Advancing Careers and Training (ACT) for Healthcare in Wisconsin

Final Evaluation Report

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Introduction

Driven in large part by economic mobility considerations and concerns about global competition, policy leaders at the local, state, and national levels are setting goals for increasing postsecondary credential attainment. In 2009, President Obama challenged all Americans to commit to at least one year of postsecondary training or education and set a national goal of five million community and technical college graduates with associate degrees or certificates by 2020. As a part of this effort, in 2009 the American Recovery and Reinvestment Act (ARRA) amended the Trade Act of 1974 to authorize the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program. In 2010, Congress authorized the U.S. Department of Labor to invest $2 billion over four years to fund the TAACCCT program.

TAACCCT provided community and technical colleges, as well as other eligible higher education institutions, with funds to expand and improve their capacity to deliver education and career training programs that can be completed in two years or less, while also suited for workers eligible for training under the TAA for Workers program as part of preparing program participants for high-skilled, high-wage employment. Additionally, the TAACCCT grants aimed to increase the number of workers who attain certificates, degrees, and other industry-recognized credentials to help meet President Obama's college graduation goal.

In 2014, Wisconsin was granted $15 million over four years from the U.S. Department of Labor to fund Advancing Careers and Training for Healthcare (ACT for Healthcare), a statewide project with participation from all 16 colleges in the Wisconsin Technical College System (WTCS) to develop, improve, and expand adult education training pathways to careers in healthcare related occupations.[1] Wisconsin's technical colleges provided training and support services to adult learners including TAA-eligible workers, veterans, and others—preparing them for high-growth careers in the healthcare industry. The project builds on the two previous rounds of statewide TAACCCT funding in advanced manufacturing and information technology. Each consortium grant enabled the technical colleges to further strengthen career pathways across the state[2] by engaging educators, employers, workforce systems, the Department of Veterans Affairs, and the WTCS to expand, enhance, and deliver industry-relevant training to adult learners.

The Department of Labor required a third-party evaluator for the TAACCCT grants to address program implementation and participant outcomes and impact. In this Final Evaluation Report of ACT for Healthcare, the evaluation team of DVP-PRAXIS LTD, Equal Measure, and Brandon Roberts + Associates present the participant impact evaluation, which utilizes rigorous statistical methodology to examine program impact, and the summative qualitative assessment of implementation. In this report, the evaluation team focuses on the colleges' efforts to serve participants through the implementation of curricular and instructional innovation, support services, and partnership engagement during the TAACCCT Round 4 grant period. We have organized the report around two distinct, though related, sets of analyses:

[1] The ACT for Healthcare evaluation focuses on 15 of the 16 WTCS colleges. Fox Valley Technical College is not implementing healthcare programming as a part of this grant, and instead is serving as a third-party subject matter expert.

[2] In addition to the ACT for Healthcare grant, the state also received an additional $4.9 million project aimed at scaling the state's career pathway system. This project, called Advancing Careers for TAA and Transitioners, or ACT^2, is geared toward bringing dedicated and directed cohesion to existing practices, and taking career pathway advancement in Wisconsin to greater scale and alignment. A final ACT2 Evaluation report, *Advancing Career Pathway Development in Wisconsin Technical Colleges*, is also available.

1. The **impact study** examines education and employment outcomes for grant participants, focusing on those who received an academic or non-academic support service delivered in-class or out-of-class. Outcomes include credential attainment and retention, and employment and earnings outcomes for previously unemployed participants and incumbent workers, respectively.

2. The **implementation study** examines the operational strengths and challenges of the ACT for healthcare grant-funded training programs, including curricular and instructional innovations, support services, and partnership engagement. Additionally, the study examines institutional factors that contributed to effective implementation and sustainability.

We describe the evaluation questions in detail in the design and methods section of the report, as well as in each related section.

Section I: Advancing Careers for Healthcare

The strong infrastructure in place through the Wisconsin Technical College System (WTCS), coupled with the existing precedent for coordination across the consortium colleges through two previous TAACCCT grants, provided the necessary foundation from which to build the ACT for Healthcare strategy and to develop, expand, and enhance healthcare training programs.

The ACT for Healthcare consortium sought to address gaps in healthcare education and training in Wisconsin through a comprehensive strategic approach, working collaboratively as a system to address each of the TAACCCT core elements. At the outset, the consortium identified a set of complementary goals[3] including:

1. Increase attainment of degrees, certifications, certificates, diplomas, and other industry-recognized credentials that match the skills needed by employers to better prepare TAA-eligible workers, veterans, and other adults for high-wage, high-skill employment or re-employment in the healthcare industry.

2. Introduce or replicate innovative and effective methods for designing and delivering instruction that address specific industry needs in healthcare.

3. Demonstrate improved employment outcomes.

The consortium worked to achieve these goals by using a cohesive approach to implement strategies, drawing on several evidence-based design elements. ACT for Healthcare was designed using research and best practices from previously-funded Wisconsin TAACCCT grants and additional research to support the following key elements: Career Pathways, Student Support Services, Simulation Learning, and Prior Learning Assessment (PLA).[4] The ACT for Healthcare colleges developed institution-specific scopes of work that included expanding or modifying healthcare programs; providing student supports and career guidance to improve student success in healthcare programs; and aligning efforts of educators, employers, and local workforce systems to better connect technical college students to jobs. In addition, the consortium identified several strategies to work on together as a part of the curricular and instructional innovations implemented under the grant that include simulation education and a program bridge to nursing for Veteran medics. Each of these strategies is briefly explored below, and in greater detail in Section 4.

Throughout the grant period, the evaluation team remained focused on the strategies originally outlined in the ACT for Healthcare logic model, with a **greater emphasis across all colleges on curricular and instructional innovations, support services, and partner engagement**. The final evaluation report concentrated on this set of strategies and provides an assessment of implementation progress and sustainability.

The ACT for Healthcare consortium identified a variety of **innovative instructional and curricular strategies** for colleges to design and implement. Notably, 14 new credentials (degrees, diplomas, or certificates) were developed under the grant in response to regional employer demands. Additionally, the consortium identified several strategies to work on together. These strategies include the development of new statewide courses to update curricula on Digital Literacy and the Culture of Healthcare; the creation of simulation learning scenarios for healthcare programs (i.e., Augmented Reality Integrated Simulation Education or ARISE); and the development of a statewide VA Medic to

[3] Chippewa Valley Technical Grant Agreement Attachment D: Statement of Work.
[4] Given the small number of colleges engaged in Prior Learning Assessment work specific to the ACT for Healthcare project, PLA is primarily explored as a component of the curricular program-to-program bridge strategy.

Nursing pathway that awards credit for prior learning for veterans. Finally, as a means of increasing access to healthcare programs, colleges offered increased flexibility in where and when classes were offered, including online/hybrid courses, remote locations, and flexible scheduling including evening, weekend, and new summer offerings.

The ACT for Healthcare colleges also identified **academic and non-academic support services** as a key area of focus and opportunity. These supports were incorporated into ACT for Healthcare programs of study or offered alongside specific programs. Support strategies included academic supports like enhanced classroom instruction, tutoring, and test preparation; as well as non-academic supports such as counseling and case management, job search and placement, and study skills and time management. The national evidence-base for many of these approaches is strong, including the positive benefits associated with student success coaching and intrusive academic advising.[5] Given the widespread nature of this approach across the consortium, the impact study (Section 3) focuses on participants receiving these support services.

Finally, **partnership engagement** with ACT for Healthcare colleges was identified as a way to 1) help ensure program relevancy and alignment with industry standards, 2) establish pipelines both into and out of programs through program recruitment, and 3) provide work-based learning opportunities. As standard practice, these partnerships are maintained through college-based program advisory committees and regional partnerships between employers, and to a lesser extent in conjunction with Workforce Development Boards. Through ACT for Healthcare, the expectation was that employers would be involved throughout the grant period by serving on local leadership councils, identifying industry-based competencies, partnering on work-based learning opportunities, and facilitating employment upon certificate and degree completion.

We explore each of these key strategies in more detail in Section 4.

ACT for Healthcare Participants and Programs

According to the most recent Annual Performance Report (APR), ACT for Healthcare aimed to serve 2,452 unique participants during the three-year period of the grant. **Preliminary performance numbers indicate the consortium surpassed its original goal by 62%—serving 3,928 unique participants**. For the purposes of this final report, the evaluation focuses on 3,376 participants who enrolled in a healthcare program of study anytime from the start of the grant through December 2017. While participants often experienced more than one programmatic enhancement, the most common cross-cutting enhancement experienced by participants was academic or non-academic support services.

Table 1 provides demographic information on the approximately 3,400 ACT for Healthcare participants who enrolled in a healthcare program of study, as well as a comparison pool of healthcare students enrolled during the same time period. Across the consortium, participants were slightly older than non-participants, with an average age of 28.5 versus 27.9, were more likely to be female (88% versus 84%) and were more likely to have had some college and no degree (39% versus 33%) at the time of initial enrollment. Healthcare programs along the Nursing pathway—including Nursing Assistant (NA), Professional Nurse (PN), and Registered Nurse (RN)—were the most prolific among ACT for Healthcare participants (66% of all participants), and Medical Assistant was the second most popular program (12% of all participants).

[5] Jenkins, D. & Weiss, M. J. (2011). Charting pathways to completion for low-income community college students (CCRC Working Paper No. 34). New York, NY: CCRC.

Table 1: Demographics of ACT for Healthcare Participants and a Comparison Pool		
	All Participants (n=3,376)	**Comparison Pool (n=51,724)**
Gender		
Female	88%	84%
Male	12%	16%
Race[6] and Ethnicity		
Black or African American	5%	11%
White	82%	76%
Hispanic (any race)	6%	8%
Other	7%	5%
Age		
Less than 25 years old	49%	51%
25 years old or older	51%	49%
Average age	28.5	27.9
Highest Credential Earned Prior to ACT		
No Credential	2%	3%
HS diploma	36%	46%
Some college no degree	39%	33%
Credential (2-year)	14%	11%
4-year degree or higher	9%	7%
Workforce Clients		
Title 1 Recipient	7%	3%
Healthcare Program[7]		
Nursing Pathway[8]	66%	51%
Medical Assistant	12%	7%

Data sources: WTCS Technical College administrative records, Department of Workforce Development

The ACT for Healthcare initiative served key target populations of the TAACCCT grant, including a higher percentage of older adults, WIOA Title I recipients, and those who had some college experience but no degree. More specifically, 51% of grant participants were 25 years or older when they enrolled in a healthcare program, which is two percentage points greater than enrollments of adults 25 and older in all healthcare programs during the grant period. Additionally, ACT for Healthcare participants were more likely to be WIOA Title I recipients. Although only 7% of participants were WIOA Title I clients at some point during the grant period, this group of adult participants was more than twice the share of WIOA Title I clients who enrolled in all healthcare programs. Moreover, enrollment by participants with some prior college experience but no credential approached 40% of all grant participants, compared with one-third of students enrolled in healthcare programs generally. In short, the ACT for Healthcare consortium colleges appeared to have effectively enrolled a higher proportion of targeted adults than was typical for healthcare programs statewide.

[6] Differences between participant and comparison groups in racial demographic data is primarily driven by MATC; MATC makes up 20% of the comparison sample and <4% of the participant sample.
[7] Program concentration indicated as of first term in the sample.
[8] Enrolled in NA, PN, or Nursing AD in first term in sample.

Section II: Evaluation Design and Methodology

The comprehensive evaluation of ACT for Healthcare included regular, formative feedback on the implementation progress among the ACT for Healthcare colleges, a summative assessment of implementation strengths and challenges, and a quantitative analysis of the impact of grant strategies on educational and employment outcomes for ACT participants receiving support services. In this section, the team describes the methodology and approach to the evaluation.

Impact Study

The participant impact study focused on ACT for Healthcare participants enrolled in programs of study who received grant-funded support services, including academic and non-academic supports provided inside and outside the classroom. As noted in the previous section, the delivery of support services was the most widespread strategy implemented across the consortium to improve participant outcomes. Various academic and employment student-level outcomes are examined, including within-institution retention, credential attainment, employment, and earnings. The research questions for the impact study are listed below:

1. *Do participants who received support services earn credentials, and are they retained within institutions at higher rates than a matched comparison group of healthcare students?*

2. *Are participants who were not employed at the start of their ACT for Healthcare program, and who received support services, employed one quarter after program exit[9] at higher rates than a matched comparison group of non-incumbent healthcare students?*

3. *Do participants who were incumbent workers at the start of their ACT for Healthcare program, and who received support services, have greater earnings gains than a comparison group of incumbent healthcare students?*

In Wisconsin, the data required to analyze these education and employment outcomes are housed in different systems. The evaluation team partnered with each technical college to gain access to student academic records, and with the WTCS and the Department of Workforce Development (DWD) to gain access to employment records and data on workforce program participation (e.g., TAA, WIOA Title 1, veterans programs). Data sharing agreements were executed by all consortium colleges, as well as with WTCS to gain access to employment and program participation records from DWD.

In addition to providing access to unit-record academic data, consortium colleges collected and submitted student-level data on academic and non-academic support services delivered to TAACCCT participants outside of a regular classroom setting. These additional participant-level data collected by colleges on student support services allowed for a robust assessment of the impact of this strategy. In addition, some support services were delivered to *all* participants enrolled in particular TAACCCT programs or courses. For example, one college incorporated a required student success course into several healthcare programs, and all students enrolled in that course experienced the supports. Colleges did not provide unit-record data on these types of support services; thus, whole-class supports that were required of all participants were collected via unit-record academic program and course data.

[9] We use the standard U.S. Department of Labor measure for employment, which is one quarter after exiting a program; exiting a program does not mean completing the program or earning a credential.

Propensity score matching (PSM) was utilized to generate a comparison group that is similar to the treatment group along a set of background characteristics that could affect the likelihood of receiving treatment. To conduct PSM for the impact study, data were requested on both participants and a comparison pool from colleges. The comparison pool data consisted of students in healthcare programs at the consortium technical colleges that were not supported by the TAACCCT grant but were enrolled during the grant period.

The PSM approach enabled the evaluation to meet standards of rigor for non-experimental research studies as defined by the Clearinghouse for Labor Evaluation and Research (CLEAR)[10] and the Institute of Education Sciences What Works Clearinghouse (WWC).[11] PSM is a quasi-experimental design methodology that can achieve a moderate rating from CLEAR, as well as meet WWC standards with reservations. See Appendix A for detailed information about the PSM process and baseline equivalence statistics for predictors used in the PSM models.

PSM is an increasingly common and robust approach to account for factors that may influence both the receipt of treatment and the outcome of interest, and thus confound analysis of impact. By generating a comparison group that resembles the treatment group on variables thought to affect likelihood of receiving treatment, evaluators can infer that the subsequent impact of the treatment is the result of the treatment, and not the result of observable characteristics in the two groups.[12]

Implementation Study

The implementation evaluation was designed to provide formative feedback on program implementation at each technical college during the first two years of the initiative, as well as to gather data for the summative implementation study. The evaluation team documented and assessed key elements of program implementation, ranging from efforts to develop and establish curricular and instructional innovations to sustaining and institutionalizing grant strategies like support services upon conclusion of the TAACCCT grant. The following are the framing questions for each strategy area:

- **Curriculum and Instruction:** *What kinds of curricular and instructional innovations were implemented, and how did colleges determine if new programs or modification of existing programs were needed?*
- **Support Services:** *What kinds of support services were offered to participants? How did colleges deliver supports to participants, including decisions to offer them in-class or out-of-class, and for services to be required or voluntary?*
- **Partnership Engagement:** *To what extent were employers and workforce system partners engaged in developing, modifying, and implementing ACT for Healthcare programs? How were workplace learning opportunities, such as clinical experiences, internships, and job shadowing integrated into ACT for Healthcare training programs?*

This Final Evaluation Report explores these framing questions with a focus on **the implementation strengths and challenges of these strategies and the likelihood each strategy will be sustained**.

At the onset of the grant, the evaluation team led a consortium-wide logic model meeting with grant administrators, faculty, and deans from participating colleges. This meeting resulted in a master logic model that provided a framework for the colleges' work, guiding local efforts to create aligned action plans for implementing their ACT for Healthcare activities (Appendix B). Following the logic model

[10] Clearinghouse for Labor Evaluation and Research. *Causal Evidence Guidelines*, Version 2.1, December 2015.
[11] Institute of Education Sciences, What Works Clearinghouse. *WWC Standards Brief for Baseline Equivalence*, n.d.
[12] Guo, S. & Fraser, M. (2010). *Propensity Score Analysis: Statistical Methods and Applications*. Los Angeles: Sage Publications; and, Austin, P.C. (2011). An introduction to Propensity Score Methods for Reducing the Effect of Confounding in Observational Studies. *Multivariate Behavioral Research*, 46(3), 399-424.

meeting, the evaluation team conducted telephone interviews with approximately 30 project leaders and key stakeholders at each college, such as department chairs, faculty leaders, and program deans. The initial interviews with members of the core team at each college informed the development of an evaluation framework[13] and associated outcomes and indicators for the implementation study (Appendix C). Within each implementation stage, the indicators reflect factors influenced by research literature and findings from previous evaluations in this field.[14] This early implementation data collection phase reaffirmed many assumptions embedded in the initial logic model, but also provided greater clarity and specificity with respect to the key areas of focus and lines of inquiry for the evaluation. The evaluation framework served as a necessary guidepost along the way—serving as a master reference for data collection and analysis around implementation of ACT for Healthcare activities during the first two years.

In this Final Evaluation Report, we focus on the **curricular and instructional innovations** colleges implemented during the grant period, including the consortium strategies, the development of new programs and credentials, and other innovations in this domain such as simulations, online and hybrid instruction, and accelerated program delivery. We also address **support services** and **partnership alignment**. The three implementation outcome areas align with the ACT for Healthcare logic model, the consortium's proposal to the U.S. Department of Labor, and with colleges' scopes of work. In short, the final implementation study addresses the following core evaluation questions:

1. *What kinds of curricular and instructional innovations, student support services, and partnership engagement strategies were implemented?*
2. *What were the strengths and challenges affecting implementation progress?*
3. *Which curricular and instructional innovations, student support services, and partnership engagement strategies will be sustained; and what factors contributed to sustainability?*

Over three years, the evaluation team engaged in several data collection activities to assess and document implementation efforts among the ACT for Healthcare colleges. These data collection efforts included interviews with key stakeholders—such as college administrators, faculty, support staff, and students—and external stakeholders such as employers and workforce groups. The team conducted qualitative interviews and focus groups either in-person during site visits or via telephone. A brief survey of project leaders was also conducted in spring 2017 to remain abreast of the work at each college and to inform a second round of site visits.

