

Kansas Technical Re/training Among Industry-targeted Networks (KanTRAIN)

TAACCCT IV Evaluation Final Report



Submitted to:
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Topeka, KS 66621

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September 2018

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Executive Summary

With support from a Trade Adjustment Assistance Community College and Career Training (TAACCCT) Round IV grant, the Kansas Technical Re/training Among Industry-targeted Networks (KanTRAIN) project sought to align programs with statewide initiatives as well as expand institutional capacity and develop career pathways programs at four two-year postsecondary institutions and a university. Each of the institutions customized its KanTRAIN programs to respond to local labor market needs. Three institutions focused on the advanced manufacturing industry (Flint Hills Technical College [FHTC], Garden City Community College [GCCC], and Wichita State University Campus of Applied Sciences and Technology [WSU Tech])¹; one focused on health care (Washburn Institute of Technology [WIT] and its affiliate, Washburn University [WU], School of Applied Studies²). Table ES-1 provides an overview of KanTRAIN programs at each of the sites.

Table ES-1. Overview of KanTRAIN programs, by institution

College	Location	KanTRAIN programs	Participants (2015–18)
Flint Hills Technical College	Emporia	Welding Technology Industrial Engineering Technology	119
Garden City Community College	Garden City	Welding Technology Industrial Maintenance	160
Washburn Institute of Technology and Washburn University	Topeka	Certified Medication Aide Certified Nurse Aide Emergency Communications Emergency Medical Technician Health Information Technology Home Health Aide Medical Billing and Coding Occupational Therapy Assistant Phlebotomy Physical Therapist Assistant Practical Nursing Respiratory Therapy Surgical Technology	1,359

¹ On July 1, 2018, Wichita Area Technical College affiliated with Wichita State University and became known as Wichita State University Campus of Applied Sciences and Technology.

² WU is affiliated with WIT, an arrangement unique in the state that stems from legislation enacted in 2008 that enabled technical colleges, which were previously housed in the K–12 education system, to affiliate with a community college or four-year institution.

College	Location	KanTRAIN programs	Participants (2015–18)
Wichita State University Campus of Applied Sciences and Technology	Wichita	Climate and Energy Control Industrial Automation Machine Maintenance Machining Technology Robotics Technology Welding Technology	530

With support from a grant management team, housed at WU, the KanTRAIN sites participated in grant-funded activities from 2014 to 2018 to develop and enhance workforce training programs and align them with career pathways requirements. Grant activities were organized around seven driving strategies that supported TAACCCT grant requirements and addressed cross-site programmatic needs. The strategies included 1) the design and delivery of career pathways to meet employer needs; 2) use of a continuous improvement process; 3) increased availability of and access to industry-recognized credentials; 4) integration of competency-based training; 5) adoption of evidence-based curriculum and instruction; 6) comprehensive data management and participant tracking; and 7) strategic alignment of program activities with state initiatives.

KanTRAIN programs served workers eligible for Trade Adjustment Assistance (TAA), veterans workers, and employed and unemployed adults. Between fall 2015 and spring 2018, a total of 2,167 participants enrolled in KanTRAIN programs, with an average age of 29 and 70 percent incumbent workers. KanTRAIN coincided with a period of increasingly strong labor markets, which resulted in few TAA-eligible workers and relatively low unemployment rates, ranging from 3.6 percent in Garden City to 5.5 percent in Wichita, as of August 2016.

Evaluation Design Summary

RTI International's third-party evaluation of KanTRAIN included both formative and summative analyses, as well as the collection and analysis of quantitative and qualitative data, to identify lessons learned from KanTRAIN implementation and to assess the impact of participation in KanTRAIN programs on individuals' educational and employment outcomes. Specifically, the evaluation was designed to address the research questions established by the U.S. Department of Labor and supplemental questions on KanTRAIN components that were developed by RTI and the grant management team (Appendix A).

To address these questions, RTI's evaluation included both an implementation and outcomes study. The goal of the implementation study was to understand how KanTRAIN changed the capacity of the individual institutions and state education and workforce systems to serve participants and meet labor force needs in the targeted fields. RTI collected

qualitative data through five site visits that included interviews and focus groups with KanTRAIN grant management, site staff, faculty, employers, workforce center partners, and participants; an employer and instructor survey; review of project documentation; and notes from regular meetings with project staff.

The goal of the outcomes study was to assess the effect of KanTRAIN activities on participants' educational and labor market outcomes. RTI's outcomes study included a descriptive analysis to report average KanTRAIN participant outcomes, including degree progress, credential accumulation, and employment characteristics. RTI also conducted a quasi-experimental analysis to estimate the impact of KanTRAIN on participant outcomes. The evaluation team used propensity score matching to compare the outcomes of KanTRAIN participants to participants with similar characteristics who enrolled in programs impacted by KanTRAIN in previous academic years. Data for the analyses came from KanTRAIN program data collected by the grant management team and from the Kansas Board of Regents (KBOR). The KBOR data included data on participants in programs impacted by grant-funded activities between fall 2009 and spring 2018.

Implementation Findings

A total of 21 programs were either created or enhanced through KanTRAIN. KanTRAIN implementation included individual and cross-site capacity building activities, with a focus on sustaining career pathways beyond the grant, as described in the findings below.

Instructional enhancements

- **Equipment upgrades:** As a key step in pathways design, KanTRAIN sites upgraded equipment and facilities to align program curriculum with workplace requirements and increase sites' capacities to enroll and prepare participants for employment. This included building new and expanded welding facilities at FHTC and GCCC, building a new energy and climate control technology lab at WSU Tech, and adding a regional simulation center at WIT.
 - **Use of simulation learning:** KanTRAIN sites integrated simulation technology into instruction to provide participants with realistic workplace preparation. At WIT/WU, for example, the use of simulated learning enabled participants to practice realistic patient interactions, perform medical procedures, and receive immediate feedback from instructors in a high fidelity and low risk setting.
 - **Specialized program designs:** Two sites, GCCC and WIT, provided accelerated pathways for adult learners by leveraging support from the state's Accelerating Opportunity in Kansas (AO-K) initiative. AO-K pairs basic skills and technical instructors to enable participants to work on their GED and technical credentials at the same time.
-

Responsiveness to employer needs

- **Focus on employability skills:** KanTRAIN employers expressed a need for trained employees with strong employability skills. The colleges addressed this need by incorporating employability skill instruction into KanTRAIN programs, both through introducing external training resources and the adoption of workplace practices in the classroom to emphasize punctuality, workplace safety, and attendance. For example, GCCC, WIT, and WSU Tech implemented the Bring Your A Game to Work curriculum developed by the Center for Work Ethics, which focuses on seven key workplace attributes.
- **Employer engagement:** Sites also held special events to engage employers and connect participants with potential employment opportunities. FHTC hosted the annual Reverse Career Fair at FHTC to bring employers to campus and allow them to visit welding booths, see participants' work samples, and discuss career opportunities. WIT/WU also invited employers to observe the Big Sim event, during which participants engaged in multidisciplinary health care scenarios and received feedback from employers on their performance.

Strengthened case management supports

- **Workforce center partnerships:** To enhance student support services available on campus, the KanTRAIN colleges contracted with their local workforce centers for intensive case management support for KanTRAIN participants. The services provided by workforce centers included career counseling and coaching, information on job openings, participant recruitment and referrals, identification of funding sources for training, and resume and interview skill workshops.
- **Veteran recruitment and outreach:** The grant supported the KanTRAIN military transitions director position, which provided individualized support for veterans and connected them with education and training programs and other services.

Expanded institutional and system capacity

- **State-level alignment:** To strengthen local programs and facilitate sustainability, KanTRAIN activities were aligned with state-level initiatives in partnership with KBOR and the Kansas Department of Commerce (Commerce). This led to increased opportunities for veterans to earn credit for prior learning from KBOR, access to veterans' networks and events for recruitment and outreach from Commerce, and coordination with the state's workforce system.

Participant Impacts and Outcomes

The quantitative analysis found that KanTRAIN had a positive effect on participant academic and employment outcomes, as evidenced in the following key findings.

Academic outcomes of participants

- **Time to completion:** KanTRAIN participants exited their programs after an average of 14 months. Participants tended to exit within the expected time frame for their respective programs (e.g., exiting a one-year program within one year; exiting a two-year program within two years).
- **Course pass rates:** KanTRAIN participants passed 93 percent of their technical courses and were more likely to pass technical courses relative to past participants with similar characteristics.
- **Credential attainment:** About 70 percent of participants exited their programs with at least one nondegree credential. KanTRAIN participants were more likely to earn a credential of any kind and, among those with nondegree credentials, earned a higher number of nondegree credentials than past participants with similar characteristics.

Employment outcomes of participants

- **Labor market status:** Over 90 percent of participants were employed within two years of initially enrolling in an advanced manufacturing or health care program.
- **Wages:** On average, KanTRAIN participants earned \$6,341 in quarterly wages within nine months of program completion. KanTRAIN participants earned wages comparable to those of past participants with similar characteristics.
- **Wage increases:** After exiting the program, four in five KanTRAIN participants received a wage increase relative to their wages prior to enrollment. KanTRAIN participants were 6 percent more likely to receive a wage increase than past participants with similar characteristics.

Table ES-2. Summary of select KanTRAIN participant outcomes

Program progress	87% of general credits passed and 93% of technical credits passed
Time to completion	14 months to program completion
Nondegree credentials	70% earned a nondegree credential; 1.3 certificates earned among those with any nondegree credentials
College degrees	13% earned a college degree
Employment status	93% were employed
Employment field	69% were employed in program-related industries
Wages	\$6,341 average quarterly wages
Wage difference	83% received a wage increase; +\$2,900 average net change in quarterly wages

Limitations

The outcomes study focused on short-term employment outcomes within three quarters of program exit and focused on employment outcomes for those participants who had time to complete their programs during the data collection period. Therefore, the extent to which KanTRAIN participation had a positive impact on employment outcomes several years after program exit is unknown, as it is for those who participated in KanTRAIN programs toward the end of the grant period or who did not complete their programs before data collection ended. Likewise, the analysis did not account for state or regional labor market or industry-level changes that may have occurred at the same time as KanTRAIN implementation. It is unknown whether the broader economic context may have impacted the estimated effects of the KanTRAIN program on participant employment outcomes.

Conclusions

KanTRAIN made a positive impact at both the institutional and system levels through enhanced instructional programs, a focus on employability skills, strengthened career and other support services for participants, and strong partnerships with employers and workforce centers. KanTRAIN also had a positive effect on participant outcomes. Efforts were made by grant management staff and site staff to embed grant activities within college and state infrastructures to ensure continuity of programs beyond the grant. Sites expect KanTRAIN programs to continue to enroll participants at similar levels. Certain grant activities, such as career services and support for veterans, will be absorbed by campus departments or continue to be provided through partnerships.

Connections between the implementation and outcomes studies can be observed, such as the increased offering of nondegree credentials by KanTRAIN sites and the higher number of credentials earned by KanTRAIN participants compared with past participants with similar characteristics. Because programmatic changes differed across institutions, individual program effects may differ as well. Moreover, KanTRAIN represents a mix of programmatic and instructional strategies, rather than a single intervention, that led to improved outcomes for participants. This approach allowed for sites to be responsive to their local labor markets and to customize implementation to meet campus and employer needs.

Introduction

In 2014, Washburn University (WU) received funding from the U.S. Department of Labor under the Round IV Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program to implement the Kansas Technical Re/training Among Industry-targeted Networks (KanTRAIN) project. KanTRAIN activities centered on expanding institutional capacity and developing career pathways programs in health care and advanced manufacturing—two key industries for the state³—at four two-year postsecondary institutions and one university. Activities also focused on aligning programs with statewide initiatives to increase employer engagement, facilitate outreach to veterans, and upgrade technical skill training programs.

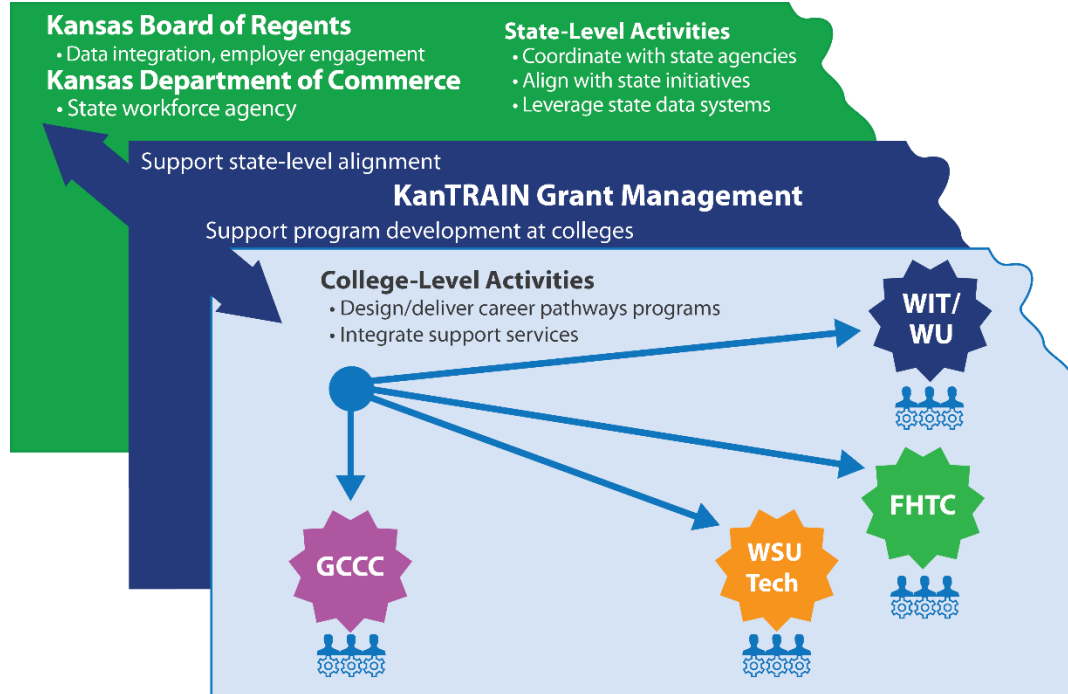
The KanTRAIN sites—Flint Hills Technical College (FHTC), Garden City Community College (GCCC), Washburn Institute of Technology (WIT)/WU,⁴ and Wichita State University Campus of Applied Sciences and Technology (WSU Tech)⁵—are in different regions of the state. They all have their own unique local labor market needs that drove program design and implementation. WIT/WU, located in Topeka, focused on the health care industry given the demand for skilled workers from local health care employers ranging from large hospitals to smaller long-term care facilities. The other three sites focused on different types of advanced manufacturing, depending on the specialties of local industry, such as aeronautics in Wichita. Figure 1 displays an overview of KanTRAIN activities at the state and site levels).

³ See https://www.kansasregents.org/workforce_development.

⁴ WU is affiliated with WIT, an arrangement unique in the state that stems from legislation enacted in 2008 that enabled technical colleges, which were previously housed in the K–12 education system, to affiliate with a community college or four-year institution. This affiliation has resulted in the involvement of a four-year institution in KanTRAIN.

⁵ On July 1, 2018, Wichita Area Technical College affiliated with Wichita State University and became known as Wichita State University Campus of Applied Sciences and Technology.

Figure 1. KanTRAIN overview



KanTRAIN programs incorporated a variety of evidence-based strategies to strengthen and expand existing career pathways in advanced manufacturing and health care. These strategies include the design and delivery of industry-focused and employer-driven workforce training models, the integration of industry-recognized and stackable credentials into career pathway programs, and strengthened case management and other supports for participants. Specifically, the KanTRAIN workplan centered on seven strategies (see Table 1).

Table 1. Proposed KanTRAIN strategies for program design and implementation

Strategy #1	Support the evidence-based design and delivery of industry-targeted, employer-driven, work-based training models and career pathways.
Strategy #2	Conduct multitiered program evaluation and continuous improvement process of data-driven program effectiveness and growth.
Strategy #3	Increase the availability of and access to industry-recognized stackable and latticed degrees, certifications, and credentials for high-wage, high-skill employment in growth industry sectors.
Strategy #4	Integrate competency-based advanced training technologies and participant support and outreach to accelerate learning, credential attainment, articulation, and transfer.
Strategy #5	Integrate and replicate effective methods of data-based curriculum development, program delivery, and instruction addressing industry needs and leading to outcomes mastery, credential/certificate/degree attainment, and employment.
Strategy #6	Implement comprehensive, integrated, and longitudinal data management and tracking system of participant, educational, and occupational outcomes.
Strategy #7	Facilitate the strategic alignment of program activities and outcomes with federal and state initiatives, military agencies, employers, workforce partners, and previously funded Trade Adjustment Assistance Community College and Career Training grants.

RTI International served as the third-party evaluator for KanTRAIN and conducted both formative and summative analyses as well as the collection and analysis of quantitative and qualitative data. This report documents the results of the third-party evaluation, with a focus on highlighting key factors related to KanTRAIN implementation at the site and grant management levels from 2014 to 2018. The report also focuses on summarizing the impact of KanTRAIN participation on individuals' educational and employment outcomes.

Evaluation Design

RTI's third-party evaluation included both formative and summative evaluation activities to identify lessons learned from KanTRAIN implementation and to assess the impact of participation in KanTRAIN programs on individuals' educational and employment outcomes. The evaluation, which included both an implementation and outcomes study, was guided by the research questions established by the U.S. Department of Labor and supplemental questions related to specific components of KanTRAIN (see Appendix A).

Implementation Study

The implementation study is based on qualitative data collected through site visits, stakeholder surveys, a review of project documentation, weekly meetings with grant management, and updates from site coordinators during monthly site team meetings.

Site visits

RTI staff conducted five in-person site visits to Kansas, with visits varying in length from three to four days conducted yearly in the spring and fall (see Table 2). Each site was visited at least twice. During the site visits, the evaluation team conducted interviews with site administrators, faculty, participants, employer and workforce center partners, and state-level partners in the Kansas Board of Regents (KBOR) and the Kansas Department of Commerce (Commerce). The evaluation team also visited upgraded facilities paid for with KanTRAIN grant funds and attended two cross-site team meetings.

Table 2. Details on KanTRAIN evaluation site visits conducted by RTI International

Time frame	Location	Purpose	Stakeholders interviewed
April 2016	Emporia, Garden City, Topeka, Wichita	Conduct baseline visit to all sites	<ul style="list-style-type: none"> • College leadership • KanTRAIN site staff • Program instructors
September 2016	Topeka	Attend site team meeting, conduct state agency interviews, and visit Washburn Institute of Technology (WIT) / Washburn University (WU)	<ul style="list-style-type: none"> • Kansas Board of Regents (KBOR) staff • Kansas Department of Commerce staff • Military transitions director • WIT employer partner • WIT program instructor
March 2017	Emporia, Wichita	Attend site team meeting and visit Flint Hills Technical College and Wichita State University Campus of Applied Sciences and Technology	<ul style="list-style-type: none"> • KanTRAIN site staff • Program instructors • Participants • Workforce center staff • Industry partners
October 2017	Garden City, Topeka	Visit Garden City Community College and WIT/WU, and meet with KBOR to discuss data needs	<ul style="list-style-type: none"> • KanTRAIN site staff • Program instructors • Participants • Workforce center staff • Industry partners
April 2018	Emporia, Topeka, Wichita	Meet with grant management and conduct final interviews (virtual and in-person) at all four sites	<ul style="list-style-type: none"> • KanTRAIN site staff • Program instructors • Participants • Workforce center staff • Kansas Department of Commerce staff

The evaluation team documented findings from the site visits in summary memos that were shared with grant management and site staff. The team also developed annual interim reports in December 2016 and 2017. As part of the formative evaluation, these reports described implementation status updates, lessons learned, and challenges, and provided a set of considerations for the project team.

Surveys

RTI staff developed two surveys—one for employers and one for instructors—to solicit feedback on stakeholder involvement in KanTRAIN. Copies of both surveys are included in Appendix B.

- 1) The KanTRAIN Employer Survey, a 21-item survey, was designed to gather information from KanTRAIN sites' employer partners on their input into program design and interactions with program staff and participants. The survey also ascertained the extent to which sites responded to employer partners' hiring and skills needs. The survey was piloted during the spring 2017 site visit and then refined and administered in both paper and online formats during fall 2017 and winter 2018. A total of 49 individuals from 34 employers responded to the survey, representing all four KanTRAIN sites.
- 2) The KanTRAIN Instructor Survey was administered to faculty at the end of the grant to understand the influence of KanTRAIN on instructional practice. This 11-item questionnaire was administered to 15 instructors during final in-person interviews in spring 2018.

Project meetings and documentation

As an additional source of qualitative data on project activities, the evaluation team participated in regular project meetings and reviewed project documents on an ongoing basis. Project meetings included weekly calls with members of the grant management team to discuss project accomplishments and challenges, and updates from site coordinators during monthly site team meetings. Project documentation included programmatic and instructional materials developed by the sites, such as career pathway models, sustainability plans, and partnership agreements.

Outcomes Study

The design for the evaluation of KanTRAIN participation on academic and employment outcomes included two components. First, RTI reported descriptive statistics on the outcomes of KanTRAIN program participants. This analysis summarized the average degree progress, credential accumulation, and workforce outcomes of KanTRAIN participants overall and across subgroups (e.g., by college or by incumbent status).

Second, the KanTRAIN outcomes study included a quasi-experimental analysis of the effects of participation on academic and post-enrollment employment outcomes. RTI analysis used propensity score matching (PSM) to identify a comparison group of participants who enrolled in the same programs impacted by KanTRAIN in previous academic years, who match the KanTRAIN participants on academic and demographic characteristics. The evaluation team then used multivariate regression analysis to compare the outcomes of KanTRAIN participants and the comparison group to evaluate the impact of the KanTRAIN program. The evaluation assessed the impact of grant-funded activities on degree progress, credential accumulation, and workforce outcomes.

The data used for the outcomes study came from KanTRAIN program data collection and KBOR. The KanTRAIN program data collection was led by the grant management team and gathered information on all participants from fall 2015 through spring 2018. The KBOR data included administrative, academic, and unemployment insurance data on participants in programs impacted by grant-funded activities between fall 2009 and spring 2018.

Implementation Study Findings

The KanTRAIN project implemented a variety of activities that align with program goals, along with processes and procedures at the grant management level to support site-level implementation. The results of project implementation at the site level included the design of career pathway programs; integration of employability skills into instruction in response to employer need; and coordinated career and other support services for participants, including targeted outreach to veterans. Summaries of key features of implementation across sites and at each individual site are provided in the sections that follow.

Grant Management

KanTRAIN staff at WU implemented a variety of grant management processes to facilitate program development and improvement and ensure compliance with grant requirements. The grant management team, led by a project director and research analyst, provided support and oversight to institutions through site visits, work plan and budget reviews, and data collection and analysis of KanTRAIN programs and participants. Other key elements of the KanTRAIN management model included the following:

- Monthly in-person meetings of KanTRAIN staff members from each of the colleges to review implementation progress, milestones, and challenges, and to discuss cross-site topics. These topics ranged from sustainability practices to strategies for collecting participant follow-up information and managing subcontract agreements with workforce centers.
 - A continuous improvement process that involved regular reviews of sites' progress towards achieving process and performance outcomes and ongoing course corrections. Concepts from the continuous improvement model were embedded in the monthly site team meeting agendas and formed the basis for cross-site discussions. The grant management team worked with sites to revise and update the model on an annual basis.
 - Ongoing communication with institutional leadership to promote high-level site buy-in and discuss strategies for institutionalizing KanTRAIN programs after the grant ends. This included monthly steering committee meetings, annual meetings with college presidents, and periodic visits with site administrative teams. These meetings helped focus site attention on key outcomes of the grant by, for example, requiring college presidents to sign off on site deliverables and sustainability plans.
-

- Processes and procedures to facilitate data collection and use for grant management and formal and informal evaluation purposes. This included an agreement with KBOR for access to individual-level data on KanTRAIN participants and their educational and workforce outcomes. This agreement leveraged KBOR's data collection and analysis capabilities to provide new access for KanTRAIN sites to post-program employment data.

Cross-Site Implementation Strategies

This section describes key implementation highlights and challenges with a focus on cross-site lessons learned.

