet well established during the grant period, which contributed to relatively low WISE participant rates.
- Shoreline’s Energy Tech and Energy Systems programs, South Seattle’s WABO program, and Everett’s Welding and WABO programs also reported low numbers of participants.

Chart 1: Unique WISE Participants Served



Total Number of Participants Completing a TAACCCT-funded Program of Study

Definition and Goal for Metric

This implementation metric measured the number of WISE participants who earned 1 or more credentials from a TAACCCT-funded program. TAACCCT-funded program credentials included: associate’s degrees, long certificates, and short certificates. The goal submitted to the DOL for this implementation output was 1,316 WISE students completing at least one credential. Students’ completion of a “Program of Study” reflects programs’ success in both offering industry recognized certificates and credentials and supporting students’ engagement in them.

Assessment and Conclusions

Chart 2: Total Number of WISE Participants Completing a TAACCCT-funded Program of Study

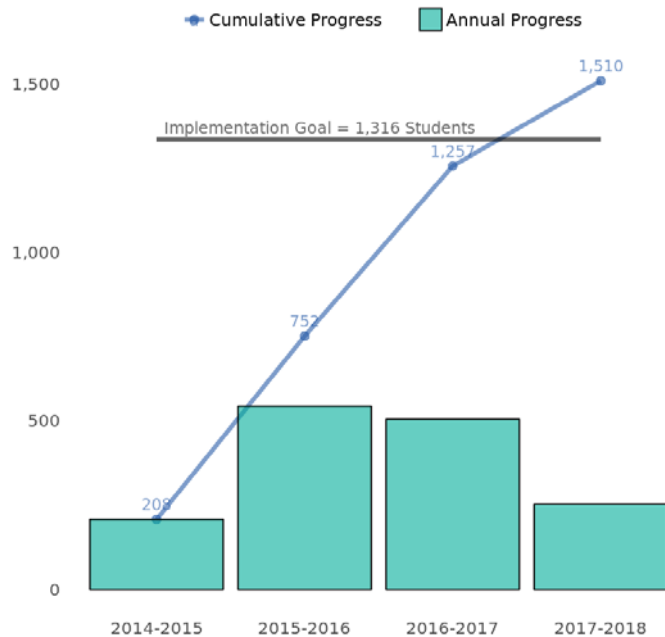
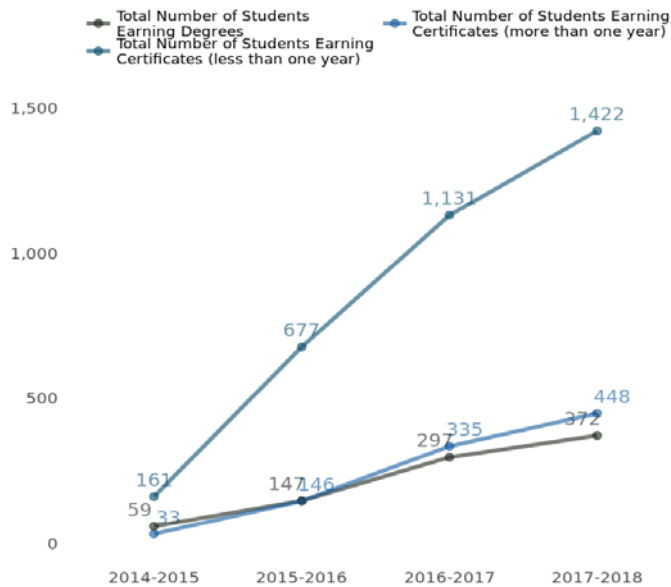


Chart 3: Cumulative WISE Program Completion Credential Type and Year



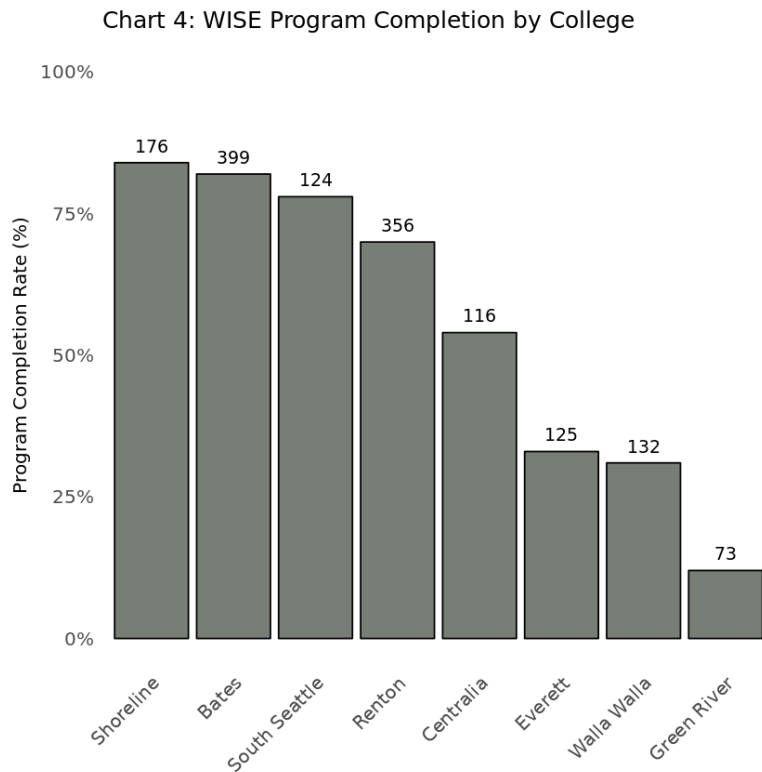
The WISE program exceeded the implementation goal. In total, 1,510 WISE students completed at least 1 WISE certificate or degree between 2014 and 2018.¹⁰ Chart 2 shows the total number of participants completing at least one WISE credential annually and cumulatively over the four years of the grant. The average number of credentials earned over the grant period was 1.7 per student. The most commonly earned credentials were short certificates (1,422), followed by long certificates (448) and degrees (372). Programs expected to see this distribution, which is inverse to the financial and time commitment required to earn each credential.

Note, in a single academic year, disaggregating the data by credential type, a

student can be identified – and counted – as completing more than one certificate if they earned multiple credentials. Consequently, the sum of counts for the total number of different types of credentials earned (2,242) does not equal the counts of the total number of students completing a TAACCCT-funded Program of Study (1,510).

¹⁰ As previously discussed, the Total Number of Participants Completing a TAACCCT-funded Program of Study is counted using a different methodology than **Unique WISE Participants Served**, which makes direct comparisons between the two metrics problematic.

For additional perspective, we explored the rate for the anticipated conversion from enrollment to program completion. That rate, the *Total Number of Participants Completed a TAACCCT-funded Program of Study* goal (1,316) over the *Total Unique Participants Served* goal (1,992), is .66.¹¹ We interpret this to mean 66% was the original planned completion rate from student enrollment to program completion set by the WISE grant team. The actual WISE program completion rate was 50% (1,501 over 2,977), falling short of the completion rate derived from the goals for program completion and unique participant. Chart 4 shows the absolute number of participants completing as well as the completion rate at each college, both of which varied significantly.



While the grant overall had high levels of completion and came close to the goal for conversion, a few colleges had programs with significantly lower completion rates. Anecdotal evidence suggests this was result of program designs offering fewer certificates and longer completion requirements – and thus

providing students fewer opportunities to achieve credentials and more opportunities to leave their course of study. Insights from qualitative exploration suggests students in some programs may have felt they could acquire the skills and experiences they perceived as necessary for their employment and/or education goals without achieving a credential and exited the program before completion. Examples of these situations include:

- Centralia’s Business and Management (BASM) program had only a 20% completion rate because it is a long certificate, generally requiring multiple quarters to complete and students can transition to other degree programs without completing the WISE coursework.
- Walla Walla’s programs included Carpentry and Energy Systems, which ran longer and had fewer completers. Additionally, the Walla Walla team invested in completely revising the Energy Systems program to better meet evolving employer needs in this new and dynamic field; this led to some disruption (and potentially a drop) in participants’ completion rates.

¹¹ The *Total Number of Participants Completed a TAACCCT-funded Program of Study* goal reports the number of unique participants who earned a credential. The first year in which a participant completes a WISE program is the year we use to count them toward the Total Number of Participants Completed a TAACCCT-funded Program of Study measure. We are able to calculate a completion rate here because both figures count participants only once. In cases where a participant can be counted multiple times it is not possible to calculate a completion rates for goals because the numerator used to calculate rates includes duplicate counts of students while the denominator is a unique count of students.

The following three factors may have contributed to the low number of completers at Green River, which had the lowest rate in the consortium. To start, Green River’s Customer Service program did not achieve its initial enrollment goals; consequently, the potential number of completers was low. Additionally, the program did not include certificates therefore completion required earning the full Customer Service credential which was a greater investment of time and money. Finally, Green River shared a Navigator with Everett, which was not sustainable and likely insufficient to meet student needs.

Total number of participants still retained in their program of study or other TAACCT-funded program

Definition and Goal for Metric

This implementation metric measured the number of WISE participants who enrolled and did not complete the program and continued their studies or transferred to a different WISE program. While the primary goal of the grant was student employment, continued student participation in educational programs that further their careers – measured here – was a secondary goal. The implementation goal for this metric, established in the initial grant application, was 277 WISE students.

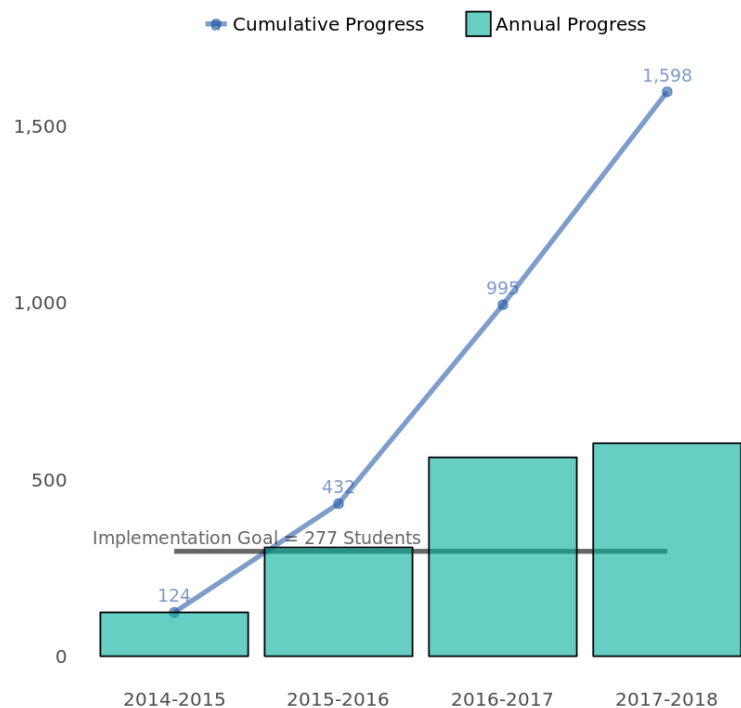
Assessment and Conclusions

Student interest and participation in continued education within their program of study or another WISE program far exceeded the implementation goal. In fact, the WISE program achieved its goal by year 2 of the grant and WISE programs retained 1,598 students between 2014 and 2018.

Note, students could be counted only once per year but could be counted up to four times over the full term of the grant. As such, cumulative figures for this metric cannot be compared with metric that did not allow for double counting.

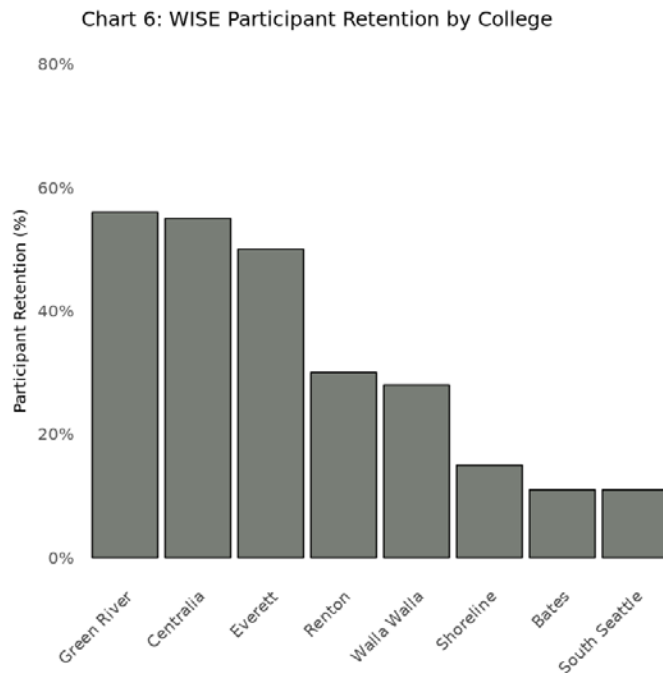
It is curious that the goal is so low relative to the actual number of participants retained. However, as noted earlier, goals were set prior to 3SI’s involvement with the evaluation process and we cannot speak to how they were set.

Chart 5: Total Number Still Retained in Their Program of Study or Other Grant-Funded Program(s)



It is possible that gaps in data collection and reporting may be leading to overstating the number of students continuing on in their programs (and contributing to such a significant disparity between the goal and actual result). Midway through the grant, the WISE Lead Grant Manager discussed with the evaluation team the challenge of capturing student program exit data. In cases where program staff found it difficult to collect a student’s program exit data, it is possible they opted to identify that student as “retained” when in fact that was not their status. If so, these students should not have been counted

in the data reported above. This possible challenge along with the DOL prescribed measurement of this metric leads to overcounting and potentially inaccurate information, caveat to keep this in mind in reviewing this data.



The overall retention rate for the WISE Program is 34%.¹² Chart 6 reflects the retention rate by college. Retention rates at Renton, Walla Walla, Shoreline, Bates, and South Seattle are notably lower than those for Green River, Centralia, and Everett colleges. Within this evaluation, we do not have data to explain the difference in rates between the two groups of colleges with any certainty but further exploration is possible and could be fruitful.

It is possible colleges with large numbers of participants who continued on with their education may have been subject to the following factors, which came up in qualitative research:

- A weak economy in fields related to the degrees and certificates students acquired within WISE, especially in the early years of the program (2014 and 2015), may have motivated students to continue with their studies rather than take positions outside of their industry or expertise. Additionally, Navigators and Program Managers reported that Millennials or post-Millennial generation within this age cohort expressed higher expectations for employers and a lack of urgency in finding employment.
- Stacked and latticed certificates and credentials may have encouraged students to complete educational pathways and helped students realize the potential of additional education generally and individual credentials specifically. Observations from program staff suggest that with Navigator help, students gained clarity on the full potential of their educational pathway and were more likely to continue to earn credentials within their program or within a related degree program.
- Some WISE colleges implemented programs that culminated in degrees, which take longer to complete, rather than shorter certificate and credential programs. Consequently, students remained in school longer.

Ultimately, we do not have enough information to explain this trend.

¹² We cannot compare the overall WISE program retention rate to the retention rate. This is because of the duplicate counting of students that is possible when tracking retention.

Total number of participants completing credit hours

Definition and Goal for Metric

This implementation metric measured the number of WISE participants who completed one or more WISE program courses/credit hours.¹³ Students completing credit hours is a measure of the WISE program’s implementation of coursework and progress in supporting students’ accumulation of the credits needed to complete their studies. The implementation goal was 1,336 WISE students.

Assessment and Conclusions

The WISE program exceeded the goal and in total 3,527 students earned at least one credit hour between 2014 and 2018. 83% of students across the WISE program earned one or more credits. Colleges awarded an average of 24 credits to credit earners.

Chart 7 shows the annual and cumulative numbers of students completing credit hours.