Site visits: The evaluation team conducted 30 in-depth site visits—visiting each ACT for Healthcare college twice during the grant and interviewing more than 400 stakeholders. During site visits, the team conducted in-depth interviews with grant staff, college leadership, faculty, support services staff, employers, and external partners, and conducted focus groups with students. The team designed site visits to yield important information about the systems and processes each college and its partners undertook during implementation, and to document implementation progress of the key strategies. The purpose of the initial site visits in 2016 was to collect qualitative data on program implementation, and to draft and share formative feedback memos. The second round of site visits in 2017 was to learn about steps the colleges were taking to institutionalize and sustain elements of their ACT for Healthcare work to inform the summative implementation analysis. Two-person teams conducted all site visits, spending one and a half to two days onsite, and provided substantive feedback to each

[13] ACT for Healthcare Outcomes and Indicators developed by DVP-PRAXIS LTD, Equal Measure, and Brandon Roberts + Associates. Utilization with attribution is acceptable. Implementation stages were adapted from the National Implementation Research Network (http://nirn.fpg.unc.edu).

[14] See for example, Price, D., McMaken, J., and Kioukis, G. (2015). *Case Informed Lessons for Scaling Innovation at Community and Technical Colleges*. Available at http://www.equalmeasure.org/ideas/report/case-informed-lessons-for-scaling-innovation-at-community-and-technical-colleges; and, Kezar, A. (2011). "What is the Best Way to Achieve Broader Reach of Improved Practices in Higher Education?" in *Innovation in Higher Education*, 36, pp. 235-247.

college after the initial site visit in a summary memo highlighting operational strengths and weaknesses and offering guidance for continuous improvement.

Phone interviews: The evaluation team conducted an initial round of structured interviews in fall 2015 with each college to gain a broad understanding of the activities colleges were pursuing as part of ACT for Healthcare. The team gathered initial information on the program(s) of study being enhanced or newly developed, including curricula modifications, support services, and embedding credentials. Additionally, we learned about plans for implementing consortium-wide strategies, and how employers and/or workforce development partners were being engaged. The team conducted approximately 30 phone interviews with the consortium leads at each college. The team also conducted interviews in fall 2015 with the consultants leading the consortium strategies to gain a better understanding of Prior Learning Assistance, Augmented Reality, and the Digital Literacy and Culture of Healthcare courses.

Survey: In spring 2017, the evaluation team developed a survey that was administered to project leads at each college. The survey was used to gain additional quantitative information on implementation efforts at each college. The survey focused on implementation of consortium strategies and engagement of employers and workforce development boards. Information from the survey was used to inform protocols for the final set of site visits.

Table 2: Key Data Collection Methods

- Development of consortium-wide logic model (2015)
- Development of ACT evaluation framework (2015)
- Development of data dictionary (2015)
- Semi-structured phone interviews with project leaders and key stakeholders at 15 colleges (2015)
- Semi-structured phone interviews with consortium strategy leads (2015)
- Support services data template (2016)
- Site visits to 15 colleges with in-depth interviews and focus groups of key stakeholders (2016)
- Site lead survey (2017)
- Site visits to 15 colleges with in-depth interviews and focus groups of key stakeholders including students (2017)
- Document review (ongoing)
- Participant observation at consortium meetings (ongoing)
- Collection of academic unit-record data and support services from colleges, and labor market and workforce data from DWD (ongoing)

The data collected through the initial site visits and phone interviews during the first two years of the initiative helped refine the implementation study and key lines of inquiry. As noted earlier in this section, the final implementation study is focused on the operational strengths and challenges of these strategies during the implementation process and the likelihood each strategy will be sustained.

Section III: Impact Study

The evaluation impact study focuses on ACT for Healthcare participants enrolled in programs of study receiving a variety of grant-funded academic and non-academic support services. The development and delivery of support services was the most common strategy implemented by ACT for Healthcare colleges and is the primary reason for focusing the impact study on these participants. As noted previously, and as detailed further in Section 4, the delivery of support services was a widespread and robust strategy implemented across the consortium, involving 14 of 15 colleges and affecting a majority of participants enrolled in grant-funded healthcare programs.[15]

A second reason for focusing the impact study on these participants is the growing national attention to the importance of support services for adult learners. The provision of academic and non-academic supports is an increasingly popular strategy pursued by community and technical colleges nationwide to boost success and completion rates for their students.[16] According to recent estimates, fewer than 40% of community college students go on to earn a postsecondary credential of any kind within six years.[17] Barriers to completion are often academic in nature, as an increasing proportion of students arrive to college academically unprepared.[18] However, many community and technical college students also face challenges not directly related to academics, including balancing study with work, childcare, and other life responsibilities; financial pressures; personal health needs; and uncertainty regarding career goals, how college courses connect with job opportunities, and how to prepare and search for employment.

To address these needs of community and technical college students—a diverse population of learners including recent high school graduates, returning adult students, and incumbent workers looking to upgrade skills—institutions across the country are experimenting with the delivery of a variety of support services including enhanced academic advising, tutoring, basic skills support courses, college success courses focused on study skills and time management, and non-academic personal and career coaching by dedicated support services staff. Evidence on the effectiveness of many of these supports is promising, with several studies pointing to increased retention and completion rates for students who receive them.[19]

ACT for Healthcare colleges' use of TAACCCT funds to develop and deploy a host of academic and non-academic support services provides an opportunity to more closely examine the implementation of these supports within the field of healthcare, as well as the outcomes of students who receive them.

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[15] Northcentral Technical College (NTC) did not use TAACCCT funds to develop new or enhance existing support services for participants. Participants at NTC had access to the business-as-usual support services provided for all NTC students.

[16] Price, D.V., Roberts, B., Kraemer, S, & Chaplot, P. (2018). *Community College Approaches to Address Basic Needs and Improve Financial Stability for Low-Income Students: Lessons from the Working Students Success Network Implementation Study*. Indianapolis, IN. DVP-PRAXIS (January).

[17] Shapiro, D., Dundar, A., Wakhungu, P.K., Yuan, X., Nathan, A. & Hwang, Y. (2016, November). *Completing College: A National View of Student Attainment Rates – Fall 2010 Cohort* (Signature Report No. 12). Herndon, VA: National Student Clearinghouse Research Center.

[18] Bound, J., Lovenheim, M., & Turner, S. (2010). Why have college completion rates declined? An analysis of changing student preparation and collegiate resources. *American Economic Journal: Applied Economics*, *2*(3), 1-31.

[19] Scrivener, S. and Coghlan, E. (2011). *Opening Doors to Student Success: A Synthesis of Findings from an Evaluation at Six Community Colleges*. New York: MDRC, Policy Brief, March.
Community College Research Center (2013). *What We Know About Nonacademic Student Supports*. Community College Research Center, Teachers College, Columbia University.
Bettinger, E.P., Baker, R. (2014). The Effects of Student Coaching: An Evaluation of a Randomized Experiment in Student Advising. *Educational Evaluation and Policy Analysis*, 36(1).

Grant-Funded Support Services at ACT for Healthcare Colleges

ACT for Healthcare colleges used TAACCCT funds to implement a variety of support services intended to improve academic and employment outcomes for students in targeted healthcare programs. Some of these supports were integrated into program curricula or embedded in the classroom, while others were delivered outside of class through one-on-one and group-level sessions. Although the types of support services, and the ways they are delivered, varied across and within institutions, the majority were intended to help students in three primary areas: academic readiness, career or employment preparation, and personal support.[20]

Approximately 70% of ACT for Healthcare participants, representing 2,297 students, received at least one grant-funded support service. In order to classify and differentiate the approaches to support service delivery within and across ACT for Healthcare colleges, the evaluation team developed a simple ACT for Healthcare Support Services Typology. This typology—which was first presented in a 2017 Issue Brief,[21] and which is discussed in more detail in Section 4—emphasizes two primary dimensions: support service *content area* (academic vs. non-academic) and support service delivery *location* (in-class vs. out of class), resulting in the following four content/location area service types:

- In-Class Academic
- Out-of-Class Academic
- In-Class Non-Academic
- Out-of-Class Non-Academic

Distinguishing supports according to service location is important given that most in-class supports are inherently mandatory—all students attending class have exposure to the support—whereas out-of-class supports are typically optional. Research suggests that optional supports tend to be accessed by fewer students, and not always by the students with the greatest need.[22] Differentiating between supports provided in-class versus out-of-class was also important for the evaluation from a data collection perspective. Whereas exposure to in-class supports could be gleaned from student-level course enrollment data, the delivery of support services offered outside of class are tracked in different ways and to different degrees by colleges. To ensure consistent data collection across the ACT for Healthcare consortium, the evaluation team developed a standard template for colleges to record support service provision outside of class at the student level.

As shown in Figure 1, academic supports were more widespread across the consortium than non-academic supports, reaching a larger number of students. **Academic supports delivered in class reached the largest number of participants (1,173 students)**. The most common approach to delivering in-class academic supports across the ACT for Healthcare consortium was to embed support instructors or staff within healthcare courses or labs, or to develop new academic support courses offered separately but concurrently alongside regular program courses. In addition, some colleges added new industry exam test preparation modules delivered during regular course hours; this latter approach was especially common for colleges focusing TAACCCT efforts on Nursing Assistant students.

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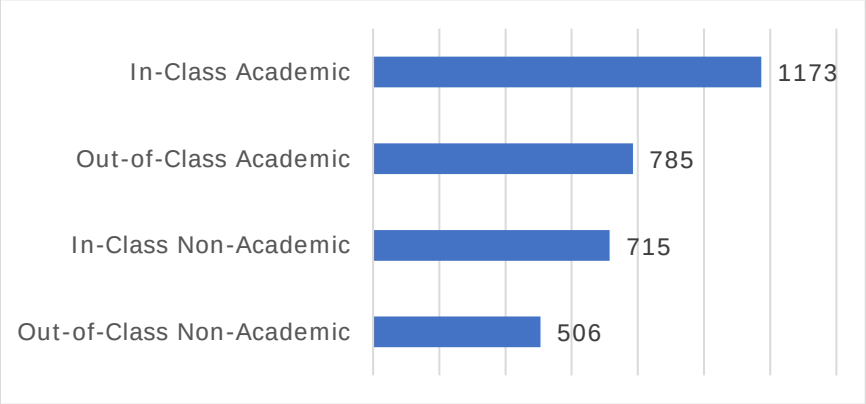
[20] The latter two areas—career preparation and personal supports—do not deal directly with academic content and are commonly referred to as "non-academic," although they are designed to support and encourage academic success. (Community College Research Center (2013). *What We Know About Nonacademic Student Supports*. Community College Research Center, Teachers College, Columbia University.)

[21] Valentine, J.L. et al (2017). "*Advancing Careers and Training (ACT) for Healthcare through Student Support Services*." http://www.equalmeasure.org/wp-content/uploads/2017/09/EM_Wisconsin_ACT_FINAL_post.pdf.

[22] Karp, M., O'Gara, L., Hughes, K.L. (2008). *Do Support Services at Community Colleges Encourage Success or Reproduce Disadvantage? An Exploratory Study of Students in Two Community Colleges.* Community College Research Center Working Paper No.10. Teachers College, Columbia University.

Out-of-class academic supports was the second largest support service type, reaching 785 participants. Out-of-class academic supports at ACT for Healthcare colleges were provided by faculty and non-faculty tutors, academic coaches, or academic specialists who met 1:1 with participants or who led group-level study sessions during designated office hours and/or open labs. Although not delivered during regular class time, these supports were often targeted to students in program courses that have high non-pass rates. This approach was especially prevalent for colleges serving students in Associate Degree of Nursing programs, and follows a nationwide trend in the nursing field to provide additional academic supports for students struggling with challenging courses such as Pharmacology and Complex Health Alterations.[23] Importantly, participants accessing academic supports outside of class tended to do so frequently; on average, participants accessed these supports on 6.3 separate occasions between Summer 2016 and December 2017.

Figure 1: Number of ACT for Healthcare Participants Receiving Support Services, by Type



Although a relatively higher proportion of ACT for Healthcare participants received supports that were academic in nature, grant-funded non-academic supports also reached a substantial number of participants. **Non-academic supports delivered within classrooms reached 715 participants** and included services like time management and study skills workshops and success courses, as well as career preparation sessions focused on resume writing and interviewing strategies. In addition, **506 participants received non-academic support services outside of class**. These services at ACT for Healthcare colleges consisted primarily of personal advising or counseling sessions with ACT support service staff. Most out-of-class non-academic services were provided on a 1:1 basis, and they were almost always voluntary. The most common approach to providing these non-academic support services was through the role of a broadly-defined "Navigator" or "Success Coach," although in some instances non-academic supports were provided by a licensed professional counselor. Students accessed non-academic supports outside of class less frequently than out-of-class academic supports; on average, participants accessing out-of-class non-academic supports did so on 2.3 occasions between Summer 2016 and December 2017.

It is important to note that many colleges implemented multiple support types; for example, a combination of academic and non-academic supports, or a combination of supports delivered both in-class and out-of-class. Of the nearly 2,300 participants receiving support services, **one-third received more than one support service type**. In addition, as noted above, **the number of supports varied according to whether the support was academic or non-academic in nature**. Overall, academic supports tended to be delivered within classrooms and accessed outside of classrooms more frequently

[23] Harding, M. 2012. Efficacy of supplemental instruction to enhance student success. *Teaching and Learning in Nursing,* 7(1): 27-31; and, Schrum, Ronna A. 2015. Nursing student retention in an associate degree nursing program utilizing a retention specialist. *Teaching and Learning in Nursing,* 10: 80-87.

than non-academic supports. These descriptive details provide important context for interpreting the impact results presented in the remainder of this section.

Impact Evaluation Questions and Methodology

Evaluation Questions

The impact evaluation focuses on four education and labor market outcomes: credential attainment, within-institution retention, employment, and earnings. Specifically:

- ***Credential Attainment:*** *Do participants who received support services earn credentials at higher rates than a matched comparison group of healthcare students?*
- ***Within-Institution Retention:*** *Are participants who received support services retained within institutions at higher rates than a matched comparison group of healthcare students?*
- ***Employment:*** *Are participants who were not employed at the start of their ACT for Healthcare program, and who received support services, employed one quarter after program exit at higher rates than a matched comparison group of non-incumbent healthcare students?*
- ***Earnings:*** *Do participants who were incumbent workers at the start of their ACT for Healthcare program, and who received support services, have a greater rate of quarterly earnings gains than a comparison group of incumbent healthcare students?*

Methodology

Primary analyses for the impact study use Propensity Score Matching (PSM) to generate a comparison group of concurrently-enrolled healthcare students that is similar to the treatment group of interest along a set of observable characteristics. PSM can account for factors that may influence the receipt of treatment and the outcome of interest, and thus confound analysis of impact. By generating a comparison group that resembles the treatment group on variables thought to affect likelihood of receiving treatment, evaluators can infer that the subsequent impact of the treatment is the result of the treatment, and not the result of observable characteristics in the two groups.[24] The PSM approach meets standards of rigor for non-experimental research studies as defined by the Clearinghouse for Labor Evaluation and Research[25] and the Institute of Education Sciences What Works Clearinghouse.[26] Appendix A provides more detailed information about the PSM process, as well as baseline equivalence statistics for the predictors used in all PSM models.

Impact Evaluation Treatment Group: Participants Receiving Grant-Funded Support Services

As noted above, nearly 70% of all participants enrolled in healthcare programs, representing approximately 2,300 students, received at least one support service during the grant period. *The primary impact analyses explore academic and employment outcomes for this group of participants receiving any grant-funded supports*, compared to a statistically matched control group of healthcare students. Across the consortium, 2,297 students received at least one grant-funded support service. Table 3, Column II presents demographic and baseline enrollment characteristics for the primary treatment group of 2,297 participants receiving grant-funded supports. As shown in the table,

[24] Guo, S. & Fraser, M. (2010). *Propensity Score Analysis: Statistical Methods and Applications*. Los Angeles: Sage Publications; and, Austin, P.C. (2011). An introduction to Propensity Score Methods for Reducing the Effect of Confounding in Observational Studies. *Multivariate Behavioral Research*, 46(3), 399-424.
[25] Clearinghouse for Labor Evaluation and Research. *Causal Evidence Guidelines*, Version 2.1, December 2015.
[26] Institute of Education Sciences, What Works Clearinghouse. *WWC Standards Brief for Baseline Equivalence*, n.d.

participants receiving supports are demographically similar to the broader sample of grant participants in healthcare programs (Column I): approximately one-half (51%) of treatment students are aged 25 years or older, and they are predominantly female (88%) and non-Hispanic white (82%). In terms of prior education, students receiving grant-funded support services were slightly more likely than the broader participant population to have some college experience but no credential (42%). On average, these students had earned 16 credits during prior periods of college enrollment. Very few treatment students were enrolled in adult education courses (4%), and only a small proportion of students (7%) were WIOA Title I participants during the grant period (although, as noted in Section 1, TAACCCT participants were more likely that the broader healthcare population to be WIOA Title I recipients). However, nearly one-third of students were Pell recipients during their first term in their grant-funded program. Finally, nearly one-quarter (73%) of students receiving any support services were enrolled in the Nursing pathway—including a full 40% of students who were enrolled in Nursing Assistant in their first term.