Enhanced instructional programs

Key enhancements to sites' career pathways and instructional programs because of KanTRAIN included the following:

- **Increased access to career pathways that incorporate nationally aligned industry-recognized credentials.**

One of the goals of KanTRAIN was to increase the integration of and access to industry-recognized credentials for KanTRAIN participants. Sites did this by establishing clear pathways for participants to help them navigate through their chosen programs of study. To create pathways, site teams sequenced college courses to align with KBOR requirements and identified college degrees and nondegree credentials (including industry-recognized credentials).

To assess site progress toward this goal, in winter 2017, the KanTRAIN grant management team contracted with WorkED Consulting, in partnership with The New Growth Group and the National Institute for Metalworking Skills (NIMS). The WorkED team analyzed the alignment of advanced manufacturing certifications offered at KanTRAIN sites to national certifications and local workforce needs and identified ways to strengthen employer engagement in the programs. Overall, the analysis revealed strong labor market demand for graduates from KanTRAIN advanced manufacturing programs and confirmed that program curricula align with the skills needed by local employers. It also recommended that college staff conduct more targeted outreach to employers around particular industry-recognized credentials and their corresponding skills. The grant management team worked with sites to develop strategies for responding to the WorkED recommendations, especially around continuing to engage employers in program activities and

identifying work-based learning opportunities for participants to earn additional credentials.

- **Use of simulated learning to provide more realistic training and experience using workplace-relevant equipment.**

Learning simulations were incorporated into programs at all four sites through simulated workplace experiences incorporating technology and tools that participants will encounter on the job. At WIT/WU, for example, the use of simulated learning enabled participants to practice realistic patient interactions, perform medical procedures, and receive immediate feedback from instructors in a high fidelity, low risk environment. All KanTRAIN programs at WIT/WU had access to the grant-funded simulation center, both for individual programs' instructional purposes and for cross-program activities, typically through the biannual Big Sim event (see text box description). At FHTC the use of augmented reality welding simulators in the classroom allowed participants to practice welding techniques without using consumable materials. At WSU Tech, simulated trainers replaced large, expensive equipment in the Industrial Automation Machine Maintenance (IAMM) program, while still giving participants the chance to develop and practice needed skills. Climate and Energy Control participants at WSU Tech practiced service call interactions and maintenance on certain equipment using simulation software and simulated zonal, automated climate control systems.

Understanding How Cross-Program Collaboration Improves the Patient Experience

Over the course of the grant, WIT/WU hosted the Big Sim three times (in fall 2016, spring 2017, and fall 2017), during which participants from different programs worked together to simulate a complete patient experience throughout multiple health care settings.

For example, in one scenario, a resident of a local nursing home falls in the hallway and is found by a Certified Nurse Aide (CNA) participant working in the facility who calls 911. Emergency Medical Technicians (EMTs) stabilize and transport the patient to the emergency room. There, participants from the CNA, Phlebotomy, and Practical Nursing programs complete patient intake, establish an IV line, and prepare the patient for surgery. Then participants from the Surgical Technology and Respiratory Therapy programs “operate” on the patient, after which the patient is moved to the post-anesthesia care unit and into the “post-op” unit for continued care and rehabilitation by Physical Therapy Assistant and Occupational Therapy Assistant program participants.

According to instructors and administrators, the Big Sim provided participants with experience working with other health care professionals and interacting with one another as they will be expected to in the workplace. Employers attended the Big Sim and debriefed the experiences with participants, with a focus on participants’ communication and other essential workplace skills.

- **Integration of basic and technical skill instruction to accelerate participant progress through pathways.**

At least two sites (GCCC and WIT) leveraged support from the Accelerating Opportunity in Kansas (AO-K) initiative,⁶ a statewide program to integrate adult basic education and technical instruction to help participants advance quickly through career pathways. By pairing basic and technical skill instructors in a team-teaching approach, AO-K participants work toward both their GED and technical certificates at the same time, rather than doing each sequentially over an extended time. KBOR offers financial support and other incentives for AO-K participants.

At WIT, KanTRAIN funded an adult basic education instructor to provide GED instruction to CNA, Certified Medication Aide (CMA), and Home Health Aide (HHA) participants. The AO-K instructor worked with KanTRAIN participants in

⁶ See https://www.kansasregents.org/resources/PDF/HANDOUT_KansasBoardofRegents_AOK_Jan2016.pdf.

a small group setting and connected participants with additional advising and assistance through the AO-K program. Likewise, the GCCC site coordinator partnered with the AO-K coordinator on campus to initially extend the welding career pathway to AO-K participants. The site coordinator then decided that the Industrial Maintenance program would be a better fit for those participants needing to take both GED and technical courses at the same time.

- **Development of new internship or apprenticeship opportunities for participants.**

All sites offered differing degrees of internship opportunities for KanTRAIN participants, though only WSU Tech formalized work experiences for participants through the IAMM program's internship/capstone course. At WIT, most health care programs require clinical rotations, providing participants with supervised on-the-job training at local health care facilities. During the grant, the site did establish a new arrangement with Stormont Vail, a large local hospital, for a paid residency experience for participants in the Surgical Technology program. As residents, Surgical Technology participants receive additional clinical experience and operating room practice and are paid for their time.

Additionally, as part of KanTRAIN, WSU Tech instituted a new requirement for IAMM participants to intern with a local employer or take a summer capstone course. The internship program originated from discussions with a large national employer, with an established internship program in Ohio through the University of Cincinnati, that was interested in setting up a similar arrangement in Wichita. Site staff worked with this employer and other local employers to design the internship option, including mapping learning objectives and creating a final reflection project. If participants choose not to participate in an internship, they may instead enroll in the summer capstone course, in which they repair actual machinery rather than work on simulated trainers as in the classroom.

WSU Tech also partners with employers to offer training for apprentices, including participants in Spirit AeroSystems' registered electrical apprenticeship. Apprentices work part time at Spirit while taking classes at WSU Tech to earn their technical certificate in IAMM during the first two years. They then receive two years of additional training on practices specific to Spirit's operations, resulting in an 8,000-hour, four-year apprenticeship program. As noted by Spirit's facilities manager, the company is facing rapid baby boomer retirements and struggling to hire people to fill the gaps, so the apprenticeship program is one way of bringing in entry-level employees and providing them with the necessary training to advance their careers at Spirit. During interviews with IAMM participants, some who were not a part of Spirit's apprenticeship expressed interest in the program as a way to get hired at the

company. They noted that Spirit seems to be moving toward using apprentices to fill certain positions, like electricians, rather than hiring outside applicants.

- **Specialized pathways for incumbent workers and unemployed adults.**

To meet the needs of working and nonworking adults, KanTRAIN sites offered both customized training for employers and accelerated or short-term programs to help participants quickly gain the skills they need to enter the workforce. For example, WSU Tech launched the FastTrack welding program, which teaches basic welding techniques to adult learners in the evenings. As noted by site staff, the accelerated program focuses more on mastery of common welding types and less on welding theory, with the goal of preparing participants for entry-level welding positions. At FHTC, rather than change the program length, the site integrated stackable credentials into its welding pathway so that participants can earn sequential certifications throughout the program, offering tangible evidence of their career preparation should they leave the program prior to earning a technical certificate or college degree.

Both FHTC and GCCC offer customized training for employers to strengthen the skills of incumbent workers. At FHTC, site staff responded to a request from a local employer for training on the Tungston Inert Gas welding-to-repair model and created a short-term program designed specifically to meet this need. Incumbent worker training is also part of GCCC's regular workforce department offerings, with training available both on location at the worksite and on campus.

Focus on employability skills instruction

KanTRAIN employer partners consistently reported the need for workers with strong employability skills, with some saying they value such skills more than specific technical knowledge, which can often be learned on the job. According to employer interviews, KanTRAIN colleges fully responded to this workforce need by emphasizing employability skills in instruction, both through classroom strategies and bringing in outside training resources, such as the Bring Your A Game to Work ("A Game") and TeamSTEPPS® models.

A common approach to addressing employability skills by KanTRAIN colleges was to treat the classroom like a workplace and instill a sense of accountability in participants for their attendance and work quality. In FHTC's welding program, for example, participants can be "fired" and sent home for the day for being late or violating workplace safety issues (they are "rehired" the next day if they arrive on time). FHTC instructors implemented this approach after hearing from employer partners that attendance and timeliness were the skills most desired in their workplaces. WSU Tech offers the Blueprint for Personal Success course for

many KanTRAIN programs. This online course guides students through important topics for the workplace such as professionalism, communication, teamwork, and goal setting.

Three of the four sites (GCCC, WIT/WU, and WSU Tech) also brought in specialized training on employability skills using the “A Game” curriculum developed by the Center for Work Ethics Development. WSU Tech incorporated “A Game” into its Machining Technology and Industrial



Automation Machine Maintenance programs, which was taught by the KanTRAIN case manager and student support specialist. During interviews, instructors from both programs said they noticed a difference in participants’ general workplace awareness as a result of “A Game” training. At GCCC, only degree students participated in “A Game,” as the certificate program is not long enough, though the site’s welding instructors mentioned that they already incorporated many similar concepts into program curricula. The KanTRAIN grant also enabled WIT/WU to adapt the TeamSTEPPS® training for long-term care settings. In most cases, two different KanTRAIN programs participate in TeamSTEPPS® together, allowing for cross-discipline collaboration from the start. As shared during interviews, KanTRAIN participants found TeamSTEPPS® training useful, especially in preparing them for difficult conversations and to communicate with their superiors.

Coordinated student support services

KanTRAIN staff provided case management support to participants at all four sites, directing them to other campus resources for broader academic support, such as advising and tutoring. In general, intensive case management support at the KanTRAIN sites involved enrolling participants and tracking their program outcomes, providing advising support related to their career pathways, connecting them to campus resources for additional advising and tutoring support, and assisting with job searches.

Examples of specific case management strategies at each campus include the following:

- FHTC’s site coordinator met one-on-one with participants every other month to ensure their course loads aligned with pathway requirements.
- At GCCC, the case manager’s office was housed in the welding facility to ensure visibility among participants. The instructors, in particular, offered considerable career advising, given their experience working in the industry and connections with employers.

- WIT's case manager originally provided on-one-one support but shifted to classroom advising to address participants' common needs, along with the use of paper assessments to offer customized resources for individual needs.
- WSU Tech hired an employment specialist who, along with the KanTRAIN data and student recruitment specialist, conducted classroom visits and provided follow-up support around resume writing and job searches.

Additional career services were made available to KanTRAIN participants by local workforce centers. All sites signed contracts with their local workforce centers to establish a formalized referral process between the colleges and centers and to provide specialized case management and employment services for KanTRAIN participants. Typically, these services included career counseling and coaching, information on job openings, participant recruitment and referrals, tracking and reporting of participant data, and resume and interview skill workshops. At three of the four sites (all but WIT), the agreements included compensation for the workforce center for KanTRAIN-specific services provided. At the state level, the grant management team established a contract with Commerce to operate a mobile workforce unit throughout the state and provide workforce services to communities where workforce centers have closed as well as to military bases.

Sites' partnerships with their workforce centers differed in terms of how often participants interacted with workforce staff and which services were provided by each partner. For example, some sites referred participants for all career services to the workforce center, while others did some career advising on site and only referred participants with particular employment needs (e.g., WSU Tech referred participants needing intensive employment services, such as individuals with a criminal background). All sites, however, underscored the importance of having a single point of contact at the workforce center for both participants and site staff. All sites also suggested that the partnerships worked best when workforce services staff came to campus and interacted personally with participants (rather than when sites simply referred participants to off-campus services).

Veterans services

KanTRAIN supported a military transitions director during the grant to connect veterans and their spouses with education and training services at KanTRAIN sites. This position built on work initiated under a TAACCCT Round I grant to provide outreach to veterans by attending military-sponsored events and connecting with veterans' groups throughout the state. As documented in an article published by the Office of Community College Research and Leadership,⁷ support for veterans under KanTRAIN is provided in five stages: 1)

⁷ See <http://occr.illinois.edu/docs/librariesprovider4/tci/strategies-for-transformative-change/military-transitions-program.pdf>.

awareness and relationship building; 2) outreach; 3) continuous research, improvement, and training; 4) collaboration with business, industry, and education stakeholders; and 5) job placement assistance and follow-up.

While the focus of KanTRAIN veterans' services was on the first two stages, the KanTRAIN military transitions director also provided case management support for veterans and worked with site staff to connect veterans with specialized services available on each campus. Case management services ranged from helping veterans access funding to support their education and training to sending information about military job fairs and job openings, identifying experiences and skills that might translate into

KanTRAIN programs enrolled 173 total eligible veterans and their spouses throughout the grant.

(Source: KanTRAIN data collection)

program credits, and connecting them to community services geared toward serving veterans. WSU Tech, in particular, made concerted efforts to leverage on-campus support for veterans, such as access to a veterans' lounge, an annual veterans' breakfast, and other events.

Alignment with state-level initiatives

To strengthen local programs and facilitate sustainability at the systemic level, the grant management team sought to align KanTRAIN activities with state-level initiatives related to employer engagement, data integration, workforce services, and veterans' services.

Alignment was formalized through contracts with two state agencies: KBOR, to support employer, credit for prior learning for veterans, and data activities, and Commerce, to address workforce and veterans' initiatives. These contracts took considerable time to establish, which posed some challenges for execution of all the planned activities, but the alignment activities did result in the following system-level outcomes:

- Opportunities to earn credit for prior learning for veterans: The KBOR Collaborative on Military Credit established crosswalks between military occupational specialties and college programs of study. With input from the KanTRAIN military transitions director, three KanTRAIN programs completed crosswalks to grant credit for prior learning to veterans: Physical Therapist Assistant (WU), Surgical Technology (WIT), and Welding Technology (GCCC).
- Access to veterans' networks and events: In partnership with Commerce, the KanTRAIN military transitions director met with state and regional staff working to support veterans and leveraged their connections with veterans to raise awareness about KanTRAIN and other education and training opportunities in the state.
- Coordination with the workforce system at the state level: The KanTRAIN program purchased a mobile workforce center to support coenrollment in KANSASWORKS and KanTRAIN programs. Although the mobile center was only used for a limited

time due to damage sustained in a hail storm, the contract with Commerce allowed for the agency's own mobile unit to share information about KanTRAIN and recruit potential participants during travel throughout the state.

Partnerships

A key strength of KanTRAIN implementation was the partnerships initiated and strengthened by the consortia colleges with local employers and workforce centers. Lessons learned from and challenges with these partnerships are highlighted below.

Employer outreach

Sites typically gathered employer input through program advisory committees, with each structured and coordinated differently across colleges. For example, in addition to individual advisory committees for each program at WIT, the regional simulation center (RSC) manager convened an industry advisory committee focused on the integration of simulation into health care instructions. This committee met on a quarterly basis to discuss simulation equipment needs and review cross-program scenarios. Industry members also attended the Big Sim to provide feedback to participants on their performance and reinforce connections between the scenarios and the workplace.

This partnership has allow[ed] us to view the skill and knowledge of students who will be potential candidates for employment at our facility and [has] allow[ed] industry to help shape the areas of study needed for successful employment.

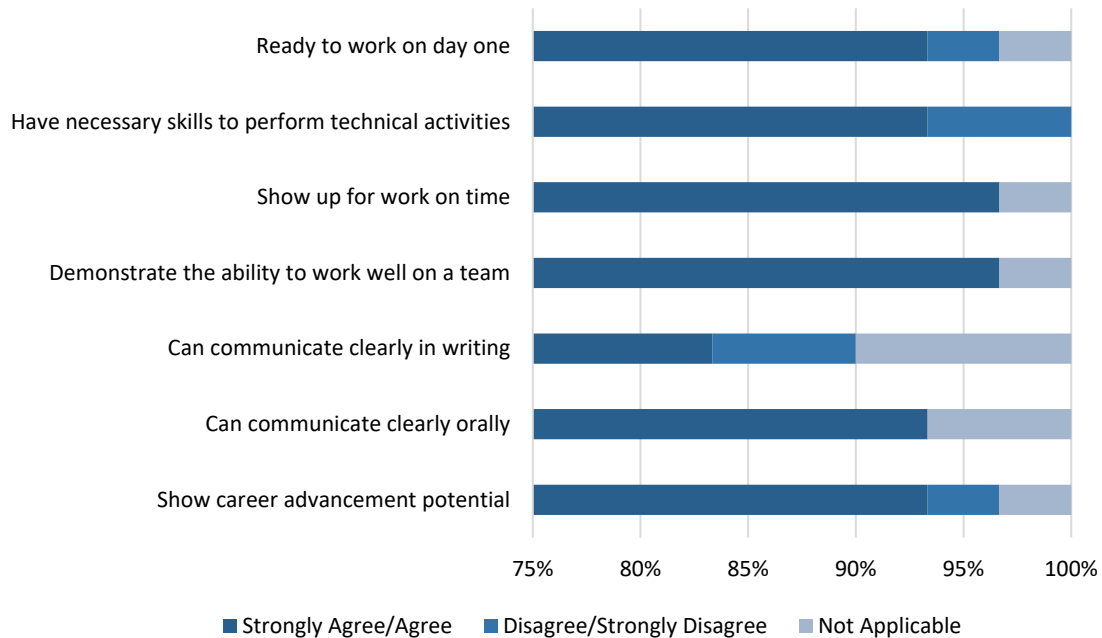
—WU employer partner

Sites also held special events to engage employers and connect participants with potential employment opportunities. This included the Reverse Career Fair at FHTC, for which employers came to the welding center and visited participants' booths to view their weld samples. FHTC held this event twice and site staff, instructors, and participants commented on the benefits of giving participants the opportunity to speak directly with employers and display their employability skills in a familiar environment. Similarly, the machining program at WSU Tech participated in the college's guaranteed interview program, which began through the "Wichita Promise" program, designed to help students pay for school and secure gainful employment upon completing their computer numerical control (CNC) operator certification. Local employers agreed to conduct first-round interviews with all students in the machining program and then selected qualified candidates to continue in the interview process.

In general, employers at all four sites expressed satisfaction with their college partnerships and indicated that KanTRAIN sites were responsive to industry needs, particularly when it came to

adapting curriculum to focus on key industry concepts and integrating employability skills. For example, WIT worked closely with Stormont Vail, a local health care provider, to address the overwhelming demand for qualified surgical technologists at its Topeka hospital. WIT responded by adding a second cohort of Surgical Technology participants with a staggered start to ensure a steady supply of program graduates and by working with the employer to create a residency experience for participants.

Figure 2. Employer perceptions of KanTRAIN program graduates



N = 30

Source: KanTRAIN Employer Survey.

When surveyed, 46 out of 49 employer respondents believed they had benefited from their collaboration with KanTRAIN programs through hiring program graduates, having improved relationships and communication with the college, providing input on program and curriculum content, and receiving higher quality applicants for job openings at their companies. The majority of respondents agreed that graduates of KanTRAIN programs have the technical skills needed to work on day one, are prepared to work on a team, and can communicate more clearly, both orally and in writing, than other applicants. Some employers believed that KanTRAIN program graduates also show better career advancement potential than other applicants, but this is highly dependent on the field of study and training as some fields, such as phlebotomy, do not lend themselves to advancement beyond the requisite certificate earned.

The college is doing a great job training students for the future in welding. I have had several of my customers hire students from FHTC and the students have been valuable additions to those companies.

—FHTC employer partner

Workforce partnerships

As previously described, each KanTRAIN college established a new agreement with its local workforce center to enroll participants, offer mutual referrals, and streamline career support services. All four colleges had previously worked with their workforce center partners, but TAACCCT funding allowed them to leverage these relationships to provide targeted services for KanTRAIN participants. Both the colleges and workforce centers attributed the success of these arrangements to common goals and target populations. The partnerships did not necessarily result in any new services for either partner but allowed both the KanTRAIN colleges and the workforce centers to streamline and/or coordinate previously duplicate services. For example, WSU Tech and its workforce partner identified that both entities offered the WorkKeys assessment, which is required for any WSU Tech student who wishes to participate in its guaranteed interview program, and determined that it should just be administered by the workforce center.

According to both site and workforce staff, strong personal contacts proved to be most effective for connecting participants with services. For example, the case manager from the Workforce Alliance of South Central Kansas was colocated in WSU Tech's career services office for most of the grant period, which allowed for close collaboration with KanTRAIN staff. At FHTC, the representative from Southeast Kansas Works remained the same for the duration of the grant which, according to the workforce center representative, allowed for clear communication between the workforce center, KanTRAIN staff, and program participants. FHTC participants mentioned the workforce center representative by name and reported that they knew how to contact her for assistance when needed. Conversely, GCCC staff identified distance as a challenge to connecting participants with workforce services, since its workforce center partner covered a huge service area and did not provide the same level of on-site support as the other colleges experienced. At other sites, staff turnover at the workforce centers was identified as a challenge in providing continuous and consistent support for participants.

According to at least two site coordinators, one of the major benefits of the workforce center partnerships was the identification of financial support for eligible KanTRAIN participants. In fact, one site mentioned that more participants received *Workforce Innovation and Opportunity Act (WIOA)* funding than in the past. Both the site and workforce center staff attributed the increase to the close contact between the center and KanTRAIN participants, which helped workforce center staff identify eligible candidates.

In establishing agreements with the workforce centers, KanTRAIN sites had hoped that the workforce centers would be able to provide follow-up data on registered KANSASWORKS participants to help with reporting on their employment status, placement, and wages. However, like the KanTRAIN colleges, the workforce centers experienced challenges with

tracking participants beyond their contact with the centers. In only some instances, therefore, did sites feel that the workforce partnerships expanded the institutions' data collection and reporting capacities.

Site Implementation Snapshots

With KanTRAIN funds, each site upgraded program equipment and facilities to align with current and emerging industry standards and engaged employers in the process. Likewise, all programs relied on significant employer input into curriculum selection and/or design. Sites also integrated employer connections into instructional programs through internships, classroom visits, and special events. The following snapshots present key features of KanTRAIN implementation at the four sites.

Flint Hills Technical College

Emporia, KS

**Key Features of KanTRAIN Implementation at Flint Hills Technical College**

Total KanTRAIN Enrollment (Fall 2015–Spring 2018)	119
Programs	Welding Technology Industrial Engineering Technology
Facility and Equipment Upgrades	Renovated and expanded the Welding Technology Center, which allowed for twice as many participants to enroll.
Curriculum Updates	<ul style="list-style-type: none"> • Introduced a focus on automation in welding curriculum. • Adopted the Hobart curriculum based on industry recommendation. • Developed online curriculum modules to support hybrid learning approach. • Integrated stackable credentials so that participants can earn industry-recognized credentials (Cert A and Cert B from American Welding Society [AWS]) while working toward one- and two-year technical certificates.
New Instructional Content	Created Certificate of Completion for Introduction to Welding course, which is a required course for Industrial Engineering Technology students and offered to incumbent workers.
Employer Involvement Highlights	<ul style="list-style-type: none"> • Business and Industry Leadership Team met quarterly to discuss program curriculum and equipment needs. • Industry members attended the annual Reverse Career Fair to view participants' welding samples and discuss potential employment opportunities.

At FHTC, KanTRAIN investments centered on upgrading and outfitting the new Welding Technology Center, which allowed for expanded enrollment in the college's Welding Technology and Industrial Engineering Technology programs. The renovated facility contains 18 welding booths, which means that the site can enroll 36 participants per semester in morning and afternoon classes. FHTC leveraged private industry dollars to fund the building renovation and used the KanTRAIN grant for equipment purchases, which included virtual and simulated welders and a robot. The need for the latter was identified by industry members and enabled the college to incorporate a new focus on automation into its welding curriculum. According to instructors, "the grant has expanded how [they] teach" and given them "a much bigger space and overall better environment." The new equipment also enables instructors to teach participants on the same machines used in the workplace.

During focus groups, many participants shared that they had decided to enroll after visiting the welding facility and seeing the new equipment. They also identified the expertise and approachability of instructors as a key strength of the program. When asked about their job readiness, most participants believed the level of preparation provided was appropriate and that the program would help them secure employment. In fact, two participants interviewed in spring 2018 mentioned that they were already employed in the field and what they were learning in class matched what they needed to do at work.