Chart 7: Total Number of Students Completing Credit Hours

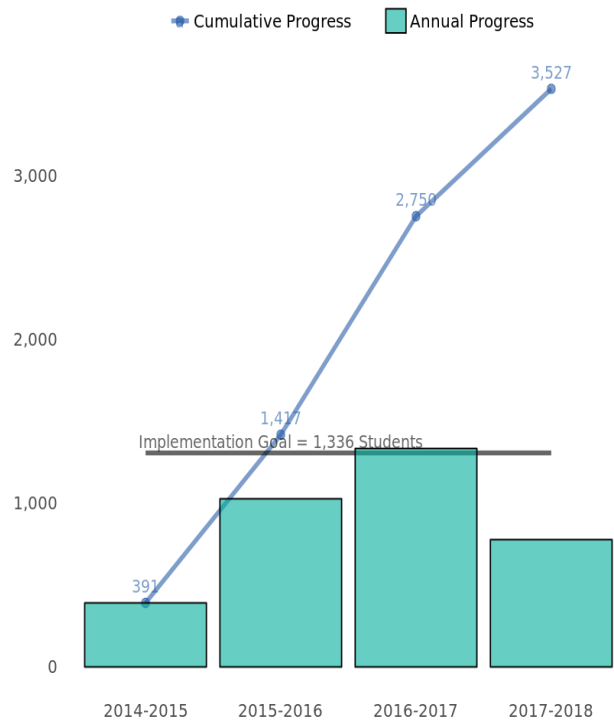


Chart 8: WISE Participant Earning Credits by College

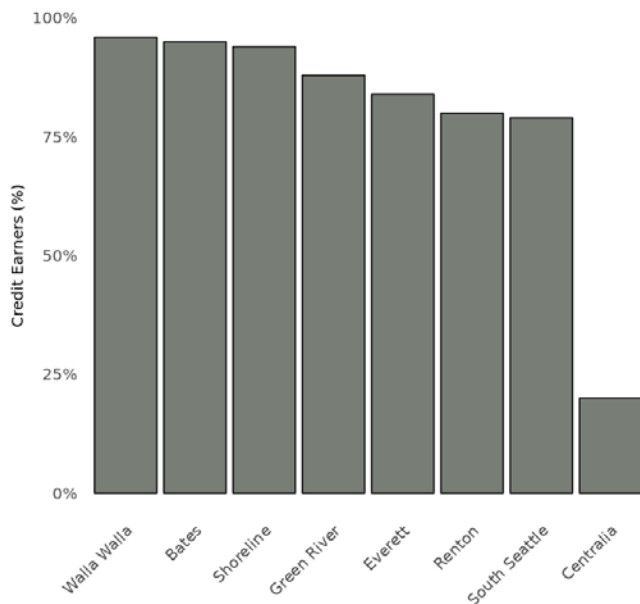


Chart 8 presents data for the individual colleges. At all colleges other than Centralia, the percentage of students earning at least one credit was greater than or equal to 79%. At Centralia the number of reported credit earners is fewer than the reported number of “completers”, a result that is not possible given that a student could not complete a program without earning credit hours. This suggests a data collection error.

If data collection does not explain the disparity between Centralia and the other colleges, two other factors may be at play. First, Centralia offered course options that were longer on average than the courses offered at the other colleges leading students to drop out. Second, in Centralia’s Business and Management Program students faced obstacles to course

¹³ It is possible to count a WISE participant multiple times in this metric. This happens when a WISE participant earns a credit in two or more years of the grant.

enrollment even after accepting an admission offer at Centralia College. In such cases, the students would be counted as WISE participants but they would not be counted as credit earners.

IV.C.ii. WISE Program Surveys - Additional Input on Implementation and Satisfaction with the WISE Program

In order to add context and nuance to output reporting, the evaluation administered surveys with three different sets of WISE stakeholders: student participants, WISE faculty, and employers of WISE participants. The evaluation team designed the surveys for each group to supplement analysis of WISE program implementation goals and provide insight into overall stakeholder satisfaction levels as well as the elements of the WISE program that provided the most value to stakeholders.

Survey Design and Limitations

Survey Design

3SI designed the surveys to capture the satisfaction and opinions of key stakeholders using closed-response questions (in the form of multiple-choice questions and Likert scales). Survey questions recorded information that could not be captured elsewhere in the data collection process. Input from program leadership including the WISE Lead Grant Manager and the Navigation leadership at RETC helped to ensure that information was collected in the most efficient and effective way possible.

The surveys for the three stakeholder groups shared a similar design. Two general satisfaction/impact questions were followed by a series of questions asking respondents to rate their satisfaction with the individual aspects of the program relevant to them. The design was intended to assess the value of each of the key elements of the WISE program. Complete copies of the survey instruments are included as Appendix D.

Since the surveys were voluntary with no incentive for completion, 3SI developed a process to maximize response rates. 3SI tapped the WISE program staff member most likely to get a response from a given group to administer their survey. For example, Navigators administered the student survey because they had the closest relationship with students and already administered an exit survey with which the evaluation survey could be paired. Where Navigators had a close relationship to a WISE employer, they administered the employer survey. If the Navigators did not have an existing relationship, the college's WISE Program Manager administered employer surveys, one for each WISE participant employed. Program Managers also led the faculty survey process, first getting Dean approval of the tool and then emailing it to faculty members who taught in WISE programs. Using WISE employees to administer the survey had the potential to create bias, an issue discussed in detail below.

Survey Response Rates

Surveys were sent to every participant who completed at least one WISE program credential. The evaluation team received responses from 199 participants, which reflects a 13% response rate among WISE program completers (and 6.6% among the pool of all participants). The number of responses received for individual survey questions ranged from a low of 176 responses (question 8) to a high of 198 responses (question 10). Surveying only WISE participants who complete a WISE program rather than all participants has the potential to create a bias in the survey results as there are likely to be differences between these two groups. The factors that led to some students completing while others did not may influence their perceptions of the program, likely in a more positive direction.

The employer survey received 10 responses from nine different companies employing WISE program completers. (One company submitted responses for two different employees who were WISE participants.) Due to data limitations, the evaluation team does not have a final count for the total number of employers. However, we do know that after completing the program WISE participants found employment with more than 100 total employers. Therefore the 9 responding employers reflect a response rate of less than 10%.

The faculty survey received 20 responses from 15 different faculty members (five faculty members submitted two responses each as they taught more than one course). The evaluation team did not calculate a response rate as they did not have the total number of WISE faculty. However, the total number of WISE courses is approximately 30, therefore this sample may represent as much as half of the WISE faculty/courses.

Survey Limitations

Several factors may contribute to bias or lack of representativeness in the survey results. Interpretation of surveys should take into account the following potential influences:

Response bias due to Navigators involvement in administering the survey. Students may have been more positive in their survey responses because they received the request from someone with whom they have a personal relationship. The survey asked respondents whether they took the survey with a Navigator present and analysis of surveys taken with and without a Navigator present do not show significantly different results. Absent a control group, the evaluation team cannot control for potential bias here. Rather, we describe the potential bias and caution the reader to consider it in interpreting the survey results.

Non-response bias. A low response rate is generally considered an indicator of non-response bias¹⁴, with lower response rates considered to indicate a greater degree of bias. For the student survey, the response rate of 13% is considered quite low, and likely indicates some level of non-response bias. Although we don't know the precise response rates for the faculty or employer surveys, it is safe to assume that the response rates for both are low enough to indicate a high likelihood of non-response bias.

Non-response bias is the tendency to over-emphasize the perspective of the respondents and under-emphasize the perspective of the non-respondent. This is particularly significant if there is cause to believe respondents and non-respondents are different, as there is here.

When the decision of whether or not to respond to a survey is voluntary – as it is in the three evaluation surveys – there is often reason to believe that the characteristics of the people receiving the survey may influence their propensity to respond. For example, busier respondents may be less likely to respond to the survey, or people with very high or very low satisfaction may be more inclined to respond to the survey.

Small absolute number of respondents to the faculty and employer surveys. With only 10 or 15 responses (as in the employer survey and faculty survey respectively), it becomes much harder

¹⁴ While it may be possible to reduce non-response bias by weighting individual respondents so that the respondent group is more representative of the target population, these methods are not foolproof. We were unable to apply any such corrective methods as we do not have the demographic data required to compare the respondent group with the target group of all students, faculty or employers.

to detect low-frequency responses. We can see the relevance to our employer survey – not one of the 10 respondents expressed dissatisfaction on any of the survey questions, but we know it is likely that there are some dissatisfied employers in the broader set of all WISE employers.

Results from surveys with sample sizes this small should be treated as directional and qualitative in nature.

In summary – it is highly likely that some non-response bias is present across the surveys. However, it is impossible to quantify this bias with additional work. The student survey, with its large number of respondents, should be more reliable in detecting infrequent responses than the other two surveys.

Recognizing the surveys’ limitations, the entirety of the following discussion of survey findings must be viewed within the context of both response and non-response bias (all three surveys) and the low numbers of respondents (the faculty and employer surveys). Specifically:

- Any (or all) of the three survey’s results discussed below may be biased towards more (or less) satisfaction. It is up to the reader to develop their own hypotheses regarding the presence of any bias and the effect of any such bias on the interpretation of the data presented below. Despite these sources of bias, the evaluation team believes that the survey results in aggregate will be directionally appropriate and are valid for interpretation in the context of the rest of the evaluation.
- Given the low (absolute) number of respondents, the employer and faculty surveys may underestimate dissatisfaction. Of the two surveys, the faculty survey is most likely to underestimate dissatisfaction. However, it is unlikely that either survey significantly overestimates dissatisfaction. Again, results should be considered directional.

Student Surveys

The student surveys had three types of questions:

- Overall satisfaction with the program of study and with career/educational goals
- Satisfaction with specific aspects of the program (How satisfied were you with the following aspect of your program of study?)
- Identifying information

The identifying information questions were not required and are not discussed in this report for students, faculty, or employers. See Appendix D for the full survey tool.

Overall satisfaction with the program of study and career/educational goals

Table 2: Q1 - How satisfied were you with your experience in your program?

Not at all	Mostly Not	Somewhat	Mostly	Very
2%	2%	11%	42%	43%
Dissatisfied		Neutral	Satisfied	
4%		11%	85%	

Students expressed high levels of satisfaction with the WISE program of study and its ability to help them reach their career and/or educational goals. Most respondents – 85% - were *Mostly* or *Very* satisfied with their program of study. Only 4% of respondents were *Mostly not* or *Not at all* satisfied with

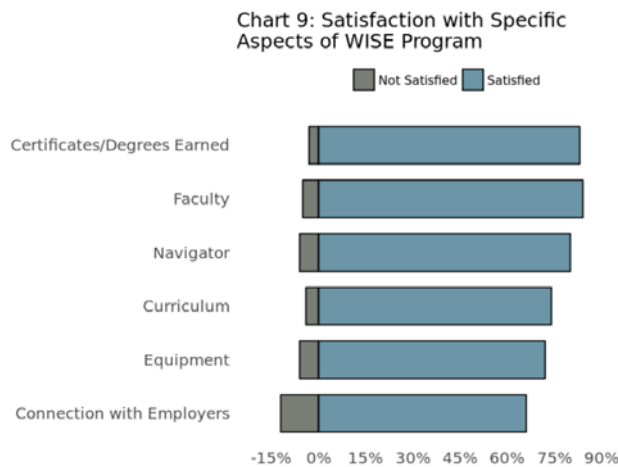
their program of study. The ratio of satisfied respondents to not satisfied respondents is 24:1, indicating high respondent satisfaction with their program of study. In fact, overall program satisfaction (85%) was higher than the average satisfaction across individual aspects of the program (77%; questions 3-8). Again, these findings should be caveated that both response and non-response bias exist which may increase reported student satisfaction levels. Comparative data for non-WISE programs is not available, so we are unable to describe the relative satisfaction of WISE participants vs. students in non-WISE programs.

Most respondents felt their program of study helped them to *Mostly/Completely* reach their career and/or educational goals. Only 7% of respondents had negative views on the extent to which their program helped them.

Table 3: Q2 - Did your program help you reach your career and/or educational goals?

Not at all	Mostly Not	Somewhat	Mostly	Completely
3%	4%	21%	39%	33%
Dissatisfied		Neutral	Satisfied	
7%		21%	72%	

Satisfaction with specific aspects of the program



Questions in this section asked participants to rate satisfaction with specific aspects of the WISE program. Chart 9 below compares the rate of satisfaction and dissatisfaction for specific program aspects.¹⁵

Notably, across all program aspects, very high percentages of respondents expressed satisfaction. The lowest levels of satisfaction were for *Connections with employers* and *Equipment*. While these two areas

have the biggest opportunities to improve participants' experience even here participants were very positive and few expressed dissatisfactions.

Detailed survey responses and analysis follow below.

¹⁵ Participants are considered to be satisfied if they responded by saying they were either *mostly* or *very* satisfied. Participants are considered to be dissatisfied if they responded by saying they were either *mostly not* or *not at all* satisfied.

Almost all participants expressed satisfaction with program faculty, include 52% of respondents who were *very* satisfied. The only other program aspect to register a *very* satisfied rating above 50% is Navigators, which speaks to the strength (and perhaps also the importance) of the program personnel.

Table 4: Q3 – Satisfaction with program faculty (program instructors)

Not at all	Mostly Not	Somewhat	Mostly	Very
1%	4%	11%	32%	52%
Dissatisfied		Neutral	Satisfied	
5%		11%	84%	

Table 5: Q4 – Satisfaction with program curriculum (Lectures, homework, class materials, etc.)

Not at all	Mostly Not	Somewhat	Mostly	Very
1%	3%	22%	36%	38%
Dissatisfied		Neutral	Satisfied	
4%		22%	74%	

Again, a significant majority of respondents reported satisfaction with their program’s curriculum. Only 4% of participants were dissatisfied with program curriculum, which is the 2nd lowest dissatisfaction rate across the six program aspects represented in the survey.

expressed satisfaction with the program equipment and tools. This was the second lowest satisfaction rating across the six program aspects included in the survey despite the fact that major investments in program equipment and tools were made. Program equipment – along with connections to industry – is the biggest opportunity for improvement. The satisfaction level with program equipment may have been lower because of limited awareness of WISE equipment investments and, in fact, about 1 in 4 respondents were simply neutral. The programs did use signage and stickers to clearly label equipment purchased with grant funds such as computers and training equipment but these signs may not have been noticed by participants.

Table 6: Q5 – Satisfaction with program equipment (machinery, tools, computers, etc.)

Not at all	Mostly Not	Somewhat	Mostly	Very
2%	4%	22%	30%	42%
Dissatisfied		Neutral	Satisfied	
6%		22%	72%	

Roughly 3 in 4 respondents

A significant majority of respondents were satisfied with their program Navigators. This includes 55% of respondents who said they were *very* satisfied with their Navigators, the highest *very* satisfied rating in the survey. Navigators reported, and were observed by the evaluators to be, investing in strong relationships with participants, maintaining close professional relationships with participants, and seeking out participants who they identified as needing support. This is likely to have driven the high level of satisfaction.

Table 7: Q6 - Satisfaction with your program Navigator (Staff member that helped guide you through the program and placement)

Not at all	Mostly Not	Somewhat	Mostly	Very
2%	4%	14%	25%	55%
Dissatisfied		Neutral	Satisfied	
6%		14%	80%	

Table 8: Q7 - Satisfaction with connection with employers (Opportunities such as workshops, job fairs, lectures, etc.)

Not at all	Mostly Not	Somewhat	Mostly	Very
5%	7%	22%	32%	34%
Dissatisfied		Neutral	Satisfied	
12%		22%	66%	

While two-thirds of respondents were satisfied with the program’s employer connections, which reflects the lowest satisfaction level in the survey. In addition, employer connections had the lowest percentage of respondents that were *very* satisfied. On the flip side, the 12% dissatisfied was by far the highest for any aspect.

These results suggest an important opportunity for improvement. Again, low student awareness of the work led by the Centers of Excellence, Program Managers and Navigators to expand connections with employers may have led to less positive perceptions. Looked at with the higher numbers of students than expected retained in education and the lower than anticipated who were employed within 3 months of completing and exiting the WISE program, this finding may represent real challenges for students in connecting with employers.

Table 9: Q8 - Satisfaction with certificates/degrees earned (Certificates/Degrees earned through this program that can be included on your resume)

Not at all	Mostly Not	Somewhat	Mostly	Very
2%	1%	14%	36%	47%
Dissatisfied		Neutral	Satisfied	
3%		14%	83%	

These results suggest an important opportunity for improvement. Again, low student awareness of the work led by the Centers of Excellence, Program Managers and Navigators to expand connections with employers may have led to less positive perceptions. Looked at with the higher numbers of students than expected retained in education and the lower than anticipated who were employed within 3 months of completing and exiting the WISE program, this finding may represent real challenges for students in connecting with employers.

Most respondents expressed satisfaction with the certificates / degrees they earned by participating in the program, including 47% of respondents who were *very* satisfied. Respondents clearly perceived that the WISE program added valuable certificates and degrees relevant to their field.

Correlations – Do participants who are generally satisfied (dissatisfied) tend to also be satisfied (dissatisfied) with specific program aspects?