In addition to primary analyses examining educational and labor market impacts for students receiving any grant-funded support services, educational outcomes for two treatment subgroups are also explored. As noted above, several ACT for Healthcare colleges pursued common strategies with respect to the types of services provided, the manner in which they were delivered, and the students to whom they were targeted. The *treatment subgroup analysis* allows for closer examination of two common support service strategies pursued by consortium colleges:

- **Students receiving grant-funded out-of-class, non-academic support services:** Examination of outcomes for students receiving out-of-class non-academic supports is motivated by increasing national attention to the non-academic barriers faced by community college students. As noted above, several colleges hired success coaches, navigators, or counselors to offer 1:1 personal advising and counseling sessions on a variety of non-academic topics. Approximately 500 participants across 11 ACT for Healthcare institutions received out-of-class supports, accessing these supports more than two times on average during the roughly 18 months data were collected. Although there is concern within the researcher and practitioner community regarding the extent to which non-academic supports are accessed by students who need them most, especially when those services are provided outside of class on a voluntary basis,[27] demographic information for our sample suggests that students receiving non-academic supports were a more diverse group of students compared to the broader participant sample. As shown in Table 3 (Column III), students receiving out-of-class non-academic support services were significantly older (60% aged 25 and up) and more likely to have a non-Hispanic white racial or ethnic background (23%) compared to the broader participant population. In addition, students accessing out-of-class non-academic supports were more likely to have received WIOA Title I services (10%) and Pell financial aid (37%).

- **Nursing students receiving grant-funded out-of-class academic supports targeted to specific courses:** The focus on nursing students is motivated in part by the regional and national nursing shortage facing the healthcare industry, as well as by other national efforts to boost nursing student success through provision of targeted academic supports.[28] As noted already, ACT for Healthcare colleges focused heavily on students in the Nursing pathway. A

[27] Community College Research Center (2013). *What We Know About Nonacademic Student Supports*. Community College Research Center, Teachers College, Columbia University.
Karp, M., O'Gara, L., Hughes, K.L. (2008). *Do Support Services at Community Colleges Encourage Success or Reproduce Disadvantage? An Exploratory Study of Students in Two Community Colleges.* Community College Research Center Working Paper No.10. Teachers College, Columbia University.
[28] Harding, M. 2012. Efficacy of supplemental instruction to enhance student success. *Teaching and Learning in Nursing,* 7(1): 27-31; and, Schrum, Ronna A. 2015. Nursing student retention in an associate degree nursing program utilizing a retention specialist. *Teaching and Learning in Nursing,* 10: 80-87.

common strategy pursued by four colleges and reaching approximately 450 Nursing participants was the provision of weekly academic tutoring and review sessions targeted to high-failure first-year courses such as pharmacology and complex health alterations. As shown in Table 3 (Column IV), Nursing students receiving these grant-funded out-of-class supports were relatively older (nearly two-thirds aged 25 or more) and more likely to have some prior college experience but no four-year degree, compared to the broader participant population.

Table 3: Treatment Group Demographics and Other Baseline Characteristics

	I	II	III	IV
	All TAACCCT 4 Participants in healthcare programs (N=3,376)	**Treatment Group – Participants Receiving Grant-Funded Support Services (N=2,297)**	**Treatment Subgroup – Participants Receiving OOC, Non-Acad Supports (N=506)**	**Treatment Subgroup – Nursing Participants Receiving OOC, Acad Supports (N=455)**
Gender				
Female	88%	88%	88%	92%
Male	12%	12%	12%	8%
Race and Ethnicity				
Black or African American	5%	5%	8%	3%
White	82%	82%	77%	86%
Hispanic (any race)	6%	6%	6%	6%
Other	7%	7%	9%	5%
Age				
Less than 25 years old	49%	49%	40%	36%
25 years old or older	51%	51%	60%	64%
Average age	28.5	28.4	30.9	29.5
Highest Credential Earned (Pre-Grant)				
No credential	2%	2%	2%	--%
HS diploma	36%	36%	37%	16%
Some college no degree	39%	42%	38%	51%
Credential (<4-year)	14%	13%	13%	21%
4-year degree or higher	9%	8%	10%	11%
Workforce Clients				
Title 1 Recipient	7%	7%	10%	1%
Enrollment characteristics in first grant term				
Credits attempted	7.9	7.5	8.3	8.4
Prior Credits Earned	17.0	16.2	20.5	26.4
Enrolled in Adult Basic Education course	4%	4%	4%	0%
Pell receipt	34%	31%	37%	36%
Healthcare Program				
Nursing Assistant	33%	40%	26%	n/a
Nursing AD /Practical Nurse	33%	33%	37%	100%
Medical Assistant	12%	13%	16%	n/a

Impact Evaluation Results: Overall Summary

Table 4 summarizes overall impact results for academic and labor market outcomes for *participants receiving any grant-funded support services*.[29] Average treatment effects on the treated (ATT) were substantial and significant ($p<.05$) for all outcomes of interest. PSM impact analyses indicate that participants receiving grant-funded support services were significantly more likely to earn credentials and to remain enrolled within their academic institutions; they were also significantly more likely to experience employment and earnings gains. Specifically:

- 74% of treatment students earned a postsecondary credential, versus 51% for a matched comparison group;
- Treatment students were eight percentage points more likely to be retained into the next semester, and seven percentage points more likely to be retained one year later, compared to a matched comparison group;
- 45% of treatment students who were unemployed at the start of their program had gained employment one quarter after program exit, compared to 37% for a matched comparison group of non-incumbent workers; and
- Treatment students who were incumbent workers were six percentage points more likely to experience quarterly earnings gains following program exit, compared to a matched comparison group of incumbent workers.

Table 4: Impact Analysis Results Summary

Outcome	Treatment Group	Comparison Group	ATT	P-value
Credential attainment	74%	51%	23%	0.00
Within-Institution Retention (1-Semester)	63%	55%	8%	0.00
Within-Institution Retention (1-Year)	48%	41%	7%	0.00
Employment Gains	45%	37%	8%	0.02
Average Earnings Gains	66%	60%	6%	0.01

The following sections provide a more detailed discussion and exploration of each of the main educational and employment outcomes summarized above.

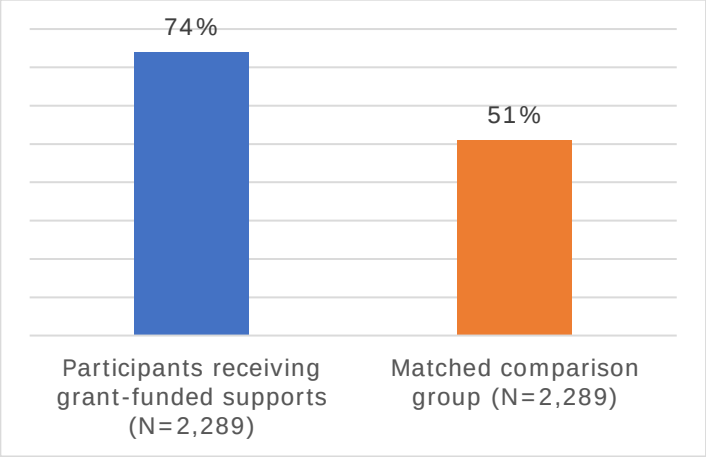
Educational Outcomes—Credential Attainment

Research Question: *Do participants receiving grant-funded support services earn credentials at higher rates than a matched comparison group of healthcare students?*

As noted previously, increasing investments nationwide by community and technical colleges in support service infrastructure is driven by research suggesting that many students within these institutions struggle with numerous academic and non-academic barriers that can impede their success, including their completion of a desired credential. The PSM analysis for credential attainment suggests that students receiving grant-funded support services had a greatly increased likelihood of receiving a credential during the grant period. As shown in Figure 2, nearly three-quarters (74%) of these students received a credential of some kind, whereas only about one-half of the matched comparison group received a credential—a difference of 23 percentage points in credential attainment rates.

[29] Although the PSM approach seeks to balance the treatment and comparison group on observable characteristics, its power is limited by the availability of data. In this context, many participants also experienced the curricular and instructional innovations implemented in these healthcare programs of study as well as workplace learning opportunities that may have been enhanced during the grant period. Our impact estimates do not account explicitly for these innovations.

Figure 2: Credential Attainment: PSM Impact Results, Any Support Services



*ATT = 23% (p=0.00)

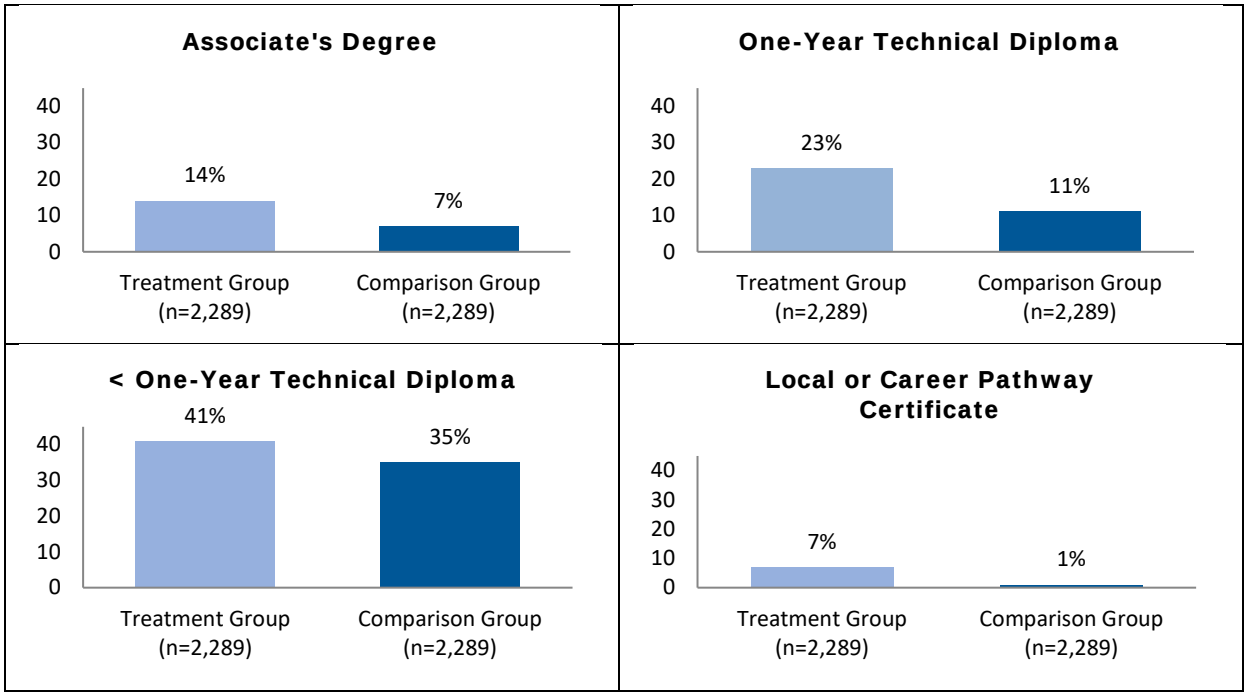
A central objective of the TAACCCT initiative was "to help adult students obtain industry-recognized credentials more quickly"[30] through a variety of strategies including the expansion and enhancement of shorter-term credentials with labor market value. Figure 3 displays the proportion of treatment students versus matched comparison group students earning various credential types. Results indicate that the treatment group was significantly more likely to attain a variety of credential types. However, the most prevalent credentials earned by TAACCCT participants receiving grant-funded support services were shorter-term technical diplomas of one year or less; 23% and 41% of treatment students earned a one-year or less-than-one-year technical diploma, respectively, during the grant period. As noted above, a full 40% of students receiving grant-funded support services were enrolled in Nursing Assistant, a short-term credential of a single semester that can lead to immediate employment in the healthcare field and to the next steps on the Nursing career pathway of Practical Nurse (1-year program) or Registered Nurse (2-year program).

Although less common, 7% of treatment students earned short-term local or Career Pathway certificates, compared to only 1% of a matched comparison group. These results are reflective of the efforts of several ACT for Healthcare colleges to develop shorter-term certificates in regionally-specific high-demand fields such as gerontology (see Section 4).

Finally, Figure 4 provides a comparison of credential completion rates by healthcare program. As noted above, grant participants were heavily represented in the Nursing pathway and Medical Assistant programs—both the short-term Nursing Assistant program, and longer-term Practical Nurse and Registered Nurse programs. Credential completion rates in all of these programs were much higher for participants receiving grant-funded support services, compared to a matched comparison group of students in the same program.

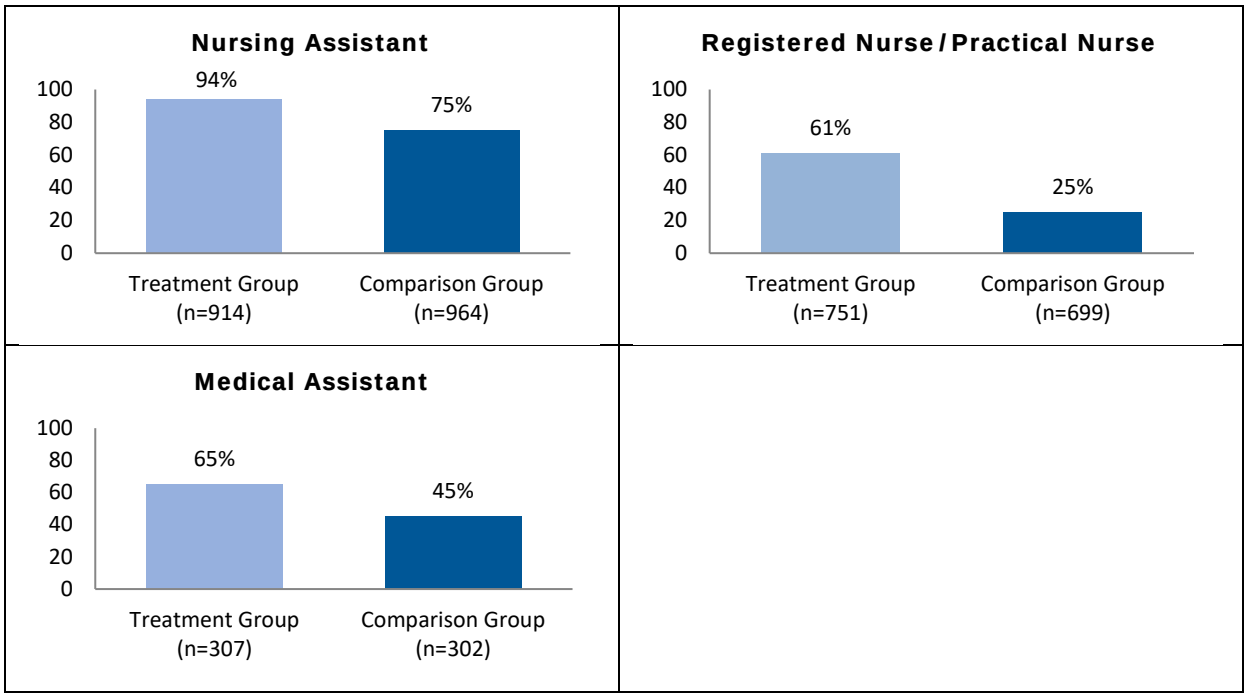
[30] https://doleta.gov/taaccct/

Figure 3: Credential Attainment by Type: Participants who received any support service v. matched comparison group



*All differences between treatment and control groups significant at p<.05.

Figure 4: Any Credential Attainment, by Program of Enrollment: Participants who received any support service v. matched comparison group



*All differences between treatment and control groups significant at p<.05.

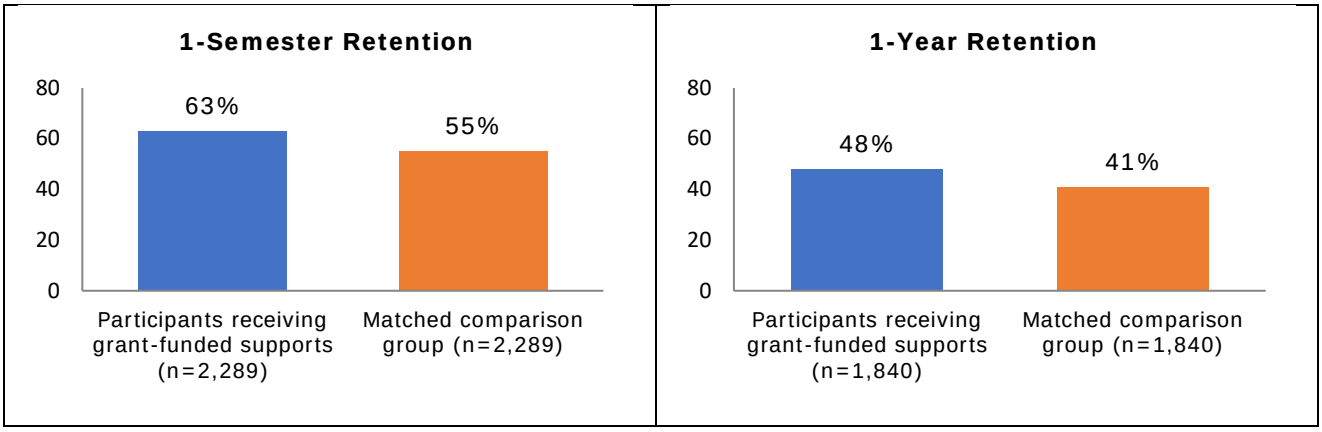
Educational Outcomes—Within-Institution Retention

Research Question: *Are participants receiving grant-funded support services retained within institutions at higher rates than a matched comparison group of healthcare students?*

In addition to credential attainment, the impact study examined within-institution retention outcomes, or the likelihood that students remain enrolled within their institutions one semester and one year later. Continued enrollment has implications for students' eventual completion of credentials. Given the notoriously chaotic enrollment patterns of many community college students, it is not surprising that research suggests students who remain continuously enrolled are more likely to earn college credentials.[31] By helping students navigate academic and non-academic barriers that can impede standard program progression, support services can increase student retention rates and thus eventual program completion. Increasing student retention rates also has positive implications for colleges' full-time-equivalent student enrollment and institutional budgets.