Garden City Community College

Garden City, KS



Key Features of KanTRAIN Implementation at GCCC

Total KanTRAIN Enrollment (Fall 2015–Spring 2018)	159
Programs	Welding Technology Industrial Maintenance (IM)
Facility and Equipment Upgrades	Renovated, upgraded, and expanded welding facility from 12 to 24 welding booths. Also purchased new equipment to restart the IM program.
Curriculum Updates	<ul style="list-style-type: none"> Adapted flexible welding curriculum to accommodate different course schedules, including shortening the program length to 18 weeks at the start of the grant and returning to a two-semester format in fall 2017. Updated curriculum based on National Center for Construction Education and Research (NCCER) to align with American Welding Society (AWS) standards. Revised the IM curriculum with input from employer and support from IM instructors at other colleges.
New Instructional Content	<ul style="list-style-type: none"> Relaunched IM program. Created and implemented a contextualized math course for welding students and added two new courses aligned to AWS certifications.
Employer Involvement Highlights	<ul style="list-style-type: none"> Designed trainings for incumbent workers, both in welding and IM.

Using KanTRAIN funds, GCCC upgraded its welding facility, adapted the program's structure and content to meet workforce and accreditation requirements, and relaunched the Industrial Maintenance (IM) program. The grant allowed the college to expand its welding center from 12 to 24 booths, purchase equipment to better meet industry training needs, and hire a third welding instructor. During initial grant implementation, GCCC instructors reduced the welding curriculum from two semesters to 18 weeks in response to employer input and implemented the shortened format in fall 2015. The revised curriculum emphasized welding practice over welding theory, per industry recommendation, and increased the amount of practice time with welding equipment for participants. However, the program returned to the original two-semester length in fall 2017 to comply with postsecondary accreditation requirements.

Toward the second half of the grant period, GCCC prepared to relaunch its IM program by working with instructors from other colleges, including WIT, to update the recently dormant program. Administrators also visited other colleges with IM programs to review equipment and curricula. After offering a weeklong IM course for incumbent workers, the college began offering a two-semester IM program in January 2018. Based on industry feedback, instructor turnover, and low student enrollment, the program was reconfigured to focus on short-term training to incumbent workers by the end of the grant.

Washburn Institute of Technology and Washburn University

Topeka, KS



Key Features of KanTRAIN Implementation at WIT/WU

Total KanTRAIN Enrollment (Fall 2015–Spring 2018)	1,150 (WIT) 209 (WU)	
Programs	Certified Medication Aide (WIT) Certified Nurse Aide (WIT) Emergency Communications (WIT) Emergency Medical Technician (WIT) Health Information Technology (WU) Home Health Aide (WIT)	Medical Billing and Coding (WIT) Occupational Therapy Assistant (WU) Phlebotomy (WIT) Physical Therapist Assistant (WU) Practical Nursing (WIT) Respiratory Therapy (WU) Surgical Technology (WIT)
Facility and Equipment Upgrades	Built new regional simulation center (RSC) for health care programs and purchased simulation equipment, including high- and medium-fidelity manikins, medical equipment, and HoloLens.	
Curriculum Updates	<ul style="list-style-type: none"> Integrated simulation into instruction and developed new lab curriculum using the RSC and its equipment. Introduced TeamSTEPPS® training at WIT and modified the TeamSTEPPS® curriculum for applicability to long-term care settings. 	
New Instructional Content	<ul style="list-style-type: none"> Launched Emergency Communications program based on local industry shortages. Developed simulation scenarios for individual program use and to facilitate cross-program, interdisciplinary collaboration through the Big Sim event. 	
Employer Involvement Highlights	Advised development of RSC and attended Big Sim to debrief patient experience with participants.	

Through KanTRAIN, WIT/WU collaborated to develop health care career pathways across the two institutions, allowing participants to start with the certified nurse aide training and continue through to a doctorate degree in nursing. This involved aligning WIT's health care certificate programs with WU's degree programs and enhancing existing health care programs through the integration of simulations and cross-disciplinary instruction or creating new programs.

WIT leveraged grant funds and private industry dollars to build and equip the RSC, which houses state-of-the-art equipment and facilities such as human simulators, surgical bays, and flexible classrooms, to provide health care participants with realistic opportunities to apply their classroom learning to a simulated workplace. The grant-funded RSC coordinator convened faculty to write scenarios for using simulation in both individual and multiple programs and trained faculty on how to use the RSC for instructional purposes.

The two campuses also implemented the TeamSTEPPS® curriculum, created by the U.S. Department of Health and Human Services' Agency for Healthcare Research and Quality, which emphasizes cross-discipline communication in health care to ensure patient safety. WU had adopted TeamSTEPPS® for acute care before KanTRAIN because the program was being used by a large local employer, St. Francis Hospital, which employs many WU graduates. With KanTRAIN funds, the TeamSTEPPS® training was adapted for long-term care contexts and implemented at WIT. WU's Team STEPPS coordinator also designed a series of online modules to supplement in-person training led by WIT's TeamSTEPPS® master trainers. At WIT, TeamSTEPPS® is available to programs that are long enough to accommodate the program's eight hours of instruction, and all participants receive a certificate of completion at the end.

Wichita State University Campus of Applied Sciences and Technology



Wichita, KS

Key Features of KanTRAIN Implementation at WSU Tech	
Total KanTRAIN Enrollment (Fall 2015–Spring 2018)	530
Programs	Climate and Energy Control Technology Industrial Automation Machine Maintenance (IAMM) Machining Technology Robotics Technology Welding Technology
Facility and Equipment Upgrades	Upgraded the Climate and Energy Control Technology labs using new equipment and purchased robots for integration into robotics, welding, and machining programs.
Curriculum Updates	<ul style="list-style-type: none"> Revised program curricula to add a focus on automation and align with industry certifications. Condensed IAMM curriculum to one year based on industry feedback.
New Instructional Content	<ul style="list-style-type: none"> Created new internship program/capstone course for IAMM program. Created one-week Introduction to Robotics course for welding. Launched eight-month accelerated welding program leading to technical certificate for adult learners and incumbent workers.
Employer Involvement Highlights	Hosted participants for internships and company tours, and participated in career fairs, guaranteed interview program, and apprenticeships.

At WSU Tech, formerly Wichita Area Technical College, KanTRAIN implementation focused on integrating automation into four existing programs through the acquisition of robotic technology, curriculum updates, and other programmatic changes. According to site staff, these programmatic updates reflect the advanced manufacturing industry's shift toward a blended production environment that incorporates both manual and automated processes. For example, WSU Tech redesigned the existing HVAC lab into an automated climate and energy lab for commercial facilities, hired a new Climate and Energy Control Technology instructor, and updated the IAMM curriculum and condensed it into one year, based on industry's need for quickly trained workers. WSU Tech also purchased new robotic cells and a large format robot for use in the Robotics, Welding, and Machining Technology programs, adding a one-week introduction to robotics course for welding and updating the machining curriculum to include automation. To support use of the robot, the site hired a new welding instructor with relevant expertise to teach and develop curriculum on automation.

Sustainability

Since the start of the grant, the KanTRAIN grant management team and consortia colleges explored strategies to integrate activities into state agency and college infrastructures once the grant ends. Regular discussions about sustainability, including financial and staffing considerations, were part of the monthly site team meetings. Grant management also led a SOAR (Strengths, Opportunities, Aspirations, Results) analysis at team meetings to identify measurable sustainability strategies, and site staff participated in the TAACCCT virtual sustainability institute and created individual sustainability plans. Through this work, two overarching strategies were used to plan for sustaining KanTRAIN activities:

1) institutionalizing program components into campus structures and 2) aligning program goals with state-level initiatives.

According to site staff, all programs at each of the colleges are projected to continue at current enrollment levels. Instructors acknowledged that some of the equipment will need to be maintained and updated over time to keep pace with labor market changes and upgrades, and sites have plans in place to leverage industry and institutional support to do so. For example, FHTC raised funds from its college foundation to add a fabrication lab to the welding center and expand its capacity for enrolling students. WIT/WU also leveraged support from industry partners to secure donations for RSC maintenance and developed a business plan for using the RSC for outside training purposes.

Certain program activities, such as case management and support for veterans, will be absorbed by campus departments or continue to be provided through workforce center partnerships. For example, WSU Tech's career services department started providing advising and job search support to KanTRAIN participants towards the end of the grant to allow for a smooth continuation of such services. At all sites, administrators anticipate that partnerships will continue with workforce centers since relationships between the colleges and workforce centers existed prior to the grant. The KanTRAIN model for veterans' outreach and support relied heavily on one-on-one contacts with the military transitions director, who had served in the military himself and could easily relate to other veterans and connect them to education and training programs and other services. This position ended with the grant, but colleges have expanded their institutional services to connect veterans in their programs with on-campus supports to meet the specialized needs of these participants. For example, WU established a new veterans' support center and GCCC dedicated a portion of its new welding facility to training use by the National Guard.

At the system level, efforts were made by grant staff to embed KanTRAIN activities with those overseen by state agencies. These included designing a process to award credit for prior learning to veterans, leveraging the mobile workforce center to recruit participants for

education and training programs throughout the state, and expanding institutions' access to data for analyzing the educational and labor market outcomes of program completers. In these ways, KanTRAIN will have a lasting impact at both the institutional and system levels in terms of expanded capacity throughout the state to provide access to high-quality career training programs.

Implementation Analysis Summary

KanTRAIN made a positive impact at both the institutional and system levels through enhanced instructional programs, a focus on employability skills, and strengthened career and other support services for participants. A total of 21 programs were either created or enhanced through KanTRAIN, with 2,167 total participants served from fall 2015 to spring 2018. Table 3 summarizes the key features of KanTRAIN implementation.

Table 3. Summary of KanTRAIN implementation evaluation findings

Instructional Enhancements	<ul style="list-style-type: none"> • Renovated facilities and purchased equipment to align with workplace needs. • Integrated simulation technology to provide participants with realistic preparation for work. • Provided support for adult learners through contextualized GED and workforce training opportunities. • Integrated nationally recognized and industry-valued credentials into programs. • Implemented accelerated training opportunities for adult learners and incumbent workers. • Designed work-based learning opportunities with industry partners.
Responsiveness to Employer Needs	<ul style="list-style-type: none"> • Increased classroom focus on employability skill instruction through adoption of workplace practices and other external training resources. • Connected participants with employers through campus and workplace events.
Strengthened Case Management Supports	<ul style="list-style-type: none"> • Contracted with workforce centers to provide career advising and identify funding sources for training. • Provided individualized support for veterans to connect them with education and training programs and other services.
Enhanced Partnerships	<ul style="list-style-type: none"> • Engaged employer feedback through existing platforms, such as program advisory committees, and facilitated more personalized connections with participants through special events, like the Reverse Career Fair and Big Sim. • Formalized relationships with workforce centers through signed agreements.
Expanded Institutional and System Capacity	<ul style="list-style-type: none"> • Embedded grant activities within college and state infrastructures to ensure continuity of programs and expanded access to career pathways throughout the state.

Outcomes Study Findings

Overview

The KanTRAIN strategies for program design included supporting work-based training models, increasing access to credentials, and improving program curriculum and training technologies. These strategies were intended to help participants complete college programs, obtain skills relevant for employment in high-demand fields, and enter employment. The intent of this quantitative impact analysis is to explore whether the KanTRAIN program met its goals by describing the outcomes of KanTRAIN participants and comparing them with the outcomes of participants in past years. It includes two parts: the first analysis summarizes the academic and employment outcomes of KanTRAIN participants. The second analysis evaluates the impact of KanTRAIN on academic and employment outcomes using a quasi-experimental design.

Overall, this analysis assesses the impact of KanTRAIN on the following eight academic and employment outcomes (full details are available in Appendix Table C-1):

- *Program progress:* The number of credits earned and the proportion of general credits and technical credits accumulated.
- *Time to completion:* The number of months a participant is enrolled in the program of study until program completion.
- *Nondegree credentials:* Whether participants have earned any nondegree credentials and, among participants with any nondegree credentials, the number of credentials earned.
- *College degrees:* Whether participants have earned any college-issued degrees.
- *Employment status:* Employment or continued enrollment two years after program entry.
- *Employment field:* Among employed participants, employment in an industry related to the program of study, disaggregated by incumbent status.⁸

⁸ Incumbents are participants who were employed prior to program enrollment. In the KanTRAIN program data collection, incumbent status is self-reported. In the KBOR data, incumbent status is determined by whether employment data is available during the three quarters leading up to program enrollment.

- *Wages*: Among employed participants, average quarterly wages during the three quarters following program completion, disaggregated by incumbent status.
- *Wage difference*: Among employed incumbent participants, change in wages in the three quarters following program completion, from pre-enrollment wage levels and the magnitude of observed differences, disaggregated by incumbent status.

Data

The participant-level data used for this outcomes study come from two sources. First, RTI received KanTRAIN program data collected quarterly by the grant management team for the purposes of U.S. Department of Labor reporting. All KanTRAIN participants were included in this dataset. Data points included demographic characteristics, program of study, post-exit enrollment and employment status, and credential accumulation. Credential accumulation included college degrees and nondegree credentials. Nondegree credentials include industry-recognized certificates, occupational licenses, and educational certificates.⁹ All outcomes were measured as of spring 2018. While this dataset included some information on employment status and wages, the data were self-reported and not available for all participants, making it an unreliable source for employment data. This dataset also lacked a comparison group to determine how KanTRAIN participant outcomes compare with other participants in similar programs. Despite these limitations, data from the KanTRAIN data collection were used for most of the impact analysis because this dataset contained all KanTRAIN participants and program of study counts. The dataset consists of 2,167 KanTRAIN participants.

To supplement the KanTRAIN data collection, RTI received administrative data from KBOR. This dataset included participants enrolled in KanTRAIN programs of study between spring 2009 and spring 2018, inclusive of data on both KanTRAIN participants and a comparison group of participants who enrolled before KanTRAIN implementation (pre-fall 2015). The analytic sample for this study was restricted to participants who enrolled between fall 2011 and spring 2017 to include only participants who entered after the end of the 2008 recession and only participants who had time to accumulate post-program wage data. Additionally, the sample was restricted to participants who exited by fall 2017 to ensure completion data would be available for all participants. Data points include demographic characteristics, credits taken each term overall and for technical courses, college degrees earned, nondegree credentials earned, and employment data pre- and post-enrollment. The employment data spans all quarters between the second quarter of 2008 through the second

⁹ The definition of nondegree credentials is based on definition guidelines from the National Center for Education Statistics Interagency Working Group on Expanded Measures of Enrollment and Attainment (GEMEnA).

quarter of 2018 and, for each participant, includes quarterly wages for up to three quarters before enrollment, quarterly wages for up to three quarters after enrollment, and the North American Industry Classification System (NAICS) code associated with any job held during those six quarters. After omitting participants with missing demographic characteristics, the analytic sample included 3,449 comparison participants and 1,168 KanTRAIN participants.

Though the KBOR dataset supplied valuable employment data and credit-hour completion information, it had several limitations. First, data for KanTRAIN participants were incomplete: participants from the academic year 2017–18 were omitted because there was not enough time to collect post-enrollment outcomes, and data for 120 participants were missing from academic years 2015–16 and 2016–17.¹⁰ Second, employment data were only available on participants employed in Kansas or Missouri and for whom a valid social security number could be matched to the unemployment insurance database in either state. This means that participants who found work outside of these states, who are employed with the federal government (e.g., military), or who are working but did not provide a valid social security number would not be counted in the employment outcomes. For this reason, it is unclear whether participants without employment data are unemployed or working in a situation not tracked by KBOR; accordingly, an analysis of likelihood of employment across cohorts cannot be conducted.

Outcomes of KanTRAIN Participants

The initial summary of KanTRAIN participant outcomes focuses on participants who enrolled during the 2015–16 academic year to ensure that participants had ample time to complete their programs and/or achieve a certificate ($N = 749$).¹¹ Among 2015–16 academic year participants, more than half of participants were female (61 percent) and three-quarters were White, non-Hispanic (76 percent). Approximately 9 percent of participants were veterans and 28 percent were eligible for Pell Grants. Less than 1 percent of participants in this academic year were Trade Adjustment Assistance eligible. See Appendix Table C-5 for demographic characteristics of these participants by college.

Time to Completion

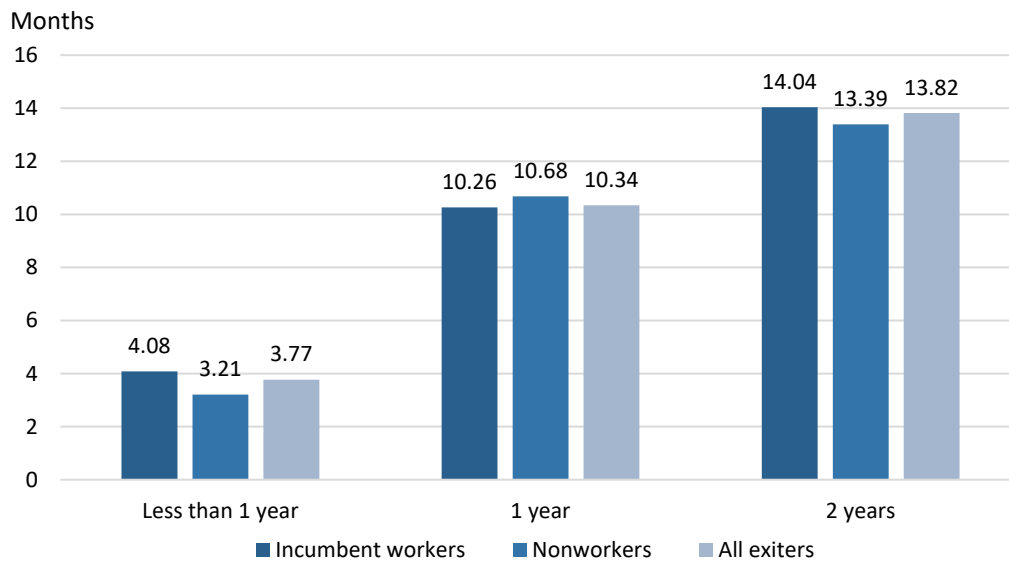
KanTRAIN participants tended to finish their programs of study ahead of schedule. Participants in two-year programs, for example, had an average completion time of 14

¹⁰ Data for KanTRAIN participants enrolling between fall 2015 and spring 2017 may be missing from the KBOR dataset for several reasons. One possibility is underreporting of participants in lists provided by program directors. Another possibility is that participants exited the program before 20 days because KBOR does not track participants until the 20th day of a program. Participants may exit before the 20th day for a variety of reasons, such as fast completion of a certificate or the desire to discontinue the program.

¹¹ Time to certificate ranged from a few days to two years.

months (Figure 3a). Overall, incumbent workers and nonworkers had similar average completion times when comparing programs with similar durations. However, there are completion time differences across incumbent status across colleges. Welding programs across colleges are used as an example: incumbent workers finish FHTC’s two-year welding program on average five months faster than nonworking welding participants but two months slower than nonworking participants in WSU Tech’s two-year program (Figure 3b). Average and expected completion times for all programs of study can be found in Appendix Table C-6.

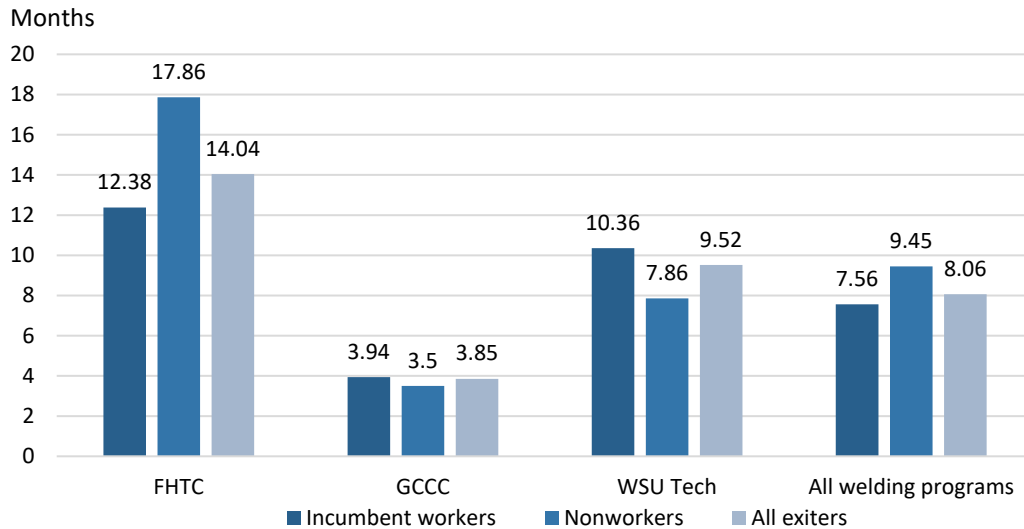
Figure 3a. Average months to program completion for KanTRAIN participants who entered their program in 2015–16 and completed their program as of spring 2018, by expected program duration



$N = 614$

Source: KanTRAIN program data collection.

Figure 3b. Average months to program completion for KanTRAIN welding program participants who entered the program in 2015–16 and completed their program as of spring 2018, by college and overall



$N = 84$

Note: Expected program duration is two years at Flint Hills Technical College (FHTC) and Wichita State University Campus of Applied Sciences and Technology (WSU Tech) and 18 weeks at Garden City Community College (GCCC) during the time frame of the analysis.

Source: KanTRAIN program data collection.

Program Progress

Total credit hour attainment was highly variable across participants. Advanced manufacturing program participants completed an average of 25 credit hours, compared with health care program participants who completed an average of 18 credit hours. There was also variation within program type by college. For example, welding participants at FHTC completed an average of 31 credit hours, while welding participants at WSU Tech or GCCC completed 18 and 22 credit hours, respectively. Credit hour accumulation also differed by race and ethnicity: White, non-Hispanic participants completed two more credit hours than Hispanic participants and five more credit hours than non-White, non-Hispanic participants.¹²

Among program exiters, average college credit accumulation also varied by college credential attainment. Program exiters who earned a college credential completed an average of 34 credit hours, compared with an average of 20 credit hours among exiters who did not earn a

¹² Additional statistics by race/ethnicity, field of study, and college can be found in Appendix Tables C-14, C-15, and C-16.

college credential. Average credit hours by credential attainment, program, and college among program exiters can be found in Appendix Table C-10.

Credential Attainment

Most KanTRAIN participants earned a credential—either a college degree or a nondegree credential—within two years of initial enrollment. Among 2015–16 KanTRAIN participants, approximately 70 percent of participants earned a credential and were no longer enrolled by spring 2018, and another 15 percent earned a credential and were still enrolled in spring 2018 (Figure 4). Less than 20 percent of participants were still enrolled two years after initial enrollment at each college. Overall, 14 percent of participants acquired no credential and were no longer enrolled as of spring 2018.

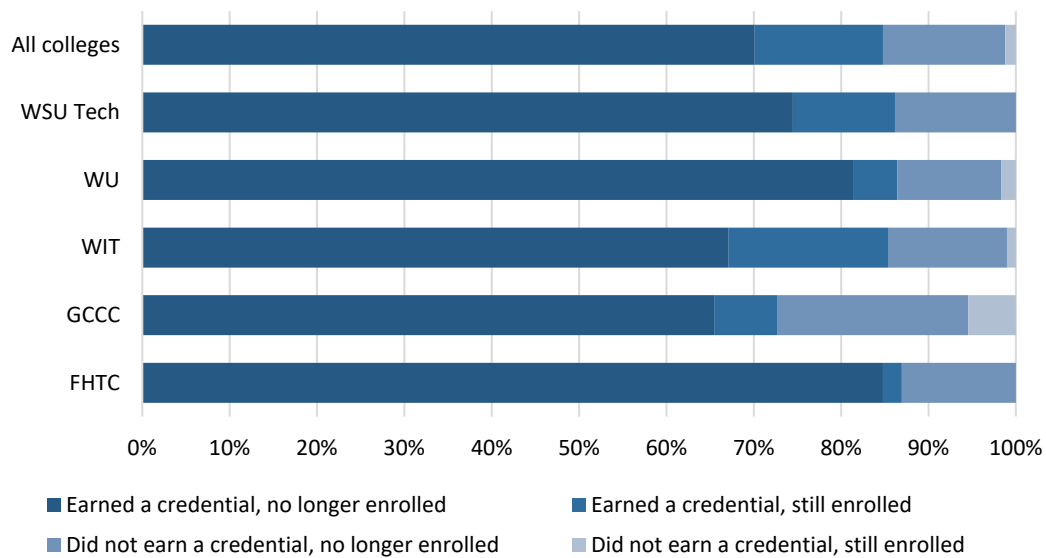
Over half of KanTRAIN participants earned a credential at each college. The proportion of participants who earned a credential by spring 2018 varied across schools, ranging from 72 percent at GCCC to 87 percent at FHTC. The highest percentage of participants who did not earn credentials and were also not enrolled was at GCCC (22 percent).