Satisfaction with the program (Question 1) and assessment of whether it helped in reaching career goals (Question 2) were, as might be expected, very highly correlated with each other, revealing strong

Table 10: Correlations with general satisfaction and satisfaction of program aspects

	Q3 Faculty	Q4 Curriculum	Q5 Equipment	Q6 Navigator	Q7 Employer Connections	Q8 Certificates/ Degrees
Number dissatisfied with specific program aspect	10	8	11	11	21	5
% Dissatisfied with specific program aspect	5%	4%	6%	6%	12%	3%
% Dissatisfied with specific program aspect and dissatisfied with question 1	60%	63%	36%	27%	24%	80%
% Dissatisfied with specific program aspect and dissatisfied with question 2	40%	38%	45%	36%	29%	80%

consistency in terms of overall program satisfaction. While both satisfaction with the program and assessment of its helpfulness showed moderately strong correlation across individual program components, the correlation with overall satisfaction was higher. Notably, satisfaction with faculty was the best predictor of overall program satisfaction. Satisfaction with Navigators was the least predictive of satisfaction with the overall program, despite anecdotal evidence of the Navigators' importance. See Appendix E for detailed findings on correlations.

A closer look at note on dissatisfied respondents

Out of 189 respondents who replied to both questions 1 and 2, a total of seven (4%) reported dissatisfaction in response to both. Nothing conclusive can be said based on such a small number of respondents. However, a closer look at their responses to other questions suggests dissatisfaction with faculty and employer connections may have led to overall dissatisfaction.

Faculty Surveys

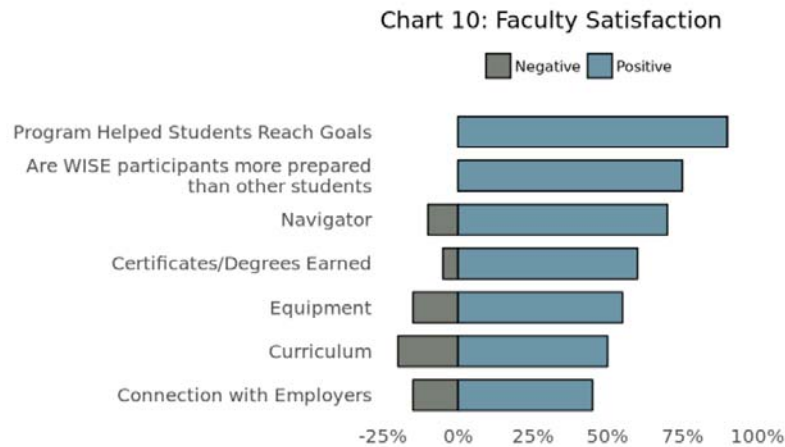
The faculty survey asked WISE faculty to rate the extent to which the WISE program contributed to preparedness and success of WISE student participants.

The faculty survey had three types of questions:

- Overall impact of WISE program on student job preparedness and career/educational goals
- Degree to which WISE program elements contributed to the preparedness and success of the students (same elements as were asked of students)
- Identifying information

The chart below summarizes the faculty survey results. Note, given the small sample size (n=15) these results should be understood as qualitative in nature and directional despite the use of percentages.

Overall, faculty respondents expressed a strongly positive assessment of the WISE program's value to students. 14 of the 15 respondents believed that the program helped students to reach their career



and/or educational goals, and 11 of indicated they believed WISE participant students were more prepared than other students they have taught (Q2). None of the faculty respondents believed that the program had little/no impact on helping students to reach their educational goals, and no faculty respondents indicated that the WISE student participants were less prepared than other (non-WISE) students.

Faculty were similarly positive in their assessment of the contribution of various WISE program elements to student success. Like student respondents, they were least positive about employer connections, curriculum and equipment. They were most positive about the contribution of Navigators – consistent again with student evaluations as well as anecdotal evidence.

It is worth noting that while faculty respondents indicated strong overall support for the WISE program, they were less enthusiastic about specific WISE program components (though still generally positive). It's possible they see the whole as greater than the sum of its parts, or they recognize other aspects of the program that contribute to its overall value and impact but were not included here.

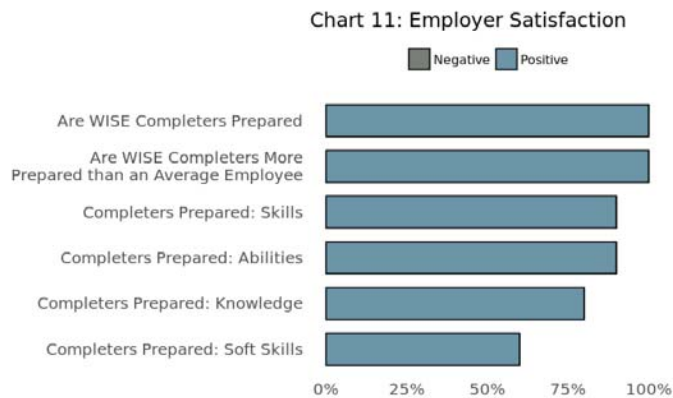
Employer Surveys

The employer survey asked employers of WISE completers to rate the extent to which those individuals were properly prepared for their jobs. Once again, given the small sample size (n=10) these results should be considered qualitative and directional at best.

The employer survey had three types of questions:

- Overall job preparedness of WISE program completers and as compared to others
- Degree to which WISE program elements contributed to the preparedness and success of the students (with respect to knowledge, skills, ability and soft skills)
- Identifying information

The chart below summarizes the employer survey results.



Employer respondents provided a very positive assessment of WISE program completers' preparedness for their respective jobs. All 10 employer respondents indicated that they believed WISE completers were mostly or very prepared for their job (Q1), and more prepared for their job than other company employees (Q2).

Employer respondents also believed that WISE employees were moderately to very prepared for their jobs with regard to specific aspects of preparedness. Furthermore, no employer respondents indicated that their WISE completer employees were unprepared with respect to the specific dimensions queried in the survey. Employer respondents were least positive about WISE completer's soft skills (only 6 in 10 were satisfied).

IV.D. Implementation Analysis Conclusions

Overall, the WISE program met or exceeded implementation-related output goals. Enrollment in the programs outperformed goals WISE had set for itself and each of the subsequent goals for implementation related to ongoing student engagement and earning of credits were similarly strong. These results suggest the development of programs that aligned well with student and market needs. At the level of individual colleges, we see some disparity in results. Consistency and success in implementation were strongest at Renton, Bates and Walla Walla. While don't have the data to explain these differences, anecdotal evidence suggests challenges with implementation of specific programs, the mix of credentials and length to completion, and some staffing challenges.

Even so, survey results from students, faculty, and WISE participant employers indicate high levels of satisfaction. For those responding to surveys, the WISE programs overall and in their constituent elements, were successful. Surveys of students, faculty, and employs reflected largely positive sentiment around how the college programs were implemented and the value they provided to key stakeholders.

The next section will discuss whether these programs achieved results.

V. Outcomes Evaluation

While implementation evaluation assessed program and student progress against goals for activities and outputs expected to drive impact, the outcomes evaluation measured whether students, in fact, achieved the employment-related goals set in the WISE grant. The WISE logic model provided context for the outcome metrics and possible hypotheses regarding their connection to program elements and outputs. Where possible, the evaluation team sought to establish the relationship between these outcomes and program elements. However, the nature of the data collected, constraints on data sharing, the quality of available data and/or the scope of this project preclude answering more probing questions.

V.A. Outcomes Analysis Research Questions

The primary purpose of the WISE program was to measurably improve employment and earnings levels for participants (including TAA-impacted workers and veterans) in focus industries: Clean Energy, Construction, and Advanced Manufacturing. Given this objective and the proposed implementation strategy, the outcomes evaluation was guided by the following questions which address both what impact the program had and what factors might have influenced the nature/scope of that impact:

- Did the program meet its goals for student employment?
- To what extent does navigation improve employment and completion outcomes?
- How effective is attainment of the NCRC soft-skills certification in improving the employment and employment retention of WISE participants?

The key metrics included in the WISE outcome evaluation and used to answer these questions were established and defined by DOL in the Solicitation for Grant Applications (definitions are provided in Appendix C). WISE set specific goals for those metrics in their initial grant application, as detailed in Section III. Key metrics listed below are reported on in this section of the report:

1. Total number of participants enrolled in further education
2. Total number of participants employed after TAACCCT-funded program of student completion (job attainment)
3. Total number of participants still retained in their program of study or other TAACCCT-funded program
4. Total number of those participants employed at enrollment who received a wage increase post-enrollment completion (wage increase)

V.B. Outcomes Reporting

V.B.i. Total number of participants enrolled in further education

Definition and Goal for Metric Participation

This outcome measures the number of students who completed a credential and exited the WISE program or transferred programs in a subsequent year. The outcome goal was 655 WISE students. This outcome measure was designed to capture continuing education, a positive outcome and alternative to student employment.

Assessment and Conclusions

The WISE program overperformed on this goal. Between 2014 and 2018, 872 students enrolled in further education. The WISE colleges were on track to achieve the ‘participants enrolled in further education’ goal from early in the grant.

Participation in further education varied significantly among the colleges. Bates and Shoreline colleges had the highest percentages of students enrolled in further education as a percentage of their total unique WISE participants (each with 68%). Centralia, Everett and South Seattle reported extremely low percentages. It is outside of the scope of this evaluation and the available data to identify what motivated so many participants to seek further education in some colleges.

Chart 12: Total Number Enrolled in Further Education After Program of Study Completion

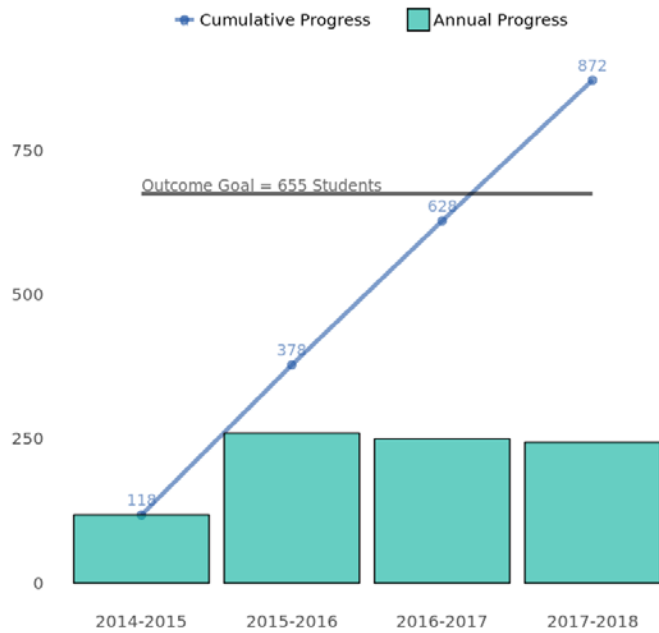


Table 11: Number of Students Enrolled in Further Education by College

	Bates	Centralia	Everett	Green River	Renton	Shoreline	South Seattle	Walla Walla
Number of Students	330	4	5	81	198	142	12	95
Percentage of Students	68%	2%	1%	14%	39%	68%	8%	22%

However, looking specifically at Bates and Shoreline which had very high rates, anecdotal evidence from WISE stakeholders suggests that upon entering the Diesel Mechanics, Pre-apprenticeship, and Electrical Construction programs (at Bates) and the CNC and Energy Technology programs (at Shoreline) students may have determined there was particularly

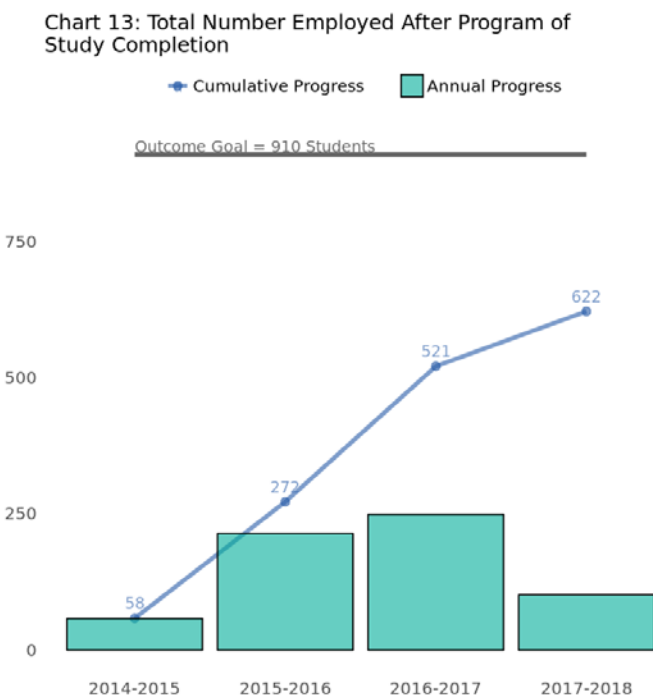
significant value in moving on to other education programs. It’s also possible employment opportunities in these industries were also have been especially weak during the grant period making continued education a more viable option and one with less of an opportunity cost.

V.B.ii. Total number of participants employed after TAACCCT-funded program of study completion

Definition and Goal for Metric

This outcome measured the number of non-incumbent participants employed within 3 months after completing, i.e., students who were not employed when they entered the WISE program, earned a WISE credential, exited the program, and found employment. Given the focus of the WISE program on employability, this was a critical metric. The outcome goal was 910 WISE participants.

The participating colleges expressed interest in seeing results for employment using a different definition that INCLUDED incumbent participants. In response to their interest, we have reported outcomes using their definition, as well.



Assessment and Conclusion

The WISE program did not meet the DOL employment goal. According to the DOL definition the program in total produced 622 employed participants (68% of the goal) and falling short by 288 students.

Under the DOL’s limited definition of employed (only non-incumbents who completed, exited, and found employment), every college in the WISE consortium missed their individual cumulative employment goal. The colleges coming closest to their goals were Renton (131 of 140, 94% of their goal); South Seattle (62 of 72, 86% of their goal); and Bates (121 of 184, 66% of their goal). Those furthest from their goal were Everett (22 of 71, 31% of their goal) and Green River (20 of 117, 17%).

With limited data on employment-related outcomes and no individual data, the evaluation team cannot draw conclusions about factors that prevented the colleges from reaching these goals. Qualitative anecdotal evidence, and ad hoc reporting by WISE program managers provide the only insights. Stakeholders hypothesized that low numbers at both Everett and Green River might be explained in part by the fact that the Customer Service degree did not include certificates, which meant they produced fewer completers. This, in turn, meant there was a smaller pool of participants who could exit, gain employment, and count toward this metric. Additionally, they noted Everett had high numbers of incumbent students who could not be counted in the DOL definition for this metric. Centralia’s BASM program, like the Customer Service program described above, did not include certificates that students could complete, thus disqualifying them for the DOL employment outcome measure.

It is also possible that gaps in staffing due to hiring and retention challenges may have resulted in weaker Navigation and program leadership in some programs. Looking at Green River in particular, they lost a significant portion of the WISE team and some funding in the last year of the grant. These issues created challenges for ensuring that all of the program requirements and outcomes for participants were being maintained and supported. Additionally, it presented difficulties for data collection. Both the program teams and evaluators reflected that staff hiring and retention was such a pervasive issue that the grant overall as well as individual programs – and especially their participants - would have benefited from greater attention to establishing redundancies, transition strategies, etc.

As mentioned, the colleges were interested in understanding outcomes around participant employment using a different, more inclusive definition that allowed them to count incumbents, i.e. those who entered WISE programs employed in some capacity (likely including many who were under-employed or not employed in their desired industry). For the colleges, this definition aligned better with the

outcomes they were working toward and their definitions of success. Working this this revised, alternative definition, colleges showed much more positive results, with the top performers exceeding their DOL goals. Overall, under this definition there were 917 participants employed within 3 months of exiting, which reflects 101% of the DOL goal. Counting incumbents, Renton reported 208 employed participants, 148% of their DOL goal. Similarly, if counting incumbents South Seattle reported 85 employed participants, 118% of their DOL goal. Finally, Bates achieved 103% of their goal when counting all 189 incumbent and non-incumbent participants.

While the grant did not achieve its cumulative goal for employment under the DOL defined metric, colleges made significant efforts to measure progress, course-correct, and outreach to students through. Furthermore, applying a more inclusive definition of the metric that may better reflect success as the colleges define it, the grant did, in fact, achieve critical goals.

V.B.iii. Total number of participants retained in employment after completing their program of study or other TAACCCT-funded program

Definition and Goal for Metric

This outcome measured the number of participants who were retained in employment for 3 quarters after completing the WISE program. The outcome goal was 678 WISE students.