Figure 5 displays one-semester and one-year within-institution retention rates for students receiving grant-funded support services versus a matched comparison group of healthcare students. As displayed in the figure, students in the treatment group are 7-8 percentage points more likely than a statistically matched comparison group to be enrolled one semester later (63% v. 55%) and one year later (48% v. 41%).[32]

Figure 5: Within-Institution Retention: PSM Impact Results, Any Support Services



*ATT = 8% (p=0.00)

*ATT = 7% (p=0.00)

Labor Market Outcomes—Employment (Non-incumbent Workers)

Research Question: *Are participants who were not employed at the start of their program, and who received grant-funded support services, employed one quarter after program exit at higher rates than a matched comparison group of non-incumbent healthcare students?*

In line with U.S. Department of Labor definitions, assessment of employment was limited to students who were not employed during their first term of enrollment during the study period. As is typical of community college students, a high proportion of healthcare students were employed alongside their

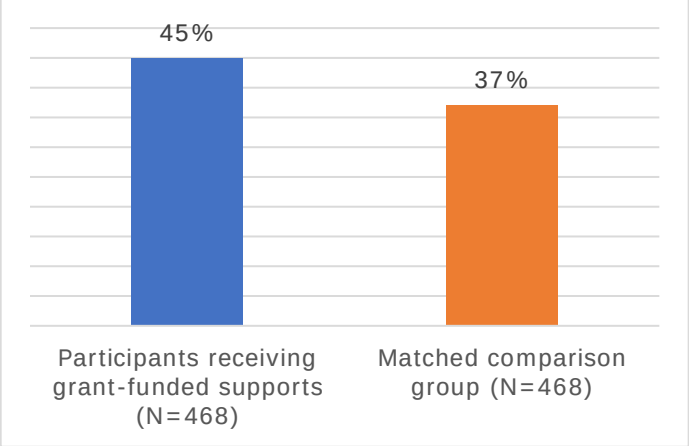
[31] Crosta, Peter. (2014). "Intensity and Attachment: How the Chaotic Enrollment Patterns of Community College Students Relate to Educational Outcomes." *Community College Review, 42(2): 118-142.*

[32] Analysis of one-year retention is restricted to students who could be observed one year following initial healthcare enrollment.

studies. Approximately 70% of participants receiving grant-funded support services were employed during their first term of healthcare program enrollment. The assessment of employment for the treatment group is thus limited to the 30% of students who were not employed as of their first term—i.e., non-incumbent workers. In addition, the sample was further restricted to students who exited the college within the observation window of the study. The last term of administrative data available to the evaluators was for the spring 2018 term; any students still enrolled during that term were excluded from the analysis. The final analytic treatment sample for the employment outcome consists of 468 students who were not employed when they entered the sample and who exited prior to spring 2018. We used PSM to generate a matched comparison group that is similar to the non-incumbent worker treatment group.

PSM results indicate that participants who received grant-funded support services become employed at a significantly higher rate than the matched comparison group. As shown in Figure 6, 45% of treatment students were employed one quarter after exit, compared with 37% of comparison group students. It is important to note that the assessment of employment is not restricted to students who complete their programs. In other words, the sample is composed of students who have completed their programs *and* students who have exited without completion. As shown in the previous section, students in the treatment group were more likely than a matched comparison group to have earned a variety of credentials, which is partially driving this positive result.[33]

Figure 6: Employment (Non-incumbent Workers): PSM Impact Results, Any Support Services



*ATT = 8% (p=0.02)

Labor Market Outcomes—Earnings Gains (Incumbent Workers)

Research Question: *Do participants who were incumbent workers at the start of their program, and who received grant-funded support services, have greater rates of quarterly earnings gains than a comparison group of incumbent healthcare students?*

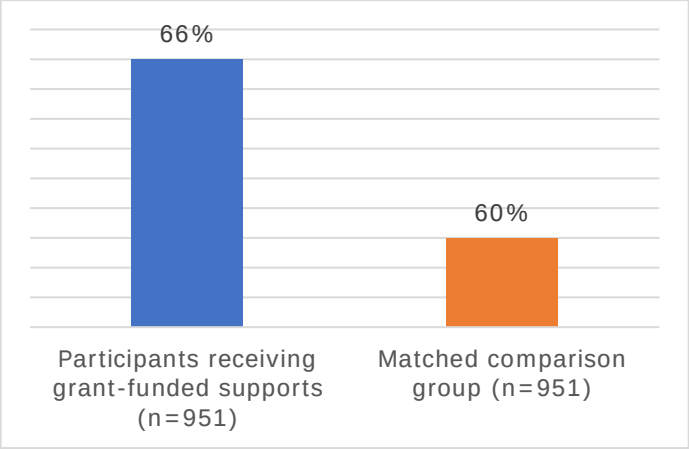
Similar to the analysis of employment impacts, assessment of earnings gains was restricted to students who were incumbent workers (defined as employed in first term of enrollment or in the two

[33] In supplementary analysis of employment outcomes that adds credential receipt as a matching variable in PSM models, the ATT is reduced from 8% to 6%, suggesting that the treatment group's higher likelihood of credential receipt is partially driving employment impacts.

terms preceding enrollment), who had exited the college within the observation window of the study, and who had gained employment within three quarters of exit. The resulting analytic sample of students receiving grant-funded supports, who also meet these additional restrictions, is 951 treatment group students. These students were matched with a comparison group using PSM meeting the same restrictions noted above.

The PSM impact analysis results for earnings gains are presented in Figure 7, which indicates a significantly higher likelihood of earnings gains for students receiving grant-funded support services: 66% of incumbent worker treatment students, versus 60% of a matched comparison group, experienced an increase in average quarterly earnings after exiting the program. Supplementary analysis suggests that this impact is especially large for Nursing students—72% of Nursing students in the treatment sample experienced positive quarterly earnings gains, compared to 56% of comparison group students enrolled in a Nursing program.

Figure 7: Rate of Quarterly Earnings Gains (Incumbent Workers): PSM Impact Results, Any Support Services



*ATT = 6% (p=0.01)

In terms of dollar value, students receiving grant-funded support services experienced significant proportional increases in average quarterly earnings. Average quarterly earnings for treatment group students at baseline was approximately $5,000. For treatment group students securing employment after program exit, average earnings gains were over $900, representing a nearly 20% gain over baseline earnings. When restricting to the 66% of treatment students who experienced an increase in earnings (i.e., when excluding those who experienced zero or negative gains), the average quarterly earnings gain for treatment students was roughly $2,800.

Subgroup Analyses for Participants Receiving Out-of-Class Supports

The evaluation conducted supplementary impact analyses on two subgroups of participants receiving grant-funded support services: any participant receiving out-of-class, non-academic supports; and Nursing participants receiving out-of-class, academic supports targeted to courses with traditionally low pass rates. These subgroups were selected because they are reflective of common support service strategies pursued across both the ACT for Healthcare consortium and nationally.

As mentioned above, 1:1 advising or counseling sessions provided by a navigator, success coach, or counselor are intended to help students overcome a number of non-academic barriers that can get in the way of academic success. Although support services offered on a voluntary basis can reproduce

disadvantage if they are accessed only by students who are already poised to succeed, the students in ACT for Healthcare colleges who accessed out-of-class non-academic supports (n=500) were more diverse than the broader participant population on a number of traits including age, race/ethnicity, and workforce program client status (see Table 3 above).

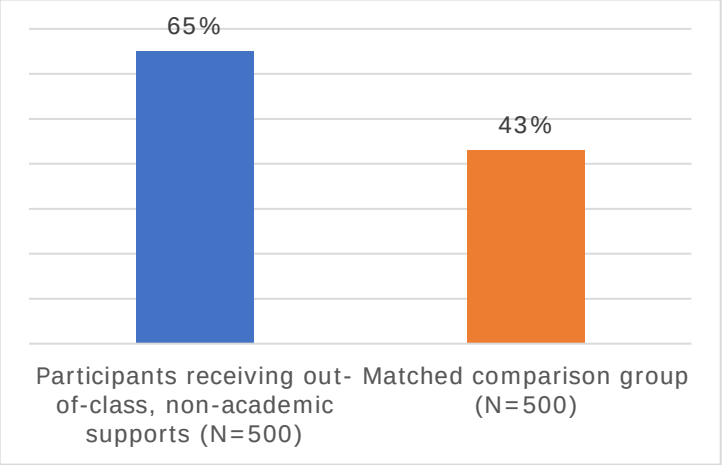
Given the notorious rigor of several first-year Nursing classes like pharmacology, four colleges in the ACT for Healthcare consortium provided additional tutoring and review sessions targeted specifically to these hard-to-pass courses outside of regular class time. Approximately 450 Nursing participants took advantage of these out-of-class academic supports, which they accessed more than seven times on average. Given that the gap between supply and demand for registered nurses in Wisconsin is expected to reach 35% by 2035 (see footnote 1), providing additional academic supports to students in this rigorous healthcare program is one way to boost student persistence and credential completion, which can serve to address this challenge.

In the remainder of this section, we present PSM impact results for these two subgroups of interest, focusing on the credential completion and within-institution retention outcomes. Sample size limitations prevented the assessment of employment outcomes for these subgroups.[34]

Participants Receiving Out-of-Class, Non-Academic Supports

Numerous non-academic issues—including challenges with transportation or childcare, and the time and scheduling barriers those and other challenges present—can stymie students' successful credential completion. The PSM analysis for credential attainment suggests that students receiving non-academic supports outside of class were much more likely to earn a credential during the grant period than a statistically matched comparison group. Figure 8 shows that students receiving such supports were 22 percentage points more likely to earn a credential of some kind compared to a control group—the treatment group credential attainment rate was 65%, compared to 43% for a matched comparison group.

Figure 8: Credential Attainment: PSM Impact Results, Out-of-Class Non-Academic Supports

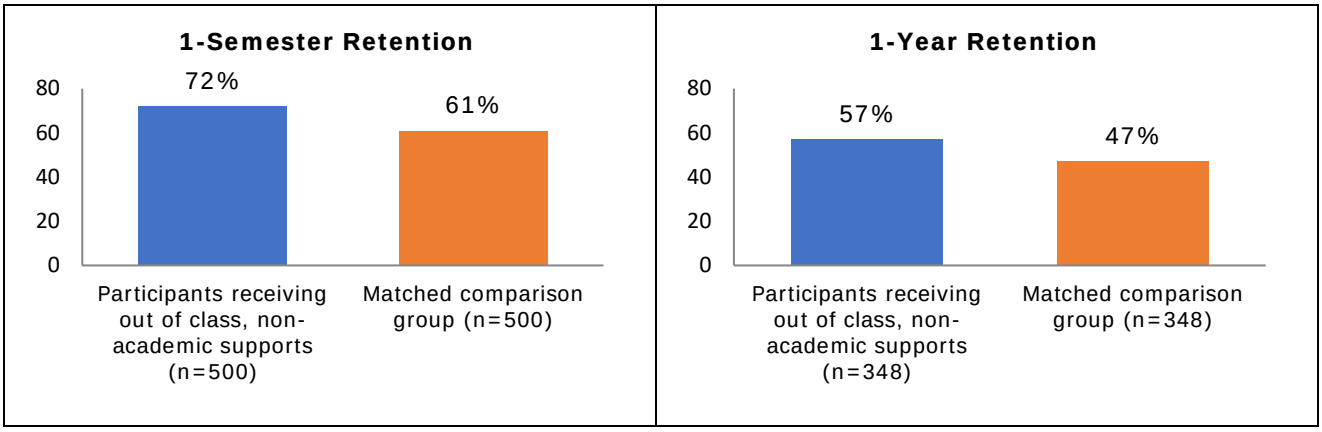


*ATT = 22% (p=0.00)

[34] The employment and earnings gains outcomes are restricted to non-incumbent and incumbent workers, respectively, and are further restricted to those who exited the program. The resulting subgroup samples were too small to support PSM models that could effectively balance across a set of meaningful covariates. See Appendix A for more information on the PSM modeling approach pursued in this impact study.

Non-academic challenges are often a primary driver of students exiting programs, and many community college students do not re-enroll once they have left an institution. Support service staff focused on helping students with the non-academic barriers they face can help students remain enrolled in programs. As displayed in Figure 9, students receiving non-academic support services outside of class were 11% more likely to still be enrolled one semester later compared to a matched comparison group (72% v. 61%), and a similar impact for one-year retention, with treatment students 10 percentage points more likely to be enrolled in their institution one year later compared to a matched comparison group (57% v. 47%).

Figure 9: Within-institution Retention: PSM Impact Results, Out-of-Class Non-Academic Supports



*ATT = 11% (p=0.00)

*ATT = 10% (p=0.01)

Nursing Participants Receiving Out-of-Class, Targeted Academic Supports

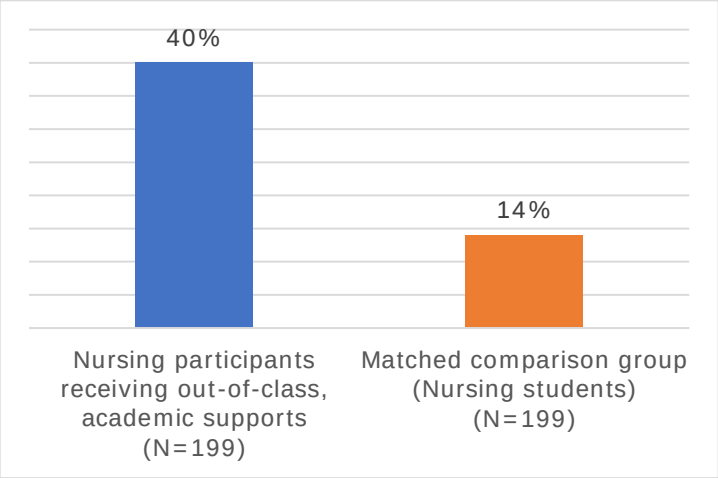
The academic supports provided to Nursing students were focused on specific courses that are known to present challenges for students. These challenges might be especially great for students who have not attended college for some time. As shown in Table 3 above, Nursing students who attended out-of-class tutoring and review sessions were notably older students who had prior college experience but who likely had not been enrolled in college in some time.

The rationale for providing targeted academic supports for Nursing students is to help these students get "over the hump" of challenging first-year courses, thereby improving student term-to-term persistence as well as their overall likelihood of completing a Nursing degree.

Figure 10 shows that Nursing participants who accessed out-of-class academic supports had a much higher likelihood of eventual Associates degree attainment compared to other Nursing students. Specifically, 40% of Nursing participants receiving out-of-class academic supports, compared to just 14% for a matched comparison group of Nursing students.[35] Nursing students receiving out-of-class academic supports were also significantly more likely than other Nursing students to be retained within their programs—compared to a matched comparison group, Nursing students receiving grant-funded targeted academic supports were 21 percentage points and 29 percentage points more likely to be retained one semester and one year later, respectively (Figure 11).

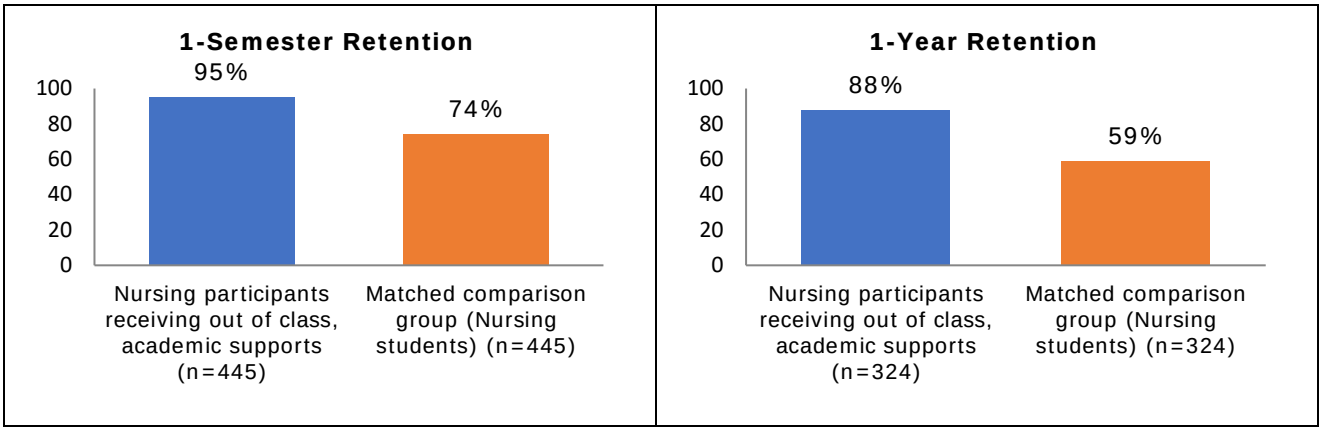
[35] Analysis of Associates degree receipt for Nursing students was restricted to students who could have been observed for two academic years, which is the minimum number of terms required to complete an associate's degree. Given that many community college students attend part-time, most students take longer to complete their degrees.

Figure 10: Associates Degree Attainment: PSM Impact Results, Out-of-Class Targeted Academic Supports for Nursing Students



*ATT = 26% (p=0.00)

Figure 11: Within-institution Retention: PSM Impact Results, Out-of-Class Targeted Academic Supports for Nursing Students



*ATT = 21% (p=0.00)

*ATT = 29% (p=0.00)

Summary Assessment of Education and Employment Impacts for Support Service Recipients

The impact evaluation of Wisconsin's TAACCCT Round 4 ACT for Healthcare grant revealed large, statistically significant impacts on credential attainment for participants receiving grant-funded support services compared to a matched comparison group of healthcare students. These credential completion impacts were consistently positive across key healthcare programs, and across a variety of credential types. In addition, the impact evaluation showed that participants receiving grant-funded supports were more likely to be retained within their programs one semester and one year later. These within-institution retention impacts were particularly pronounced for participants receiving non-academic supports outside of a regular classroom setting, as well as for Nursing participants who accessed out-of-class academic supports targeted to challenging first-year Nursing courses. Notably, in the participant sample, students accessing these out-of-class supports tended to be older students, and in the case of non-academic supports they also tended to be more diverse.

In terms of labor market outcomes, impact analyses indicated that participants receiving grant-funded support services were significantly more likely to experience employment and earnings gains. Participants who were unemployed at the start of their grant program were more likely than a matched comparison group of non-incumbent workers to gain employment following program exit; and participants who were incumbent workers were more likely than a matched comparison group to experience average quarterly earnings gains. Earnings gains experienced by participants receiving grant-funded supports were non-trivial, representing an average 20 percent increase with respect to baseline quarterly earnings.