Most of the credentials earned were nondegree credentials. Nondegree credentials include industry-recognized certificates, occupational licenses, and educational certificates. About 76 percent of fall 2015 participants reported receiving a nondegree credential, while only 17 percent reported receiving a college degree. The percentage of participants who have earned a credential by program and credential type can be found in Appendix Tables C-7, C-8, and C-9.

Like credit-hour attainment, the average number of nondegree credentials earned varied across programs and colleges. Advanced manufacturing participants received, on average, two more nondegree credentials than health care participants (four vs. two credentials). Welding participants at FHTC earned seven nondegree credentials on average, compared with five at GCCC and two at WSU Tech. Unlike credit-hour attainment, the number of nondegree credentials attained by participants was similar across racial and ethnic groups.

In summary, most participants exited the program with a credential of some sort rather than without any credentials (70 percent vs. 14 percent), and most credentials earned are nondegree credentials. Credential totals differed across programs and colleges but overall indicated that participants across programs were exiting having earned at least one credential.

Figure 4. Percentage distribution of the credential and enrollment status of participants enrolling in KanTRAIN during the 2015–16 academic year in spring 2018



$N = 749$

Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology; WIT = Washburn Institute of Technology; WU = Washburn University. Credentials include college degrees and nondegree credentials. Average time to credential varies from less than one week to two years.

Source: KanTRAIN program data collection.

Labor Force Status

Almost all KanTRAIN exiters successfully found employment. Among KanTRAIN exiters, 93 percent were employed two years after initial enrollment in 2015–16. The percentage of incumbents who became employed after program exit was higher than the percentage of nonworkers, or those who were not working prior to enrollment, who became employed after program exit (95 percent vs. 86 percent) (Appendix Tables C-11 and C-12).¹³

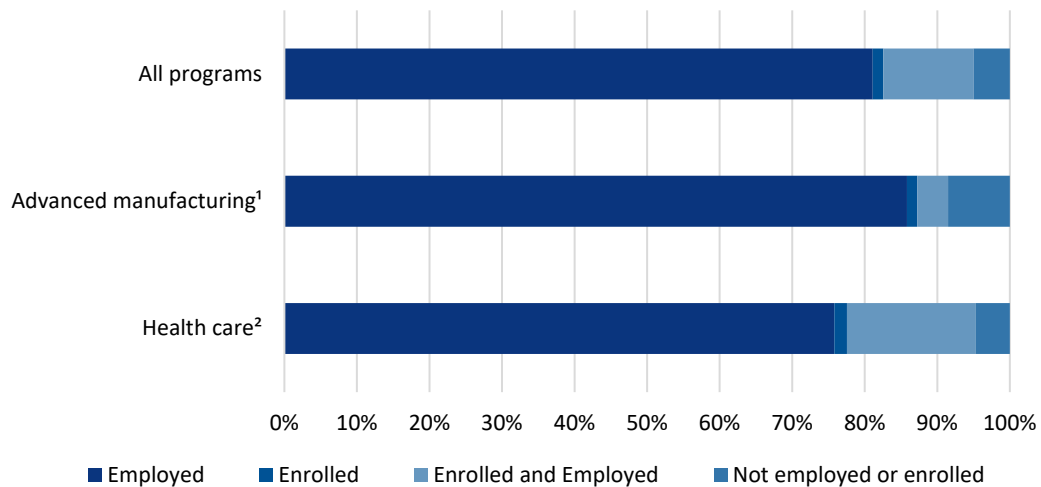
More than 90 percent of advanced manufacturing and health care program exiters were employed two years after program exit, with a slightly higher rate (four percentage points higher) for health care programs (Figure 5a). A small portion of those employed were still enrolled in another higher education program; 76 percent of health care program exiters and 86 percent of advanced manufacturing program exiters reported employment and no longer being retained in an education program. About 90 percent of welding participants were

¹³ The data do not show whether the job held prior to enrollment is the same as the job held after enrollment.

employed two years after initial enrollment, enrolled or not, across the three colleges with welding programs (Figure 5b).

KanTRAIN programs were designed to prepare participants for jobs, resulting in very few exiters enrolling in further education. There was some variation for participants across colleges. Again using welding programs across colleges as an example, 7 percent of welding participants at GCCC were enrolled in further education, compared with 0 percent of welding participants at FHTC or WSU Tech. The percentage of participants pursuing further education after exit also varied across programs; the highest continuation rates were for exiters of health-related programs (e.g., CMA, CNA, EMT) (Appendix Table C-13).

Figure 5a. Labor force status among KanTRAIN participants who started the program during the 2015–16 academic year and exited their program by spring 2018, by program field and overall



$N = 492$

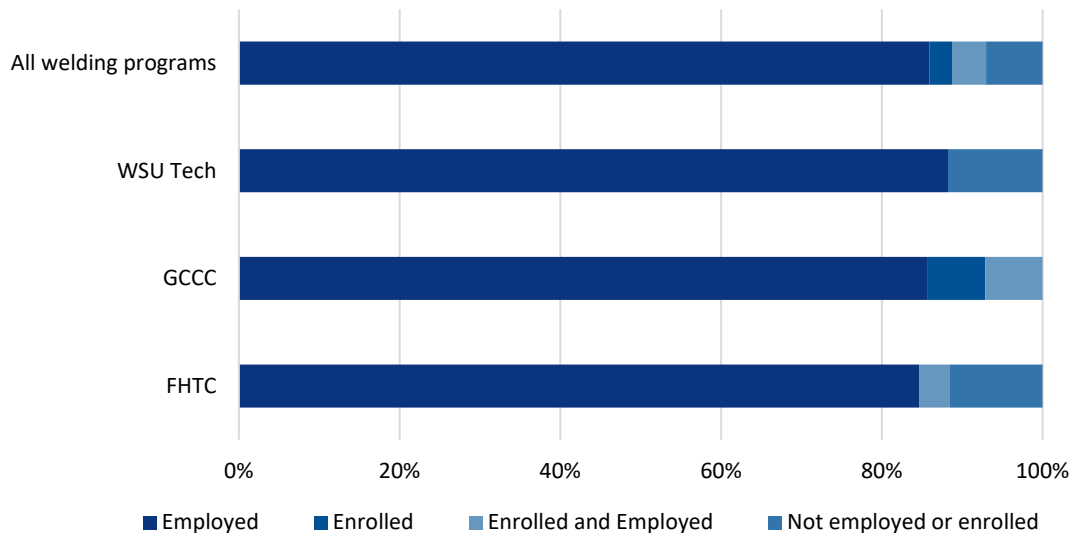
Note: Program exiters include participants who are no longer enrolled in a program of study, whether or not they earned a credential. Enrolled includes individuals who are enrolled and not employed. Not employed or enrolled includes exiters whose status is unknown.

¹ Advanced manufacturing includes Climate and Energy Control Technology, Industrial Automation and Machine Maintenance, Industrial Engineering Technology, Industrial Maintenance, Machining Technology, Robotics Technology, and Welding Technology.

² Health care includes Certified Medication Aide, Certified Nurse Aide, Emergency Communications, Emergency Medical Technician, Health Information Technology, Home Health Aide, Medical Billing and Coding, Occupational Therapy Assistant, Phlebotomy, Physical Therapist Assistant, Practical Nursing, Respiratory Therapy, and Surgical Technology.

Source: KanTRAIN program data collection.

Figure 5b. Percentage distribution of the labor force status of KanTRAIN welding participants who started the program during the 2015–16 academic year in spring 2018, by college and overall



$N = 71$

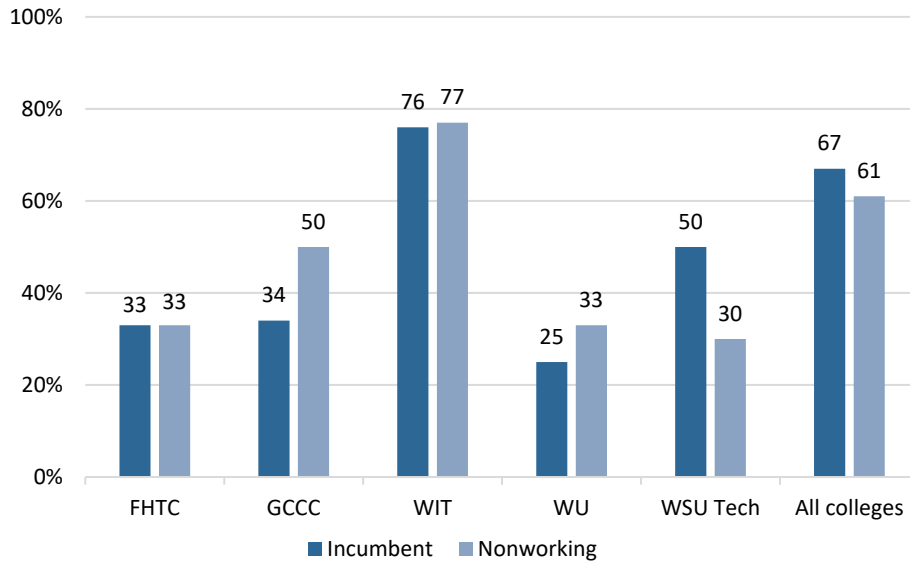
Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology. Program exiters include participants who are no longer enrolled in a program of study, whether or not they earned a credential. Not employed or enrolled includes exiters whose status is unknown.

Source: KanTRAIN program data collection.

Employment Characteristics and Wages

KanTRAIN participants found employment in industries related to their programs of study and received wage increases relative to pre-enrollment wages. Among employed KanTRAIN exiters who enrolled in the 2015–16 academic year, about two-thirds were employed in the industry for which they were trained within three quarters of exit. The percentage of participants in related fields varied across colleges (Figure 6). For example, about 30 percent of FHTC participants were in training-related employment, while about 77 percent of WIT participants were in training-related employment. Cross-college differences may relate to program offerings at each site because matriculation into training-related employment differed across field of study. Across all colleges, approximately 77 percent of health program participants entered training-related employment, compared with 48 percent of advanced manufacturing program participants who entered training-related employment.

Figure 6. Percentage of employed KanTRAIN exiters who worked in an industry related to their program of study among those who enrolled during the 2015–16 academic year, by incumbent status and college



N = 637

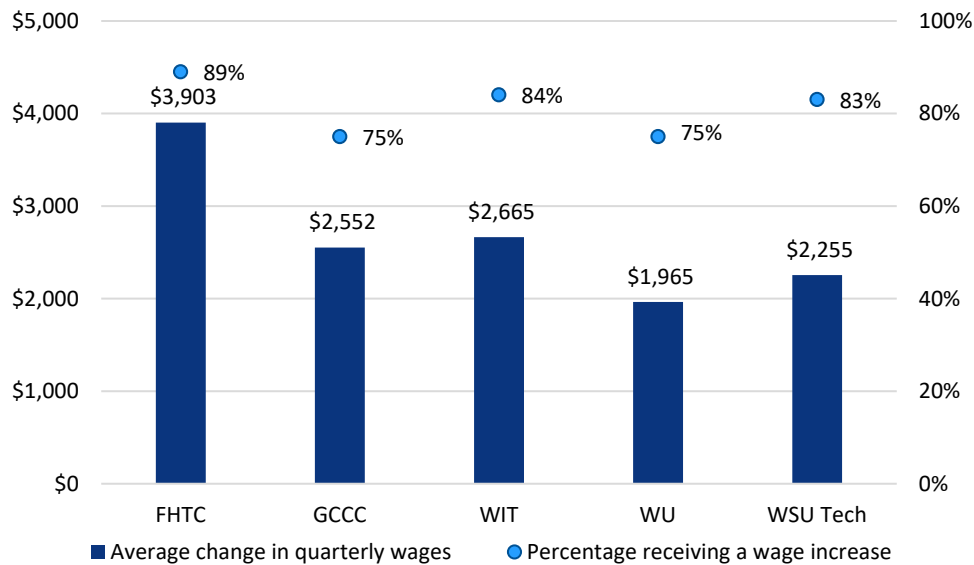
Note: Employment in an industry related to the program of study is determined if the North American Industry Classification System (NAICS) code for any job held in the first three quarters post-program exit matches the list of Classification of Instructional Programs (CIP) codes associated with the program of study. Matching was done using O*NET and by hand.

Source: Kansas Board of Regents.

The average net change in quarterly wages was a +\$2,909 net difference. Annually, this amounts to an approximate \$11,600 average wage increase relative to the pre-enrollment wages for KanTRAIN participants. The median net change was +\$2,593, indicating that very high wage increases earned by a few participants did not substantially skew the average change. The average change in wages differed across colleges—from +\$2,524 at GCCC to +\$4,577 at WU—and may reflect variations in the cost of living across the state, which are not accounted for in the data (Figure 7). Wage changes were similar across field of study, with health care program exiters and advanced manufacturing program exiters both earning average wage increases around +\$2,800.

Four out of five incumbent exiters received a wage increase relative to their wages pre-program enrollment. Specifically, 83 percent of KanTRAIN exiters received quarterly wages in their first nine months after program exit that were higher than their quarterly wages in the nine months leading up to program entry. Within individual colleges, at least three-quarters of incumbent exiters experienced a wage increase. About 84 percent of health program exiters and 80 percent of advanced manufacturing program exiters received wage increases after exit.

Figure 7. Net change in quarterly wages for incumbent KanTRAIN program exiters who were employed within three quarters of program exit, by college



N = 573

Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology; WIT = Washburn Institute of Technology; WU = Washburn University. Wage increase determined by comparing average post-program quarterly wages during the three quarters following exit to the average pre-program quarterly wages during the three quarters prior to program entry.

Source: Kansas Board of Regents.

KanTRAIN Participants Compared with Past Participants

This section compares the outcomes of KanTRAIN program exiters who enrolled between fall 2015 and spring 2017 (“KanTRAIN cohort”) to participants who enrolled in the same or similar programs prior to KanTRAIN implementation between fall 2011 and summer 2015 (“historic cohort”) to determine the impact of KanTRAIN on participant outcomes. This analytic sample differs from that used in the previous section in three ways. First, the sample uses KBOR data since the KanTRAIN data collection did not contain information on the historic cohort. Second, this analytic sample includes KanTRAIN participants who enrolled in 2016–17 who were omitted in the previous section. This decision was made to increase sample size and analytical power for the multivariate analysis, which was not necessary for the descriptive analysis in the previous section. Sensitivity checks using the 2015–16 data yielded comparable results. Third, the sample size varies across outcomes because

employment data pre- and post-enrollment was not available for all participants. Sample sizes by cohort and by college can be found in Appendix Table C-17.

Methodology

RTI used PSM, a quasi-experimental design, to limit the impact of selection bias on the estimation of outcomes by establishing a comparison group that was similar to the KanTRAIN cohort for a set of observed variables.¹⁴ PSM uses matching to correct for selection bias and allow estimation of causal differences in academic and employment outcomes that could be attributed to the KanTRAIN program. Selection bias was a factor because new student recruitment practices introduced during the TAACCCT grant may have attracted more qualified students with a higher likelihood of completing the program. As a result, differences in student outcomes may be the result of student characteristics rather than program quality. Descriptive statistics show that the historic cohort did not possess the same demographic and academic characteristics as participants in the KanTRAIN cohort, necessitating a matching weight to adjust for differences (Appendix Table C-18).

The KanTRAIN and historic cohorts were matched on a set of 21 academic and demographic variables. Overall, the matching was successful, as measured by 1) balance achieved on propensity scores across the matched historic cohort and the KanTRAIN cohort and 2) baseline equivalence on the standardized differences for the propensity score and all 21 covariates. The matching was conducted separately on a sample restricted to participants with post-employment data to be used for models predicting employment outcomes. Separate matching was completed for three restricted samples: participants with any credentials, participants with nondegree credentials, participants with post-enrollment wage data, and participants with pre- and post-enrollment wage data. Baseline equivalence standards were met on all or most covariates for all samples. For additional details on the propensity score matching process for all samples and for statistics related to balance, see Appendix D.

Next, RTI predicted the academic and employment outcomes using multivariate regression models that incorporated the matching weights and individuals with valid matches. Logistic regression was used in cases where the outcome was binary and ordinary least squares regression was used in cases where the outcome was continuous. All covariates used in the matching process and the propensity score were included as control variables in the models to account for residual bias not corrected for in the matching process.

¹⁴ Rosenbaum, Paul R., and Donald B. Rubin. 1985. "Constructing a Control Group Using Multivariate Matched Sampling Methods That Incorporate the Propensity Score." *The American Statistician* 39 (1): 33–38.

Impact Analysis Findings

This analysis compares the average academic and employment outcomes of the KanTRAIN cohort to the historic cohort and then uses multivariate analysis to predict the effect of KanTRAIN on outcomes using PSM to account for cohort differences. Table 4 displays the average values for each cohort and reports whether the values across cohorts are statistically different based on t-tests and chi-square tests. Table 5 displays the coefficients for the effect of being in the KanTRAIN cohort in models predicting individual outcomes. Each coefficient was calculated in a separate model. All models applied matching weights and included the propensity score and matching covariates as predictors; the sample is limited to the participants who have valid matches.

Academic outcomes

On all measures, the KanTRAIN cohort achieved better academic outcomes than the historic cohort. The KanTRAIN cohort earned 1.5 more credits per semester and passed a higher percentage of the credits attempted than the historic cohort (87 percent vs. 83 percent (Table 4). The same pattern existed for technical coursework: the KanTRAIN cohort earned 2.1 more technical credits per semester and had a higher pass rate for technical credits attempted compared with the historic cohort (91 percent vs. 88 percent). These differences in credit attainment and pass rates persisted in models comparing matched cohorts, suggesting that the improved achievement levels may be the result of KanTRAIN program participation (Table 4).

Compared with the historic cohort, the KanTRAIN cohort was more likely to have earned a credential of any type and to have earned a nondegree credential within two years of initial enrollment, even when comparing participants with similar characteristics. About 72 percent of the KanTRAIN cohort earned a nondegree credential, compared with 62 percent of the historic cohort. The proportion earning a college degree was similar across cohorts on average, with 11 percent of the KanTRAIN cohort and 9 percent of the historic cohort having earned a college degree. When comparing participants with similar characteristics, the KanTRAIN cohort was more likely to obtain a college degree than the historic cohort. The number of degrees and nondegree credentials attained did differ across cohorts, though the substantive differences in average number of degrees or nondegree credentials earned were less than one.

The KanTRAIN cohort also differs from the historic cohort in the types of nondegree credentials earned. Participants may earn short-term nondegree credentials in less than 16 credit hours or long-term nondegree credentials in 16 or more credit hours. On average, the KanTRAIN cohort was less likely to earn short-term nondegree credentials and more likely to earn long-term nondegree credentials, relative to the historic cohort. In both cohorts, short-term nondegree credentials are the most commonly earned credential. When similar

participants across cohorts are compared, results showed that the Kan'TRAIN cohort was just as likely to complete short-term nondegree credentials and more likely to complete long-term nondegree credentials.

Finally, the Kan'TRAIN cohort was more likely to obtain non-Kan'TRAIN credentials than the historic cohort (Table 4). These non-Kan'TRAIN credentials are certificates or degrees earned at non-Kan'TRAIN colleges during the enrollment period. Non-Kan'TRAIN credentials were not counted toward the other outcomes in this analysis (e.g., a participant who earned a credential at a non-Kan'TRAIN college but not at a Kan'TRAIN college was not marked as having earned a credential in this analysis). This measure was included to provide context for the proportion of participants who enrolled in multiple programs or colleges simultaneously; but the measure was excluded from the PSM analysis because it was not a focal outcome of interest.

Table 4. Average outcome values by cohort

	Historic cohort	KanTRAIN cohort	Significance
Academic outcomes			
Average course credits per semester	7.45	8.92	**
General credit pass rate	82.55%	86.90%	**
Average technical course credits per semester	6.24	8.33	**
Technical credit pass rate	88.08%	91.46%	**
Earned any type of credential	67.61%	76.46%	**
Average number of credentials ¹	1.47	1.64	**
Earned a nondegree credential	61.99%	71.75%	**
Average number of nondegree credentials ²	1.31	1.37	*
Earned a short-term nondegree credential ²	76.99%	64.32%	**
Earned a long-term nondegree credential ²	25.77%	43.08%	**
Earned a college degree	9.45%	11.13%	
Any non-KanTRAIN credentials while enrolled	7.63%	11.82%	**
Employment outcomes³			
<i>All participants with post-enrollment employment data</i>			
Worked in a job related to program of study	69.00%	70.65%	
Average quarterly wages	\$5,317.18	\$5,819.88	**
<i>All incumbent workers with post-enrollment employment data⁴</i>			
Worked in a job related to program of study	70.86%	69.57%	
Average quarterly wages	\$5,709.89	\$6,595.78	**
Any quarterly wage increase pre- to post-enrollment	87.23%	85.91%	
Percentage change in quarterly wages pre- to post-enrollment	758.40%	233.48%	**

$N = 4,617$

* $p < 0.01$; ** $p < 0.001$

Note: Employment outcomes are measured during the three quarters post-program exit for all participants.

All wages are adjusted for inflation and reported in 2017 dollars.

¹ Among participants who earned at least one credential ($N = 3,405$).

² Among participants who earned at least one nondegree credential ($N = 2,976$).

³ Among participants with post-enrollment employment data ($N = 2,729$).

⁴ Incumbent workers are defined as participants with pre-enrollment employment data ($N = 2,218$).

Source: Kansas Board of Regents.

Table 5. Effect of being in the KanTRAIN cohort, relative to the historic cohort, on outcomes: Multivariate models using propensity score matching

	Effect size (standard error)	Significance
Academic outcomes		
Average course credits per semester	1.50 (0.13)	**
General credit pass rate	0.05 (0.01)	**
Average technical course credits per semester	1.97 (0.14)	**
Technical credit pass rate	0.04 (0.01)	**
Earned any type of credential	0.07 (0.02)	**
Average number of credentials ¹	0.06 (0.02)	**
Earned a nondegree credential	0.03 (0.01)	*
Average number of nondegree credentials ²	0.21 (0.03)	**
Earned a short-term nondegree credential ²	-0.04 (0.02)	
Earned a long-term nondegree credentials ²	0.07 (0.02)	*
Earned a college degree	0.11 (0.03)	**
Employment outcomes³		
<i>All participants with post-enrollment employment data</i>		
Worked in a job related to program of study	-0.03 (0.03)	
Logged quarterly wages	0.03 (0.03)	
<i>All incumbent workers with post-enrollment employment data</i>		
Worked in a job related to program of study	-0.00 (0.03)	
Logged quarterly wages	0.03 (0.03)	
Any quarterly wage increase pre- to post-enrollment	0.06 (0.03)	*
Logged percentage change in quarterly wages pre- to post-enrollment	-0.02 (0.05)	

$N = 4,617$

* $p < 0.01$; *** $p < 0.001$

Note: Sample is restricted to participants with valid matches. Logistic regression was used to predict all binary outcomes, including earning any credential, earning a nondegree credential, earning a college degree, working in a job related to program of study, working multiple jobs, and receiving a wage increase. Ordinary least squares regression was used to predict all continuous outcomes including average credits and technical credits earned, general and technical credit pass rate, number of credentials earned, number of nondegree credentials earned, and quarterly wages. The log of wage is taken to transform the wage distribution into a normal distribution and the coefficient can be interpreted as the percentage change in wages. All models include propensity score and all matching covariates as predictors.