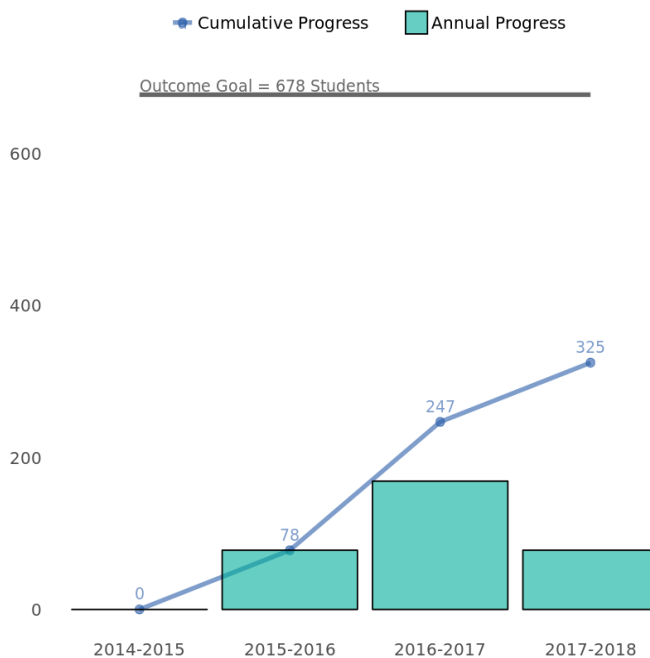
Assessment and Conclusion

The WISE program did not achieve the employment retention goal. Between 2014 and 2018 325 students (48% of the goal) were recorded as retaining employment. Chart 14 shows the annual and cumulative numbers of students retained in employment. Given that WISE did not meet its goal for number of participants employed post-program, we would not expect them to have met this goal, which counts participants who are a subset of that metric.

Again, it is possible that data collection challenges resulted in under-reporting of students retained in employment. Reliably collecting data on retention in employment was difficult; students who fell into this category had, by definition, been out of school for 9 months and were no longer connected to the WISE program/data collection. Reporting relied heavily on ESD, which was not always timely or comprehensive in providing data.

Further analysis on this goal is not possible due to data sharing limitations. Data visualized were received in aggregate to comply with the most current interpretation of the data sharing agreement.

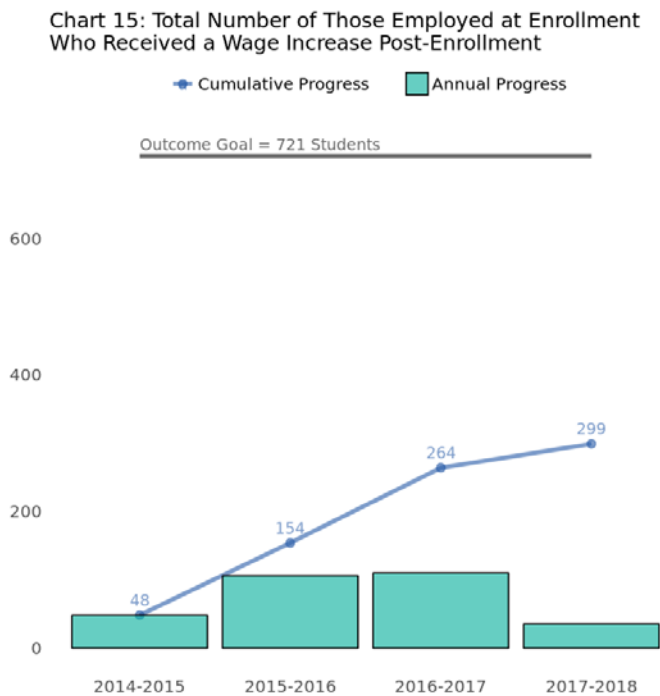
Chart 14: Total Number Retained in Employment After Program of Study Completion



V.B.iv. Total number of those participants employed at enrollment who received a wage increase post-enrollment completion

Definition and Goal for Metric

This outcome measured the number of participants who were employed when they enrolled in the WISE program and received a wage increase upon completing the academic program. The outcome goal was 721 WISE students. This metric was designed to measure the impact of the WISE program on students who started the program already employed or were veterans.



Assessment and Conclusion

The WISE program did not meet its wage-increase goal. Between 2014 and 2018, only 299 students earned a wage increase post-enrollment.

Programs – and students – made the greatest progress toward this goal during the second and third years of the grant, SY 2015-2016 and SY2016-2017, years with higher rates of incumbent enrollment, program completion and exiting.

Additional analysis of performance on this metric is not possible due to data sharing limitations. As with other reported outcomes, the evaluation team received the data in aggregate in compliance with the most current interpretation of the data sharing agreement.

V.C. Additional Outcome Analysis

V.C.i. Navigation Analysis Summary

Data and Design

As a complement to measuring progress on DOL established outcomes, the evaluation team conducted an analysis of the Career Navigation Program’s impact on participant outcomes. This analysis contributed to understanding program elements that may have contributed to positive employment outcomes.

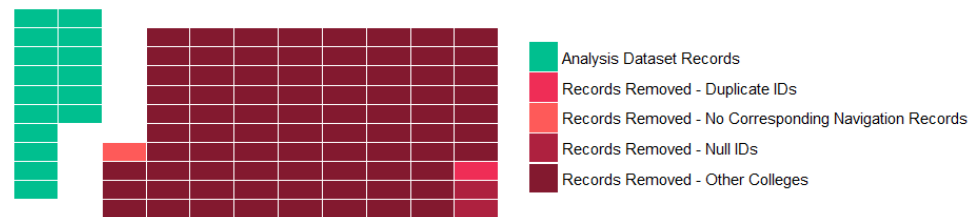
Navigation programs varied across participating colleges with respect to both implementation and documentation/data collection. Consequently, the evaluation team decided to focus their analysis exclusively on Renton, where data collection for the Navigation program was consistent and implementation well-documented. The Renton team worked closely with the evaluation team throughout the grant to design data collection that supported the evaluation analysis goals and to establish good data management practices that ensured high-quality data. Importantly, they established a disciplined approach to collecting data about Navigation interactions with students. Other colleges collected Navigation program data but without the consistency of the Renton data. Further, while other

programs teams suffered from data gaps during various personnel gaps, Renton created redundancy in roles and collected data throughout.

The dataset used for the analysis included records for 329 Renton students who enrolled in a WISE program at Renton between the first and tenth quarters of the grant (January 2015 through June 2017). The evaluation combined data from two sources: (1) Renton itself, which provided information on students'

Chart 16: WISE and RTC Navigation Data Represented in Analysis

WISE records used for analysis: 16% (n = 329 participants)



Navigation records used for analysis: 75% (n = 1361 navigation sessions)



experiences with the Navigation program; and (2) the master record set of WISE data prepared by the WISE Data Manager which included WISE participant demographic and academic data. The combined dataset included an observation for each navigation session, resulting in multiple observations per student and a total of 2,151 observations.

With respect to data from both Renton and the WISE Data Manager, the evaluation team established conditions for including or excluding specific records (i.e. observations of navigation sessions or student outcome data). With the navigation data prepared by Renton, the evaluation team excluded records for observations of navigation sessions deemed less relevant to program outcomes. Consequently, the data set *included* observations of navigation sessions related to career guidance, job placement, guidance on further education, course selection, and WISE program completion¹⁶ and *excluded* records of sessions focused on financial aid, general orientation, and follow-up interviews that occurred after a student exited the WISE program. The evaluation team also removed records in cases of duplication or if matching student records weren't available in the WISE master data set.

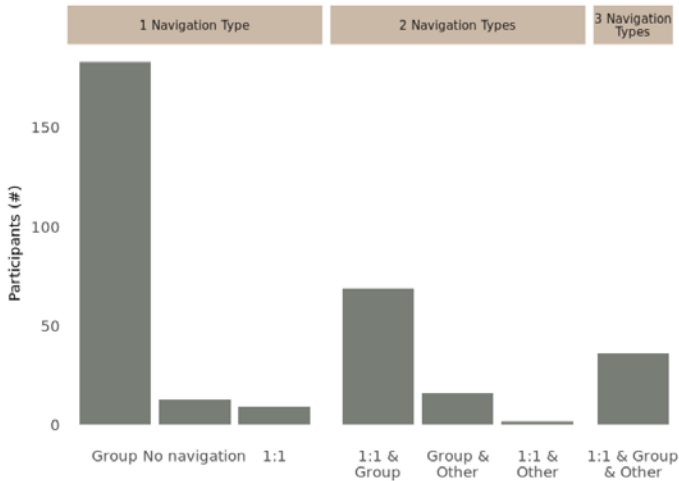
Within the WISE master data set, the evaluation team removed records from all colleges other than Renton, records with *null* ID values, and records with duplicate ID values. The evaluation team merged

¹⁶ These are example description of relevant navigations sessions attended by WISE participants at Renton Technical College: Cover Letter Assistance, Education Plan, General Job Placement Assistance, Graduation Paperwork, Industry Partner presentation, Job Placement Assistance, Job Placement Assistance for a Specific Employer, Job Search Networking, Resume / Cover Letter Assistance, Resume Assistance, Student catch-up, UI/CAT/TB/TAA, Workforce Program- BFE&T, Workforce Program- Worker Retraining, Workshop- Federal Resume, Workshop TCDS- Campus/Community Resources, Workshop TCDS- Interviewing, Workshop TCDS- Job Search/Marketing Yourself/LinkedIn, Workshop TCDS- Master Application/References, Workshop TCDS- Resume/Cover Letter, Workshop TCDS-Portfolio, Reviewed support services to class, Reviewed support services to class/stress mgmt.

the datasets after preparing each for analysis. Chart 16 reflects this segmentation of the data sets into those included/excluded from analysis.

Analysis and Conclusions

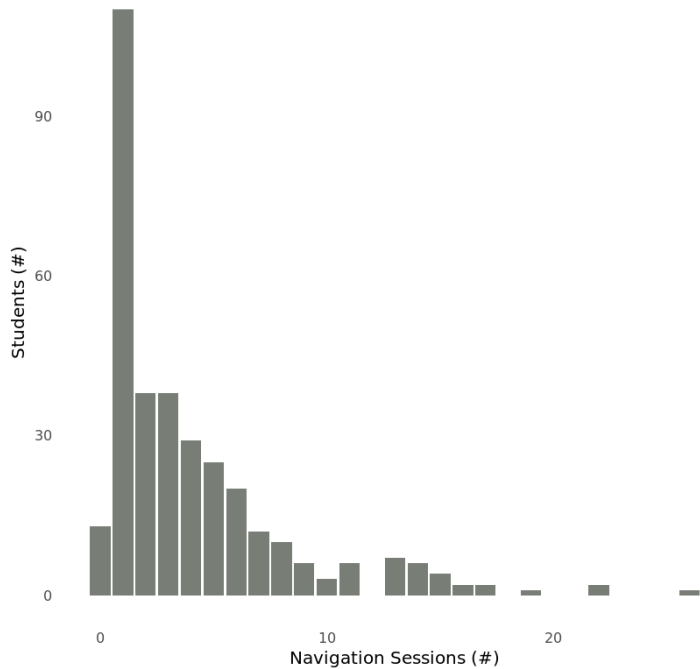
Chart 17: Number of Students Enrolled in Further Education by College



To understand the impact of engagement with navigation, analysis first captured and described the level of engagement participants experienced. Renton offered navigation to students in one of three forms: group navigation, one-on-one (1:1) navigation, or “Other” navigation (phone calls, emails, letters mailed to the home of the student, etc.). The majority of Renton participants received navigation as a member of a group such as in a class setting. Providing navigation support this way leveraged important economies of scale. A third of students included in the dataset received one-on-one navigation, either exclusively or in combination with another navigation form.

The number of navigation sessions for a student ranged from 0 and 26. Over half of the 329 students whose experiences the evaluation team analyzed received between one and three sessions of navigation (56%, n = 186) (See Chart 18). The inferential model executed by the evaluation team to understand the impact of navigation excluded the 3 students with more than 20 navigation sessions to minimize the effect of outliers.

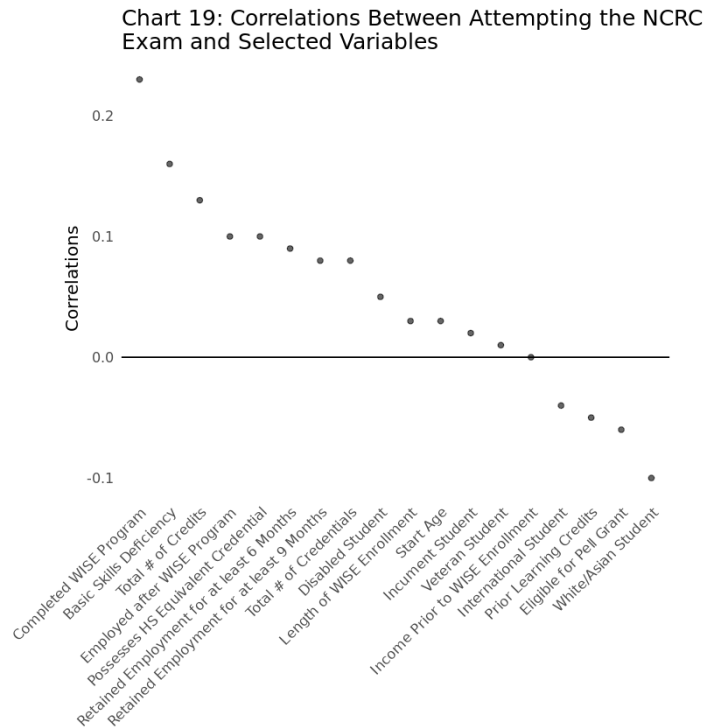
Chart 18: Renton Technical College Navigation Sessions



To understand the impact of navigation – as distinct from other program elements or potentially influential factors – the evaluation team developed a logistic regression model.¹⁷ The model included the following explanatory variables: number of navigation sessions, academic program, incumbency, number of earned credentials, WISE program exit status, and gender. The extent to which a variable is a strong predictor of employment depends on the consistency in the relationship between the variable and the employment outcome.

¹⁷ 115 WISE Participants are represented in chart 19. These students are non-incumbents who earned a credential and exited from WISE.

In this model, number of navigation sessions was a better predictor of employment than number of earned credentials and enrollment in the Major Appliance and Refrigeration Technology program in particular. But the absolute predictive power of number of navigation sessions was low. The team identified some correlation between additional navigation support and the likelihood of becoming employed, however the relationship flattens after about 8 navigation sessions. The most predictive variables for employment were incumbency, WISE program exit status (exit status = “yes”) and gender (“male”), all of which had a positive influence.¹⁸



This finding contributes to a more complete picture of the value of navigation. Very simply, additional navigation sessions do correlate with higher likelihood of finding employment. At the same time, results of this analysis suggest there are diminishing returns. After 8 sessions the participant’s likelihood of employment no longer increases, suggesting that additional navigation time after 8 sessions is not impactful. For colleges considering if and how to continue their Navigation programs, it is potentially very useful to know how much support is impactful and the point at which more sessions (and the staffing or resources necessary to provide them) no longer have a positive impact and may not be worth the necessary investment.

V.C.ii. NCRC Analysis Summary

Again with the goal of understanding drivers of positive outcomes, the evaluation team explored the impact of a student attempting the National Career Readiness Certification (ACT NCRC®).¹⁹ The WISE program worked to establish the use of certificates such as the NCRC as a tool to improve participants’ soft-skills and a signal of employment readiness. While the NCRC was not adopted by industry as hoped, the evaluation team analysis found a positive relationship between taking the NCRC certification and employment and job retention. Anecdotally, Navigators and WISE leadership saw evidence that the NCRC navigation process giving provided Navigators a valuable tool to support students’ demonstration

¹⁸ See Table E in the appendix to view the full regression output.

¹⁹ Four NCRC score values exist: Bronze, Silver, Gold, and Platinum.¹⁹ Also, in the WISE dataset is a value of “Attempted”. “Attempted” indicates that the student sat for the NCRC exam, but the score for the exam is unknown. 287 out of 2,970 WISE students (9.7%) took the NCRC exam. Over half of the 149 students (52%) earned a Silver score on the NCRC exam. 29% earned a Gold score and less than 1% earned a platinum score. 17% of the WISE students earned a Bronze score. Note, the NCRC is not an industry recognized credential and therefore, while it’s a certification, it does not count toward completion.

of soft-skills based on skill sets and align strengths with both education and career guidance. This, in turn, may have contributed to students achieving employment.

The evaluation team calculated correlations between attempting the NCRC exam and the 18 variables in Chart 20. Correlations were fairly weak between the “attempting the NCRC exam” variable and the correlation variables. This indicated that variables used to characterize a student do not have a strong directional relationship with attempting the NCRC.