These positive findings on the benefits of support services for students in healthcare programs have important implications for colleges seeking to meet increasing labor market demand for healthcare workers. More specifically, by enhancing the provision of both academic and non-academic support services, and by embedding these supports in classrooms and targeting them to students in "gatekeeper" courses, colleges can:

- Increase the number of healthcare students to meet them growing labor market demands of employers;
- Improve institutional retention and completion rates, thus generating additional revenue to help pay for key support services positions; and,
- Better serve the adult populations who need additional skills and re-training, and who represent a large and essential source of future students and healthcare workers.

In short, providing support services for healthcare students generates benefits for students, colleges, and employers—suggesting that this approach to enhanced education and training should be an essential aspect of institutional reform efforts with potential replicability to sectors beyond healthcare.

Section IV: Implementation Study

The summative implementation study focuses on the strengths, challenges, and sustainability of three core areas: curricular and instructional innovations, student support services, and partnership engagement. In the Interim Evaluation Report (January 2017), the evaluation team reported that "Wisconsin's technical colleges have made significant progress implementing new and modified healthcare career pathways, providing comprehensive academic and non-academic supports to participants, engaging employer partners, and developing and adopting ACT consortium strategies."[36]

As the grant sunsets in September 2018, the evaluation documents that ACT consortium colleges:

- Delivered education and training opportunities to 3,376 participants in 35 ACT for Healthcare programs that included 14 new credentials with labor market value;
- Provided a wide variety of academic and non-academic support services to 2,297 participants that were either integrated into program curriculum and/or embedded in the classroom, or delivered outside of class through one-on-one and group-level sessions;
- Enhanced their strong foundation with employer partners by leveraging employer advisory committees, expanding opportunities to support incumbent worker training, and collaborating with a handful of employers to provide tuition reimbursement for participants; and,
- Served 230 participants who were WIOA Title I, TAA, or Veterans program clients enrolling in ACT for Healthcare programs.

For each of the core strategies implemented by ACT for Healthcare colleges—curricular and instructional innovations, student support services, and partnership engagement—the implementation study provides an evaluative assessment of strengths and challenges affecting implementation progress, a descriptive summary of implementation outcomes, and spotlights notable strategies and approaches among a sample of consortium colleges. We conclude the Final Evaluation Report with an assessment of sustainability for these grant-funded strategies (Section 5).

A. Curricular and Instructional Innovations

Over the past decade, Wisconsin technical colleges have transformed their occupational and technical programs to reflect a career pathways model with stacked and latticed credentials. The statewide vision for career pathways encompasses three components, including on-ramps from high school, adult education, and the incumbent workforce to technical college programs; embedded technical diplomas and career pathway certificates that lead to employment and stack to additional postsecondary programs and credentials; and articulation between technical college programs and four-year college and university programs. The progress and scale of this effort is documented in our companion report, *Advancing Career Pathway Development in Wisconsin's Technical Colleges*.

In this section, we examine the core evaluation questions for curricular and instructional innovations within healthcare career pathways, including:

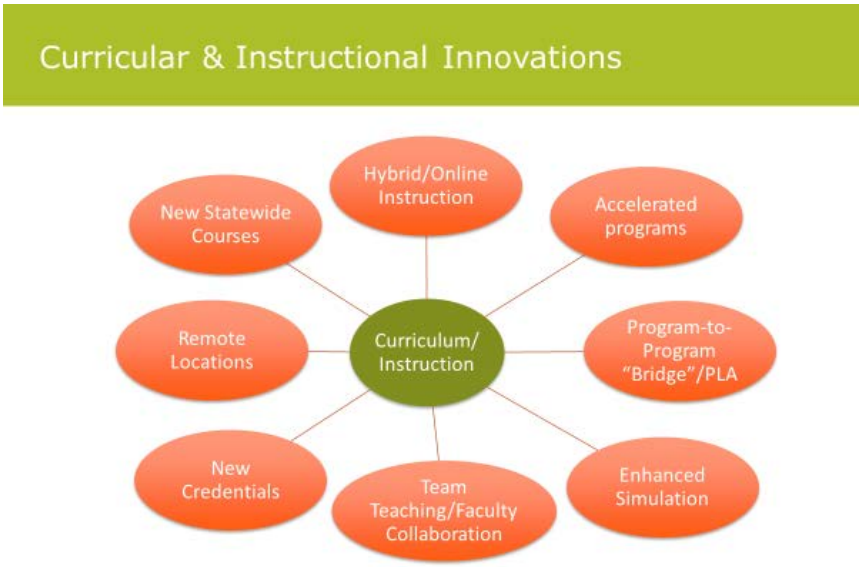
- *What kinds of curricular and instructional innovations were implemented?*
- *What were the strengths and challenges affecting implementation progress?*
- *Which curricular and instructional innovations will be sustained?*

Across the consortium, technical colleges designed and implemented many curricular and instructional innovations in their healthcare programs. These curricular and instructional innovations were

[36] Price, D. V. et al (January 2017). *Advancing Careers and Training (ACT) for Healthcare: Interim Evaluation Report*.

implemented in 35 ACT for Healthcare programs and short-term training opportunities, including seven colleges that developed and implemented 14 new credentials with labor market value.

Figure 12: Types of Curricular and Instructional Innovations



Evaluative Assessment: Implementation of Curricular and Instructional Innovations

As shown in Figure 12, the ACT for Healthcare consortium of Wisconsin technical colleges implemented a diverse array of curricular and instructional innovations across several healthcare programs of study and within short-term training opportunities such as Nursing Assistant programs. These healthcare programs and short-term training opportunities were identified by colleges in consultation with their employer advisory committees and were developed in a notably rigid curricular space that demands adherence to third-party accreditors as well as to the longstanding requirement by the technical college system that programs and credentials map to employment and career advancement opportunities. The most in-demand healthcare pathway—Nursing—already has a series of stacked credentials and so establishing new short-term credentials in this pathway was deemed unnecessary.

Moreover, the primary programs colleges focused on are well-established—and with the exception of Nursing Assistant, these healthcare pathways generally require at least one-year of education and training to gain the skills for entry-level employment. Thus, colleges focused effort to develop shorter-term credentials for new programs—like Gerontology—or that prioritized a specific set of healthcare-related skills for students in established pathways like Medical Assistant, Health Informatics and Information Management, and Executive Assistant.

Strategies across colleges and programs included:

- New programs and credentials, including several short-term credit-based training opportunities embedded along several healthcare pathways that offer credentials with demonstrated labor market value;
- Enhanced simulations including 151 new statewide Augmented Reality Integrated Simulation Education (ARISE) scenarios;
- New statewide courses in Digital Literacy and the Culture of Healthcare;

- Program-to-program bridges including PLA and a new statewide VA Medic to Nursing pathway;
- Hybrid and online instructional delivery;
- Team-teaching/faculty collaboration;
- Accelerated programming; and
- Remote locations to deliver healthcare education and training programs.

These strategies were implemented in both existing programs (Nursing Assistant, Nursing, and Medical Assistant programs were most common) and new programs (e.g., Gerontology, Office Receptionist-Medical, and Lab Science Tech). As the grant sunsets in 2018, these curricular and instructional innovations will largely be sustained at the colleges that implemented them.

Implementation Strengths

The evaluation team identified four reasons why these curricular and instructional innovations were successfully implemented and are likely to be sustained:

1. **Curricular and instructional innovations were implemented in programs that reflected high employer demand for both new workers and upskilled incumbent workers**. The most common programs were Nursing and Medical Assistant, which reflected employer demands for more skilled workers in these areas. For example, more than 2,215 participants enrolled in Nursing programs at various levels (ADN, PN, NA) with about one-third pursuing an entry-level credential as a nursing assistant. Additionally, colleges developed new programs for growth areas like Gerontology that enrolled almost 250 participants during the grant. Overall, enrollment in ACT for Healthcare programs reflected both unemployed and incumbent workers; and descriptive outcomes show that 44% of those who were unemployed when they began their grant-funded program gained employment immediately after exiting, while 78% of incumbent workers saw earnings gains after enrollment.

2. **Curricular and instructional innovations upgraded the quality of training for participants though the utilization of new technologies that better aligned with state-of-the-art skills demanded by employers**. Enhanced simulations were implemented in all consortium colleges, including the ARISE scenarios as well as college-specific innovations such as dementia simulation, upgraded mock clinics, and mobile labs. These new technologies enhanced students' learning experiences and broadened the range of hands-on training for real-life circumstances that students could face when working in the healthcare field. At several colleges, faculty participated in an in-service professional development training on new technologies, and faculty interviewed during site visits in the final year of the grant reported they planned to expand the use of these new technologies, especially simulations, in their courses after the grant ends.

3. **Curricular and instructional innovations responded to the needs of adult students by offering flexible access to working students and to students who live far from campus locations**. Faculty reported that flexible scheduling—such as online and hybrid instruction as well as shorter-term block scheduling (e.g., 8 weeks instead of 16 weeks)—were expanding enrollments especially among working adults. Students reported that it was convenient to have a program, or specific courses including pre-requisites, offered online or in a location closer to where they live, because “driving to campus multiple times a week is tough.” Students also reported they “can do it at [our] own pace;” and one student was exuberant, indicating that online and hybrid courses were “a godsend because I work full time and have three kids, so this [model] really works out for me.”

4. **Curricular and instructional innovations were supported by faculty who championed their development and adoption**. At most colleges, program faculty were involved in working groups that vetted and approved these innovative approaches. In addition, faculty were engaged in consortium committees to provide feedback and guidance on the ARISE scenarios, new courses in Digital Literacy and the Culture of Healthcare, and the new statewide VA Medic to RN pathway. Faculty leadership on these curricular and instructional innovations translated into ownership and buy-in for their adoption and widespread utilization in courses.

This implementation success was not without obstacles that colleges had to overcome. For example, as a general rule, modifying curriculum and developing new curriculum is a lengthy process with several layers of review and approval—by program faculty, college curriculum departments and committees, the technical college system office, and third-party accreditors, especially for healthcare. Healthcare deans and faculty had to navigate this complex system of oversight to ensure these innovations were enhancing program curriculum and maintaining or improving the quality of instruction. Additionally, employer advisory committees had to sign-off on the curricular and instructional innovations by indicating they would hire students trained in these program areas using these curricular and instructional techniques.

Additionally, many curricular and instructional innovations—online and hybrid, cohort-based, accelerated—require different allocation patterns for course and lab space, and that technologies be available at all times (with technical support) for students who are engaging with curriculum during evenings and on weekends. College leaders had to work through these issues, which slowed the implementation process and buy-in at many institutions. Moreover, some colleges found it difficult to enroll students in these alternative course options and had to revamp their course offerings midstream to meet their participant goals for the grant.

Lastly, the instability of new technological platforms during the development phase created initial disincentives for faculty adoption. Faculty reported early frustration with beta versions of ARISE scenarios, for example, and with the quality of display from the tablets; however, a revamped process for the development of these tools that incorporated more faculty input ultimately resulted in widespread utilization of and satisfaction with these simulations.

Colleges overcame these obstacles during the ACT for Healthcare grant and effectively implemented their curricular and instructional innovations. Notably, administrators and faculty interviewed during fieldwork the last year of the grant reported that both new and modified programs and curricula—including online, hybrid, and remote location models—would be sustained barring unexpected declines in employer and student demand for these programs.

Implementation Challenges

Colleges also faced some challenges implementing curricular and instructional innovations that were not fully addressed during the grant period, and that may have hindered their ability to serve more adult students needing additional skill enhancement prior to enrolling in a healthcare program, as well as WIOA Title I and veterans program clients that were seeking very short-term training that would prepare them for entry-level job opportunities.

The evaluation identified two challenges in particular:

- The U.S. Department of Labor issued guidance to colleges that limited participants to those enrolled in programs of study, or in required courses that were part of a program of study.

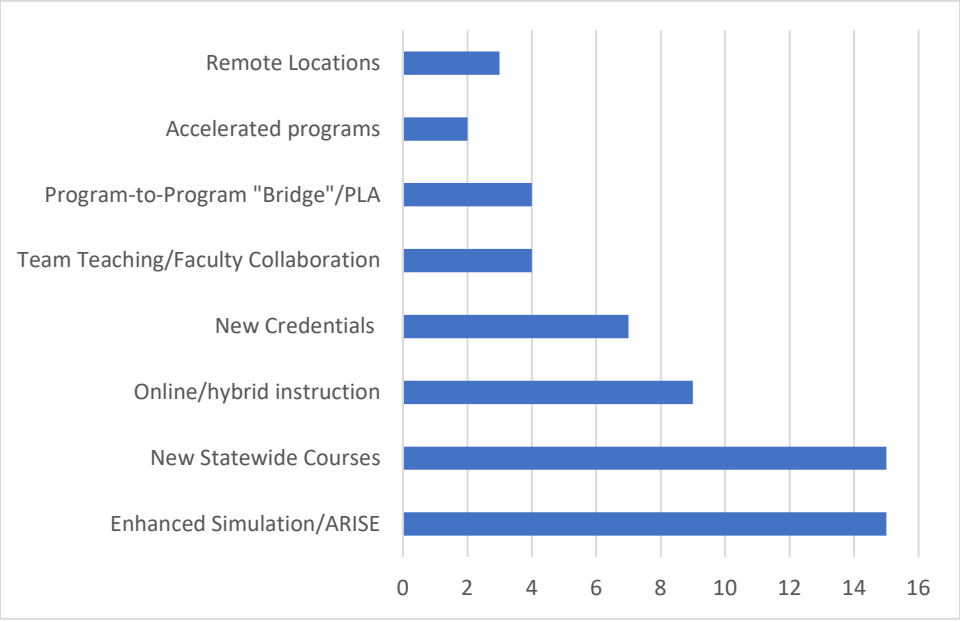
This guidance resulted in few colleges creating short-term on-ramps to healthcare programs, such as bootcamps, which can be especially beneficial for less-skilled adults who may be transitioning from one employment sector to another, and who have not enrolled in an education program for many years. The inability of college to use grant funds to support on-ramps into healthcare programs likely contributed to the low numbers of adult education students and WIOA Title I clients served during the grant period.

- Several colleges pursued a large number of innovations in multiple program areas, which made it difficult to effectively focus on implementation progress and continuous improvement. In these colleges, building support for sustainability of grant-funded curricular innovations was more difficult; and the broader campus community seemed less aware of grant-funded efforts.

Summative Implementation Accomplishments: Curricular and Instructional Innovation

In this section, we provide a descriptive summary of the curricular and instructional innovations implemented by the end of the ACT for Healthcare grant. As shown in Figure 13, every college implemented some sort of enhanced simulation to enhance students' experiential learning, as well as the two new courses in Digital Literacy and the Culture of Healthcare. The next most frequently implemented curricular and instructional innovation was online and hybrid instruction (nine colleges), followed by new credentials (seven colleges). A handful of colleges implemented program-to-program bridges like the statewide VA Medic to Nursing pathway, team teaching, new remote locations for programs, and accelerated programs. Each of these curricular and instructional innovations is described below.

Figure 13: Number of Colleges that Implemented Curricular and Instructional Innovations



Enhanced Simulation

All 15 colleges utilized ARISE scenarios in at least one healthcare program. Moreover, six colleges implemented additional enhanced simulation strategies in their healthcare programs during the ACT for Healthcare grant. For example, both Northcentral and Wisconsin Indianhead developed dementia simulations for their Nursing and Gerontology programs, respectively; Northeast Wisconsin upgraded its simulation lab to enhance mock clinics; Milwaukee and Waukesha updated simulation equipment

and technology for their Medical Assistant and Nursing programs, respectively; and Lakeshore launched a mobile simulation lab for Nursing.

Spotlight: NTC Dementia Simulation

Since fall 2016, all Nursing Assistant and first-year Nursing students are required to do a dementia simulation at Northcentral Technical College. This simulation is offered on-campus and via a new mobile bus that travels to rural communities. College administrators, faculty, and students expressed excitement about the dementia simulation, and said it added value to the learning experience. Employers expressed interest in the dementia simulation for their incumbent workers and indicated a willingness to pay for the mobile bus to come to their place of business.

During focus groups, students said that "*getting a glimpse of dementia was eye-opening*," and that "*it was hard to try to function*" with the cloudy goggles and headphones they wore. One student reported "*it really hit me hard [experiencing] what they actually go through on a daily basis*." Overall, students spoke of "empathy" as a core outcome from the Dementia simulation.

Augmented Reality Integrated Simulation Education

A primary area of enhanced simulation implemented by all colleges was the ARISE scenarios. During the ACT for Healthcare grant, the consortium developed 151 scenarios,[37] including storylines, simulations, serious games, and case studies through the design of "open source, healthcare simulations for multiple disciplines that augment the reality of the simulated environment."[38] These scenarios map to ten different curricular areas of focus for healthcare programs. Consortium colleges also received tablets for use with these scenarios in courses and labs. The scenarios developed and implemented by the consortium are applicable to several healthcare programs, including Nursing, Medical Assistant, Respiratory Therapy, and EMT/EMS.

Based on responses to a 2017 survey of project leads,[39] technical colleges were most likely to have used scenarios for "End of Life Care" and "Atypical Chest Pain-Female" curriculum at that point in time (See Figure 14). Survey data also indicated that scenarios for all healthcare curricular areas had been implemented in Nursing by at least two colleges; and two technical colleges (Lakeshore and Moraine Park) reported they incorporated all ten curricular areas of focus, and many related scenarios, into their Nursing programs.