¹ Among participants who earned at least one credential ($N = 3,405$).

² Among participants who earned at least one nondegree credential ($N = 2,974$).

³ Among participants with post-enrollment employment data ($N = 2,728$).

⁴ Incumbent workers are defined as participants with pre-enrollment employment data ($N = 2,209$).

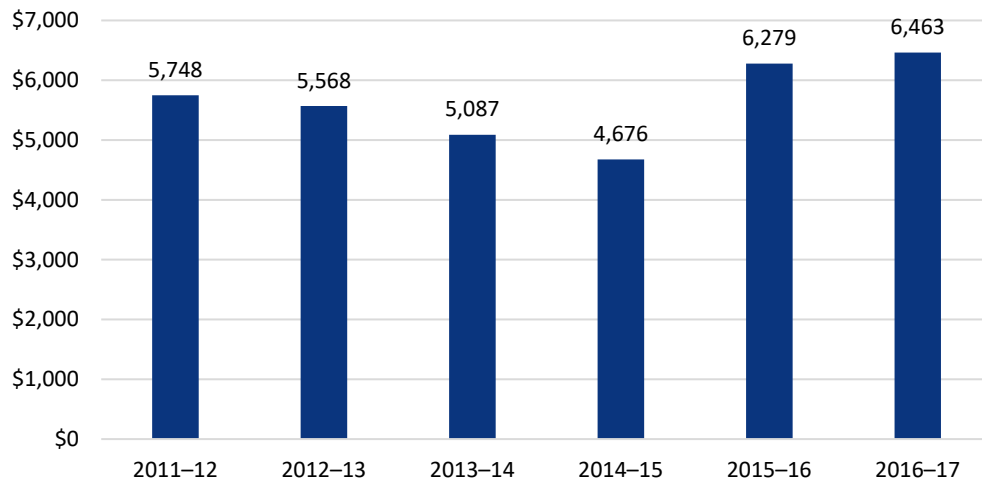
Source: Kansas Board of Regents.

Employment outcomes

Overall, the employment outcomes of the KanTRAIN cohort was similar or better compared with those of the historic cohort with similar characteristics. Among employed exiters, over two-thirds of all workers are in industries related to their programs of study; there is no difference across cohorts in this percentage. The pattern is similar for incumbent workers: the percentage of incumbent workers in training-related programs of study is around 70 percent for both cohorts.

The average KanTRAIN participant earned \$6,300 in quarterly wages during the first three quarters after program exit, while the average historic cohort worker earned \$5,300 in quarterly wages during this period.¹⁵ Figure 8 displays the average post-enrollment quarterly wages by academic year, revealing a jump in average wages of participants from before KanTRAIN implementation to after the start of KanTRAIN implementation. A similar pattern is present for incumbent workers. Among incumbent workers, average quarterly wages post-enrollment was higher for the KanTRAIN cohort (\$6,600) relative to the historic cohort (\$5,700).

Figure 8. Quarterly wages for program participants after program exit, by academic year of initial enrollment



$N = 2,218$

Note: Sample includes all participants who initially enrolled between fall 2011 and spring 2017, who exited the program, and who have post-enrollment data. KanTRAIN began at the start of the 2015-16 academic year. All wages are adjusted for inflation and reported in 2017 dollars.

Source: Kansas Board of Regents.

Though average wages differed across cohorts, these differences became obsolete in comparisons of participants with similar characteristics across cohorts. Being a KanTRAIN

¹⁵ All wages are adjusted for inflation and reported in 2017 dollars.

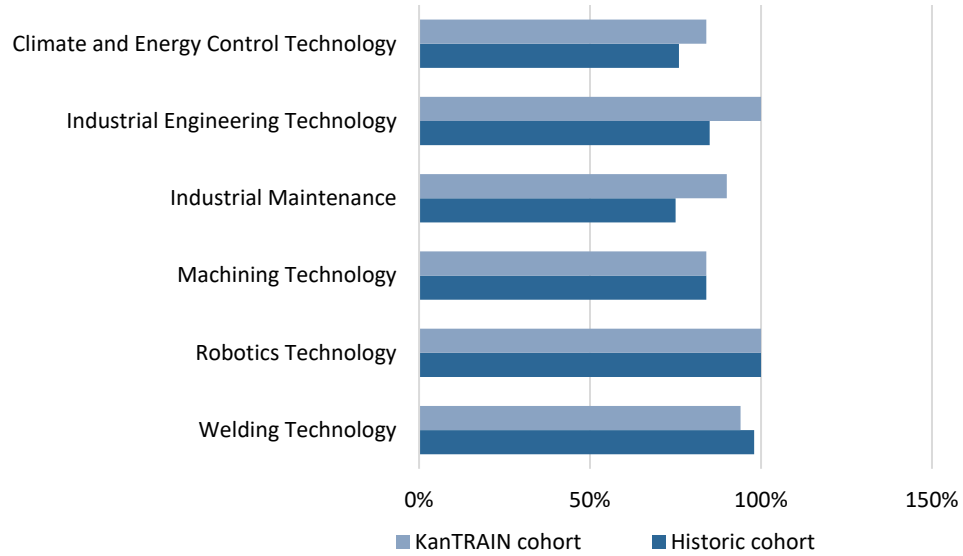
participant increased quarterly wages after program enrollment by 3 percent; among incumbents, being a KanTRAIN participant also increased quarterly wages by 3 percent. Neither of these increases were statistically significant, meaning they should not be interpreted as differences in wages across cohorts.

Findings indicated a positive effect of KanTRAIN on the likelihood of a wage increase. Among incumbent workers, the percentage of exiters who received a wage increase was 86 percent for the KanTRAIN cohort and 87 percent for the historic cohort.¹⁶ While these average values were not significantly different, the models comparing similar participants across cohorts estimate that the odds of receiving a wage increase were 0.06 higher for participants in the KanTRAIN cohort than for participants in the historic cohort. In other words, all else equal, the likelihood of a wage increase went up by 6 percent for the KanTRAIN cohort relative to the historic cohort.

The percentage of exiters who received wage increases differed across programs. Figures 9 and 10 display the percentage of exiters in each program, in the KanTRAIN and historic cohorts, who received a wage increase. The percentage of exiters receiving wage increases was equal to or higher for the KanTRAIN cohort in 12 programs across advanced manufacturing and health care. All exiters of two programs received wage increases in the historic cohort, while all exiters of five programs received wage increases in the KanTRAIN cohort.

¹⁶ The percentage of KanTRAIN exiters who received a wage increase is higher in this estimation than in the previous section (86 percent vs. 83 percent) because the sample differs in two ways. First, the second estimation includes incumbents who enrolled in the 2015–16 and 2016–17 academic years, while the first estimation is limited to incumbents who enrolled in the 2015–16 academic year. Second, the second estimation excludes participants who did not have valid data on covariates used for the matching process ($n = 153$).

Figure 9. Percentage of advanced manufacturing program exiters who received a wage increase, by program of study and cohort

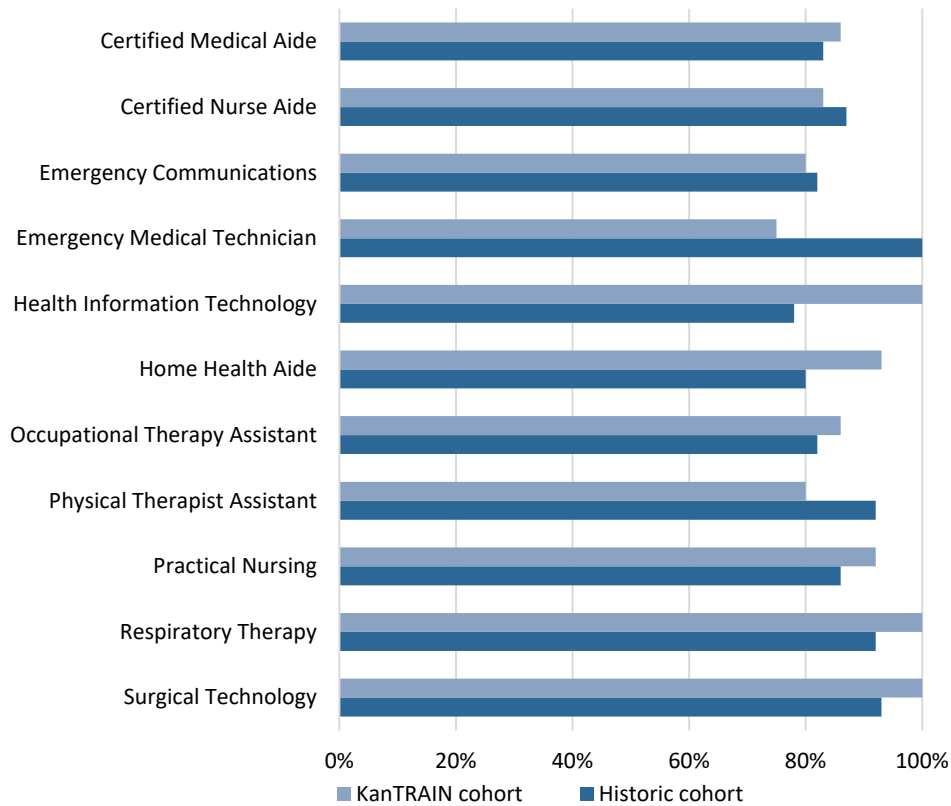


$N = 274$

Note: Sample includes all participants in each cohort who declared an advanced manufacturing program of study, who exited the program, and who have pre- and post-enrollment data.

Source: Kansas Board of Regents.

Figure 10. Percentage of health care program exiters who received a wage increase, by program of study and cohort



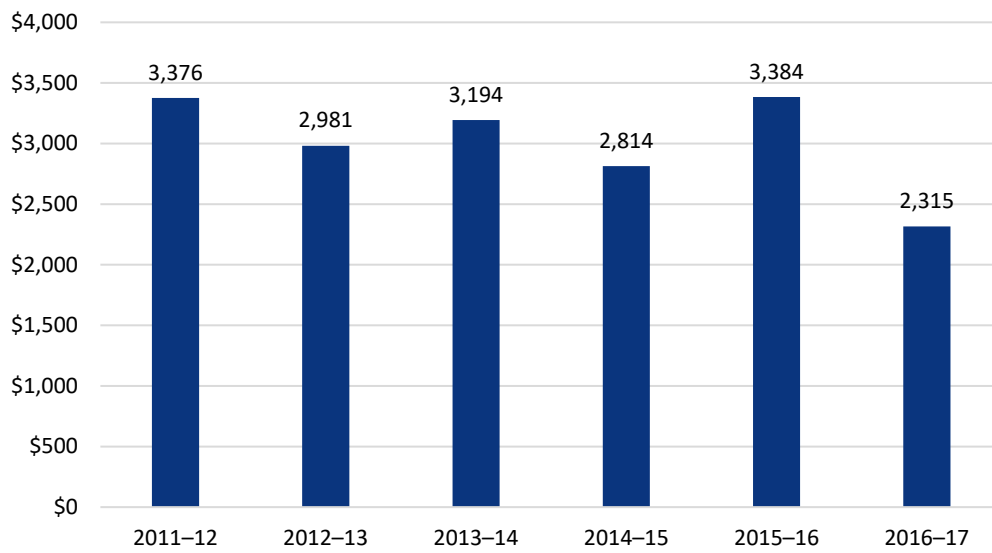
$N = 1,804$

Note: Sample includes all participants in each cohort who declared a health care program of study, who exited the program, and who have pre- and post-enrollment data. Excludes the Phlebotomy and Medical Billing and Coding programs because there were not exiters with pre- and post-enrollment data in both cohorts.

Source: Kansas Board of Regents.

Finally, the analysis revealed no significant differences in the magnitude of the wage change between the KanTRAIN and historic cohorts. This suggests that, while the KanTRAIN cohort is more likely to receive wage increases, the wage increases are no different in size from those received by the historic cohort. Figure 11 displays average wage changes for participants by initial academic year of enrollment. The magnitude of the average wage change rises and falls across academic years with no clear pattern. The smallest wage increase across all cohorts was observed for 2016–17 participants. One possible explanation is that high wage increases are related to program duration (e.g., the longer the program, the higher the wage increase), and the 2016–17 participants with post-enrollment data were all enrolled in shorter programs.

Figure 11. Average wage change for incumbent program exiters, by academic year



$N = 2,218$

Note: Sample includes all incumbent exiters who have post-enrollment wage data.

Source: Kansas Board of Regents.

One reason for the lack of significant differences in wage changes could be the variation in wage patterns across programs. While the KanTRAIN cohort earned larger wage increases than the historic cohort after exiting some programs, the cohort earned smaller wage increases after exiting others (Appendix C - Figures A and B). The KanTRAIN cohort received relatively larger increase in wages, compared with the historic cohort, in seven programs of study including Climate and Energy Control Technology, Robotics Technology, Certified Medication Aide, Practical Nursing, and Surgical Technology. The KanTRAIN cohort received a relatively smaller wage increase in 10 programs of study including Industrial Maintenance, Welding Technology, Emergency Medical Technician, Emergency Communications, and Physical Therapist Assistant.

Limitations

There were several limitations for this analysis. First, the employment data were incomplete for many participants. For example, 27 percent of the KanTRAIN cohort and 33 percent of the historic cohort were missing pre-enrollment wages, post-enrollment wages, or both in the KBOR data. RTI is unable to determine whether these individuals were unemployed, out of the labor force, or working in jobs outside of Kansas and the immediate geographic region during these time periods. The average quarterly wage estimates might be underestimated if participants are traveling farther to take higher paying jobs.

Second, post-enrollment data was only available up to three quarters after program exit. Data farther out from program completion may be needed to accurately measure KanTRAIN effects on employment outcomes. Most researchers examine the effects of certificates on earnings a minimum of five years after program completion. Following this example, RTI recommends reexamining employment outcomes of the KanTRAIN cohort at least five years after program exit.

Third, post-program exit data is only available for KanTRAIN participants who enrolled in the first two years of implementation. It is possible that the KanTRAIN effects increased over time as additional programmatic changes went into effect. RTI recommends comparing the outcomes of participants across implementation years to examine whether the effects on participants varied over time.

Finally, external economic and industry shifts over the implementation period were not accounted for in the analysis. Changes to the labor market supply, manufacturing industry, or health care industry may have impacted employment outcomes for the KanTRAIN and/or historic cohort. For example, an expanding health care labor market may have produced new or different employment opportunities for the KanTRAIN cohort that did not exist for the historic cohort.¹⁷ The impact of these external factors should be considered in the interpretation of the results.

¹⁷ Thompson, Derek. 2018. "Health Care Just Became the U.S.'s Largest Employer." *The Atlantic*. <https://www.theatlantic.com/business/archive/2018/01/health-care-america-jobs/550079>.

Outcomes Study Summary

The KanTRAIN cohort successfully accumulated credit hours, earned credentials for their skills, and found employment in higher paying jobs after program exit. Table 6 summarizes KanTRAIN participant academic and employment outcomes. After exiting the program, most participants became employed in training-related employment and earned higher wages relative to their jobs prior to program entry. There are differences in academic and employment outcomes across program of study and college, though they do not suggest that participants from one particular program or college are reaping greater benefits.

Compared with the historic cohort with similar characteristics, the KanTRAIN cohort achieved larger academic gains and similar employment outcomes. KanTRAIN participants earned more credit hours, more credentials overall, and more nondegree credentials than the historic cohort. The KanTRAIN cohort was also more likely to have received college degrees and long-term technical certificates. Among incumbents, the KanTRAIN cohort was more likely to receive a wage increase after program exit than the historic cohort. While there were differences in average values on other employment outcomes across cohorts, RTI found no measurable difference in training-related employment, wages, or wage increases between the KanTRAIN cohort and the historic cohort when comparing participants with similar characteristics across cohorts.

This outcomes study offers several key takeaways. First, the KanTRAIN cohort gained industry-relevant skills and credentials, and more so than the historic cohort. Most participants exited with a credential and, overall, the KanTRAIN cohort completed more credits and more credentials than the historic cohort. The increased student supports and offering of new certificate opportunities may have contributed to these improvements in program progress and credential counts. Another takeaway is that the KanTRAIN cohort is completing programs quicker than expected, which may relate to the implementation of new accelerated training options as part of KanTRAIN. A final takeaway is that, while wages do not differ from the wages of the historic cohort, the KanTRAIN cohort was more likely to see pay increases relative to pre-program wages, indicating a better pay-off to participation. In sum, these findings suggest the KanTRAIN cohort had positive academic and employment outcomes after program completion.

Table 6. Summary of KanTRAIN participant outcomes

Program progress	25 credit hours completed 87% of general credits passed and 93% of technical credits passed
Time to completion	14 months to program completion
Nondegree credentials	70% earned a nondegree credential 1.3 certificates earned among those with any nondegree credentials 43% earned a long-term nondegree credential (≥ 16 credit hours) 64% earned a short-term nondegree credential (< 16 credit hours)
College degrees	13% earned a college degree
Employment status	93% were employed 12% were enrolled in other programs two years after program entry
Employment field	69% were employed in program-related industries
Wages	\$6,341 average quarterly wages
Wage difference	83% received a wage increase +\$2,900 average net change in quarterly wages

Source: KanTRAIN program data collection and Kansas Board of Regents data.

Conclusions

As described in this evaluation report, the KanTRAIN sites implemented a mix of programmatic and instructional strategies, rather than a single intervention, that led to improved educational and employment outcomes for participants. This approach allowed for sites to be responsive to their local labor markets and to customize career pathways design and implementation to meet institutional and employer needs. Cross-site implementation activities centered on enhancing instructional programs and aligning them with labor market needs through equipment upgrades, simulated learning, employability skill instruction, stackable credentials, and student support services. KanTRAIN sites also leveraged strong employer partnerships and connections with their local workforce centers to provide targeted support to participants. These site-level strategies were supplemented by the grant management team's efforts to align grant activities with state-level initiatives to support employer and workforce system engagement, veterans' recruitment and outreach, and data integration as well as to sustain activities beyond the grant period.

As a result of these various strategies, KanTRAIN participants earned better academic and employment outcomes than prior participants. For example, KanTRAIN participants gained industry-relevant credentials, more so than past participants. Additionally, the majority of KanTRAIN participants became employed after exiting the program, with most entering industries related to their program of study. Finally, KanTRAIN participants were more likely to see pay increases relative to their pre-program wages than past participants. While these results cannot necessarily be attributed to a particular aspect of KanTRAIN, there are some connections between the programmatic changes and resulting participant outcomes, such as efforts by sites to offer increased opportunities to earn credentials and to tighten connections between program curricula and local industry needs to improve employment outcomes.

Future Directions for Research

While the initial educational and employment outcomes are positive for KanTRAIN participants, the impact analysis included in this report provides a partial assessment of the program's labor market effects. Future research will allow an examination of how participant outcomes vary by program length, location, field of study, and over varying times in the labor market. Additionally, the current analysis compares all KanTRAIN participants, and cannot distinguish outcomes by program completion status due to grant requirements and sample size limitations. It also only addresses the 9-month employment outcomes of

participants in programs with a duration of one year or less and excludes most 2-year program participants because the programs were implemented too recently for enough participants to have completed and entered the workforce. In the context of the grant work, this limitation means that employment data for participants in about two-thirds of KanTRAIN programs – including all programs at three of the five participating institutions – are incomplete in the impact study and outcomes for these programs cannot be analyzed separately. As more students complete KanTRAIN programs and enter the labor force, continued data collection and analysis will allow for a more in-depth understanding of how the programs benefit students and how benefits vary by program type, field, and location.

The KanTRAIN project is uniquely positioned to contribute to future research on career pathways given the availability and richness of data collected by the grant management team and KBOR. Table 7 summarizes the additional completer outcomes that it will be possible to examine as more data becomes available. In addition to the time-dependent outcomes highlighted in the table, more data would permit the KanTRAIN analysis to facilitate a better understanding of the impact of career pathway programs by student completion status and program characteristics.

Table 7. Potential outcome analyses for all KanTRAIN program of study completers through spring 2018, across data collection periods

KanTRAIN program length	Post-program outcomes	Through August 2018 (Current)	Through August 2019	Through August 2020	Through August 2021
Less than 1-year programs	Credential attainment	X	X	X	X
	Employment status, industry, and wages 6 months after completion	X	X	X	X
	Pre- and post-program wage differences (6 months after completion)	X	X	X	X
	Employment status, industry, and wages 1 year after completion	X	X	X	X
	Pre- and post-program (1 year after completion)	X	X	X	X
One-year programs	Credential attainment	X	X	X	X
	Employment status, industry, and wages 6 months after completion	X	X	X	X
	Pre- and post-program wage differences (6 months after completion)	X	X	X	X
	Employment status, industry, and wages 1 year after completion			X	X

KanTRAIN program length	Post-program outcomes	Through August 2018 (Current)	Through August 2019	Through August 2020	Through August 2021
	Pre- and post-program wage difference (1 year after completion)			X	X
Two-year programs	Credential attainment			X	X
	Employment status, industry, and wages 6 months after completion			X	X
	Pre- and post-program wage difference (6 months after completion)			X	X
	Employment status, industry, and wages 1 year after completion				X
	Pre- and post-program wage difference (1 year after completion)				X

Note: Program of study completer is defined as a KanTRAIN participant who completed a credential associated with a KanTRAIN program of study.

Appendix A: Evaluation Questions

Implementation Research Questions
<p>Questions required by the U.S. Department of Labor</p> <ul style="list-style-type: none"> • How was the particular curriculum selected, used, and/or created? • How were programs improved or expanded using grant funds? • What delivery methods were offered? • What was the program administrative structure? • What support services and other services are offered? • Are in-depth assessments of participants' abilities, skills, and interests conducted to select or enroll participants into the program? • What assessment tools and processes were used? <ul style="list-style-type: none"> • Who conducted the assessment? How were the assessment results used? • Were the assessment results useful in determining the appropriate program and course sequence for participants? • Was career guidance provided and, if so, through what methods? • What contributions did each of the partners 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? • What factors contributed to partners' involvement or lack of involvement in the program? • Which contributions from partners were most critical to the success of the grant program? • Which contributions from partners had less of an impact?
<p>Other research questions</p> <ul style="list-style-type: none"> • How successful was the project in recruiting the specific subgroups of participants, such as veterans, workers eligible for Trade Adjustment Assistance, and KANSASWORKS and Workforce Center referrals? • To what extent did the project meet the training and support service needs of participants enrolled in the program? • How did the KanTRAIN Connections Center support KanTRAIN program participants? • How effective were the enhancements made to technology-enabled offerings at improving student engagement? • How effective is the KanTRAIN Military Transitions Program in the development and awarding of institutional credits for military experience? <ul style="list-style-type: none"> • What relationship did such credits have on participants' retention and completion rates? • What workforce agency services was the KanTRAIN consortium able to leverage for the grant, and what role did these services play in participants' program experiences? • What was the extent of employer engagement in program development and implementation? • To what extent has program implementation resulted in systemic changes that can be sustained and expanded once grant funding ends? • How did changes in context and environment in which the institutions operate, such as policy changes or changes in economic conditions and employment rates, influence project outcomes?

Implementation Research Questions

- How did the differences in the institutions' local context impact their implementation of the KanTRAIN program and their participants' outcomes?

Impact (summative) analysis

- What is the effect of KanTRAIN on participants' attainment of key U.S. Department of Labor outcomes (program persistence, program credentials earned, enrollment in further education, employment, employment in field of training, employment retention, and wage increases)?
- To what extent do KanTRAIN participants' outcomes vary by institution and program? What programmatic features might have contributed to observed differences?
- To what extent has the TAACCCT IV program contributed to the development of a statewide system for workforce development that reflects industry needs?

Appendix B: Evaluation Surveys

Employer Survey

Methods

In December 2016, an RTI survey methodologist drafted a survey to collect data from employer partners of KanTRAIN programs. It was designed to capture employers' involvement with KanTRAIN programs and campuses, hiring needs and priorities, and level of satisfaction with any employees hired from KanTRAIN programs. RTI worked with the KanTRAIN grant leadership team to finalize the questions and the data collection instrument from August to October 2017. The KanTRAIN employer survey instrument included 21 questions (23 for WIT/WU because of additional questions regarding college-specific programs) and required eight minutes to complete. A copy of the survey is included at the end of this section.