Only two variables correlated with attempting the NCRC exam at an absolute value of a Pearson’s correlation coefficient greater than .15. The correlation between program completion and attempting an NCRC exam is .23, indicating a positive relationship, and the correlation between beginning the program with a basic skills deficiency and attempting the NCRC exam is .16, also indicating a positive relationship. A possible explanation for the positive relationship between beginning the WISE program with a basic skills deficiency and taking the NCRC exam is that Navigators identified students with a skill deficiency and supported their skill attainment, which in many cases included the soft skills associated with the NCRC. Similarly, program completion and NCRC may have a strong positive relationship because students who are motivated to complete a WISE program are also motivated to take the NCRC exam.

Chi-squared tests were also performed to test for significant differences in employment and employment retention²⁰ between students attempting the NCRC exam and students not attempting the exam. Analysis found meaningful differences in both variables (employment: $\chi^2 = 30.24$, $df = 1$, $p = .05$; retention: $\chi^2 = 26.08$, $df = 1$, $p = .05$). This means students who attempt the NCRC exam were more likely to find employment as well as keep their jobs than students who do not attempt the NCRC exam. Of the students who attempted the NCRC exam, 33% ($n = 95$) were employed after exiting the WISE program, while 18% ($n = 531$) of their peers, who did not attempt the NCRC exam, found employment after exiting their program of study. 40% of students who attempted the NCRC exam retained employment, while 24% of students who did not attempt the NCRC exam retained employment.

Several possible explanations for the differences between groups are worth exploring, though it was beyond the scope of the analysis and the available data to determine the accuracy of these explanations. Explanations can be characterized as *student*, *college*, and *program effects*. A *student effect* presumes an inherent quality of a student that motivates her/him to attempt the NCRC exam. The same quality, or a related quality, might motivate the student to find employment upon program completion. *College* and *program effects* presume environmental factors related to the college and/or the program motivated students to attempt the NCRC exam and seek and retain employment. It is currently not possible to test the extent to which these effects impact NCRC enrollment and employment outcomes. It is also possible that the NCRC fulfilled its intended goal, acting as a signal to employers that in addition to skill-based credentials and certificates, students have the necessary soft-skills to be successful in employment. The scope of this evaluation and available data don’t allow us to confirm that hypothesis.

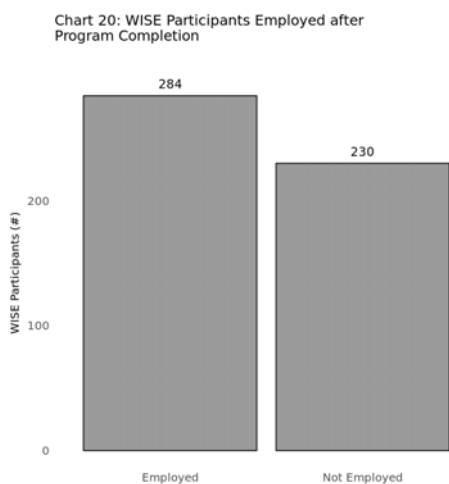
V.C.iii. Employment Likelihood Analysis Summary

In 2016 when it became clear the WISE program was not making anticipated progress toward student employment goals, the evaluation team undertook an analysis of the relationship between selected variables and employment. The goal of this analysis was to forecast whether the WISE grant was on

²⁰ In this analysis, we define “retention” as employment which lasts at least six months.

track to ultimately meet employment goals or, if they were projected to fall short, identify those shortfalls. The analysis was conducted in early 2016 with ample lead time to course correct if opportunities were identified. The evaluation team designed the analysis to identify WISE participants as likely or unlikely to find employment, thus providing WISE Program Managers and Navigators with critical input to target support to students less likely to become employed and thus maximize the number of employed participants. The analysis explored a wider set of factors than the navigation analysis in the preceding section in which we estimated the extent to which navigation support impacts employment outcomes.

The analysis used a multivariate logistic regression methodology to forecast the likelihood of employment for each participant which could then be analyzed in relation to selected WISE participant characteristics such as race, gender or program participation. The conclusion of the employment likelihood analysis was that, despite upward trends in participants and completions, the grant was not placing enough participants in employment to close the gap on the DOL goals.



The analyzed dataset included 514 observations²¹ including 284 WISE students identified as employed (*employed* = 1) within one quarter of completion and 230 students identified as not employed (*employed* = 0) within that time frame. The WISE Data Manager collected data on employment status from two sources: (1) WISE Navigators at colleges participating in the WISE program and (2) ESD. For the purposes of this analysis, employment status from the two sources was combined.

As part of a contextual analysis of employment status, we compared employment of students across demographic factors and program completion status (see Charts 21, 22, 23, and 24). We also calculated correlations between employment status and covariates (see chart 25).

²¹ As part of the analysis we calculated the likelihood of a WISE participant being employed within 3 months of exiting the WISE program. The dataset we analyzed included non-incumbents who exited from the WISE program before the 9th quarter of the TAACCCT grant. Prior to analysis, we also performed casewise deletion to retain records without NULL values. (Casewise deletion is one method to handle missing data when executing a statistical model.) These are the only conditions used to constrain the dataset. We did not use a variable indicating completion of the WISE program as a condition so that the relationship between such a variable and employment could be assessed. The data for the analysis came from cumulative data up to the 11th quarter in which WISE data was collected and processed. Note that although students at Centralia College met the exit quarter and incumbent status conditions, Centralia students did not appear in the analysis dataset due to exclusion by the casewise deletion step in preparing the data.

Chart 21: WISE Participant Employment by WISE Completer Status

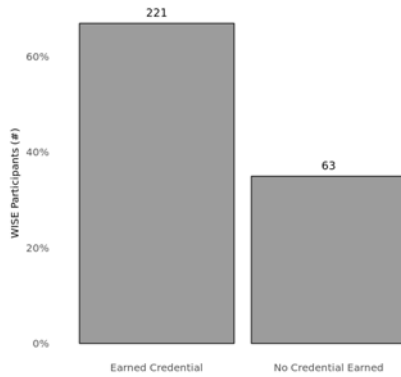
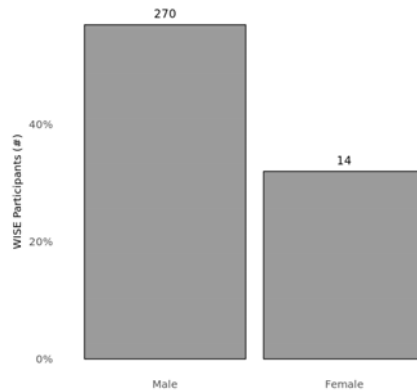


Chart 22: WISE Participants Employed after Program Completion by Gender



The percentage of employed WISE students who completed a credentialing program is significantly higher than the percentage of those students who did not earn a WISE credential (in Chart 21). We can see (in Chart 22) that the percentage of male students who find employment is higher than the percentage of female students.

When disaggregating data by age and race, we see that employment rates range between 47% and 62% and 44% and 60% respectively. Students who are 27 to 32, when disaggregating by age, and white, when disaggregating by race/ethnicity, represent the highest rates of employment compared to students from other age and race/ethnicity groups.

Chart 23: WISE Participants Employed after Program Completion by Race

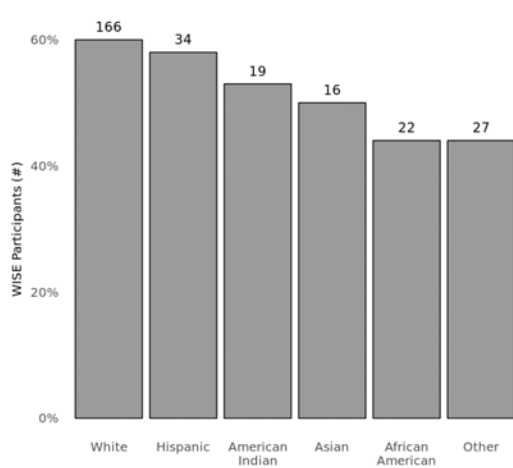
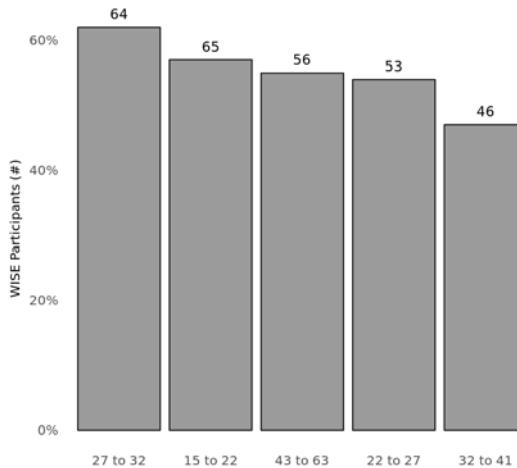
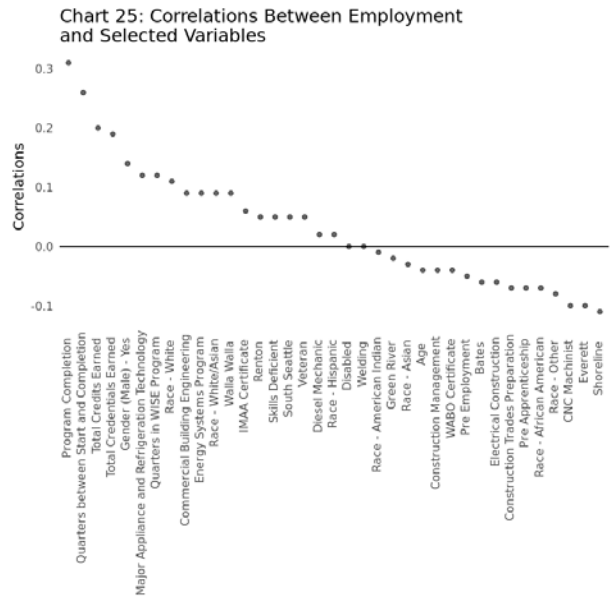


Chart 24: WISE Participants Employed after Program Completion by Age



Analysis explored a total of 37 variables/variable values and found that none of them correlated strongly with employment. The strongest correlation to employment was with completion status ($\rho = .31$) and number of quarters between enrollment completing a credential for the first time ($\rho = .26$). Within the top ten highest correlations were WISE program completion, gender, and racial identification as white or Asian. However, correlations between employment and even these variables are relatively low.



Employment Likelihood Estimate

In addition to the contextual analysis discussed above, we estimated the likelihood of a WISE participant finding employment within 3 months of exiting their course of study. To estimate the likelihood of employment, we used a logistic regression.

The contextual analysis as well as variable selection models assisted in the identification of explanatory variables specified in the regression model. We used an ANOVA F-value test and a recursive feature elimination algorithm to select variables for the logistic model. By coupling the contextual analysis with these tests, we identified the following explanatory variables to specify the logistic regression model: WISE program completion, gender, white/Asian race/ethnicity, and college.

With a larger dataset, we would have liked to include a program variable in the model. Because of the relatively small size of the dataset and small frequencies of program values, inclusion of a program variable did not improve the predictive power of the model.

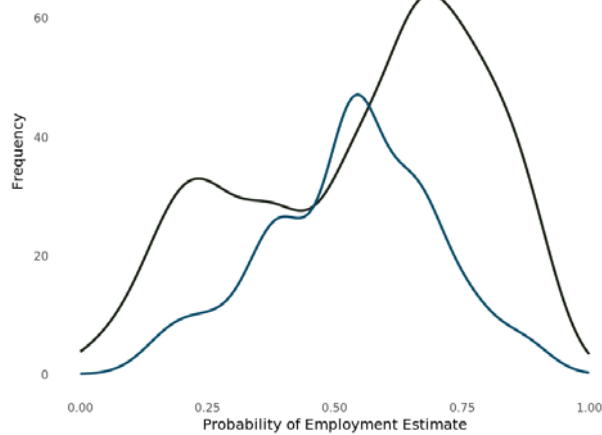
Table 12: Number of Estimated Employed and Not Employed WISE Participants Compared to Known Employed Status Values

	Estimated - Employed	Estimated - Not Employed
Known - Employed	231	53
Known - Not Employed	117	113

The logistic regression fitted to our analysis dataset estimated that at the time of the analysis 348 students of the 514 students (68%) in the dataset were likely to find employment within three months of completing a WISE program of study (see table 13). We used a threshold of .5 to classify the likelihood of employment as *likely* or *unlikely* (above .5 signifies a WISE participant is likely to find employment). We recognized the limitations of bifurcating model probabilities, namely that the nuance of probability values is lost. This is more problematic for analysis of probabilities near the threshold (.5) used for delineating between *likely* and *unlikely*. Nevertheless this approach allowed us to apply the model to iterative, ongoing strategy development in support of WISE student employment outcomes.

By identifying WISE participants as likely or unlikely to find employment, WISE Program Managers and Navigators could revise and tailor strategies used to assist students in finding employment. For example, Navigators may have decided to spend more time with participants who are unlikely to become employed without additional intervention, especially if a relatively low level of additional time was likely to produce significant results. This finding is also in the context of diminishing returns to Navigation time after 8 navigation sessions. Taken together, these findings, lead Navigators to focus their time where the return is highest – with participants with a low likelihood of becoming employed and through fewer than 8 navigation sessions.

Chart 26: Density of Employment Estimation Accuracy
 — Accurate Prediction — Inaccurate Prediction



The accuracy rate of the estimation based on the fitted model is about 67%. The logistic regression has a pseudo R^2 of .21. The table below shows how well the model estimates employment for WISE participants. The rows represent known employed status. The columns represent estimated employment status. The intersections of *employed:employed* and *not employed:not employed* labels are the number of accurately estimated employment statuses of students. From Table 13 and Chart 27, we can see that the model has a propensity to overestimate employment. The false positive rate is 51%, while the false negative rate is 19%. In the density plot, we can see the accuracy of the fitted model in terms of probability estimates. At the ends of the probability spectrum (below $\sim .27$ and above $\sim .74$) the model performs much better than toward the

middle of the spectrum of probability values. This indicates the ability to accurately estimate employment for two distinct clusters of students.

In the model we ran, we see statistically significant relationships between employment and the four explanatory variables.

Table 13: Logistic Regression Output for Employment Likelihood

	Estimate	Standard Error	P Value
Intercept	-2.8521	0.5353	0.0000***
Completed WISE Program - Yes	1.9211	0.2718	0.0000***
Gender (Male) - Yes	1.1928	0.4280	0.0053**
Race (White/Asian) - Yes	0.5459	0.2302	0.0177*
College - Everett	-0.4349	0.4544	0.3385
College - Green River	1.5695	0.6864	0.0222*
College - Renton	0.5707	0.3240	0.0782.
College - Shoreline	-3.0130	1.0772	0.0052**
College - South Seattle	0.5030	0.3928	0.2004
College - Walla Walla	1.1251	0.3293	0.0006***

Table 13²² shows the difference in effects between Bates and Walla Walla, Shoreline, and Green River are statistically significant. The effects of enrollment at Green River and Walla Walla are positive. The effect of enrollment at Shoreline is negative and, relative to the other coefficient values, large. The key takeaway from the analysis of college data Table 14 is that enrollment at the mentioned colleges most likely impacts the likelihood of finding employment. In other words, participants at Green River and Walla Walla are more likely to find employment than participants in programs at Shoreline. Walla Walla and Green River had strong Navigation and programs with high employment rates such as Business Management (Green River) and Energy Systems (Walla Walla).

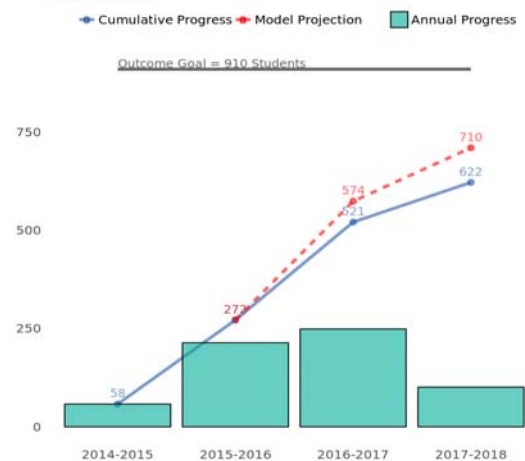
We also saw strong relationships between completion of a WISE program, gender, and race and the employment outcome variable. Controlling for other variables, employment likelihood values were higher for students who were male, white or Asian, and completed at least one WISE program.

When we fit the regression model to the WISE data we estimated that 718 WISE participants would be counted as employed. As expected this is an overestimation. We know the model overshoots the actual number of employed participants at the end of the TAACCCT grant by 88 students.

We can draw several conclusions from this analysis.