ARISE Scenarios

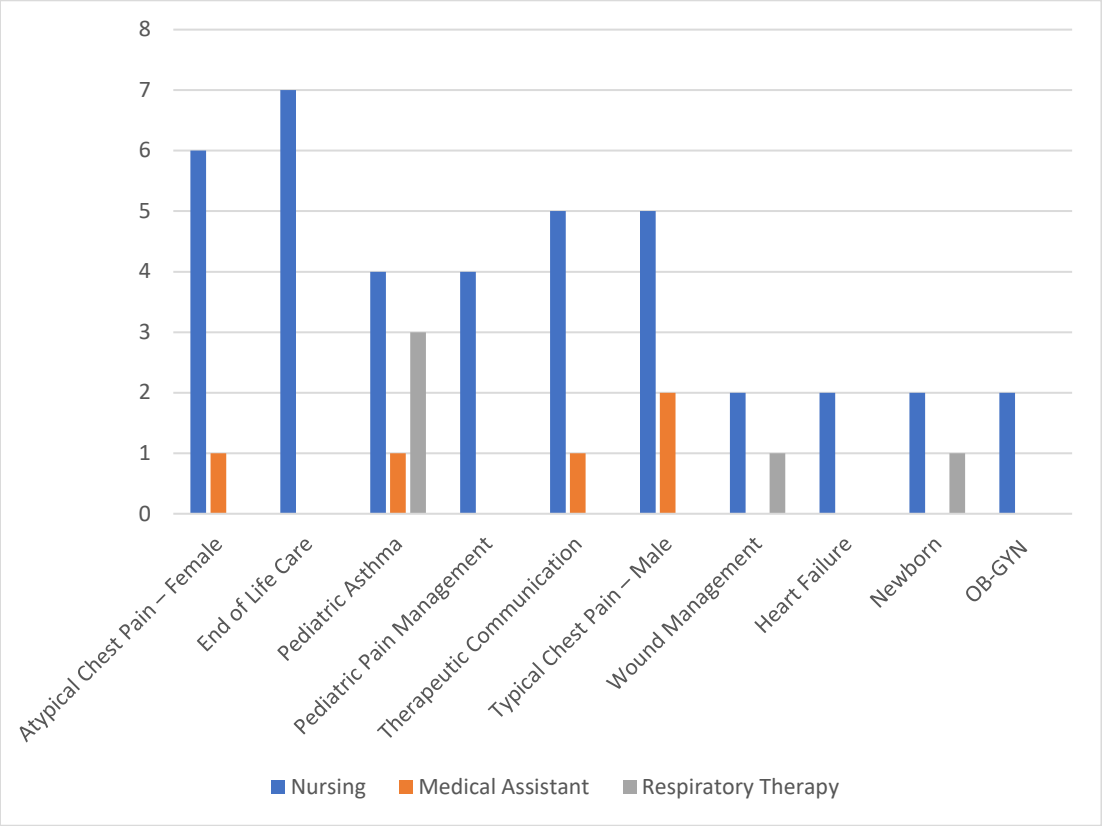
- 13 story lines
- 115 simulations
- 27 serious games
- 9 case studies

Total = 151 Scenarios

Scenarios in four curricular areas were implemented in Medical Assistant programs, and scenarios in three curricular areas were implemented in Respiratory Therapy programs. Scenarios had not been implemented in EMT or Paramedic programs nor in Pharmacy Tech programs at the time the survey was administered. With one exception, colleges implemented scenarios in only one program—most generally Nursing—followed by Medical Assistant and Respiratory Therapy. Chippewa Valley implemented scenarios in Nursing and Respiratory Therapy programs.

[37] February 2018 ACT for Healthcare Biannual Meeting ARISE presentation.
[38] Leffingwell, C. and Meinen, T., 2016. "Using ARIS to Enhance Learning in Healthcare Simulation." ARIS Summit 2016.
[39] Data is based on 2017 project lead survey ARISE scenario questions n=13/15.

Figure 14: Number of Colleges Implementing ARISE by Programs and Healthcare Curricular Area (N=13)



During focus groups, students discussed the ARISE scenarios and other simulations positively:

> *"I appreciate being able to learn [on simulations] in an authentic lab setting… to develop my skills."*
>
> *"The simulations decrease nervousness, because the stakes are lower."*
>
> *"The [dementia simulation] is really good to help understand and create empathy with what someone is experiencing."*
>
> *"The [simulations] are repetitive, but real-world applications are useful and we will be more familiar when we get to externships [clinicals]."*

Faculty were also appreciative of the new technologies; one dean was an advocate for the ARISE scenarios, because they reflect "*a transition between classroom theoretical learning and the high-fidelity simulations with high-tech mannequins*."

New Statewide Courses: Digital Literacy and Culture of Healthcare

Two new courses that reflect a statewide curriculum were developed by the consortium during the ACT for Healthcare grant. As documented in the Interim Report (December 2017), the Digital Literacy course was designed to "enhance students' understanding of technology in the healthcare industry,"

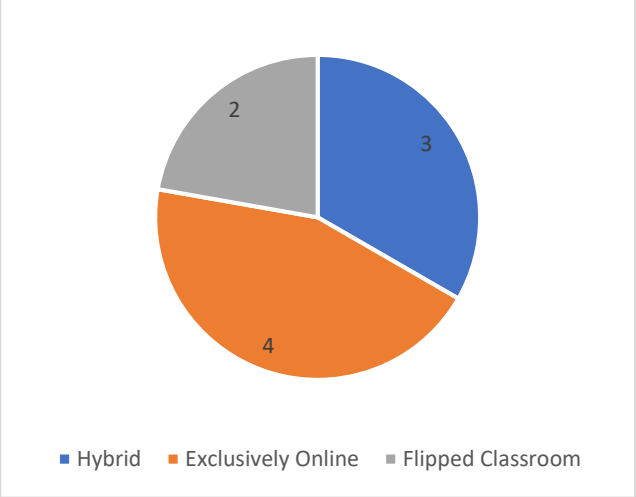
and was elevated as a priority given that "TAA-eligible workers and other low-skilled adults are often deficient in digital technology skills."[40] The Culture of Healthcare course was designed with the goal to "prepare students for clinical experiences and careers in healthcare by addressing areas such as patient confidentiality, active listening, customer service, proper attire for healthcare personnel, and other soft skills associated with healthcare settings."[41]

These two courses were approved by the Wisconsin Technical College System to replace existing, similar courses in the Medical Assistant program, and to be used for elective courses by students in other healthcare programs.

Online and Hybrid Instruction

During the ACT for Healthcare grant, nine colleges implemented online or hybrid instructional innovations (Figure 15) in their healthcare programs. These innovative models ranged from exclusively online courses, to hybrid courses that incorporated both online and in-class components, and flipped classrooms where students individually accessed material online in advance of a class meeting so that in-person time as a group was more hands-on and collaborative experience applying the content reviewed in advance.

Figure 15: Number of Colleges Implementing Online and Hybrid Instructional Models



The online and hybrid instructional approach varied among the nine colleges that implemented this model of instruction for their healthcare programs; though in all cases, the online and hybrid option was intended to provide flexibility for students to enroll in courses and programs. This flexibility was considered especially important for students who work, and whose jobs may not allow for them to miss work regularly on specific dates and times over the course of a semester.

- Three colleges delivered curricula in a hybrid manner—with students learning some content online individually or as a group, and some content in-person as a group. Nicolet delivered some Nursing Assistant course content online, and students then met in-person for clinical skills labs and the clinical workplace experience. At Wisconsin Indianhead, students in gerontology courses spend one week doing online coursework on their own, and then meet in-person for other class periods. The college covers a large rural geography in northwest

[40] Wisconsin ACT for Health Care Proposal Submitted to USDOL, September 28, 2014.
[41] Ibid.

Wisconsin, and course instructors varied the campus location where they met students face-to-face. Some students attend these group class sessions via Instructional TV. Chippewa Valley implemented "My Choice" for students in the Office Medical-Receptionist program; students could choose whether to attend class in-person or online, and this choice was possible for every class period. According to college leaders, the online option was more frequently selected than the in-person class.

- Four colleges either delivered curriculum exclusively online for certain courses, or their entire program curriculum exclusively online. Northcentral and Mid-State developed new programs that were exclusively online—a Gerontology AD program with several embedded certificates and an Embedded Medical Coder technical diploma that stacks to the Health Informatics and Information Management Associates Degree program, respectively. Southwest and Western developed and offered certain courses exclusively online for their respective Lab Science Technician program and Gerontology certificate.

- Two colleges implemented the flipped[42] classroom model for online and hybrid instruction. Madison developed instructional videos for the Dental Hygienist and Surgical Tech programs. Students would review these videos in advance, so class periods could focus on hands-on learning and the practical skills needed in these fields. At Moraine Park, students in the Medical Assistant program were expected to review materials online outside of class, so that class periods could focus on integrating this new information into the course curriculum.

New Credentials (Programs and Short-term Training Opportunities)

Seven colleges developed new programs and local certificates during the ACT for Healthcare grant. These new credentials encompassed entirely new programs at Northcentral, Southwest, Western, and Wisconsin Indianhead; and shorter-term embedded credentials or focal areas within existing programs at Chippewa Valley, Madison, and Mid-State. As shown in Figure 16, these new and modified programs resulted in 14 new degrees, diplomas, and certificates that students can earn that are also aligned with job opportunities in the local and regional labor market.

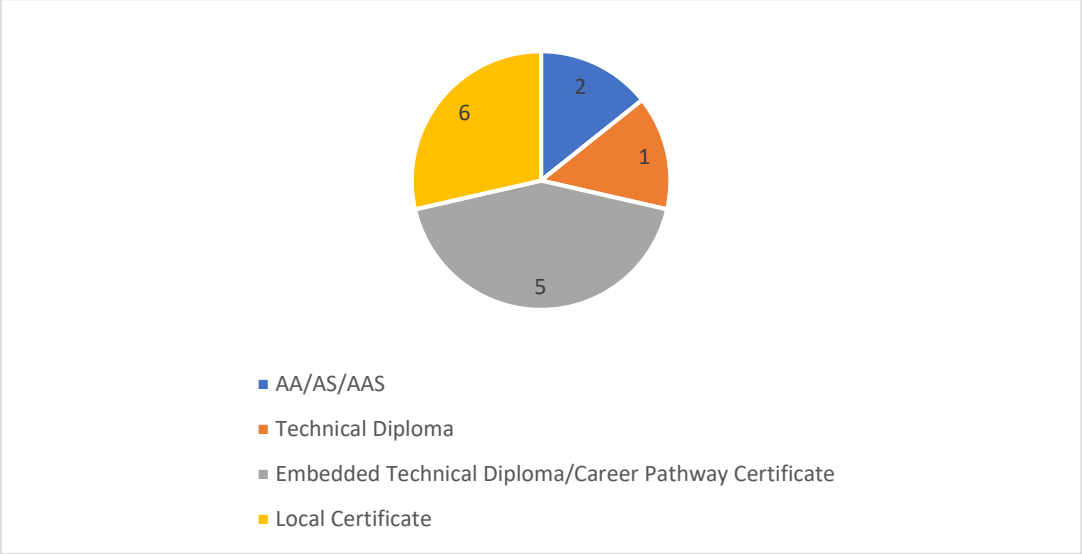
The majority of these new credentials were short-term training opportunities, tied to embedded credentials and local certificates, that students could earn in one semester (14 weeks). Often, these short-term credentials were part of a healthcare pathway along which students could eventually earn a technical diploma or Associates degree.

- Chippewa Valley developed an embedded one-year Office Medical-Receptionist technical diploma in its Executive Assistant program.
- Madison developed a short-term local Health Administrative Insurance Certificate.
- Mid-State developed an embedded one-year Medical Coder technical diploma in its Health informatics and Information Management programs.
- Northcentral developed two embedded career pathway certificates (Dementia Care and End of Life Care) that are part of a new Gerontology Associates degree program; as well as two advanced local certificates in Geriatric Allied Health and Geriatric Nursing.
- Southwest developed a new Lab Science Technician technical diploma program.
- Western developed a local Gerontology certificate.

[42] The Flipped Learning Network defines a flipped classroom as "a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter." Put simply, students watch and review lectures and materials before class, and use classroom time as a group to complete assignments and activities that would typically be considered "homework."

- Wisconsin Indianhead developed a new Gerontology Associates degree program with three embedded technical diplomas in Dementia Care, Community Based Residential Facility Caregiver, and Healthcare and Service Provider.

Figure 16: Number of New Credentials, by Type



Spotlight: WITC New Gerontology Career Pathway

The new Gerontology courses are delivered in eight-week block scheduling and follow a new method of "open-enrollment" at the college. The "open-enrollment" approach is different from the traditional way students enroll on college. Typically, program enrollments are capped, and most students enter programs as a cohort each fall or spring; the "open-enrollment" model allows the college to open a new section of the same course after the first section fills. According to college leaders, this new approach benefits part-time students and working adults who are often shut out of programs under the traditional model of capped enrollment.

The new Gerontology career pathway offers an associate's degree, two embedded career pathway certificates (i.e., Dementia and Healthcare Service Provider), and an embedded technical diploma for Community-based Residential Facility Caregiver—the latter of which meets industry licensure standards.

This innovative program design is already benefitting students, employers, and the college. Notably, senior college leaders report "*there should be no changes in how the program operates after the grant ends; [team teaching] with adjunct instructors, the eight-week block, open-course enrollment, and hybrid ITV courses will all continue. The program and courses are already accounted for in the budget model*." Moreover, this approach is spilling over into other program areas overseen by the dean who manages the new Gerontology career pathway.

Other Instructional and Curricular Innovations

A handful of colleges implemented other instructional and curricular innovations, including program-to-program bridges, team teaching, remote locations, and accelerated programs. While implementation was less widespread across the consortium, these strategies represent important innovations and possible new directions for the healthcare field.

- Four colleges implemented **program-to-program bridges** to fast-track certain students with career experience in the healthcare field to enroll in a Nursing program, or that enabled students in the Medical Assistant program to transition into Nursing.

    - Gateway led the development of the THANKS program for veteran medics to get credit for prior learning and take accelerated courses that prepared them for the second semester of the Nursing Associates degree program. The process and courses for the THANKS program are intended for use across all consortium colleges, though only to Gateway enrolled veterans in this "bridge" during the grant period.
    - Nicolet developed its own competency-based assessment for veterans and members of the general population to test out of the prerequisite Nursing Assistant course, and instead go directly into the Nursing program or other healthcare programs at the college, though very few participants pursued this option.
    - Madison developed a Paramedic to RN "bridge" to enable working paramedics to transition into the second year (third semester) of the Nursing Associates degree program at the college. Paramedics take two theory courses online during the spring term, and both skills ad clinicals during the summer. This accelerated pathway allows them to join the current Nursing cohort in the fall. Notably, most participants in Madison College's Paramedic to RN bridge were men, an underrepresented group in the Nursing pathway.

- Four colleges implemented **team-teaching approaches or other innovative faculty collaborations** in their healthcare programs. This approach varied across the colleges and programs.

    - At Wisconsin Indianhead, two gerontology instructors co-teach classes that are connected via Instructional TV. Both groups of students enrolled in the class have multiple assigned faculty in the classroom when they meet, though one instructor is considered the lead.
    - Moraine Park's cohort-based Medical Assistant program—offered at the West Bend campus—incorporates an adult education instructor teamed with an MA instructor, and both attend the mandatory lab sessions where group and individualized support is provided. The adult education instructor also provided basic math proficiency supports to students prior to the start of the program.
    - Pharmacology and Anatomy & Physiology faculty at Waukesha implemented a "cross-pollination" project, where they sat in on each other's classes and met weekly to discuss how they could better align their curriculum. This effort resulted in redesigned curriculum for both courses that were formally updated in the Wisconsin instructional database.

- Three colleges expanded their healthcare curricular offerings to **remote locations** to better meet the needs of employers and students. Blackhawk expanded its Medical Assistant program to the Monroe campus in response to a request by a regional employer, Monroe Clinic; the employer agreed to pay tuition for students who committed to working at the clinic

after completing the program. Gateway offered an EMT section at a Racine fire station, and a local employer, SC Johnson, paid tuition for participants. Nicolet expanded its Nursing Assistant program to remote locations (including Laona, Eagle River, and Tomahawk), and leveraged partnerships with high schools in those communities to provide a physical space to offer evening classes.

- Two colleges—Mid-State and Moraine Park—**accelerated healthcare programs** so students could complete the curriculum in a shorter period of time. Mid-State offered the third semester of a two-year Nursing Associates degree program to one cohort during the summer so students could complete the Nursing program in 18 months. Moraine Park offered a three-week Nursing Assistant bootcamp throughout the academic year that included both online and in-person instruction as well as a workshop to prepare for the NA certification exam.

B. Student Support Services

The delivery of academic and non-academic student support services was the most widespread and prolific strategy pursued by ACT for Healthcare colleges during the grant period. ACT for Healthcare institutions are part of a nationwide trend among community and technical colleges seeking to improve student success and increase completion rates by increasing their investments in the development and expansion of support services.[43] Impacts on both educational and employment outcomes for participants receiving support services were documented in Section 3.

Many technical and community college students are academically underprepared, while many others face challenges not directly related to academics, including balancing study with work and dependent care; financial pressures; personal wellness needs; and uncertainty about career goals and how to prepare and search for employment. Institutions are increasingly expanding the delivery of a variety of academic and non-academic support services to address the needs of community and technical college students—a diverse population of students including recent high school graduates, returning adult students, and incumbent workers looking to upgrade skills.

In this section, we examine the core evaluation questions for student support services, including:

- *What kinds of student support services were implemented?*
- *What were the strengths and challenges affecting implementation progress?*
- *Which student support services will be sustained?*

Evaluative Assessment: Implementation of Student Support Services

As noted in Section 3, new or enhanced support services were implemented by almost all colleges (14 of 15) and served almost 2,300 students, representing nearly 70% of grant participants enrolled in healthcare programs. Students receiving these supports had significantly higher rates of program retention, credential attainment, employment, and earnings gains than a matched comparison group of healthcare students.