Once the survey was finalized, the RTI evaluation team made a customized paper copy for each site for in-person administration during employer advisory board meetings. The survey was also programmed in SurveyGizmo, an online platform that enables users to create data collection instruments that can be securely completed using a computer or mobile device. The survey questions were mostly close-ended, with a few open-ended items included to capture qualitative information. Once programmed and drafted, RTI conducted multiple tests of the online and paper-based surveys, modeling response patterns for different types of respondents to ensure question text and logic accuracy as well as data collection instrument functionality and usability.

At the end of October 2017, RTI sent finalized paper copies of the KanTRAIN employer survey to KanTRAIN grant management who disseminated the survey, along with administration instructions, to the site coordinators at all four KanTRAIN colleges. Site coordinators administered paper copies of the employer survey at advisory board meetings that took place during October and November 2017. Site coordinators then sent paper-based survey responses back to RTI using a pre-paid FedEx label. A link to the online version of the survey was disseminated in November 2017.

Data collection lasted from October 2017 until January 2018. No incentive was offered to employer respondents. A questionnaire was considered final if it had more than 50 percent of the questions completed. RTI received a total of 49 completed surveys, with 34 responses from employers identified as partners of WIT/WU, 10 from WSU Tech, 4 from FHTC, and 1 from GCCC.

Questionnaire

KanTRAIN Employer Survey Fall/Winter 2017

RTI International

Introduction

Survey purpose: We are contacting employers who have collaborated with representatives of Kansas community and technical colleges—Flint Hills Technical College, Garden City Community College, Washburn Institute of Technology/Washburn University, Wichita Area Technical College—currently participating in the KanTRAIN grant program. We are asking employers to complete this questionnaire to gather information on the level of input employers may have into these college programs, and their experiences with the applicants and workers hired from these programs. The survey is voluntary, and your answers will provide important feedback that will help the colleges and the programs learn what is going well and where things may need to improve.

The survey is easy: Answering the survey takes about 10 minutes and can be done on a laptop, desktop, or mobile device. If you do not want to answer a particular question, click the “Next” button at the bottom of a page. To return to a previous page, click the “Back” button.

Confidentiality: The survey is being conducted and data analyzed by an independent evaluator, RTI International. RTI keeps your responses anonymous and stores any identifying information separately from your answers. RTI presents data to the colleges in summary report format only.

Contact: If you have any questions about the survey or your participation, please email or call Jeanne Snodgrass at snodgrass@rti.org or 503-428-5681.

First, please answer these questions regarding your company.

1. What is the name of your company? This information will only be used to indicate that you have completed an interview. Your company name will not be associated with your answers.

2. What type of business is your company?

- Agriculture, Foods, Natural Resources
- Architecture
- Construction
- Facilities SPECIFY TYPE [_____]
- Government
- Health care SPECIFY TYPE [_____]

- HVAC
 - Manufacturing SPECIFY TYPE [_____]
 - Recycling
 - Service SPECIFY TYPE [_____]
 - Transportation
 - Weatherization and Energy
 - Other SPECIFY [_____]
3. Overall, how many people does your company currently employ (including yourself)?
- 1-4
 - 5-9
 - 10-19
 - 20-49
 - 50-99
 - 100-249
 - 250+
- 3a. How many people does your company currently employ **in Kansas**?
- 1-4
 - 5-9
 - 10-19
 - 20-49
 - 50-99
 - 100-249
 - 250+

This next section includes questions about your level of involvement with Kansas colleges.

4. Do you collaborate with a Kansas community or technical college in any capacity? Examples include working or collaborating in the areas of program content, employee training, hiring needs, internships, apprenticeships, and other areas.
- Yes
 - No → **Go to Question 24**
5. Which college do you primarily work with?
- Flint Hills Technical College
 - Garden City Community College
 - Washburn Institute of Technology/Washburn University
 - Wichita Area Technical College
-

6. Which program(s) at [COLLEGE] do you work with? **Please choose all that apply.**

**WASHBURN INST. OF
TECHNOLOGY
WASHBURN UNIVERSITY**

- Certified Medication Aide
- Certified Nurse Aide
- Emergency Medical Technician
- Health Information Technology
- Home Health Aide
- Occupational Therapy
- Phlebotomy
- Physical Therapy
- Practical Nursing
- Respiratory Therapy
- Surgical Technology
- Other (Specify)_____

**FLINT HILLS TECHNICAL
COLLEGE GARDEN CITY CC
WICHITA AREA TECHNICAL
COLLEGE**

- Aerospace Coatings and Paint
 - Aerospace Manufacturing Technology
 - Climate and Energy Control
Technology
 - Emergency Communications
 - Industrial Automation Machine
Maintenance
 - Industrial Engineering Technology
 - Industrial Maintenance
 - Machining Technology
 - Robotics
 - Welding Technology
 - Other (Specify)_____
-

[Question wording for the rest of the questionnaire will differ dependent upon whether one program or more than one program was selected in Question 6]

7. Are you a member of an advisory committee for [this program/any of these programs]?
- Yes
 - No
8. In what year did you or your organization first start collaborating with [COLLEGE]?
- _____ YYYY
9. As part of your collaboration with the college, how often do you communicate with any of your contacts at [COLLEGE]?
- Once a week
 - Twice a month
 - Once a month
 - A few times a year
 - Twice a year
 - Once a year
 - Other (Specify)_____
10. During the past year, in which of the following areas have you or your organization collaborated with [COLLEGE]? **Please choose all that apply.**
- Program content
 - Curriculum development
 - Employee training
 - Hiring needs
 - Internships
 - Apprenticeships
 - Equipment or space donations
 - Program funding
 - Career fairs
 - Classroom visits
 - Workplace visits by students
 - Other (Specify)_____
11. [If the company has collaborated with [COLLEGE] for 1 one year or more (from Question 8)] Since [YEAR FROM QUESTION 8], has your collaboration with [COLLEGE] changed in any way? (For example, the frequency of contacts or new areas of collaboration)
- Yes → 11a. In what ways? _____
 - No
12. During the past year, has your company hired anyone from the [[PROGRAM] program/[FILL PROGRAMS] programs] at [COLLEGE]?
- Yes
 - No
-

13. [If Question 12 = Yes] Does your company work with [COLLEGE] on hiring needs before or after those needs arise?

- Before
- After
- Both

14. Please list any hiring needs that your company currently has that you are finding it difficult to fill.

15. Do you feel your company has benefitted from its collaboration with [COLLEGE] during the past year?

- Yes → 15a. In what ways? _____
- No

16. Has your company sent any of its current employees to [COLLEGE] for training?

- Yes
- No

17. [If Question 16 = Yes] Which program or programs at [COLLEGE] has your company sent current employees to for training? **Please choose all that apply.**

- Aerospace Coatings and Paint
 - Aerospace Manufacturing Technology
 - Certified Medication Aide
 - Certified Nurse Aide
 - Climate and Energy Control Technology
 - Emergency Communications
 - Emergency Medical Technician
 - Health Information Technology
 - Home Health Aide
 - Industrial Automation Machine Maintenance
 - Industrial Engineering Technology
 - Industrial Maintenance
 - Machining Technology
 - Occupational Therapy
 - Phlebotomy
 - Physical Therapy
 - Practical Nursing
 - Respiratory Therapy
 - Robotics
 - Surgical Technology
 - Welding Technology
 - Other (Specify) _____
 - None
-

[If Question 5 = Washburn, continue. Else, go to Question 20]

18. Are you aware that [COLLEGE] incorporates TeamSTEPPS into its programs?
- Yes
- No → Go to Question 20.
19. How important is it for your workers to have the TeamSTEPPS certificate?
- Very important
- Somewhat important
- Somewhat unimportant
- Not important at all
- I am not familiar with the TeamSTEPPS certificate
20. How many individuals from the [[PROGRAM] program/[PROGRAMS] programs] at [COLLEGE] currently work for your company? Include both full time and part time workers. If you are not sure, please give us your best guess.
- Full time workers [__]
- Part time workers [__]
21. What is the typical job title of a new hire from the [[PROGRAM] program/[PROGRAMS] programs] at [COLLEGE]? _____
22. What is the typical starting salary of a new hire from the [[PROGRAM] program/[PROGRAMS] programs] at [COLLEGE]? \$_____.
- PER HOUR
- PER MONTH
- PER YEAR

Finally, please answer the following questions about the [[PROGRAM] program/[PROGRAMS] programs] at [COLLEGE] based on your knowledge of your company's employees who were trained in [that program/those programs].

23. [This program provides/These programs provide] workers...	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
...who are ready to work on day one.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...who have the specific technical skills to perform necessary activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...who show up for work on time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...who demonstrate the ability to work well within a team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...who can communicate clearly orally (in comparison to other applicants).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...who can communicate clearly in writing (in comparison to other applicants).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...who show career advancement potential (in comparison to other applicants).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. The last few questions are about the Kansas Board of Regents' Employer Engagement Initiative. Please read the below description of this initiative and answer the following questions.

The Kansas Board of Regents Employer Engagement Initiative recognizes business and industry for partnerships with education. The initiative provides a platform for community colleges and technical colleges to recognize key employers for contributions to the system, institution, program, and students.

Colleges nominate employers at one of three levels (Supporter, Partner, and Champion). Each level carries a different distinction, as well as different levels of contribution to a program by the employer. Once an employer is nominated, the Kansas Board of Regents, in cooperation with the Kansas Department of Commerce, provides an award that recognizes the employer and the institution for their collaborative efforts. (From

http://www.kansasregents.org/resources/PDF/HANDOUT_KansasBoardofRegents_EEI_January2017.pdf)

Are you aware of the Kansas Board of Regents' Employer Engagement Initiative?

- Yes
- No → Go to Thank you screen.

24a. Has your company been recognized by your community or [COLLEGE] as part of the initiative?

- Yes
- We have been nominated for recognition → Go to Thank you screen
- No → Go to Thank you screen.

24b. What level of recognition did your company receive?

- Champion
- Partner
- Supporter
- Don't know

25. What benefits, if any, have you seen from this recognition? If none, enter 'None'.

Thank you for taking the time to answer this questionnaire.

If you have any further comments or have a suggestion of a way to improve the PROGRAM] program/[PROGRAMS] programs] at [COLLEGE], please let us know here.

Click **Submit** when you are finished with the questionnaire.

Faculty Interview Protocol

Methods

In December 2016, an RTI survey methodologist drafted a survey to collect data from program instructors. The survey was designed to capture their experiences with the KanTRAIN grant, including instructional changes that stemmed from the grant and faculty collaboration across KanTRAIN colleges. RTI worked with the KanTRAIN grant leadership team to finalize the questions and the data collection instrument through spring 2018 and administered it during in-person faculty interviews. The KanTRAIN employer survey instrument included 11 questions and was completed by 15 instructors during the final evaluation site visit in April 2018.

Questionnaire

KANTRAIN FACULTY SURVEY WINTER 2018

INTRODUCTION

All faculty in KanTRAIN programs at four community and technical colleges in Kansas are being asked to answer a few questions that will provide important feedback on how well KanTRAIN is going and where improvements may be needed.

These questions are about your experiences with your college and your program. Your participation is voluntary. If you do not wish to answer a particular question, just let me know, and we will proceed to the next question.

This data is collected and analyzed by an independent evaluator, RTI international. RTI keeps your responses anonymous and presents data to the colleges in summary report format only.

If you have any questions about these questions or your participation, please call or email Jeanne Snodgrass at snodgrass@rti.org or 503-428-5681.

1. Which college are you a faculty member of?
2. Which program you are a faculty member of?

1. COLLEGE	2. PROGRAM
<input type="checkbox"/> Flint Hills Technical College	<input type="checkbox"/> Industrial Engineering Technology
	<input type="checkbox"/> Welding Technology
	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Garden City Community College	<input type="checkbox"/> Industrial Maintenance
	<input type="checkbox"/> Welding Technology
	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Washburn Institute of Technology	<input type="checkbox"/> Certified Nurse Aide
	<input type="checkbox"/> Emergency Communications
	<input type="checkbox"/> Emergency Medical Technician
	<input type="checkbox"/> Home Health Aide
	<input type="checkbox"/> Phlebotomy
	<input type="checkbox"/> Practical Nursing
	<input type="checkbox"/> Surgical Technology
	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Washburn University School of Applied Studies	<input type="checkbox"/> Health Information Technology
	<input type="checkbox"/> Occupational Therapy
	<input type="checkbox"/> Physical Therapy
	<input type="checkbox"/> Respiratory Therapy
	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Wichita Area Technical College	<input type="checkbox"/> Climate and Energy Control Technology
	<input type="checkbox"/> Industrial Automation Machine Maintenance
	<input type="checkbox"/> Machining Technology
	<input type="checkbox"/> Robotics
	<input type="checkbox"/> Welding Technology
	<input type="checkbox"/> Other (SPECIFY).

3. Were you hired before or after July 1, 2015?
 - Before
 - After

4. **As a result of KanTRAIN**, which of the following changes to your courses or program have you experienced? **Choose all that apply.**

- I have new faculty colleagues that have been hired during KanTRAIN
- I am teaching newly created courses
- I am teaching courses that have been revised
- I am teaching courses that have new vendor-provided content
- My program offers students new industry-recognized certifications
- I have participated in professional development workshops or training
- I have earned new industry-recognized credentials and/or certifications
- My courses use new equipment purchased through KanTRAIN
- The facilities in which I teach have been renovated
- None of the above

**IF QUESTION 4 INCLUDES “I have participated in professional development workshops or training” AS AN ANSWER, CONTINUE TO QUESTION 5.
IF NOT, SKIP TO BOX F2 BELOW QUESTION 5.**

5. What additional training have you received that was paid for with KanTRAIN funds?

**IF QUESTION 4 INCLUDES “I have earned new industry-recognized credentials and/or certifications” AS AN ANSWER, CONTINUE TO QUESTION 6.
IF NOT, SKIP TO QUESTION 7 ON THE NEXT PAGE.**

6. What new industry-recognized credentials and/or additional certifications have you received?

7. What else has changed about your program since KanTRAIN was implemented?

8. Please indicate how much you agree or disagree with each of the following statements.

Since my involvement with KanTRAIN began...	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
...my program is more responsive to the interests and needs of industry.					
...my program is more up-to-date and better reflects current industry standards.					
...I have expanded the number of contacts I have with industry partners in my area.					
...I have stronger relationships with my program's industry partners.					
...I have stronger relationships with faculty at other colleges.					
...my students have more opportunities to develop their skills through hands-on training.					
...my students are better prepared to work in industry.					
...enrollments in my classes have increased.					
...my job entails more student recruiting.					
....my job entails more industry outreach.					

9. Have you worked with faculty at other KanTRAIN colleges?
- Yes
- No → **GO TO QUESTION 11**
10. In what ways have you worked with faculty at other Kansas colleges as part of KanTRAIN?
- Check all that apply**
- Worked with them to develop curricula
- Provided guidance in developing a course or program
- Shared curricula or other course content
- Had faculty from a KanTRAIN program at another college teach in your program
- You have taught at another college's KanTRAIN program
11. Please answer Yes or No to each of the following.

Have you collaborated with your college's KanTRAIN Site Coordinator and/or Case Manager to...	Yes	No
...recruit students?		
...provide students help with financial aid?		
...help students with job applications?		
...connect students to employers?		
...develop or implement an apprenticeship program?		
...develop open educational resources (OER)?		

Appendix C: KanTRAIN Outcome Data Tables and Figures

Table C-1. Definitions of impact analysis outcome measures

Outcome area	Measure	Details
Program progress	Number of credits earned	Total count of all credits earned.
	Number of technical credits earned	Total count of all credits earned in technical courses.
	Proportion of credits passed	Number of credits earned divided by the number of credits attempted.
	Proportion of technical credits passed	Number of technical credits earned divided by the number of technical credits attempted.
Time to completion	Number of months a participant is enrolled in the program of study until program completion	Total count of months between month of program completion and month of program entry.
Nondegree credentials	Earned any nondegree credentials	Earned a nondegree credential during KanTRAIN program enrollment and reported through a KanTRAIN institution. This includes industry-recognized credentials, occupational licenses, and education certificates. Due to a time lag in reporting of certificate attainment, certificates earned at the KanTRAIN institution up to one year after program completion are counted toward earning a certificate.
	Number of nondegree credentials earned	Total count of nondegree credentials earned during KanTRAIN program enrollment and reported through a KanTRAIN institution. This includes industry-recognized credentials, occupational licenses, and education certificates. Due to a time lag in reporting of nondegree credential attainment, certificates earned at the KanTRAIN institution up to one year after program completion are counted toward certificate total.
College degrees	Earned any college degrees	Earned any associate, bachelor's and advanced degrees.

Outcome area	Measure	Details
Employment status	Employed two years after program entry	Among program exiters. Participants may be enrolled and employed at the same time.
	Continued enrollment two years after entry	Among all program participants. Participants may be enrolled and employed at the same time.
Employment field	Employed in an industry related to the participant's program of study	KanTRAIN leadership mapped the CIP code for each KanTRAIN program onto NAICS codes to determine training-related employment. KanTRAIN leadership examined the CIP codes associated with each NAICS code on O*NET to determine matches where possible. When no match was identified through O*NET, some codes were matched by hand. If a participant is employed in multiple jobs in a quarter, that participant is labeled as working in a related job in that quarter if any of the jobs are in an industry related to the program of study. Among participants who exited their program of study and have at least two quarters of post-enrollment employment data.
Wages	Quarterly wages post-program exit	Average quarterly wages during the first three quarters after program exit. A quarterly wage represents the sum of wages from all jobs held in that quarter. Among participants who exited their program of study and have at least two quarters of post-enrollment wage data. Inflation-adjusted to 2017 dollars.
Wage difference	Absolute change in quarterly wages from pre- to post-program enrollment	Difference in quarterly wages between average quarterly wages during the three quarters pre-program entry and average quarterly wages during the three quarters post-program exit. Among participants with employment data pre- and post-enrollment who exited their program of study and have at least two quarters of post-enrollment wage data. Amounts are inflation-adjusted to 2017 dollars before the difference is taken.
	Wage increase	Positive difference in quarterly wages between average quarterly wages during the three quarters pre-program entry and average quarterly wages during the three quarters post-program exit. Among participants with employment data pre- and post-enrollment who exited their program of study and have at least two quarters of post-enrollment wage data.

Table C-2. Number of participants entering KanTRAIN programs in each semester

Program	Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
Flint Hills Technical College	32	14	26	12	35	0
Industrial Engineering Technology	5	12	9	4	16	0
Welding Technology	27	2	17	8	19	0
Garden City Community College	27	28	21	31	26	26
Industrial Maintenance	-	-	-	17	-	3
Welding Technology	27	28	21	14	26	23
Washburn Institute of Technology	257	238	182	178	161	134
Certified Medication Aide	11	9	9	14	11	16
Certified Nurse Aide	97	90	71	53	48	32
Emergency Communications	-	-	5	-	6	4
Emergency Medical Technician	18	43	25	61	26	37
Home Health Aide	-	-	2	-	-	2
Medical Billing/Coding	-	-	9	7	5	7
Phlebotomy	-	19	22	25	17	17
Practical Nursing	120	76	31	18	35	19
Surgical Technology	11	1	8	-	13	-
Washburn University	59	0	76	25	49	0
Health Information Technology	-	-	10	-	8	-
Occupational Therapy Assistant	20	-	25	25	-	-
Physical Therapist Assistant	24	-	24	-	23	-
Respiratory Therapy	15	-	17	-	18	-
Wichita State University Campus of Applied Sciences and Technology	36	58	134	86	156	60
Climate and Energy Control Technology	36	14	20	23	25	-
Industrial Automation and Machine Maintenance	-	11	19	3	12	9
Machining Technology	-	-	48	35	80	51
Robotics Technology	-	1	11	1	10	-
Welding Technology	-	32	36	24	29	-
Total	411	338	439	332	427	220

Note: A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-3. Number of participants who were incumbent workers entering KanTRAIN programs in each semester

Program	Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
Flint Hills Technical College	24	9	19	9	28	0
Industrial Engineering Technology	5	7	6	3	15	0
Welding Technology	19	2	13	6	13	0
Garden City Community College	23	20	14	26	18	23
Industrial Maintenance	-	-	-	17	-	3
Welding Technology	23	20	14	9	18	20
Washburn Institute of Technology	188	160	124	122	123	110
Certified Medical Aide	9	7	8	12	7	11
Certified Nurse Aide	55	51	44	27	29	22
Emergency Communications	-	-	5	-	3	3
Emergency Medical Technician	15	30	17	46	24	35
Home Health Aide	-	-	2	-	-	1
Medical Billing/Coding	-	-	6	4	3	7
Phlebotomy	-	11	15	19	11	13
Practical Nursing	101	60	21	14	35	18
Surgical Technology	8	1	6	-	11	-
Washburn University	41	0	58	20	39	0
Health Information Technology	-	-	7	-	7	-
Occupational Therapy Assistant	12	-	18	20	-	-
Physical Therapist Assistant	18	-	21	-	17	-
Respiratory Therapy	11	-	12	-	15	-
Wichita State University Campus of Applied Sciences and Technology	20	37	87	45	92	32
Climate and Energy Control Technology	20	6	15	12	17	-
Industrial Automation and Machine Maintenance	-	9	14	1	8	8
Machining Technology	-	-	27	20	43	24
Robotics Technology	-	-	9	0	3	-
Welding Technology	-	22	22	12	21	-
Total	296	226	302	222	300	165

Note: A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-4. Number of participants who were not employed entering KanTRAIN programs in each semester

Program	Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
Flint Hills Technical College	8	5	7	3	7	0
Industrial Engineering Technology	-	5	3	1	1	0
Welding Technology	8	0	4	2	6	0
Garden City Community College	4	8	7	5	8	3
Industrial Maintenance	-	-	0	-	-	0
Welding Technology	4	8	7	5	8	3
Washburn Institute of Technology	69	78	58	56	38	24
Certified Medication Aide	2	2	1	2	4	5
Certified Nurse Aide	42	39	27	26	19	10
Emergency Communications	-	-	0	-	3	1
Emergency Medical Technician	3	13	8	15	2	2
Home Health Aide	-	0	-	-	-	1
Medical Billing/Coding	-	-	3	3	2	0
Phlebotomy	-	8	7	6	6	4
Practical Nursing	19	16	10	4	-	1
Surgical Technology	3	0	2	-	2	-
Washburn University	18	0	18	5	10	0
Health Information Technology	-	-	3	-	1	-
Occupational Therapy Assistant	8	-	7	5	-	-
Physical Therapist Assistant	6	-	3	-	6	-
Respiratory Therapy	4	-	5	-	3	-
Wichita State University Campus of Applied Sciences and Technology	16	21	47	41	64	28
Climate and Energy Control Technology	16	8	5	11	8	-
Industrial Automation and Machine Maintenance	-	2	5	2	4	1
Machining Technology	-	-	21	15	37	27
Robotics Technology	-	1	2	1	7	-
Welding Technology	-	10	14	12	8	-
Total	115	112	137	110	127	55

Note: A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-5. Demographic characteristics of KanTRAIN participants who entered their program in 2015–16, overall and by college

	All		By college									
			FHTC		GCCC		WSU Tech		WIT		WU	
	#	% of enrollees	#	% of enrollees	#	% of enrollees	#	% of enrollees	#	% of enrollees	#	% of enrollees
Female	455	60.75	0	-	2	3.64	0	-	406	82.02	47	79.66
<i>Race/Ethnicity</i>												
White, non-Hispanic	520	76.09	35	76.09	17	30.91	68	72.34	350	70.71	50	84.75
Hispanic	128	17.09	10	21.74	29	52.73	19	20.21	65	13.13	5	8.27
Non-white, non-Hispanic	101	14.48	1	2.17	9	16.36	7	7.45	80	16.16	4	6.78
Eligible veterans	68	9.08	1	2.17	3	5.45	16	17.02	43	8.69	5	8.47
Pell Grant eligible	207	27.64	20	43.48	16	29.09	37	39.36	112	22.63	22	37.29
Trade Adjustment Assistance eligible	2	0.27	0	-	0	-	2	2.13	0	-	0	-

N = 749

Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology; WIT = Washburn Institute of Technology; WU = Washburn University.