First, after fitting the regression model to WISE participant data we determined that the WISE Program would likely not achieve the employment goal. The model’s best estimate of the number of WISE participants to find employment was 718. The estimate indicated that upon completion of the TAACCCT grant, WISE colleges would fall short of the employment goal of 910 by 192. The forecast we produced from the model provided evidence to WISE leadership for

Chart 27: Comparison of Actual and Projected WISE Employment



²² Interpretation of the effect of *College* on employment outcomes required knowledge of the colleges in the dataset. Bates College served as the “default” college in the regression output table below and therefore does not appear in the table. Recall as well that by means of the casewise deletion step, Centralia College does not appear in the regression output table (as a result of exclusion from the analysis). College p-values represent the statistical significance in the difference of effects between enrollment at Bates and a given college. The coefficient of the effect of enrollment at Bates College is 0.

consideration of new tactics to support WISE participant employment and adjustments to WISE budgets at colleges.

Second, the logistic regression is 21% more accurate than a modal estimate at predicting WISE participant employment. The difference in accuracy is not exceptional, however it was large enough to warrant reference when considering navigation strategies. Also we know that the model was prone to overestimate the likelihood of employment, which could be factored in when making Navigator resourcing decisions.

Third, with a reasonably high degree of confidence we can observe a positive effect of program completion, “male” gender status, and “white/Asian” race status on employment. Enrollment at Walla Walla and Green River also has a positive effect on finding employment, while enrollment at Shoreline as a negative effect on finding employment.

V.D. Outcomes Evaluation Conclusions

Despite surpassing goals for implementation, the WISE program met with mixed success in achieving its desired impact. WISE exceeded its goal for participants enrolling in further education by a significant margin. This fits with the positive results for implementation metrics around enrollment, earning credits, and completing credentials, and may speak to the appeal and relevance of programs offered by WISE colleges. It may also reflect economic circumstances that made staying in school more appealing in some industries and for some participants. The scope of this evaluation does not allow for confirming these hypotheses.

On the core DOL defined metrics of non-incumbent (i.e. previously unemployed) participants becoming and remaining employed after completing WISE programs WISE did not meet its goals. For both of those metrics there was a significant gap between the goal set in the initial application and the actual outcome. The colleges expressed interest in measuring job attainment in a slightly different way, including incumbent participants, those who entered WISE programs with jobs. Using this definition, which was a better fit with the colleges’ conception of success, the WISE programs had many more participants employed both 3 months and 9 months after exiting.

While the available data and the scope of this evaluation do not allow for explanations of why the WISE programs did not achieve their goals for employment, the evaluation team did pursue additional analyses that may contribute to such an understanding and to program improvements. Analysis of the impact of navigation on employment found a small positive impact for participants who had up to 8 Navigator sessions. Beyond 8 sessions the impact of employment disappeared. Similarly, analysis showed that attempting the NCRC has a positive impact on employment. Finally, employment likelihood analysis provided insight into which students were unlikely to achieve employment and allowed programs to more strategically deploy their resources. Collectively, these results provide potentially useful direction for the WISE programs moving forward.

VI. Comparison Cohort Analysis

VI.A. Comparison Cohort Analysis Research Question & Planned Approach

The purpose of the comparison cohort analysis was to compare the WISE treatment group with a control group to answer the following research question:

- *What is the impact of the WISE program and related components of the WISE program on WISE participant outcomes?*

The research was designed to test the hypothesis that students enrolled in WISE programs would have superior employment outcomes when compared to students enrolled in programs which did not receive WISE funding or provide Navigation support, a core WISE program element. Program completion²³ and employment within 3 months after completing a WISE program²⁴ served as the employment outcomes to be evaluated.

The following describes the initial planned approach to this analysis. Ultimately, however, data sharing restrictions and limitations externally imposed midway through the project by the Washington Employment Security Department (ESD) and Washington State Board for Community and Technical Colleges prohibited access to necessary data and implementation of this approach and necessitated development of an alternative and far more limited plan.

For context, the original proposal for WISE comparison cohort analysis entailed a quasi-experimental methodology comparing two years of data (SY2015-2016 through the end of the WISE grant period) on outcomes for Manufacturing Academy (MA) participants at Bates Technical College and South Seattle Community College, schools located in similar communities and offering programs using the same curriculum and course work. Students completing the MA and IMAA at the two colleges participated in similar employment markets. Given the close proximity of Bates Technical College and South Seattle Community College (in Tacoma and Seattle, WA respectively) and commonalities of the programs, one might argue the market for MA/IMAA skills blends geographically resulting cross-market employability of students.

The schools differed in that the Bates Technical College MA program did not receive WISE funding²⁵ while the South Seattle Community College Industrial Manufacturing Academy (IMAA) program had both WISE funding and navigation support in place²⁶. The specific elements of the WISE program model that differed between Bates Technical College and South Seattle Community College were Navigation support and the use of the NCRC certification. The presence of a WISE Grant Administrator at Bates added to the strength of this plan by simplifying elements of the analysis such as obtaining ESD data sharing agreements and FERPA permission, conducting data collection, and formatting data.²⁷

²³ Program completion is receipt of an IMAA/AMT credential

²⁴ Retention in additional academic programs is to continue matriculation in a program after completing the IMAA/AMT certificate program

²⁵ Bates Technical College had WISE programs but did not include their MA program within WISE.

²⁶ The South Seattle IMAA program was NOT OFFERED the NCRC certificate, the other key element of the WISE program.

²⁷ The WISE Program Manager at Bates planned to provide the Bates MA student demographic, program and employment information to the WISE Data Manager in the same format as all WISE data to minimize the workload and facilitate the analysis.

The planned analysis entailed a *nonequivalent groups* design, which is a quasi-experimental design with treatment and control groups. The design sought to ensure that these groups would resemble each other to the greatest extent possible helping isolate the effect of the WISE grant on employment outcomes. The two groups were defined as:

Treatment group: 66 individuals enrolled in the IMAA Certificate WISE training program at South Seattle Community College in SY2015-2016 and in the first two quarters of SY2016-2017

Control group: 79 Bates Technical College students enrolled in the MA program in SY2014-2015 and in the first two quarters of SY2015-2016.

The evaluation team proposed using logistic regression and difference of proportion test techniques as the primary instruments of analysis. Core elements of that design were:

Outcome variables for logistic regression model. Explaining the effect of the WISE grant on employment and program completion was the primary intent of the comparison cohort analysis. The key outcome variables of interest were (a) employment and (b) program completion. The evaluation team planned to analyze further enrollment in other programs if possible²⁸ and to use a logistic regression to estimate the likelihood of program completion and employment.

Explanatory variables for regression models. Explanatory variables fell into one of three subgroups: student-level effects, WISE grant effects, and college effects. The evaluation team anticipated using ANOVA F-value test and a recursive feature elimination algorithm as empirical methods to help select variables. They planned to apply the two independent methods to corroborate the inclusion / exclusion of a given variable. Ultimately the explanatory variables used in the model would reflect the best judgement of the evaluators and be substantiated by variable selection models.

The general approach would control as comprehensively as possible for factors that might account for employment outcomes of participants, while ensuring that the analysis was theory-driven and parsimonious.

Within and between-group analysis. Some of the explanatory variables were expected to allow the evaluation team to perform within and between group comparisons to understand differences in employment outcomes by demographic sub-groups based on age, race, gender, veteran status, and program-related sub-segments such as training program and college.

The evaluation team planned to use chi-squared and difference of proportions tests for these analyses. The methods would allow for assessing differences within and between groups and indicate whether a statistically significant difference existed in the performance of identified groups.

Sample size. Sample size would be determined using a confidence interval of 95% and a margin of error of 5%. In the cases of both the treatment and control groups, sample sizes represented a large percentage of the populations given their sizes of 66 and 79 respectively.

²⁸ Length of enrollment will be used as an explanatory variable as well.

VI.B. Comparison Cohort Data Sources

Data for the treatment group was sourced from the regularly processed WISE grant data through the fifteenth quarter. The WISE Data Manager designed the data processing methodology used to prepare the evaluation data. Data for the control group originated directly from Bates Technical College, where WISE staff members used a data processing methodology identical to that used by the WISE Data Manager for the WISE grant generally. WISE staff members prepared this data for the evaluation in the tenth quarter of the WISE grant. In the case of the treatment and control groups, data used for the evaluation was prepared four quarters following the final quarter of enrollment for students.²⁹

VI.C. Methodological Changes & Limitations

As documented in Section II of the evaluation report, the most recent interpretation of the ESD data sharing agreement (DSA) significantly impacted the evaluation analyses possible across this project and reported on by 3si, including in the comparison cohort analysis.

In December 2017, the WISE grant leadership determined that ESD data *could not* be used for the comparison cohort analysis due to aforementioned externally imposed data sharing restrictions and limitations. Specifically, ESD employment data for non-WISE participants in the Bates Technical College MA could not be disclosed or used in WISE analysis. The externally imposed data sharing restrictions were reversed and nullified an independent DSA signed by both ESD and Bates Technical College to cover the non-WISE Bates MA data; WISE grant leadership were then directed to apply these restrictions retroactively. As a consequence, employment data was not available for analysis of the Bates comparison cohort. Without this data the analysis plans described in detail above became impossible.

Early in 2018 the evaluation team drafted a revised comparison cohort analysis plan to accommodate the decision to not use ESD data in the WISE evaluation. The evaluation team documented the impact of these data sharing decisions in a memo to the WISE leadership team provided on 2/22/2018 and encouraged the WISE leadership to request guidance from DOL on this issue. A discussion with DOL took place on April 3, 2018. The discussion between the DOL Federal Program Officer (FPO) and other DOL staff, WISE Program leadership and Data Manager, and the evaluation team confirmed the decision not to use ESD data in the comparison cohort analysis. The evaluation team clarified that the analysis would be constrained by the decision and likely be limited to a series of descriptive statistics rather than the substance of the original analysis.

As an alternative to their initial design, the evaluation team drafted a revised comparison cohort analysis plan that focused on an assessment of academic progress and program retention. The new comparison cohort analysis plan identified two alternate metrics as the focus of the analysis: (a) *Total Number of Participants Completing a TAACCCT-funded Program of Study* and (b) *Total Number Enrolled in Further Education After Program of Study Completion*. With the support of WISE Leadership, the evaluation team indicated these metrics as “next best” areas of focus.

Despite confirmation that data for these two metrics were possible to collect, incomplete data submitted for the control group led to the exclusion of one of the two metrics from the analysis: *The Total Number Enrolled in Further Education After Program of Study Completion*. This metric is calculated using the following three variables: (a) Enrollment Year, (b) Exit Year, and (c) Transfer Year. Transfer Year

²⁹ The WISE Data Manager provided data from the fifteenth quarter, not the fourteenth quarter, over the regular course of providing data to the evaluation team. In turn, the evaluation team used data from the fifteenth quarter for the comparison cohort analysis.

data was not, however, collected for Manufacturing Academy (MA) students. Due to this situation, it was not possible to perform any analyses regarding further education.

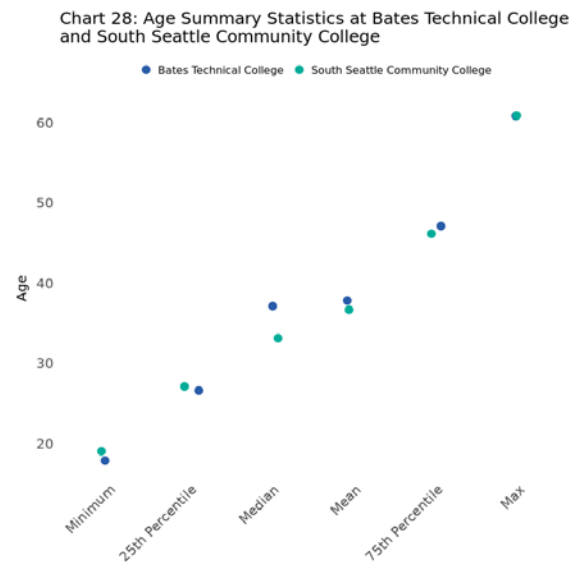
Data from the other metric, *Total Number of Participants Completing a TAACCCT-funded Program of Study*, yielded interesting results. Namely, in the case of the comparison cohort at Bates Technical College, the outcome variable, program completion, has a zero variance, which means that all students have the same outcome (100% of students completed the 10-week MA certificate program). As a result, the analysis cannot test in a meaningful way the relationship between the outcome variable (program completion) and a set of explanatory variables. The success of the MA program bodes well for the students as well as the college, but not for statistical modeling endeavors. No differentiated effects can be discerned from a model when the outcome variable is constant; therefore the analysis does not apply the statistical model to the data as intended.

Despite these limitations, the evaluation team proceeded to perform the comparison cohort analysis. The results, while not as robust as originally intended, still provided meaningful information.

VI.D. Comparison Cohort Analysis Results

Treatment and control group populations resembled each other in several ways. These similarities supported the case for a nonequivalent groups design for the intended analyzes. Analysis confirms similarities between the groups.

Chart 28 shows that the age range for the two groups is nearly identical. Students at Bates were between 18 and 61 years old. Students at South Seattle were between 19 and 61. The other summary statistics also indicate similar age distributions for the two populations. The statistic that shows the greatest difference in age for the two groups is Median, indicating a difference of 4 years. The median age at Bates is 37 years old and at South Seattle is 33 years old.



Because of the relatively small total subpopulation sizes of male and female students in the MA programs at Bates and South Seattle Colleges Chart 29 may seem to suggest that a meaningful difference in gender exists at the two colleges. However, a chi-squared test shows the difference in distribution for these two groups is not statistically significant ($\chi^2 = 2.26$, $df = 1$, $p = .05$). The chi-squared value (2.26) is less than tabulated chi-squared (3.841). This suggests that the extent to which these populations are similar would support the effort to isolate the effects of WISE on student outcomes.

Chart 29: Gender distribution at Bates Technical College and South Seattle Community College

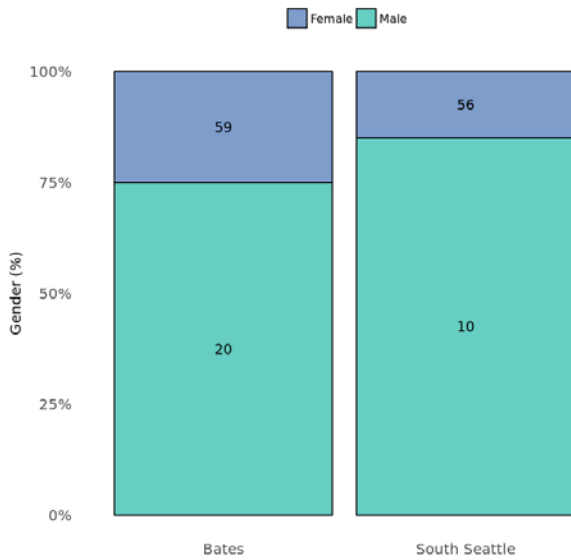
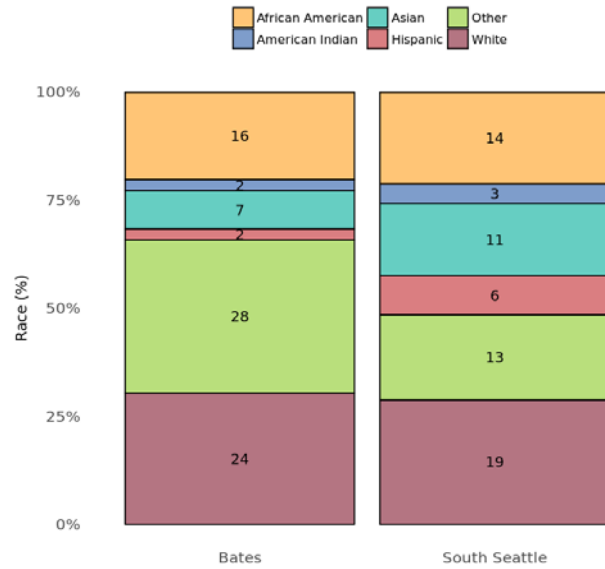
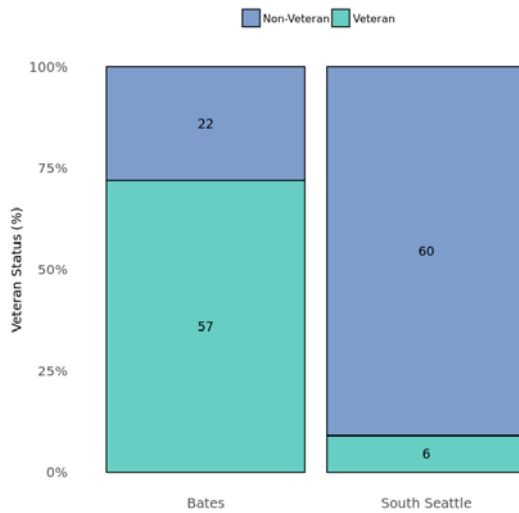


Chart 30: Race Distribution at Bates Technical College and South Seattle Community College



Student race/ethnicity in the MA and IMAA programs at Bates and South Seattle also resemble one another. The percent representation of African American, American Indian, and white students in the two programs are within two percentage points. The greatest observed difference is the “other” race/ethnicity group. Students in the “other” group are a combination of international students, students of other known races, and students of unknown race.