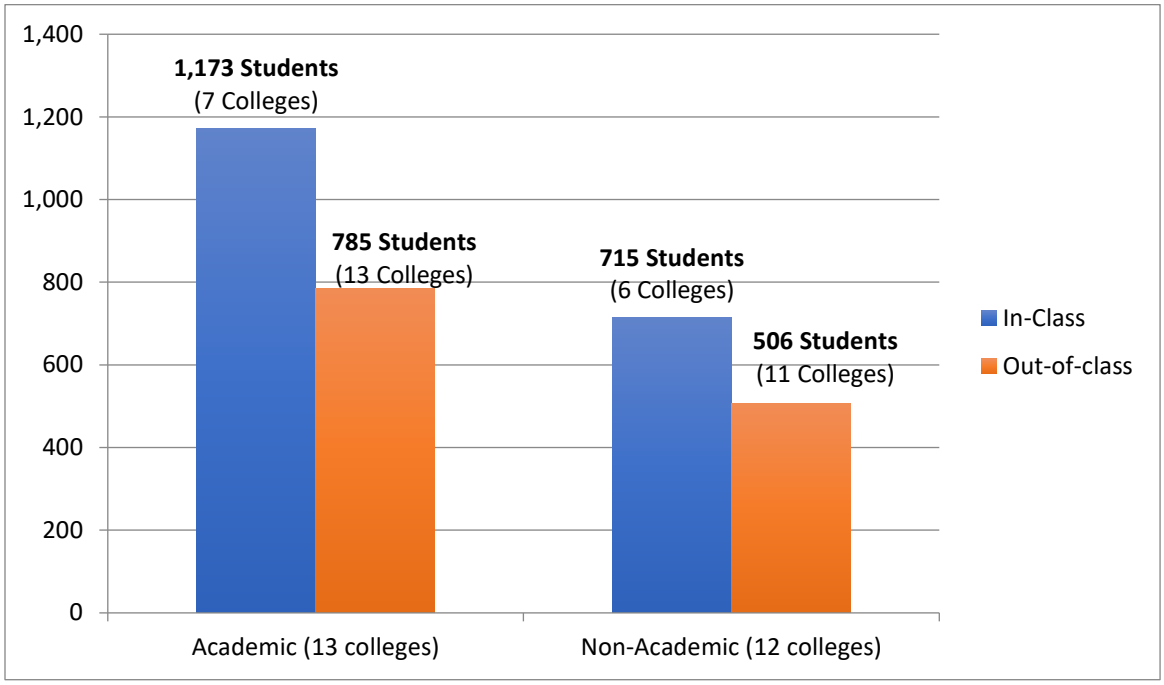
The support services delivered by ACT for Healthcare colleges included **academic supports** such as basic skills instruction, course-specific tutoring, and test preparation, as well as **non-academic supports** like personal counseling and case management, career preparation and job placement, and

[43] Price, D.V., Roberts, B., Kraemer, S, & Chaplot, P. (2018). *Community College Approaches to Address Basic Needs and Improve Financial Stability for Low-Income Students: Lessons from the Working Students Success Network Implementation Study*. Indianapolis, IN. DVP-PRAXIS (January).

study skills and time management.[44] Some of these supports were **embedded in classrooms** or incorporated into program curriculum, while others were **delivered outside of class**.

Figure 17 displays the number of ACT participants receiving academic and non-academic supports within and outside of the classroom, as well as the number of colleges implementing each type of support. Of the participants receiving supports, approximately one-third received two or more of the support types represented in Figure 17.

Figure 17: Number of ACT for Healthcare Participants Receiving Academic and Non-Academic Support Services



As shown in this figure, **academic supports were provided to the largest number of ACT participants**, with 1,173 students receiving academic supports delivered within classrooms and 785 students receiving academic supports outside of class.[45] **Colleges also provided non-academic supports to significant numbers of students** within classrooms (715 students) and outside of them (506 students). Support services delivered during required class time tend to reach more students than those delivered outside of class, since all students attending class will have exposure to in-class supports whereas most out-of-class supports are optional for students. Correspondingly, it is notable that a smaller number of colleges reached a greater number of students overall through the services they provided in-class; in contrast, the provision of out-of-class supports was a more widespread strategy across colleges but reached relatively fewer students.

In the remainder of this section, we offer several cross-cutting observations on the academic and non-academic supports provided by ACT for Healthcare colleges.

[44] Non-academic supports—which include both personal and career-related services—are a broad category of services that are not directly tied to academic content. Although these services are referred to as "non-academic," they are designed to foster and support academic success. (See "*What We Know About Nonacademic Student Supports*." Community College Research Center, 2013, Teachers College, Columbia University).
[45] Student counts are not mutually exclusive.

Implementation Strengths

The evaluation team identified several reasons why institutions were successful in their implementation of support services, as well as challenges faced in sustaining these services beyond the grant period:

- **Growing industry demand incentivized colleges to increase credential completion rates; providing support services for students was an obvious strategy to meet this demand**. As noted in Section 1, demand for healthcare workers in Wisconsin is growing rapidly. Meeting this demand required both increased enrollments in healthcare programs and improvement in completion rates of students in these programs.

- **Students and faculty recognized the value of support services, which reinforced colleges' commitment to implementation during the grant period**. Almost all students interviewed during evaluation site visits spoke positively about the benefits of support services provided through the grant, particularly academic supports. Most faculty and administrators also perceived that support services were improving student retention and success, although only a limited number of institutions collected internal data to support this perception.

- **Embedding support services within classrooms enabled colleges to easily reach a "captured audience" of students and resulted in large number of participants receiving supports**. Nearly 1,800 participants received in-class academic or non-academic supports, compared with approximately 1,100 participants who received out-of-class academic or non-academic supports.[46] All students theoretically will be exposed to supports delivered within classrooms, although these in-class supports are often less individualized.

- **Colleges targeted support strategies to address well-known bottlenecks facing students at various stages of the Nursing program pathway, thus addressing issues that students needed to overcome to be successful**. Demand for registered nurses and nurse aides in Wisconsin is growing rapidly, and ACT for Healthcare colleges were heavily focused on serving students in Nursing—a full two-thirds of grant participants were enrolled in the Nursing pathway (Nursing Assistant, Practical Nursing, or Nursing Associates degree). Several colleges pursued common strategies to supporting students in this pathway. For nursing students, four colleges implemented out-of-class tutoring and review sessions that were targeted to specific Nursing courses in which students traditionally struggle. In Nursing Assistant programs, five colleges developed and delivered test preparation for the state-mandated industry certification exam, although the way this support was delivered varied by college.

Implementation Challenges

- **Grant-funded staff providing support services were seldom integrated with existing support service operations** and were often housed organizationally within the grants department. This disconnect undermined administrative commitment to the role and function of both academic and non-academic support staff.

- **Support services provided outside of class were almost always optional for students, which led to lower take-up of these services compared to in-class services**. Out-of-

[46] As noted in Section 3, the number of students receiving out-of-class supports represents a lower-bound estimate, since data on these supports was not collected systematically by college until the summer 2016 term. However, the pattern of greater receipt by students of in-class versus out-of-class supports holds when restricting the sample to students enrolling in summer 2016 or later.

class supports are more likely to be individualized, but in ACT for Healthcare colleges they were almost never required. Research suggests that optional supports tend to be accessed by fewer students, and not always by the students with the greatest need.[47]

- **Colleges struggled to clearly communicate the role and activities of staff providing non-academic supports (e.g., navigators), and to build connections with faculty**. This challenge was noted in our Interim Report, and it remained a challenge despite some modest improvements in faculty buy-in at several colleges. Lack of faculty buy-in for non-academic supports contributed to challenges in sustaining these positions post-grant.

Summative Implementation Accomplishments: Student Support Services

Given the centrality of support services as a key ACT for Healthcare strategy, the evaluation team released a topical Issue Brief focused on this strategy in September 2017.[48] The Issue Brief provides detailed descriptions and examples of colleges' approaches to delivering support services, as well as an overview of national research on support services and student success. Readers should refer to the Issue Brief for these detailed college-level descriptions.

Table 5 presents a simple typology—adapted from the Issue Brief—that classifies and documents the key approaches to support service delivery within and across ACT for Healthcare colleges. The typology emphasizes two primary dimensions: support *content area* (academic vs. non-academic) and service delivery *location* (in-class vs. out-of-class), resulting in four content/location area service types. The typology presented in Table 5 provides a brief description of each support service type as well as several examples from across the ACT for Healthcare consortium.

[47] Karp, M., O'Gara, L., Hughes, K.L. (2008). *Do Support Services at Community Colleges Encourage Success or Reproduce Disadvantage? An Exploratory Study of Students in Two Community Colleges.* Community College Research Center Working Paper No.10. Teachers College, Columbia University.
[48] Valentine et al (2017). "*Advancing Careers and Training (ACT) for Healthcare through Student Support Services*." http://www.equalmeasure.org/wp-content/uploads/2017/09/EM_Wisconsin_ACT_FINAL_post.pdf.

Table 5: ACT for Healthcare Support Services Typology

	Academic		Non-Academic	
	In-Class (IC)	**Out-of-Class (OOC)**	**In-Class (IC)**	**Out of Class (OOC)**
Colleges & Students	*In-Class Academic* 7 Colleges 1,173 Students	*Out-of-Class Academic* 13 Colleges 785 Students	*In-Class Non-Academic* 6 Colleges 715 Students	*Out-of-Class Non-Academic* 11 Colleges 506 Students
Description	In-Class Academic supports are delivered by faculty or academic support instructors or staff embedded within existing or new courses or labs, or via concurrent support courses providing contextualized basic skills review. All students attending required courses, labs, or support courses have exposure to these in-class academic supports.	Out-of-Class Academic supports are provided by program faculty or support instructors. Group-level supports tend to focus on a particular academic topic or skill, or on exam preparation, whereas individual supports are less structured. Out-of-class supports are typically optional for students, though occasionally these supports are mandatory for all or a subset of students.	In-Class Non-Academic supports are typically provided by ACT for Healthcare support staff (e.g., success coach, education specialist, career advisor) during required class sessions. These supports are often delivered once or a limited number of times per semester, most often in a group-level, workshop format. These supports are mandatory for students attending class.	Out-of-Class Non-Academic supports generally consist of non-academic advising or counseling sessions with ACT support service staff or licensed counselors. These out-of-class sessions are typically voluntary. Although a few ACT colleges provide these supports in the form of group-level workshops, most non-academic supports provided outside of class are on a 1:1 basis.
Examples	• Concurrent basic skills support course • Academic specialist embedded in class for additional skills practice • Mandatory open lab basic skills support • Preparation for industry certification exams	• Tutoring • Course-specific review or study sessions • Preparation for industry certification exams	• Information session on resources for students (on- and off-campus) • Resume writing workshops • Program-tailored college success courses	• Personal counseling or advising sessions • Individualized career coaching sessions • Study skills and time management workshops

Academic Supports

A common approach pursued by colleges was to provide out-of-class academic supports targeted to specific healthcare courses with low pass rates. This approach was especially prevalent for colleges serving students in Associate's Degree of Nursing programs, and follows a nation-wide trend in the nursing field to provide additional academic supports for students struggling with challenging courses such as Pharmacology and Complex Health Alterations.[49] Academic supports targeted to specific Nursing courses were provided via drop-in tutoring or group-level review sessions held outside of class by a Nursing faculty member or by an academic specialist with nursing expertise. Although in all but one college these supports were optional, they were accessed by significant numbers of Nursing participants in the colleges where they were offered. This approach was also pursued by some colleges focused on Medical Assistant students.

Spotlight: Academic Tutoring for Targeted Courses in Nursing

According to projections by the Wisconsin Office of Economic Advisors, the gap between supply and demand for registered nurses in the state is expected to reach 35 percent by 2035. Nurse education programs statewide are working to address this anticipated shortage by increasing the supply of qualified nurses, both by expanding and accelerating program offerings and by working to improve success rates for students who enroll.

Forty percent of grant participants were enrolled in Associates Degree of Nursing programs. A common strategy pursued by four colleges focusing their grant efforts on Nursing students—Gateway Technical College, Lakeshore Technical College, Northeast Wisconsin Technical College, and Waukesha County Technical College—was to provide out-of-class academic supports targeted to specific Nursing courses in which students traditionally struggle. Colleges offered this support in the form of one-to-one, individualized tutoring as well as through structured, group-level review sessions led by faculty or academic specialists with Nursing expertise.

Overall, approximately 450 Nursing students at these four colleges took advantage of the new out-of-class supports. These students attended tutoring or review sessions frequently—more than seven times, on average. Although the academic supports were typically provided to all Nursing students on an optional basis, at Lakeshore Technical College any student previously failing any of the targeted courses, or considered at-risk for doing so (receiving less than 80% on an exam), was required to meet with an academic specialist for at least one hour per week.

Students, faculty, and administrators at all four colleges highly valued the targeted academic supports provided for Nursing students through the ACT for Healthcare grant. In addition, all colleges pursuing this strategy collected course-level data internally to demonstrate the effectiveness of the academic supports by comparing pass rates for selected courses before and after the academic supports were introduced.

However, only two colleges have committed to sustaining these supports beyond the grant period. At Waukesha County Technical College, Nursing faculty provide tutoring for most of the targeted courses, and dean-level support for these out-of-class supports is very strong; the college has already re-structured Nursing faculty paid-hours (substituting tutoring for traditional office hours) to ensure that these supports can be sustained. At Lakeshore Technical College, senior leaders and administrators view the new academic support services as a best practice being modeled at the college, and Nursing faculty have been deeply engaged in supporting and guiding the academic specialists providing academic supports for their program. Resources have been allocated in LTC's general operating budget to sustain the academic specialist positions once the ACT for Healthcare initiative ends.

[49] Harding, M. 2012.

As described in Section 3, Nursing students who took advantage of these academic supports targeted to specific courses had significantly better academic outcomes than a comparison group of Nursing students.

Another popular strategy was to provide academic supports to students—either in-class or out-of-class—to help them prepare for industry-specific certification exams. For many healthcare jobs, completing the relevant credential is a necessary but not a sufficient condition for gainful employment. Students often must pass industry exams before they can enter into employment, or before they can begin earning certain industry-standardized wages. Across the ACT for Healthcare consortium, industry exam test preparation was most commonly offered for Nursing Assistant students and was provided via both in-class and out-of-class delivery models. Industry exam preparation was also provided as a new, required fourth-semester course for Respiratory Therapy students at Mid-State Technical College.

Spotlight: Industry Exam Test Preparation for Nursing Assistant Students

In Wisconsin, individuals wishing to work as certified nursing assistants or certified nursing aides must pass the National Nurse Aide Assessment Program (NNAAP)—an industry-recognized exam composed of a written and skills component—within one year of completing an eligible Nursing Assistant training program.

Given that completion of the Nursing Assistant credential is a necessary but not sufficient condition for employment, a widespread strategy pursued by five ACT for Healthcare colleges focusing their efforts on their Nursing Assistant program was to provide NNAAP exam review sessions and mock tests for students.

At three of the colleges providing test preparation for Nursing Assistant students—Nicolet Area Technical College, Chippewa Valley Technical College, and Madison College—this service was provided outside of class on an optional basis, and relatively few students took advantage of it.

By comparison, two colleges—Western Technical College and Moraine Park Technical College—pursued this strategy by embedding test prep within the Nursing Assistant course, which effectively made this a required support for all students. At WTC, six additional hours of industry exam review were appended to the state-mandated 120-hour Nursing Assistant curriculum. At Moraine Park—where Nursing Assistant was offered as an accelerated, three-week "bootcamp" model—exam review was the final, required session for credential completion in this bootcamp. Stakeholders at both colleges noted improvements in students' industry exam pass rates with the implementation of the in-class test preparation. Both models will be sustained.

Although less widespread, **a final approach to providing academic supports was to focus on the basic skills education needs of students in shorter-term healthcare programs**. As noted in Section 1, ACT for Healthcare colleges served relatively low numbers of students enrolled in Adult Basic Education courses, in part due to the grant requirement that participants already be enrolled in healthcare programs to be counted in certain performance outcomes. However, the threshold for entry into many shorter-term healthcare programs is low, and many healthcare students in these programs have significant basic skills needs. Colleges pursued several approaches to addressing these needs. For example, Madison College offered concurrent basic skills support courses for students enrolled in their Nursing Assistant program (support course taught by faculty) as well as students enrolling in their newly-developed Health Administration and Insurance Certificate (support course taught by basic skills instructor). Other models for providing basic skills support included an optional basic-skills "boot camp" for Practical Nursing and Medical Office Receptionist students at Chippewa Valley Technical

College, and embedding a basic skills instructor within a weekly, mandatory lab in Moraine Park Technical College's Medical Assistant program.

Non-Academic Supports

Whereas academic supports were typically provided by faculty, academic specialists, or basic skills instructors, **non-academic supports in ACT for Healthcare colleges were often provided by grant-funded staff who typically had a broad and diffuse role**. In addition, non-academic services were often provided to participants by the project lead for the grant or by other staff with limited professional expertise in student counseling or student support provision. As shown in Section 3, participants receiving these out-of-class non-academic supports—a more diverse group of students than the broader participant population—had notably better educational outcomes than a matched comparison group. However, the role and value of many non-academic support staff—typically called "navigators" or "success coaches"—were not well-communicated to, or understood by, faculty which limited their buy-in.

A few colleges hired support staff with professional expertise in career advising or counseling; a notable example was a licensed professional counselor hired by Waukesha County Technical College to serve students in its Nursing program.

Spotlight: Providing Personal Supports through a Dedicated Program Counselor

Waukesha County Technical College used TAACCCT funds to support the hire of a full-time, licensed professional counselor (LPC) to work exclusively with its nursing student population. The goal of this new position was to provide easily accessible personal, emotional, and mental health supports for students as they balance the rigorous requirements of WCTC's Nursing Associate's Degree program with multiple work, life, and student responsibilities.

The LPC connects with nursing students at multiple points: for example, attending orientation, emailing all students once accepted into the nursing program, and reaching out to students based on WCTC's early alert system and upon referral from program faculty. Notably, the student body has been the LPC's strongest referral source.

Although WCTC offers counseling services to its entire student population, college personnel view the dedicated LPC position as a unique opportunity to increase student success by creating a direct intervention method that recognizes the rigors of the nursing program. As one nursing program administrator noted, "*I am not sure how we made it this long without [the dedicated LPC]. We are using [the LPC] a lot, making referrals, and students are grateful for this support*."

College personnel note that the personalized and engaging approach of the LPC has contributed to increased retention and completion for nursing students. WCTC has recognized this impact, and the counseling services department is reevaluating how it works with other college departments to look for opportunities to replicate this level of dedicated student support.

C. Partnership Engagement

The ACT for Healthcare colleges built upon their well-established partnerships, particularly with employers, that have been cultivated through advisory committees and further enhanced through multiple rounds of TAACCCT grants. While employers and local workforce groups have been involved

in *every* college's ACT efforts, colleges reported that employers are considerably more involved than local workforce groups.