Source: KanTRAIN program data collection.

Table C-6. Average number of months to program exit for KanTRAIN program completers who entered their program in 2015–16 as of spring 2018, by incumbent status (standard deviations in parentheses)

Program	Expected duration	Incumbent workers	Nonworkers	All completers
Flint Hills Technical College				
Industrial Engineering Technology	2 years	6.00 (4.67)	4.40 (3.13)	5.53 (4.24)
Welding Technology	2 years	12.60 (5.80)	17.86 (6.99)	14.27 (6.53)
Garden City Community College				
Welding Technology	Less than a semester	3.75 (1.67)	3.50 (1.07)	3.69 (1.55)
Washburn Institute of Technology				
Certified Medication Aide	Less than a semester	6.00 (5.20)	4.00 (0.00)	5.57 (4.64)
Certified Nurse Aide	Less than a semester	3.35 (4.00)	2.94 (4.28)	3.16 (4.12)
Emergency Medical Technician	Semester	3.72 (0.70)	3.75 (0.71)	3.72 (0.69)
Phlebotomy	Semester	4.67 (4.36)	3.00 (1.15)	4.15 (3.69)
Practical Nursing	1 year	9.85 (6.21)	10.36 (6.65)	9.94 (6.27)
Surgical Technology	1 year	9.78 (2.33)	9.00 (0.00)	9.70 (2.21)
Washburn University				
Occupational Therapy Assistant	2 years	21.00 (0.00)	21.75 (1.50)	21.33 (1.00)
Physical Therapist Assistant	2 years	21.00 (0.00)	21.00 (0.00)	21.00 (0.00)
Respiratory Therapy	2 years	21.00 (0.00)	21.00 (0.00)	21.00 (0.00)
Wichita State University Campus of Applied Sciences and Technology				
Climate and Energy Control Technology	2 years	13.86 (6.80)	13.32 (4.98)	13.58 (5.87)
Industrial Automation and Machine Maintenance	2 years	10.14 (7.40)	2.00 (0.00)	9.13 (7.43)
Welding Technology	2 years	10.75 (6.62)	7.86 (5.40)	9.68 (6.21)
Total	-	8.37 (6.96)	7.48 (7.25)	8.09 (7.06)

$N = 749$

Note: Excludes completers who are still enrolled or who are missing a date of exit. Programs are excluded from the table if there were no 2015–16 participants who completed the program and who were no longer enrolled as of spring 2018.

Source: KanTRAIN program data collection.

Table C-7. Percentage of KanTRAIN participants who earned any college degrees or nondegree credentials as of spring 2018, by initial enrollment semester

Program	Fall 2015	Spring 2016
Flint Hills Technical College		
Industrial Engineering Technology	100%	100%
Welding Technology	78%	100%
Garden City Community College		
Industrial Maintenance	-	-
Welding Technology	74%	71%
Washburn Institute of Technology		
Certified Medication Aide	100%	100%
Certified Nurse Aide	98%	98%
Emergency Communications	-	-
Emergency Medical Technician	94%	86%
Home Health Aide	-	-
Medical Billing/Coding	-	-
Phlebotomy	-	79%
Practical Nursing	76%	66%
Surgical Technology	82%	100%
Washburn University		
Health Information Technology	-	-
Occupational Therapy Assistant	75%	-
Physical Therapist Assistant	100%	-
Respiratory Therapy	80%	-
Wichita State University Campus of Applied Sciences and Technology		
Climate and Energy Control Technology	89%	100%
Industrial Automation and Machine Maintenance	-	100%
Machining Technology	-	-
Robotics Technology	-	100%
Welding Technology	-	72%
<i>Percentage of Cohort</i>	<i>86%</i>	<i>84%</i>

$N = 635$

Note: A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-8. Percentage of KanTRAIN participants enrolling who earned one or more nondegree credentials as of spring 2018, by initial enrollment semester

Program	Fall 2015	Spring 2016
Flint Hills Technical College		
Industrial Engineering Technology	100%	100%
Welding Technology	78%	100%
Garden City Community College		
Industrial Maintenance	-	-
Welding Technology	74%	71%
Washburn Institute of Technology		
Certified Medication Aide	100%	100%
Certified Nurse Aide	98%	98%
Emergency Communications	-	-
Emergency Medical Technician	94%	86%
Home Health Aide	-	100%
Medical Billing/Coding	-	-
Phlebotomy	-	79%
Practical Nursing	76%	66%
Surgical Technology	82%	100%
Washburn University		
Health Information Technology	-	-
Occupational Therapy Assistant	40%	-
Physical Therapist Assistant	0%	-
Respiratory Therapy	20%	-
Wichita State University Campus of Applied Sciences and Technology		
Climate and Energy Control Technology	89%	100%
Industrial Automation and Machine Maintenance	-	100%
Machining Technology	-	-
Robotics Technology	-	100%
Welding Technology	-	72%
<i>Percentage of Cohort</i>	<i>76%</i>	<i>84%</i>

$N = 595$

Note: A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-9. Percentage of KanTRAIN participants who earned a college degree as of spring 2018, by initial enrollment semester

Program	Fall 2015	Spring 2016
Flint Hills Technical College		
Industrial Engineering Technology	80%	83%
Welding Technology	7%	0%
Garden City Community College		
Industrial Maintenance	-	-
Welding Technology	22%	0%
Washburn Institute of Technology		
Certified Medication Aide	0%	0%
Certified Nurse Aide	0%	0%
Emergency Communications	-	-
Emergency Medical Technician	0%	0%
Home Health Aide	-	0%
Medical Billing/Coding	-	-
Phlebotomy	-	0%
Practical Nursing	0%	0%
Surgical Technology	0%	0%
Washburn University		
Health Information Technology	-	-
Occupational Therapy Assistant	75%	-
Physical Therapist Assistant	100%	-
Respiratory Therapy	80%	-
Wichita State University Campus of Applied Sciences and Technology		
Climate and Energy Control Technology	22%	7%
Industrial Automation and Machine Maintenance	-	36%
Machining Technology	-	-
Robotics Technology	-	50%
Welding Technology	-	13%
<i>Percentage of Cohort</i>	<i>17%</i>	<i>6%</i>

$N = 90$

Note: A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-10. Average number of credit hours earned among KanTRAIN exiters who started the program during the 2015–16 academic year, by college degree receipt and overall

Program	Average number of credit hours attained		
	Exited with a college degree	Exited without a college degree	All exiters
Flint Hills Technical College			
Industrial Engineering Technology	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
Welding Technology	46.00 (26.87)	34.09 (15.30)	35.13 (16.04)
Garden City Community College			
Industrial Maintenance	-	-	-
Welding Technology	34.67 (9.81)	27.56 (16.48)	28.63 (15.77)
Washburn Institute of Technology			
Certified Medication Aide*	-	6.85 (8.27)	6.85 (8.27)
Certified Nurse Aide*	-	9.06 (10.29)	9.06 (10.29)
Emergency Communications*	-	-	-
Emergency Medical Technician*	-	9.70 (4.31)	9.70 (4.31)
Home Health Aide*	-	-	-
Medical Billing/Coding*	n/a	n/a	n/a
Phlebotomy*	-	11.20 (1.42)	11.20 (1.42)
Licensed Practical Nursing*	-	28.99 (12.00)	28.99 (12.00)
Surgical Technology*	-	48.60 (1.90)	48.60 (1.90)
Washburn University			
Health Information Technology	-	-	-
Occupational Therapy Assistant	40.53 (6.58)	-	40.53 (6.58)
Physical Therapist Assistant	38.38 (9.73)	-	38.38 (9.73)
Respiratory Therapy	46.58 (5.82)	-	46.58 (5.82)

Program	Average number of credit hours attained		
	Exited with a college degree	Exited without a college degree	All exiters
Wichita State University Campus of Applied Sciences and Technology			
Climate and Energy Control Technology	54.33 (3.94)	35.32 (11.96)	39.04 (13.24)
Industrial Automation and Machine Maintenance	14.25 (11.18)	23.00 (18.08)	19.82 (15.91)
Machining Technology	-	-	-
Robotics Technology	-	12.00 (0.00)	12.00 (0.00)
Welding Technology	38.50 (10.50)	17.84 (9.72)	21.43 (12.51)
Total	34.47 (18.07)	19.52 (15.59)	21.67 (16.80)

$N = 625$

Note: College degree excludes certificates. An asterisk (*) indicates expected program duration is one year or less. A n/a indicates a noncredit program.

Source: KanTRAIN program data collection.

Table C-11. Percentage of incumbent KanTRAIN program exiters who were employed as of spring 2018, by initial enrollment semester

Program	Fall 2015	Spring 2016
Flint Hills Technical College		
Industrial Engineering Technology	n/a	100.00%
Welding Technology	100.00%	100.00%
Garden City Community College		
Industrial Maintenance	-	-
Welding Technology	n/a	90.91%
Washburn Institute of Technology		
Certified Medication Aide	100.00%	0.00%
Certified Nurse Aide	94.74%	95.83%
Emergency Communications	-	-
Emergency Medical Technician	87.50%	100.00%
Home Health Aide	-	n/a
Medical Billing/Coding	-	-
Phlebotomy	-	100.00%
Practical Nursing	100.00%	97.37%
Surgical Technology	100.00%	100.00%
Washburn University		
Health Information Technology	-	-
Occupational Therapy Assistant	75.00%	n/a
Physical Therapist Assistant	100.00%	-
Respiratory Therapy	100.00%	-
Wichita State University Campus of Applied Sciences and Technology		
Climate and Energy Control Technology	94.12%	100.00%
Industrial Automation and Machine Maintenance	-	100.00%
Machining Technology	-	-
Robotics Technology	-	n/a
Welding Technology	-	81.82%
Total	96.89%	95.38%

$N = 323$

Note: Program exiters include participants who are no longer enrolled in a program of study, whether or not they earned a credential. Excludes participants who were still enrolled in spring 2018. Employment data were missing for 25.48 percent of fall 2015 exiters and 28.96 percent of spring 2016 exiters. A dash (-) indicates no participants entered the program in that semester. A n/a indicates that data are not available.

Source: KanTRAIN program data collection.

Table C-12. Percentage of KanTRAIN program exiters who were not employed prior to enrollment who were employed as of spring 2018, by initial enrollment semester

Program	Fall 2015	Spring 2016
Flint Hills Technical College		
Industrial Engineering Technology	n/a	75.00%
Welding Technology	83.33%	n/a
Garden City Community College		
Industrial Maintenance	-	-
Welding Technology	n/a	100.00%
Washburn Institute of Technology		
Certified Medication Aide	100.00%	100.00%
Certified Nurse Aide	82.14%	84.62%
Emergency Communications	-	-
Emergency Medical Technician	100.00%	83.33%
Home Health Aide	-	n/a
Medical Billing/Coding	-	-
Phlebotomy	-	80.00%
Practical Nursing	92.31%	91.67%
Surgical Technology	100.00%	n/a
Washburn University		
Health Information Technology	-	-
Occupational Therapy Assistant	100.00%	n/a
Physical Therapist Assistant	75.00%	-
Respiratory Therapy	100.00%	-
Wichita State University Campus of Applied Sciences and Technology		
Climate and Energy Control Technology	78.57%	71.43%
Industrial Automation and Machine Maintenance	-	100.00%
Machining Technology	-	-
Robotics Technology	-	n/a
Welding Technology	-	100.00%
Total	85.53%	85.92%

$N = 147$

Note: Program exiters include participants who are no longer enrolled in a program of study, whether or not they earned a credential. Excludes participants who were still enrolled in spring 2018. Employment data were missing for 26.92 percent of fall 2015 exiters and 25.26 percent of spring 2016 exiters. A dash (-) indicates no participants entered the program in that semester. A n/a indicates that data are not available.

Source: KanTRAIN program data collection.

Table C-13. Percentage of KanTRAIN program exiters who pursued further education as of spring 2018, by initial enrollment semester

Program	Fall 2015	Spring 2016
Flint Hills Technical College		
Industrial Engineering Technology	0%	0%
Welding Technology	3.70%	0%
Garden City Community College		
Industrial Maintenance	-	-
Welding Technology	0%	2.57%
Washburn Institute of Technology		
Certified Medication Aide	9.09%	55.56%
Certified Nurse Aide	14.58%	21.35%
Emergency Communications	-	-
Emergency Medical Technician	11.76%	32.56%
Home Health Aide	-	0%
Medical Billing/Coding	-	-
Phlebotomy	-	10.53%
Practical Nursing	11.02%	10.67%
Surgical Technology	0%	0%
Washburn University		
Health Information Technology	-	-
Occupational Therapy Assistant	0%	0%
Physical Therapist Assistant	0%	-
Respiratory Therapy	0%	-
Wichita State University Campus of Applied Sciences and Technology		
Climate and Energy Control Technology	2.78%	7.69%
Industrial Automation and Machine Maintenance	-	18.18%
Machining Technology	-	-
Robotics Technology	-	0%
Welding Technology	-	6.67%
Total	8.10%	16.27%

N = 727

Note: Program exiters include participants who are no longer enrolled in a program of study, whether or not they earned a credential. A dash (-) indicates no participants entered the program in that semester.

Source: KanTRAIN program data collection.

Table C-14. Educational and employment outcomes as of spring 2018 for KanTRAIN participants who entered their program in 2015–16, overall and by field

Outcomes	All		Health care		Advanced manufacturing	
	#	% of enrollees	#	% of enrollees	#	% of enrollees
Participants	749	-	554	-	195	-
Completed program of study	635	84.78	474	85.56	161	82.56
Retained in program of study	1	0.13	1	0.18	0	0.00
Retained in other programs	16	2.14	10	1.81	6	3.08
Average number of credit hours in program of study (standard deviation)	19.88 (16.47)	-	18.16 (15.51)	-	24.54 (18.06)	-
Average number of third-party credentials earned (standard deviation)	2.27 (2.49)	-	1.64 (1.19)	-	4.08 (3.92)	-
Earned college credential	90	12.02	51	9.21	39	20.00
Pursuing further education	86	11.48	78	14.08	8	4.10
Employed ¹	40	92.79	386	93.69	129	90.21
Incumbent workers	522	-	389	-	133	-

N = 749

Note: Employment after program of study completion data are missing for 25 percent of participants and number of credits is missing for 9 percent of participants; participants missing data are excluded from the calculations for these two measures.

¹ As a percentage of exiters with post-program employment data.

Source: KanTRAIN program data collection.

Table C-15. Educational and employment outcomes as of spring 2018 for KanTRAIN welding participants who entered their program in 2015–16, overall and by college

Outcomes	All colleges		FHTC		GCCC		WSU Tech	
	#	% of enrollees	#	% of enrollees	#	% of enrollees	#	% of enrollees
Participants	116	-	29	-	55	-	32	-
Completed program of study	86	74.14	23	79.31	40	72.73	23	71.88
Retained in program of study	-	-	-	-	-	-	-	-
Retained in other programs	6	5.17	0	-	5	9.09	1	3.13
Average number of credit hours in program of study (standard deviation)	23.36 (16.72)	-	30.97 (16.53)	-	22.25 (17.39)	-	18.38 (13.46)	-
Average number of third-party credentials earned (standard deviation)	4.49 (4.68)	-	7.07 (6.61)	-	4.76 (3.78)	-	1.69 (1.67)	-
Earned college credential	12	10.34	2	6.90	6	10.91	4	12.50
Pursuing further education	4	3.45	1	3.45	1	1.82	2	6.25
Employed ¹	65	90.28	23	88.46	26	92.86	16	88.89
Incumbent workers	86	-	21	-	43	-	22	-

N = 116

Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology. Employment after program of study completion data are missing for 25 percent of participants and number of credits is missing for 9 percent of participants; participants missing data are excluded from the calculations for these two measures. Program duration is 18 weeks at GCCC and two years at WSU Tech and FHTC.

¹As a percentage of exiters with post-program employment data.

Source: KanTRAIN program data collection.

Table C-16. Educational and employment outcomes as of spring 2018 for KanTRAIN participants who entered their program in 2015–16, by race and ethnicity

Outcomes	By race and ethnicity					
	White, non-Hispanic		Hispanic		Non-White, non-Hispanic	
	#	% of enrollees	#	% of enrollees	#	% of enrollees
Participants	520	-	128	-	101	-
Completed program of study	458	88.08	99	77.34	78	77.23
Retained in program of study	1	0.19	0	0.00	0	0.00
Retained in other programs	11	2.12	3	2.34	2	1.98
Average number of credit hours in program of study (standard deviation)	20.81 (16.60)	-	19.23 (16.57)	-	15.91 (15.13)	-
Average number of third-party credentials earned (standard deviation)	2.21 (2.49)	-	2.84 (2.85)	-	1.85 (1.76)	-
Earned college credential	78	15.00	9	7.03	3	2.97
Pursuing further education	67	12.88	12	9.38	7	6.93
Employed ¹	376	93.30	76	90.48	63	92.65
Incumbent workers	354	-	94	-	74	-

$N = 749$

Note: Non-Hispanic, non-white includes participants who are not Hispanic and identify as Asian, Black or African American, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, or more than one race. Employment after program of study completion data is missing for 25 percent of participants and number of credits is missing for 9 percent of participants; participants missing data are excluded from the calculations for these two measures.

¹ As a percentage of incumbent workers with post program employment data.

Source: KanTRAIN program data collection.

Table C-17. Number of participants with valid demographic data

	FHTC	GCCC	WIT	WU	WSU Tech	Total
All participants						
Historic cohort	240	182	1,999	421	607	3,449
KanTRAIN cohort	59	76	733	65	235	1,168
Participants with valid post-enrollment employment data						
Historic cohort	114	25	1,484	201	144	1,968
KanTRAIN cohort	37	29	564	34	97	761

$N = 4,617$

FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology; WIT = Washburn Institute of Technology; WU = Washburn University. Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid data on all covariates.

Source: Kansas Board of Regents.

Table C-18: Descriptive Statistics: Demographics

	Historic cohort	KanTRAIN cohort	Significance
Age	25.57	26.35	*
Female	60.63%	54.62%	***
Race			
White	57.96%	59.67%	
Hispanic	13.37%	15.24%	
Black	7.36%	6.59%	
Other	4.96%	6.34%	
Unknown	16.35%	12.16%	***
Ever received a Pell Grant	43.11%	42.72%	
Missing high school GPA	59.96%	57.96%	
High school GPA	2.96	2.89	*
Intended degree			
No college degree intended	70.43%	69.01%	
Any college degree intended	29.57%	30.99%	
Ever attended another college	51.38%	50.51%	
Major			
Advanced manufacturing	25.49%	29.02%	*
Health care	66.69%	63.87%	
Other	7.82%	4.11%	*
Average wages over three quarters prior to enrollment	3830.99	4771.59	***
Employment data availability			
Have both pre- and post-enrollment data	66.14%	73.20%	***
Have only post-enrollment data	16.29%	9.33%	
Have only pre-enrollment data	6.09%	11.22%	
Have no employment data pre- or post-enrollment	11.48%	6.25%	

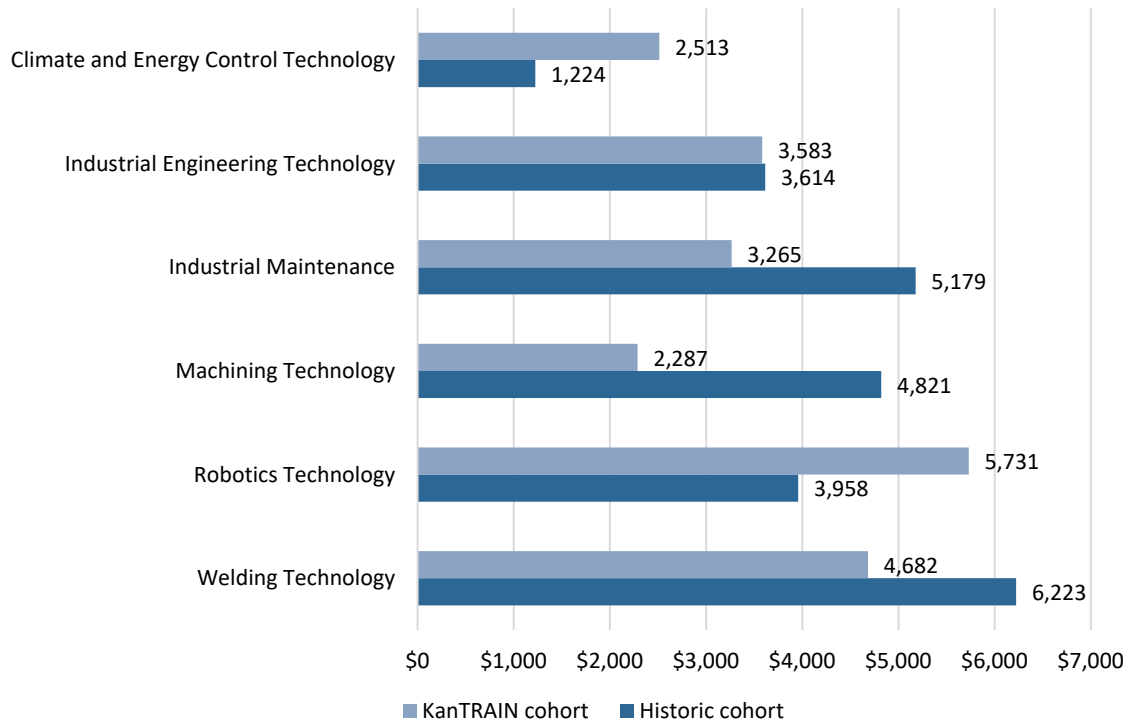
$N = 4,617$

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid data on all covariates. The calculation of average wages prior to enrollment includes only participants with pre- and post-enrollment data ($N = 2,218$).

Source: Kansas Board of Regents.

Figure C-1. Average change in quarterly wages for advanced manufacturing program participants, by program of study and cohort

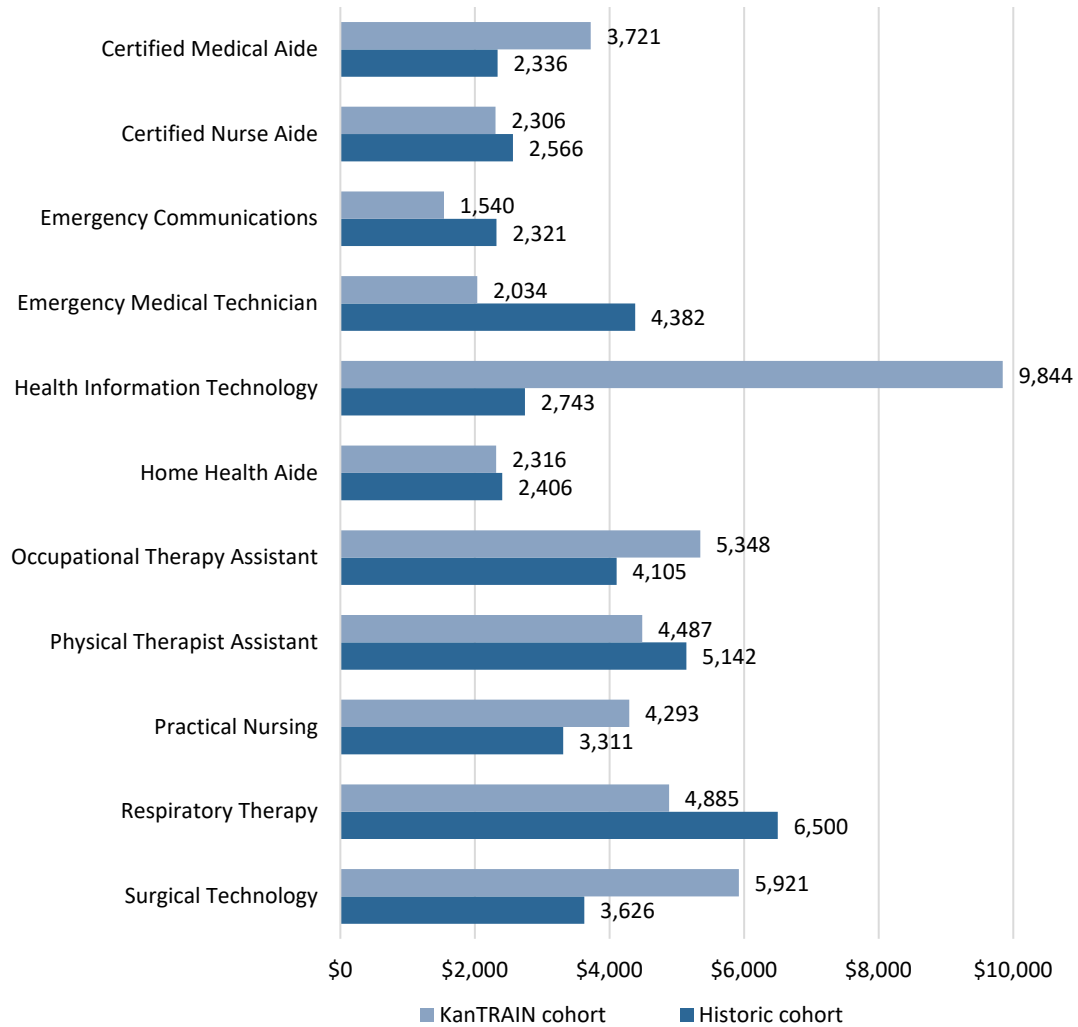


$N = 274$

Note: Sample includes all participants in each cohort who declared an advanced manufacturing program of study, who exited the program, and who have pre- and post-enrollment data.