Chart 31: Veteran Status Distribution at Bates Technical College and South Seattle Community College



While participants in the MA and IMAA programs at Bates and South Seattle are similar when disaggregating student demographic data by age, gender, and race a notable difference appears when looking at veteran status.

Bates Technical College enrolls many more veterans than South Seattle Community College. We attribute this difference to Bates greater proximity to Joint Base Lewis McCord, an Army and Airforce base located near Tacoma.

Bates and South Seattle also showed similarities in MA and IMAA program completion rates. For the period evaluated, the MA program at Bates had a 100% completion rate (79 out of 79 MA students completed the program). The IMAA program at South Seattle had

a 96% program completion rate (63 out of 66 students completed the program). To ensure confidence in the similarities between the program completion rates, the evaluation team performed a chi-squared test. The chi-squared value calculated from the above inputs is 3.67 (df = 1, p = .05). Comparing the calculated chi-squared to a tabulated chi-squared of 3.841 establishes that the difference between the two program completion rates is not statistically significant.

The test results suggest enrollment in WISE may not improve program completion rates at participating colleges. However, additional research is required to draw more robust conclusions. Several factors may explain similar program completion rates. The best, mostly likely explanation is that the length of the program was too short for attrition to occur. Both programs run only 10 weeks.

In the case of IMAA students at South Seattle, there may be evidence of eagerness to succeed academically in that students enroll in credentialing programs other than the IMAA and complete those programs.³⁰ The average number of credentials earned by an IMAA student is 4.8, more than double the number of certificates that a student earns through the MA and IMAA programs (2 credentials). Similar data is not available for Bates MA students.

VI.E. Comparison Cohort Analysis Conclusion

The discussed limitations on the analysis prevented the evaluators from testing the extent to which WISE participation attributes to employment outcomes. The similarly high levels of academic success among students at Bates Technical College and South Seattle Community College presented challenges to contrasting aggregate academic outcomes. Performing a chi-squared test showed that the difference in program completion at the two colleges is not statistically significant, indicating that enrollment in the WISE program may not improve academic outcomes significantly. Before making conclusive claims about the effect of the WISE program on student (employment and academic) outcomes, further study is required.

The Manufacturing Academy programs at Bates Technical College and South Seattle Community College still serve as ideal comparison groups. With an alternate data sharing agreement in place, it would be possible to test the hypothesis stated in the original comparison cohort analysis plan. The two colleges were close in proximity with students in both programs participating in the same labor market. The analysis above confirmed similarities between the student groups at the two schools with respect to age and gender distributions, as well as distribution of race/ethnicity. Many more veterans enroll at Bates than South Seattle, an important distinction between the two groups. If a more complete analysis were done, basic inferential modeling techniques could control for this difference in demographics in addition to others captured by the model.

³⁰ We do not have credentials data on Bates Technical College MA students other than the number of credentials they earned in the MA program. All MA students earned both MA credentials.

VII. Summary and Conclusions

VII.A. WISE Program Description and Activities

The Washington Integrated Sector Employment (WISE) training program was designed to prepare participants for employment in entry level, pre-apprenticeship and apprenticeship occupations with a focus on key growth sectors for Washington State's critical industries of Clean Energy, Construction, and Advanced Manufacturing. Using innovative strategies such as career navigation and soft skills development, and programmatic improvements such as redesigned curriculum and certificates, updated training equipment and investments in faculty, WISE aimed to address the unique needs of unemployed, or under-employed dislocated workers.

A consortium of eight community colleges implemented WISE with leadership from the Centers of Excellence for target industries, and support from a statewide collaboration of public workforce system partners. Implementation of the WISE grant varied from one college to another according to their particular programs and potential participants, as well as their unique opportunities to enhance student supports and create sustainable infrastructure. Common WISE program elements included the use of career navigators and a focus on soft skills development. While each of the colleges took a somewhat different approach, all worked toward and contributed to the overall WISE goals around participant employment.

VII.B. Evaluation Design

The plan for the WISE program evaluation consisted of two key components: an implementation evaluation to measure program execution at each college and an outcomes evaluation to measure progress toward the goals of the program. Measurement in both components focused on the metrics articulated in the Solicitation for Grant Applications with goals set by WISE in their initial application. Among those measures, the evaluation team drew an important distinction between program outputs, which reflect the completion of program activities and generally focus on program process, and outcomes, which measure results.

Along with measuring and reporting on these core metrics, the evaluation team developed several analyses to explore the impact of key program elements. These analyses were intended to provide both context for key metrics and learnings for program development as described below:

- As a complement to measuring implementation goals, the evaluation team administered surveys to students, faculty, and WISE participant employers that gauged satisfaction with the programs and perceptions of program value.
- Two additional statistical analyses looked at the relationship between employment outcomes and engagement with Career Navigators and the National Career Readiness Certificate.
- The evaluation team designed a comparison cohort analysis with control and treatment groups. Ultimately, however, this analysis was impossible to conduct because of mid-grant external restrictions to data sharing agreements. The evaluation team adjusted by proposing and attempting to execute an alternative and more limited analysis.

Limitations

During the course of the evaluation, obstacles arose in both data collection and analysis processes. The challenges encountered by the evaluators and colleges affected the ability to collect data reliably and consistently over the four-year term of the grant and impacted reporting. These challenges included gaps in WISE program staffing, difficulties staying connected with participants once they exited, lag time in receiving secondary data, response bias, and other logistical issues.

In addition to the above, however, the key challenge in data collection and reporting was the change in data sharing and limitations on the evaluator's use of data to observe the impact of the program. We thoroughly documented the effect of changing the data sharing agreement in Sections III and VI. As the result of the externally imposed change to how the WISE program shared data with the evaluators, implementation of the comparison cohort analysis as originally planned was no longer possible. Additionally, the change to the agreement limited the evaluators' ability to perform in depth analyses of outcome measures that utilized ESD data.

VII.C. Evaluation Findings

Implementation Evaluation Findings

The WISE Program achieved its goals for all four implementation measures, in several cases by significant margins.

- **Total Unique Participants Served:** EXCEEDED by 49%. 2,977 unique participants enrolled in the WISE program v. the goal of 1,992 participants.
- **Total Number of WISE Participants Completing a TAACCCT-funded Program of Study:** EXCEEDED by 15%. 1,510 WISE participants completed a TAACCCT-funded program v. the goal of 1,316 participants.
- **Total Number Still Retained in Their Program of Study or Other Grant-Funded Program:** EXCEEDED by 477%. 1,598 WISE participants continued their education in WISE or another grant-funded program v. the goal of 277 participants.
- **Total Number of Students Completing Credit Hours:** EXCEEDED goal by 164%. 3,527 WISE participants completed one or more credit hours v. the goal of 1,336 participants.³¹

Success in reaching – and exceeding – these output goals suggests the WISE colleges were effective in implementing programmatic improvements and new student supports, such as Career Navigators and NCRC testing, that appealed to potential students, appeared to provide value, and kept them engaged. Stakeholders reported high levels of participation and collaboration in the (re)design of programs and offerings, which may have helped produce well-positioned curricula, credentials, and opportunities to address student interests, industry needs, and skills gaps. Positive results from surveys administered to WISE participants and faculty, as well as participant employers, reinforce the theory that programs were

³¹ It is possible to count a WISE participant multiple times in this metric. This happens when a WISE participant earns a credit in two or more years of the grant and can cause, as is the case here, reporting a number for students earning credits that is higher than the overall number for participating students.

aligned with market needs. All three groups reported satisfaction with WISE programs; employers expressed the belief that WISE participants were well prepared for their jobs.

Outcome Evaluation Findings

Despite success in achieving implementation goals, the WISE program fell short of all but one of its outcome goals. Participants did not achieve post-WISE employment at the rates anticipated; however, they enrolled in further education at a level not anticipated and higher than the program goal.

- **Total Number Enrolled in Further Education After Program of Study Completion:** EXCEEDED by 33%. 872 WISE participants enrolled in further education after program completion. V. the goal of 655 participants.
- **Total Number Employed After Program of Study Completion:** UNDERPERFORMED by 32%. 622 participants were employed after completing a WISE program v. the goal of 910 participants.
- **Total Number Retained in Employment After Program of Study Completion:** UNDERPERFORMED by 52%. 325 retained employment after completing a WISE program v. the goal of 678 participants.
- **Total Number of Those Employed at Enrollment Who Received a Wage Increase Post-Exit:** UNDERPERFORMED by 59%. 299 incumbents earned a wage increase after exiting from the WISE program v. the goal of 721 participants.

Stakeholder input, both anecdotal and from surveys, further suggests several possible issues that may have contributed to shortfalls in participant employment goals:

- **Disconnects between initial goals and actual program design.** The goals were set with the Solicitation for Grant Applications prior to the programs being fully designed and developed. In some cases, the grant outcome measures were not consistent with how colleges implemented their programs based on industry input, perceived need, and best practice.

For example, colleges developed flexible degree programs to serve incumbent workers, but incumbent workers were not included in the employment outcome since they were considered employed when entering the program. Programs were also developed to serve the needs of veterans, but like other incumbents, veterans were considered employed when entering the grant. Students also pursued further education at much higher levels than expected, suggesting student goals and/or credentialing design may have been better aligned with driving continuing education than advancing participants on to employment.

- **Negative economic conditions.** The economy in the target sectors was weaker than expected, which resulted in slower growth and fewer open positions than anticipated during the Solicitation for Grant Applications. In a weak job market there would be less downside to continuing coursework instead of entering the workforce.

In surveys, students expressed less satisfaction with program connections to employers than with other program elements. While there was no indication that students saw this as a notable weakness (66% were satisfied), it does appear that this is an area with room for improvement.

- **Limited or slow-to-develop program appeal.** Programs at some colleges did not achieve the levels of interest from students to drive expected participation and resulting employment.

Examples include lower interest from displaced and transitioning workers than expected in the Customer Service programs at Everett and Green River. Despite significant effort by these colleges to recruit students, the Customer Service field was not as attractive as anticipated.

Additional analyses point to factors associated with positive student employment outcomes and would benefit from further exploration to inform program design moving forward.

- **Engagement with navigation support.** This core WISE program experience appears to have a positive effect on gaining employment. Analysis indicates up to eight contacts with a Career Navigator (in group or individual contexts) can contribute to student employment. Beyond that point, Navigator influence appears inconsequential. Note that these findings, while positive, are limited in scope and cannot necessarily be extrapolated to the entire WISE program, as they reflect data from only Renton Technical College.
- **Taking the NCRC.** While adoption of this tool was limited, analysis shows students who take the NCRC have better employment and job retention outcomes (compared to not taking it). While this finding does not indicate causality, it points to a relationship worth exploring to further understand what it is about taking the NCRC that tracks along with employment – and how this might inform program design.

Conclusion

While DOL employment outcome goals set in the Solicitation for Grant Applications were not achieved, the grant created significant institutional capacity for sustained program improvement and positive student outcomes in the future. Strong performance on implementation goals suggests programs have established a solid groundwork for driving employment, even if they have not yet reached desired results. Most stakeholders perceive the grant as a success and anticipate continued positive student outcomes. In survey responses, students, faculty, and employers all expressed satisfaction with the program and its value. Throughout the grant, stakeholders report building important sustainable partnerships as they continue work to increase employment in key industries and with priority groups in Washington State.

Analyses performed in the evaluation indicate student demographics, employment prior to enrollment in a WISE program, WISE program completion, exiting from the program, taking the NCRC, and Navigator support all appear to have a meaningful relationship with employment. Building on these findings, future research may be able to test assumptions about what drives employment and guide further refinement of and enhancements to programs like and including those provided by WISE consortium members. Ultimately it may be possible in a future study to more definitively identify the variables that have strong relationships with student employment outcomes.

Appendix A: WISE Industry Experts

Consortium Partners	Industry Sector Experts
<ul style="list-style-type: none"> • Center of Excellence for Clean Energy • Center of Excellence for Aerospace & Advanced Manufacturing • Construction Center of Excellence • Bates Technical College • Centralia College • Everett Community College • Green River Community College • Renton Technical College • Shoreline Community College • South Seattle College • Walla Walla Community College 	<p>Clean Energy</p> <ul style="list-style-type: none"> • Troy Nutter, Puget Sound Energy (chair) • Jeremy Gall, Avista Utilities • Bob Guenther, IBEW Local 77 • Todd Currier, WSU Energy Program Labor Alternates • Alice Massara, Tacoma Power <p>Labor Alternates</p> <ul style="list-style-type: none"> • Kairie Pierce, Washington State Labor Council <p>Workforce Development</p> <ul style="list-style-type: none"> • Dawn Karber, Spokane Area Workforce Development Council <p>Advanced Manufacturing</p> <ul style="list-style-type: none"> • Steve Kidd, CIMTech • Jesse Cote, 751 Machinists Centralia College • Bob Uptagrafft, Global Aero Ventures <p>Ex-Officio</p> <ul style="list-style-type: none"> • Barbara Hins-Turner (PI), CoE for Clean Energy • Mary Kaye Bredeson, COE for Aerospace & Advanced Manufacturing, Everett CC • Shana Peschek, Construction COE, Renton • Marla Miller, Centralia College <p>Construction</p> <ul style="list-style-type: none"> • Stephanie Caldwell, Absher Construction • Moe Salem, McKinstry Technical College • Anna Pavlik, City of Seattle • Christina Riley, Northwest Laborers Training Trust <p>Staff</p> <ul style="list-style-type: none"> • Anthony Valterra, WISE Lead Grant Manager • Scott Wagemann, WISE Grant Data Management and Analytics Associate

Appendix B: Individual College Goals

Year 1

Outcome Measures	Data Elements	Bates Technical College	Centralia	Everett CC	Green River CC	Renton TC	Shoreline CC	South Seattle CC	Walla Walla CC	Total
1	Unique Participants Served (Projected to End of Grant)	60	30	0	N/A	45	85	0	45	265
2	Number of Participants Completing a TAACCCT-Funded Program of Study	54	25	0	N/A	30	50	0	29	188
3	Number of Participants Still Retained in TAACCCT-Funded Program of Study	2	3	0	N/A	5	3	0	13	26
4	Number of Participants Completing Credit Hours	58	20	0	N/A	18	20	0	31	147
5	Number of Participants Earning Credentials	51	20	0	N/A	60	145	0	29	305
6	Enrolled in Further Education	10	25	0	N/A	30	75	0	5	145
7	Number of Participants Employed After TAACCCT-funded Program of Study Completion	0	20	0	N/A	20	20	0	18	78
8	Number of Participants Retained in Employment After Program of Study	0	20	0	N/A	20	10	0	14	64
9	Participants Employed at Enrollment Who Received a Wage Increase at Post-Employment	0	20	0	N/A	15	65	0	7	107

Year 2

Outcome Measures	Data Elements	Bates Technical College	Centralia	Everett CC	Green River CC	Renton TC	Shoreline CC	South Seattle CC	Walla Walla CC	Total
1	Unique Participants Served (Projected to End of Grant)	86	60	45	306	90	85	34	95	801
2	Number of Participants Completing a TAACCCT-Funded Program of Study	78	50	40	120	60	55	30	70	503
3	Number of Participants Still Retained in TAACCCT-Funded Program of Study	4	4	2	75	10	4	0	21	120
4	Number of Participants Completing Credit Hours	83	40	44	222	40	1	32	63	525
5	Number of Participants Earning Credentials	73	50	40	114	210	145	30	65	727
6	Enrolled in Further Education	12	25	5	40	50	75	10	13	230
7	Number of Participants Employed After TAACCCT-funded Program of Study Completion	48	30	10	0	30	20	24	37	199
8	Number of Participants Retained in Employment After Program of Study	43	20	9	0	20	10	22	28	152
9	Participants Employed at Enrollment Who Received a Wage Increase at Post-Employment	2	40	5	0	30	65	15	15	172