Source: Kansas Board of Regents.

Figure C-2. Average change in quarterly wages for health care program participants, by program of study and cohort



$N = 1,804$

Note: Sample includes all participants in each cohort who declared a health care program of study, who exited the program, and who have pre- and post-enrollment data. Excludes the Phlebotomy and Medical Billing and Coding programs because there were no exiters with pre- and post-enrollment data in both cohorts.

Source: Kansas Board of Regents.

Appendix D: Propensity Score Matching Methodology

The first step in PSM was to estimate the propensity of students to be in the KanTRAIN cohort versus the historic cohort, using variables related to cohort membership and post-exit outcomes. Through this estimation, historic cohort participants were identified as matches to KanTRAIN participants using kernel matching, and weights were created for the matched historical cohort students to adjust for bias.¹⁸ Following Rosenbaum and Ruben,¹⁹ the PSM algorithm utilized a caliper equal to 0.2 times the standard deviation of the propensity score. Students are matched only within the region of common support over the propensity score and students who are outside of the region of common support are excluded from the analysis.

The KanTRAIN and historic cohorts were matched on a set of 21 academic and demographic variables:

- what college the participant attended (FHTC, GCCC, WU, WSU Tech; omitted comparison college: WIT)
- whether the participant ever attended another college during the enrollment period
- participant's age at last data collection
- quadratic term for participant's age to account for the nonlinear distribution of age
- participant's sex (female; omitted comparison group: male)
- participant's race/ethnicity (White, Hispanic, Black; omitted comparison group: other)
- whether the participant ever received a Pell Grant
- participant's high school grade point average

¹⁸ Huber, Martin, Michael Lechner, and Conny Wunsch. 2013. "The Performance of Estimators Based on the Propensity Score." *Journal of Econometrics* 175: 1–21; Garrido, Melissa M., Amy S. Kelley, Julia Paris, Katherine Roza, Diane E. Meier, R. Sean Morrison, and Melissa D. Aldridge. 2014. "Methods for Constructing and Assessing Propensity Scores." *Health Services Research* 49 (5): 1701–20.

¹⁹ Rosenbaum and Rubin, "Constructing a Control Group," 33–38.

- whether the participant was missing data on high school grade point average
- whether the participant intended a college degree upon initial enrollment (associate, bachelor's, more than a bachelor's; omitted comparison group: no degree intended)
- whether the participant ever declared an advanced manufacturing major
- whether the participant ever declared a health care major
- participant's pre-enrollment quarterly wages
- whether the participant was missing data on pre-enrollment wages

Intended a college degree upon enrollment is determined by whether the participant's declared major was associated with a degree and, if so, which degree was associated. Ever declared advanced manufacturing or health care majors are included because students may be participants without declaring a related field of study. Pre-enrollment quarterly wages is an average of wages during the three quarters leading up to program enrollment. A quadratic age term was included to account for the nonlinear distribution of age among participants and to improve model fit. Sensitivity tests using a restricted model with fewer covariates did not improve matching and, when used in models predicting outcomes, yielded similar findings.

Overall, the matching for the entire sample was successful, as measured by balance achieved on propensity scores across the matched KanTRAIN and historic cohorts and the baseline equivalence on the propensity score and all 21 covariates.

The matching was conducted separately on a sample restricted to participants with post-employment data to be used for models predicting employment outcomes. Participants with fewer than two quarters of post-enrollment employment data were excluded because of volatility from having only one quarter of wage data. For example, participants with only one quarter of wage data may have finished their program halfway through the quarter, making that quarter's wages an inaccurate picture of what quarterly wages would look like in future quarters. The matching for this restricted sample was again judged as successful, yielding similar propensity score densities and baseline equivalence on 20 out of 21 covariates.

Separate matching was also completed for other outcomes with three other restricted samples: participants with any credentials, participants with third-party certificates, and participants with pre- and post-enrollment wage data. Baseline equivalence standards were met on all or most covariates for all samples.

Table D-1. Details on the propensity score matching algorithm and samples

	Sample size	Caliper	Range of common support	Number of matched covariates out of total covariates used
All participants	4,617	0.02	0.02-0.61	21/21
Participants with at least one credential	3,405	0.03	0.02-0.79	21/21
Participants with at least one nondegree credential	2,974	0.04	0.02-0.87	20/21
Participants with post-enrollment employment data	2,728	0.03	0.04-0.79	20/21
Participants with pre- and post-enrollment employment data	2,209	0.03	0.06-0.80	19/20

Note: All algorithms utilize the kernel matching method with a rectangular kernel and allow 5:1 matching.

Source: Kansas Board of Regents.

Table D-2. Propensity score matching baseline equivalency tests: Standardized differences

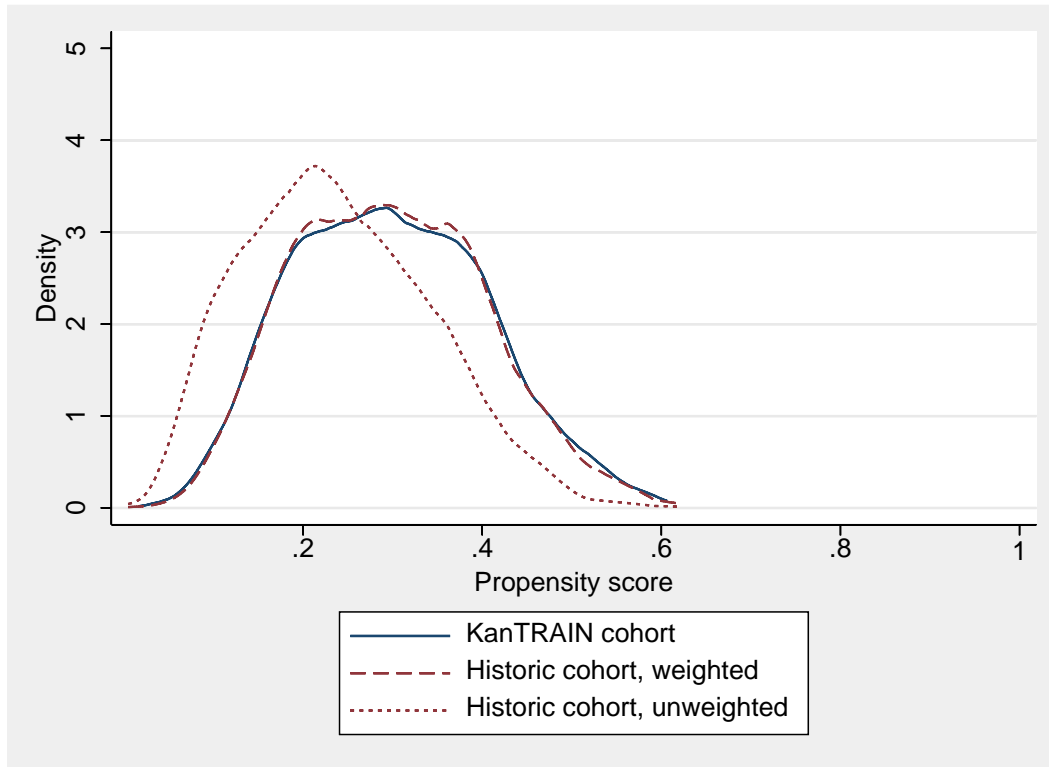
	All participants		Participants with post-enrollment employment data		Participants with pre- and post-enrollment employment data	
	Unmatched	Matched	Unmatched	Matched	Unmatched	Matched
Propensity score	0.58	0.01	0.60	0.02	0.57	0.02
College						
FHTC	0.08	0.00	0.04	0.01	0.06	0.02
GCCC	0.05	0.03	0.16	0.05	0.18	0.07
WSU Tech	0.06	0.04	0.18	0.02	0.15	0.00
WU	0.24	0.01	0.22	0.01	0.23	0.01
Age	0.07	0.01	0.15	0.05	0.10	0.03
Age squared	0.03	0.02	0.10	0.04	0.06	0.03
Female	0.12	0.01	0.21	0.04	0.19	0.05
Race						
White	0.04	0.01	0.06	0.02	0.03	0.02
Hispanic	0.05	0.01	0.07	0.03	0.09	0.03
Black	0.03	0.01	0.04	0.00	0.06	0.00
Unknown	0.12	0.02	0.16	0.00	0.13	0.00
Ever received a Pell Grant	0.01	0.04	0.02	0.01	0.04	0.00
Missing high school GPA	0.04	0.02	0.03	0.03	0.04	0.03
High school GPA	0.02	0.02	0.05	0.03	0.06	0.02
Intended a college degree	0.03	0.01	0.06	0.04	0.01	0.03
Ever attended another college	0.02	0.02	0.07	0.02	0.08	0.03
Major						
Advanced Manufacturing	0.08	0.02	0.25	0.04	0.25	0.04
Health care	0.00	0.03	0.15	0.03	0.13	0.05
Missing pre-enrollment wage data	0.31	0.01	0.24	0.02	-	-
Average wages in three quarters prior to enrollment	0.25	0.01	0.33	0.02	0.36	0.04

$N = 4,617$

Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology; WU = Washburn University. Coefficients report bias on each covariate between the control and the treatment group when unmatched and matched. A value of 0.05 or less is considered balanced across groups. Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid demographic data on all covariates and valid matches. Sample size for participants with post-enrollment data is 2,728 and sample size for participants with pre- and post-enrollment data is 2,209.

Source: Kansas Board of Regents.

Figure D-1. Weighted and unweighted density for matched cases among all participants

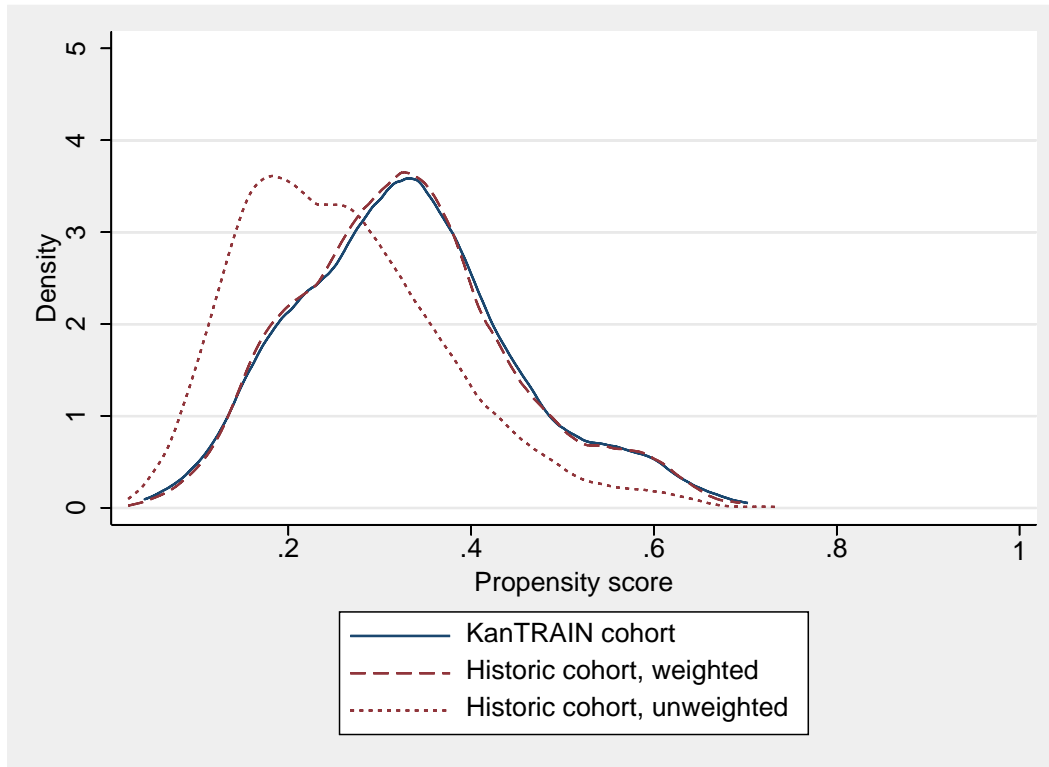


$N = 4,617$

Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid data on all covariates and valid matches. Kernel density matching method is used with a 0.02 caliper.

Source: Kansas Board of Regents.

Figure D-2. Weighted and unweighted density for matched cases among participants with post-enrollment employment data

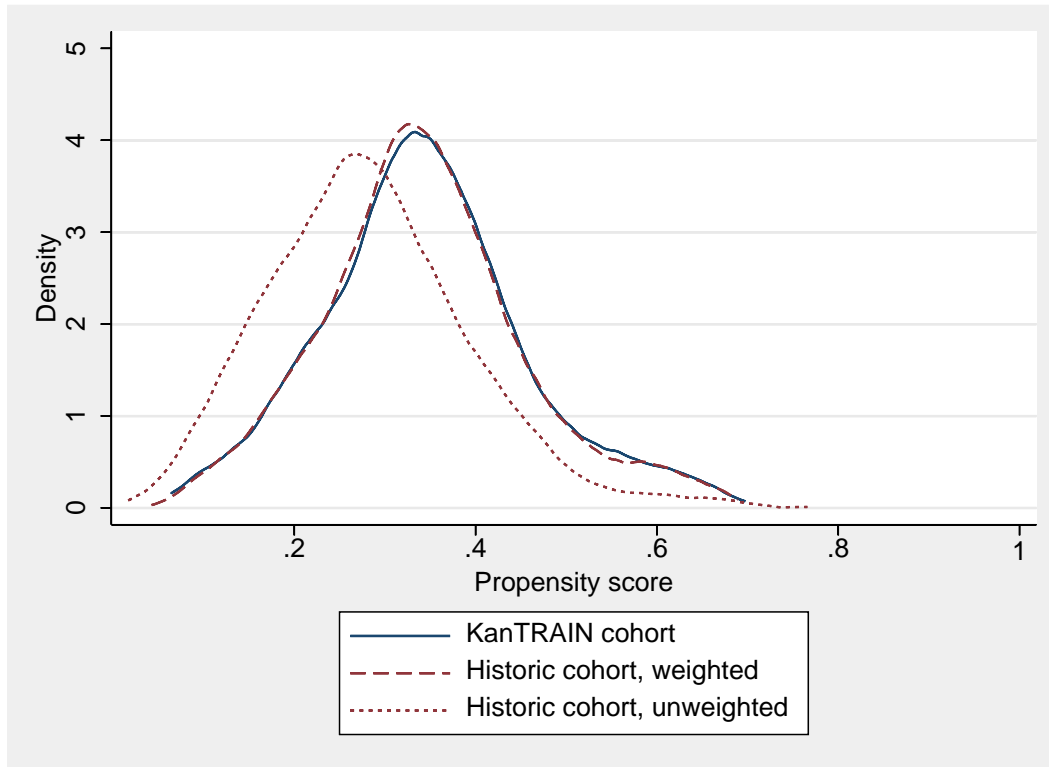


$N = 2,728$

Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid data on all covariates and valid matches. Kernel density matching method is used with a 0.03 caliper.

Source: Kansas Board of Regents.

Figure D-3. Weighted and unweighted density for matched cases among participants with pre- and post-enrollment employment data



$N = 2,209$

Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid data on all covariates and valid matches. Kernel density matching method is used with a 0.03 caliper.

Source: Kansas Board of Regents.

Table D-3. Propensity score matching baseline equivalency tests: Standardized differences

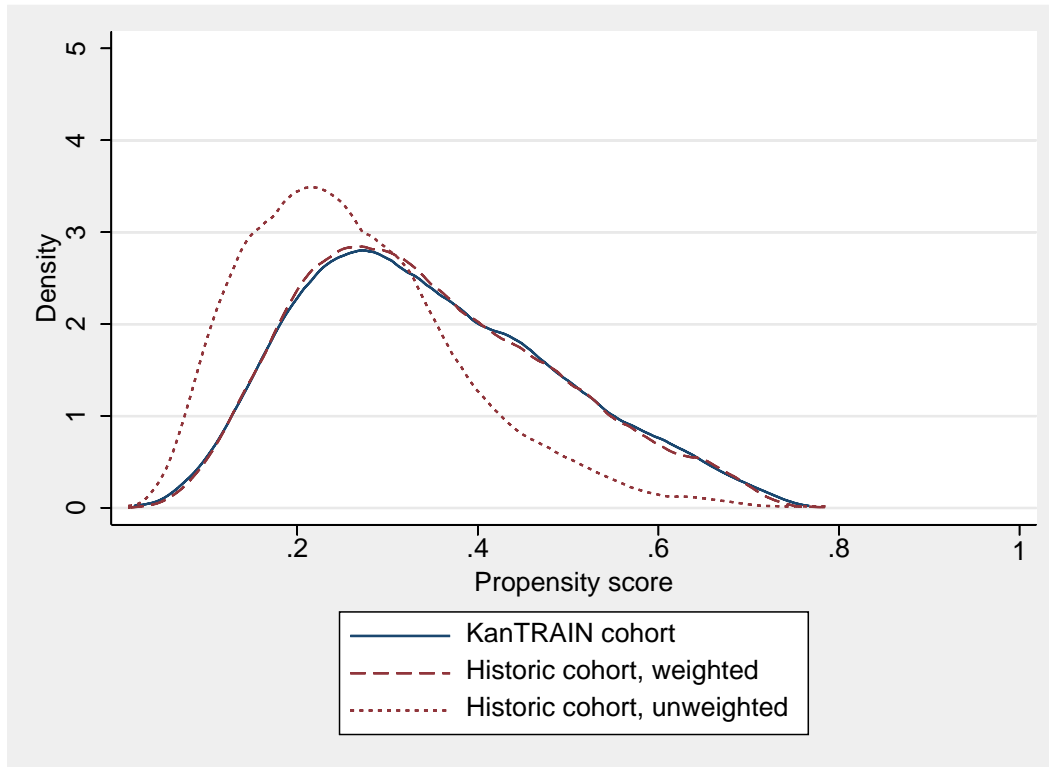
	Participants with at least one credential		Participants with at least one nondegree credential	
	Unmatched	Matched	Unmatched	Matched
Propensity score	0.65	0.02	0.61	0.01
College				
FHTC	0.05	0.01	0.03	0.00
GCCC	0.16	0.04	0.20	0.03
WSU Tech	0.27	0.04	0.19	0.02
WU	0.16	0.01	0.11	0.00
Age	0.15	0.01	0.16	0.02
Age squared	0.10	0.01	0.11	0.01
Female	0.26	0.00	0.01	0.23
Race				
White	0.07	0.01	0.08	0.01
Hispanic	0.06	0.00	0.05	0.01
Black	0.01	0.00	0.01	0.01
Unknown	0.18	0.03	0.19	0.01
Ever received a Pell Grant	0.05	0.04	0.05	0.03
Missing high school GPA	0.01	0.05	0.01	0.04
High school GPA	0.01	0.05	0.00	0.04
Intended a college degree	0.13	0.00	0.14	0.02
Ever attended another college	0.06	0.03	0.03	0.02
Major				
Advanced Manufacturing	0.32	0.00	0.28	0.01
Health care	0.23	0.02	0.23	0.02
Missing pre-enrollment wage data	0.36	0.03	0.22	0.03
Average wages over three quarters prior to enrollment	0.29	0.04	0.16	0.04

$N = 3,405$

Note: FHTC = Flint Hills Technical College; GCCC = Garden City Community College; WSU Tech = Wichita State University Campus of Applied Sciences and Technology; WU = Washburn University. Coefficients report bias on each covariate between the control and the treatment group when unmatched and when matched. A value of 0.05 or less is considered balanced across groups. Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid demographic data on all covariates and valid matches. Sample size for participants with at least one certificate is 2974.

Source: Kansas Board of Regents.

Figure D-4. Weighted and unweighted density for matched cases among all participants with at least one credential

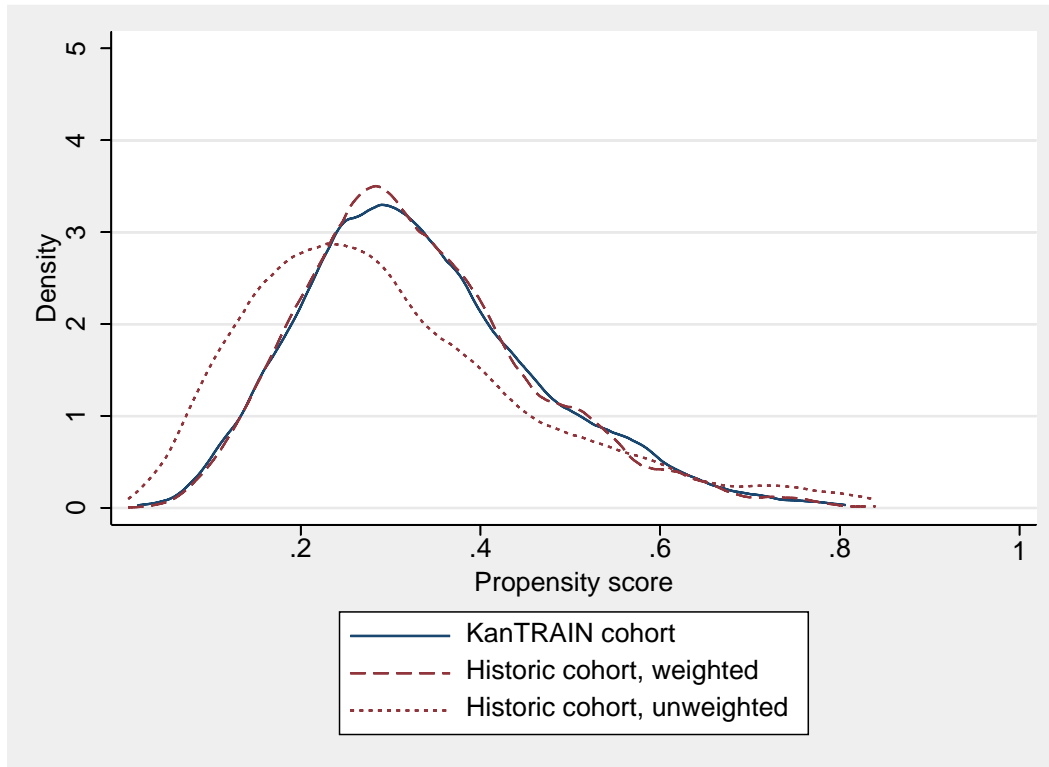


$N = 3,405$

Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid demographic data on all covariates and valid matches. Kernel density matching method is used with a 0.03 caliper.

Source: Kansas Board of Regents.

Figure D-5. Weighted and unweighted density for matched cases among all participants with at least one certificate



$N = 2,974$

Note: Sample includes participants who enrolled between fall 2011 and spring 2017 who have valid demographic data on all covariates and valid matches. Kernel density matching method is used with a 0.04 caliper.

Source: Kansas Board of Regents.