Year 3

Outcome Measures	Data Elements	Bates Technical College	Centralia	Everett CC	Green River CC	Renton TC	Shoreline CC	South Seattle CC	Walla Walla CC	Total
1	Unique Participants Served (Projected to End of Grant)	86	70	45	326	120	85	66	128	926
2	Number of Participants Completing a TAACCT-Funded Program of Study	78	60	40	146	90	75	30	106	625
3	Number of Participants Still Retained in TAACCT-Funded Program of Study	4	3	3	60	5	3	28	25	131
4	Number of Participants Completing Credit Hours	83	50	44	247	95	1	64	80	664
5	Number of Participants Earning Credentials	73	50	40	139	480	145	30	96	1053
6	Enrolled in Further Education	12	25	10	49	80	75	10	19	280
7	Number of Participants Employed After TAACCT-funded Program of Study Completion	68	40	30	54	60	20	24	61	357
8	Number of Participants Retained in Employment After Program of Study	61	20	28	36	20	10	22	51	248
9	Participants Employed at Enrollment Who Received a Wage Increase at Post-Employment	2	40	25	9	60	65	15	23	239

Year 4

Outcome Measures	Data Elements	Bates Technical College	Centralia	Everett CC	Green River CC	Renton TC	Shoreline CC	South Seattle CC	Walla Walla CC	Total
1	Unique Participants Served (Projected to End of Grant)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Number of Participants Completing a TAACCT-Funded Program of Study	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Number of Participants Still Retained in TAACCT-Funded Program of Study	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Number of Participants Completing Credit Hours	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Number of Participants Earning Credentials	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Enrolled in Further Education	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	Number of Participants Employed After TAACCT-funded Program of Study Completion	68	30	30	65	30	20	24	9	276
8	Number of Participants Retained in Employment After Program of Study	61	20	28	44	20	10	22	9	214
9	Participants Employed at Enrollment Who Received a Wage Increase at Post-Employment	2	30	25	11	50	65	20	0	203

Totals (All years)

Outcome Measures	Data Elements	Bates Technical College	Centralia	Everett CC	Green River CC	Renton TC	Shoreline CC	South Seattle CC	Walla Walla CC	Total
1	Unique Participants Served (Projected to End of Grant)	232	160	90	632	255	255	100	268	1992
2	Number of Participants Completing a TAAACCT-Funded Program of Study	210	135	80	266	180	180	60	205	1316
3	Number of Participants Still Retained in TAAACCT-Funded Program of Study	10	10	5	135	20	10	28	59	277
4	Number of Participants Completing Credit Hours	224	110	88	469	153	22	96	174	1336
5	Number of Participants Earning Credentials	197	120	80	253	750	435	60	190	2058
6	Enrolled in Further Education	34	75	15	89	160	225	20	37	655
7	Number of Participants Employed After TAAACCT-funded Program of Study Completion	184	120	70	119	140	80	72	125	910
8	Number of Participants Retained in Employment After Program of Study	165	80	65	80	80	40	66	102	678
9	Participants Employed at Enrollment Who Received a Wage Increase at Post-Employment	6	130	55	20	155	260	50	45	721

Appendix C: DOL Definitions

Outcome Definitions

- B.1 Unique Participants Served/Enrollees** – Enter the cumulative total number of individuals who entered any of the grant-funded programs offered to date (including certificate or degree programs or other training activities). Participants should only be included once, even if they enroll in multiple programs.
- B.2 Total Number Who Have Completed a Grant-Funded Program of Study** – Enter the total number of unique participants (B.1) who completed any grant-funded program to date. Completion is defined as having earned all of the credit hours (formal award units) needed for the award of a degree or certificate in that program of study. Participants should only be included once, even if they complete multiple programs.
- B.2a Total Number of Incumbent Workers Who Have Completed a Grant-Funded Program of Study** – Enter the total number of participants employed at enrollment who complete any grant-funded program to date. Completion is defined as having earned all of the credit hours (formal award units) needed for the award of a degree or certificate in that program of study. Participants should only be included once, even if they complete multiple programs.
- B.3 Total Number Still Retained in Their Program of Study or Other Grant-Funded Program(s)** – Of the total number of unique participants enrolled (B.1) who have not completed their programs, enter the total number of enrollees who were still enrolled either in their original program of study or a different grant-funded program of study at the end of the reporting year. (Note: A participant counted in B.2 should not be counted again in B.3).
- B.4 Total Number Retained in Other Education Program(s)** – Of the total number of unique participants enrolled, enter the total number of enrollees who dropped out of a grant-funded program of study, but have enrolled in another education program not funded by the grant. (Note: A participant counted in B.2 or B.3 should not be counted in B.4).
- B.5 Total Number of Credit Hours Completed** – Enter the total number of credit hours to date that have been completed by participants in grant-funded certificate and degree programs. This number should be reported in aggregate across all enrollees, even if the participant is no longer enrolled in the grant-funded program of study or did not complete the program.
- B.5a Total Number of Students Completing Credit Hours** – Enter the total number of students who have enrolled that have completed any number of credit hours to date.
- B.6 Total Number of Earned Degrees/Certificates** – Enter the total number of degrees or certificates earned to date by participants for grant-funded programs. This number should be reported in aggregate across all enrollees, including multiple certificates and degrees earned by the same participant.
- B.6a Total Number of Students Earning Certificates (less than one year)** – Enter the total number of students who earned certificates designed to be completed in one year or less. A student can be counted only once in this field, even if multiple certificates were earned by that student.
- B.6b Total Number of Students Earning Certificates (more than one year)** – Enter the total number of students who earned certificates designed to be completed in more than one year. A student can be counted only once in this field, even if multiple certificates were earned by that student.
- B.6c Total Number of Students Earning Degrees** – Enter the total number of students who earned degrees. A student can be counted only once in this field, even if multiple degrees were earned by that student.
- B.7 Total Number Enrolled in Further Education After Program of Study Completion** – Of the total number of participants who completed at least one grant-funded program (B.2), enter the total number of individuals to date who entered another program of study (grant-funded or not).
- B.8 Total Number Employed After Program of Study Completion** – Of the total number of participants who were not incumbent workers and who completed at least one grant-funded program (B.2), enter the total number of individuals to date who entered unsubsidized employment in the first quarter after the quarter in which the student exits the college. Exit is defined as being no longer enrolled at the college in any program of study and can include formal withdrawal, expulsion, graduation, and other reasons. (Note: A participant counted in B.8 may be counted again in B.9).
- B.9 Total Number Retained in Employment After Program of Study Completion** – Of the total number of participants who were employed in the first quarter after the quarter in which the student exits the college (B.8), enter the total number of individuals to date who were employed in the second and third quarters after exit. Exit is defined as being no longer enrolled at the college in any program of study and can include formal withdrawal, expulsion, graduation, and other reasons. (Note: A participant counted in B.9 should be counted in B.8).
- B.10 Total Number of Those Employed at Enrollment Who Received a Wage Increase Post-Enrollment** – Of the number of incumbent workers (those employed at enrollment) who enter a grant-funded program, enter the total number who received an increase in their wages at any time after becoming enrolled.

Appendix D: Surveys

2016 WISE Student Exit Evaluation Survey

1) Student ID

2) College

- Bates Technical College
- Centralia College
- Everett Community College
- Green River Community College
- Renton Technical College
- Shoreline Community College
- South Seattle Community College
- Walla Walla Community College

3) Which WISE Program(s) did you participate in?

- Diesel Mechanics
- Electrical Construction
- Pre-Apprenticeship
- Other - Write In: _____

4) Which WISE Program(s) did you participate in?

- BAS Business Management
- Lean Six Sigma
- Energy Tech AAS
- Other - Write In: _____

5) Which WISE Program(s) did you participate in?

- Welding
- Customer Service
- WABO Certificate
- CNC Machinist
- Pre Employment
- Other - Write In: _____

6) Which WISE Program(s) did you participate in?

- BAS Business Management
- Machine Maintenance Program
- Customer Service

Other - Write In: _____

7) Which WISE Program(s) did you participate in?

Welding

Construction Trades Preparation

Commercial Building Engineering

Major Appliance and Refrigeration Technology

Construction Management

Leadership in the Trades

Other - Write In: _____

8) Which WISE Program(s) did you participate in?

CNC Machinist

Energy Tech AAS

Other - Write In: _____

9) Which WISE Program(s) did you participate in?

IMAA Certificate

CNC Machinist

WABO Certificate

Pre Apprenticeship

Pre Employment

Other - Write In: _____

10) Which WISE Program(s) did you participate in?

Energy Systems Program

Carpentry

Other - Write In: _____

11) How satisfied were you with your experience in your program of study?

Not at all

Mostly not

Somewhat

Mostly

Very

12) Did your program help you reach your career and/or educational goals?

Not at all

Mostly not

Somewhat

Mostly

Completely

13) How satisfied were you with the following aspects of your program?

	Not at all	Mostly not	Somewhat	Mostly	Very	I don't know (NA)
Faculty <i>(Program instructors)</i>	()	()	()	()	()	()
Curriculum <i>(Lectures, homework, class materials, etc.)</i>	()	()	()	()	()	()
Equipment <i>(Machinery, tools, computers, etc.)</i>	()	()	()	()	()	()
Navigator <i>(Staff member that helped guide you through the program and placement)</i>	()	()	()	()	()	()
Connection with employers <i>(Opportunities such as workshops, job fairs, lectures, etc.)</i>	()	()	()	()	()	()
Certificates/Degrees earned <i>(Certificates/Degrees earned through this program that can be included on your resume)</i>	()	()	()	()	()	()

14) Please initial below if the Navigator was present to assist the student with this survey or if the Navigator conducted this survey.

2016 WISE Faculty Survey

1) Faculty Member Name*

2) Certificate/Degree Program*

3) How much does the WISE program contribute to supporting your students to reach their career and/or educational goals?

- Not at all
- Not much
- Somewhat
- Very much
- Extremely

4) Are the students from WISE programs more or less prepared for a job and/or further education than other students you have taught?

- Much less prepared
- Somewhat less prepared
- About the same
- Somewhat more prepared
- Much more prepared

5) To what degree do you think each of these WISE program elements contributed to the preparedness and success of the students from your program?

	Not at all	Mostly not	Somewhat	Mostly	Very	I don't know (NA)
Curriculum <i>(Lectures, homework, class materials, etc.)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment <i>(Machinery, tools, computers, etc.)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Navigator <i>(Staff member that helped guide students through the program and placement)</i>	()	()	()	()	()	()
Connection with employers <i>(Opportunities such as employer led workshops or lectures, job fairs, etc.)</i>	()	()	()	()	()	()
Certificates/Degrees offered <i>(Certificates/Degrees offered through the program)</i>	()	()	()	()	()	()

2016 WISE Employer Survey

1) Company Name*

2) Employer Survey Respondent Name

3) Employer Survey Respondent Title

4) On average, how prepared for the job are the employees you have hired that have completed WISE-supported programs?

- Not at all
- Mostly not
- Somewhat
- Mostly
- Very

5) On average, are the employees from WISE-supported training programs more or less prepared for the job than the typical employees that your company hires?

- Much less prepared
- Somewhat less prepared
- About the same
- Somewhat more prepared
- Much more prepared

6) On average, how prepared are the employees that your company hired from a WISE-supported program in the following areas?

	Not at all	Mostly not	Somewhat	Mostly	Very	I don't know (NA)
Knowledge <i>(Content knowledge)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skills <i>(Training)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Abilities <i>(Task execution)</i>	()	()	()	()	()	()
Soft Skills <i>(Communication, collaboration, reliability)</i>	()	()	()	()	()	()

WISE Evaluation Program Input Form

Instructions

College and Contact Info

1) College*

- () Bates
- () Centralia
- () Everett
- () Green River
- () Renton
- () Shoreline
- () South Seattle
- () Walla Walla

2) Name*

3) Email*

4) Title

WISE Programs Questions

5) Describe the overall goals for your WISE grant support at [question("value"), id="4"]. What were you intending to accomplish and for whom?

6) What were your team’s goals for each degree/certificate program and what investments were made to achieve those goals (what staff or faculty did you hire, what equipment did you purchase)? What licenses/ curriculum/other resources did you purchase or subscribe to?

Please fill out the table below to address these questions. Leave rows blank if [question('value'), id='4'] offers fewer than six WISE Programs.

	Name of Degree/Certificate Program Offered	Degree/Certificate Program Goals	Major Degree/Certificate Investments (faculty hired, curriculum, equipment, navigation, etc.)	Degree/Certificate Program Context or Notes
Program 1	___	___	___	___
Program 2	___	___	___	___
Program 3	___	___	___	___
Program 4	___	___	___	___
Program 5	___	___	___	___
Program 6	___	___	___	___

7) Were Career Navigators and NCRC offered at [question("value"), id="4"]? What other supports did [question("value"), id="4"] offer to WISE participants?

8) Please state how many Career Navigators your programs had. Was this resource level sufficient or did you experience more demand for Navigation that your Navigators could support? Did you have any gaps in offering Career Navigation because of hiring or other challenges?

9) What do you think are the most sustainable elements of your program (i.e., those aspects of your program or learnings that will be available after the grant and/or influence others going forward)?

10) What contributions did each of the following partners (employers, unions, workforce system, other training providers and educators, and philanthropic organizations) make in terms of: 1) program design, 2) curriculum or equipment, 3) placement?

	Program Design	Curriculum and Equipment	Job Placement
Employers	___	___	___
Unions	___	___	___
Workforce System	___	___	___
Other Training Providers	___	___	___
Philanthropic Organizations	___	___	___

11) What contributions did each of the following partners (employers, unions, workforce system, other training providers and educators, and philanthropic organizations) make in terms of: 1) program management, 2) leveraging resources, and 3) commitment to program sustainability? Which partners were most critical to the success of the grant program (identify with a 'x' below)?

	Program Management	Leveraging Resources	Commitment to Program Sustainability	Critical Partner (mark with 'x')
Employers	___	___	___	___
Unions	___	___	___	___
Workforce System	___	___	___	___
Other Training Providers	___	___	___	___
Philanthropic Organizations	___	___	___	___

12) What were your team's key successes overall? What were your team's key successes within each degree/certificate program? What elements of your approach were unique or notable?

13) What were your team's biggest challenges overall? What were your challenges within each degree/certificate program? What would you do differently if you could roll the clock back to the start of the grant?

Appendix E: Regression Output and Chi-Squared Tests of Dependence Results

Table 15: Logistic Regression Output for Navigation Analysis Model

	Estimate	Standard Error	P Value
Intercept	-0.24071	0.08509	0.00497 **
Number of Credentials	0.06168	0.11354	0.58735
Number of Navigation Sessions	0.15578	0.19745	0.43071
Program - Construction Management	-0.07817	0.07316	0.28610
Program - Construction Trades Prep	-0.18081	0.06619	0.00665 **
Program - Leadership in the Trades	-0.32082	0.25209	0.20407
Program - MART	-0.04809	0.07186	0.50382
Program - Welding	-0.11769	0.06737	0.08163 .
Incumbent - Yes	0.19117	0.04245	9.39e-06 ***
Exit Status - Yes	0.75556	0.04290	< 2e-16 ***
Gender (Male) - Yes	0.20439	0.06878	0.00319 **

Table 16: Chi-squared Test of Dependence Between Employment and Top 20 Covariates

Variable Name	X ²
Program - Welding	0.00286
Program - Carpentry	0.00989
Length of Enrollment	0.01182
College - Centralia	0.22655
Program - Construction Trades Preparation	0.33205
Race - Hispanic	0.42102
College - Bates	0.4554
Program - WABO Certificate	0.563
Program - Construction Management	0.563
Program - Diesel Mechanic	0.77439
Program - Electrical Construction	0.87169
Program - Leadership in the Trades Program	1.10453
Program - Machine Maintenance Program	1.21153
Race - American Indian	1.24604
Race - Asian	1.26677
Program - Pre Apprenticeship	2.1871
Program - BAS business Management	2.30899
Gender (Male) - Yes	2.40734
Program - Pre Employment	2.72376
College - South Seattle	2.7433

Appendix F: Accuracy of Classification Models

Table 12: Accuracy of Classification Models

Classification Model	Validation Accuracy
Logistic Regression	76%
Decision Tree	76%
Random Forest	71%
SVM	71%
Boosted Tree	62%

We chose a logistic regression model for two reasons: (1) interpretability of a logistic regression and (2) the validation accuracy of models assessed using the *GraphLab Create* machine learning (ML) classification model selector. The model selector recommended a classification model based on an iterative model fitting procedure. Tested classification models included Boosted Trees, Random Forest, Decision Tree, Support Vector Machine (SVM), and Logistic Regression classification models. The “best” model was selected by the ML procedure based on the validation accuracy of each model fit to the data. In this particular case we saw that all classification models, less the Boosted Tree classifier, performed similarly well. Because of the general familiarity with a logistic regression, we chose it from the four models with comparable validation accuracy rates to estimate employment likelihood.