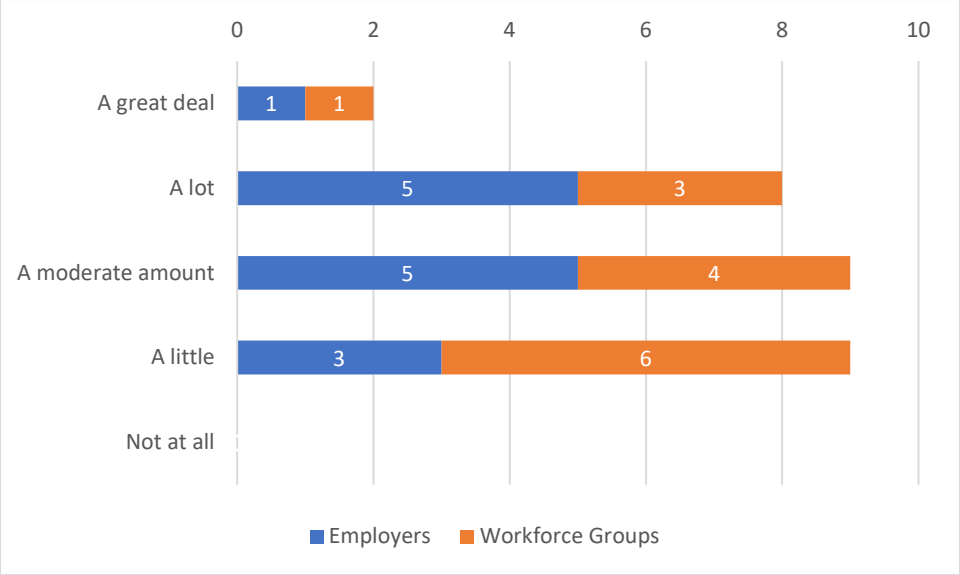
In this section, we examine the core evaluation questions for partnership engagement, including:

- *What kinds of partnership engagement activities were implemented?*
- *What were the strengths and challenges affecting implementation progress?*
- *Which aspects of partnership engagement will be sustained?*

Evaluative Assessment: Partnership Engagement with Employers and Workforce

The ACT for Healthcare consortium of Wisconsin technical colleges partnered with employers around a diverse array of activities to develop and enhance programs, and recruit and support students in these healthcare programs. By comparison, there was lower engagement overall by workforce partners despite considerable outreach and efforts by colleges. Figure 18 highlights breadth of engagement of external partners, with overall employer engagement stronger than workforce engagement based on responses to a spring 2017 survey of senior college leaders. Almost 80% of project leads who responded to this survey (11 of 14) reported that employers were involved at least a moderate amount in their ACT for Healthcare efforts. By comparison, only 57% of project leads (8 of 14) said the workforce system was involved to the same degree. In sum, **survey data along with qualitative data from our fieldwork indicate that colleges expanded their engagement with employers by pursuing innovative practices that could benefit students and be of value to employers**.

Figure 18: Extent of College Engagement with External Partners (N=14 colleges)



Partnership engagement strategies across colleges and programs included a wide variety of activities, though rarely did partners engage in more than two or three areas:

- Curriculum development/modification
- Providing input on grant-funded support services strategies
- CPL (e.g., input on assessment development)
- ARISE scenario development or implementation

- Recruiting for training programs
- Delivering training programs
- Job placement
- Tuition reimbursement
- Providing workforce-supported client services to grant participants
- Contributing resources (such as financial or in-kind contributions)
- Providing student internships (only employers)
- Job shadowing (only employers)
- Mock interviews (only employers)

These strategies were implemented in existing and new programs. As the grant ends, these relationships and activities with employers will mostly be sustained, in large part due to the program advisory structure noted below.

Implementation Strengths

The evaluation team identified three reasons why these employer partnerships were successfully enhanced and are likely to be sustained:

- **Wisconsin technical colleges leveraged their unique, longstanding program advisory committees with regular employer involvement**. In fact, all state-recognized programs are required by statute to have an advisory committee of employers that meet at least twice annually to discuss the competencies and credentials offered by technical college programs. This relationship is unusual, as employers nationally are more commonly engaged only for Perkins-funded CTE programs. The ACT for Healthcare program advisory committees focused on program development, curriculum review, program evaluation, instructor guidance, student recruitment, retention, and placement. All ACT for Healthcare colleges engaged employers through these advisory committees during early implementation and throughout the duration of the grant, and solicited feedback from employers on programs, courses, and credentials both through existing program advisory committees and/or regional health care alliances, as well as through new advisory committees created in the process of establishing new programs.

- **All Wisconsin technical colleges focused on education and training programs that met local employer workforce needs and regional labor market demand** for entry-level or middle-skilled positions in healthcare. All colleges recognized that success is about employment that meets the needs for both students and businesses. In developing and modifying various healthcare programs and pathways for ACT for Healthcare, colleges responded directly to the demands of local and regional employers, and evidence collected though fieldwork suggests that local and regional employers value the resulting programs and credentials supported by the ACT grant. As noted, employer engagement is strong across the consortium, in large part due to required clinical rotations from most healthcare programs; though colleges *further enhanced* these relationships to get input on new programs in Gerontology (a direct response to employer demand), and to modify existing programs to create short-term certificates. These certificates can be used for incumbent worker training or lead to entry-level employment in healthcare fields. For example, employers encouraged and promoted the new Gerontology programs and certificates developed by three consortium colleges (Indianhead, Western, and Northcentral) and Southwest's new Lab Science Technician program.

- **Given the focus on healthcare, employers were willingly and sometimes eagerly involved in providing experiential learning opportunities for ACT for healthcare**

participants to practice their skills through clinical rotations or internships. Healthcare programs include a strong focus on clinical training opportunities as a key feature of program design, which helped many employers get to know students before offering them a job. The provision of clinical rotations had a rippling effect for colleges and for program participants. As noted earlier, colleges could leverage their relationships with employers to get feedback on programs, and employers became more engaged in other strategies to support students, including assisting students with job placements, job shadowing, and mock interviewing.

Implementation Challenges

As noted, Wisconsin technical colleges have a robust history of engaging employers through program advisory committees and by designing and delivering education and training programs aligned with employer demand. Compared with generally strong employer partnerships characterizing ACT for Healthcare efforts, engagement by colleges with local and regional workforce partners during the grant period was more limited and modest in scope, with few workforce client referrals to ACT training programs and minimal leveraging of workforce system resources for ACT participants, such as training dollars, childcare assistance, and transportation supports.

The evaluation team identified two challenges regarding partnership engagement, one focused on the workforce system and the second focused on employers:

- **Workforce groups did not operationalize their existing relationships with colleges by expanding recruitment efforts and referring more clients to ACT for Healthcare programs, or by proactively seeking to provide supports to participants eligible for workforce services**. Although some colleges described relationships with workforce partners as historically weak, many colleges reported strong institutional relationships with workforce partners; even so, engagement with workforce partners seldom extended beyond information sharing about ACT-funded training programs. Workforce system representatives suggested that the healthcare programs and credentials developed by colleges were perceived as too "intimidating" for some workforce clients (e.g., associate's degree programs), or indicated that short-term programs (e.g., Nursing Assistant) did not provide the wages and pathways appropriate for assistance under the guidelines of local Workforce Investment Boards.[50] As a result, there were a small number of workforce clients who participated in the ACT for Healthcare initiative. One notable exception comes from Moraine Park Technical College, which brought its local Workforce Investment Boards to the table early to recruit clients to the college's grant-funded bootcamps and assist with recruitment through job training and placement for the Medical Assistant students; ultimately serving 23 workforce clients and eight veterans under the grant.[51] Another possible reason why engagement with workforce partners was less widespread could be that the TAACCCT grant provided direct resources to colleges that were used for the delivery of education and training programs, participant recruitment, and supports. Thus, colleges did not need the workforce system to provide resources to support the development and delivery of TAACCCT healthcare programs.

- **Employers were interested in short-term training and credentials for their incumbent workforce, yet U.S. Department of Labor guidelines for the TAACCCT grant created uncertainty among colleges around serving incumbent workers who may have been disallowed as participants if they were not enrolled in a grant-funded program of**

[50] Of note, five colleges modified their Nursing Assistant program as part of the ACT for Healthcare grant; the local workforce board for Nicolet is the only one that did not allow this program on its approved Employer Training Program List.
[51] These are self-reported tracking and/or by the workforce partners.

study. While employers were interested in using different tools and resources, including mobile labs, to serve incumbent workers and provide them with much-needed training, the guidelines under the Solicitation for Grant Applications (SGA) and the associated outcomes focused on engaging and supporting non-incumbent workers and other adults pursuing healthcare programs of study. Incumbent workers and other participants not enrolled in a program of study could not be included in performance outcomes, like program completion, credential attainment, and employment. As a result, a ripe area of employer engagement—incumbent worker training—was not adequately leveraged during the grant period. A number of employers, as well as college leaders, reported they plan serve more incumbent workers after the grant ends.

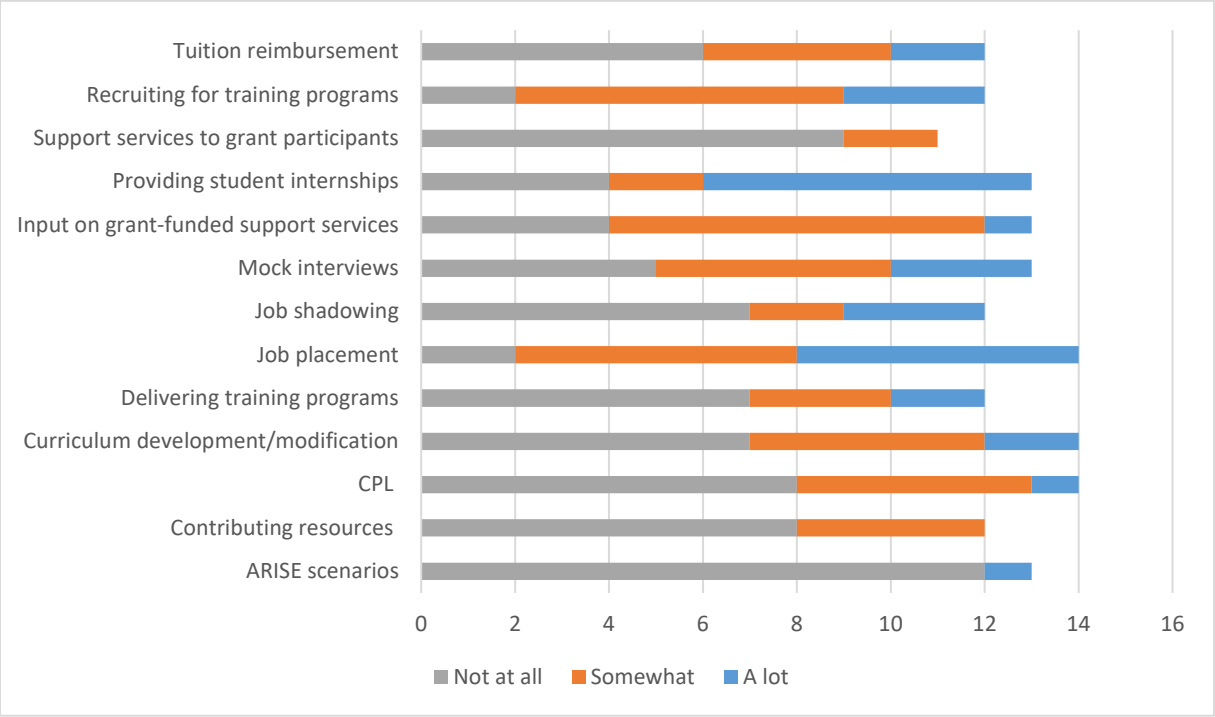
Despite these challenges, colleges effectively implemented a robust set of employer engagement activities, and interviewees reported that it is likely these employer partnerships would be sustained.

Summative Implementation Accomplishments: Partnership Engagement with Employers and the Workforce System

As shown in Figure 19[52] and discussed earlier, employers were engaged with the colleges in many ways. Among the 14 college leads who responded to a 2017 survey, the **most prevalent and deepest engagement with employers were in the areas of student internships/clinical training opportunities (n=7) and job placement (n=6)**. Project leads reported that employers assisted with internships/clinical training opportunities and job placement *a lot* in their ACT for Healthcare efforts. Employers also created rich opportunities for participating in mock interviews during the time of the grant; eight project leads reported that employers were at least somewhat involved in that activity. Finally, employers were involved in recruitment efforts—marketing the program to potential students and in some cases, taking a **proactive role in incentivizing incumbent workers' or new students' participation in ACT for Healthcare programs by paying their tuition**. Ten colleges indicated that employers were engaged at least somewhat in the recruitment process. Six colleges indicated that employers helped pay all or a portion of some ACT for Healthcare students' tuitions; a considerable and notable recruitment technique enabling students to enroll in a healthcare program and in many cases secure employment as well.

[52] For ease of display, original survey categories were collapsed. "A lot" includes those who responded, "a great deal" and "a lot" and "somewhat" includes those who responded, "a moderate amount" and "a little".

Figure 19: Employer Engagement Strategies (N=14)



While many of the strategies that employers were engaged in are relatively straightforward, in this subsection we describe a few notable examples of the role employers played in providing tuition assistance.

Tuition Assistance

As noted, regional employers regularly communicate their needs to the local college, and colleges respond accordingly by creating new programs or enhancing existing programs. This partnership is mutually beneficial, in that employers can obtain skilled workers and colleges can recruit students knowing they will leave with the necessary skills and credentials to obtain employment.

Despite this strong collaboration and a critical need on the part of employers for skilled workers, it is relatively rare for employers to provide tuition assistance for students, especially for entry level positions. That said, data from the 2017 senior leaders survey and site visit data indicate that nine ACT for Healthcare colleges partnered with employers during the grant to provide tuition assistance for students enrolled in certain programs meeting employer needs. For example:

- Gateway Technical College engaged with SC Johnson, which paid tuition for some students to enroll in the EMT technical diploma program.
- Employers at Monroe Clinic paid tuition for eight out of the 10 Medical Assistant students from Blackhawk Technical College; and students graduating from the program have committed to working at Monroe Clinic upon graduation.
- At Nicolet Area Technical College, a handful of employers are paying for their employees to participate in the Nursing Assistant program and take the licensure exam. One employer has paid for several students and advertised in the local newspaper that it will pay individuals to take the NA program and will hire them conditionally as Health Aides, to become NAs once they complete the program and pass the exam.

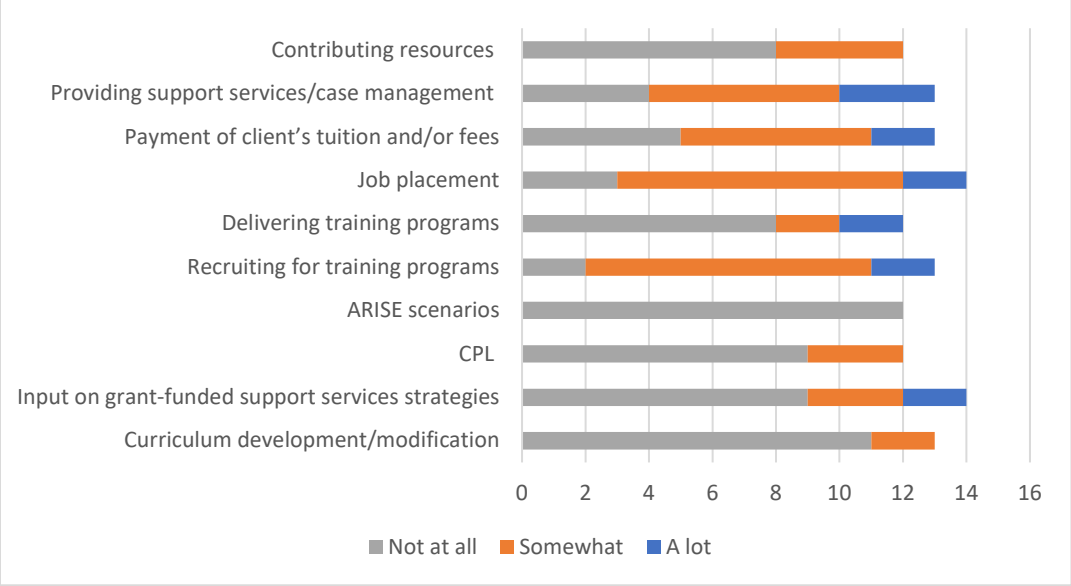
- At Northeast Wisconsin Technical College, a significant local healthcare employer, Bellin Health, was the catalyst for the Care Coordinator Certificate that was established during the grant program. Bellin sent several of its MA workers to obtain this local certification and helped to pay for this additional training.
- At Southwest Technical College, some employers offered scholarships or tuition reimbursement for employees to go through the Lab Science Technician program and others funded their workers' participation in the non-credit Hazard Analysis and Critical Control Points (HACCP) certification program.
- At Waukesha Technical College one employer of CNAs has offered tuition reimbursement for taking courses at WTC, although this was not done in conjunction or partnership with WTC.

While the strategies vary for providing tuition assistance, the end result is the same; students do not take on the financial burden of paying for tuition, and if successful, are employed upon completion of their program. Employers are more likely to be guaranteed the necessary number of workers to meet their critical needs.

Workforce Strategies

As shown in Figure 20, compared with generally strong employer partnerships characterizing ACT for Healthcare efforts, **engagement with local and regional workforce partners was more limited, with few workforce client referrals to ACT training programs and minimal leveraging of workforce system resources for ACT participants**. While workforce partners were not absent from the ACT for Healthcare initiative, they had a much lighter overall engagement, particularly when compared with employers. Data from the 2017 survey of project leads indicated that workforce partners were primarily involved *to some degree* in recruitment efforts (n=11), job placement (n=11), and providing supports (n=9), but these engagement activities were relatively modest.

Figure 20: Workforce Engagment Strategies (N=14)



Two colleges engaged in more robust efforts with their local workforce boards—Chippewa Valley and Moraine Park:

- Chippewa Valley entered into a formal contract with Workforce Resources—the local workforce board—to offer healthcare academies to interested WIOA Title I clients to recruit and market its ACT for Healthcare programs. Workforce Resources clients were recruited for the academy to explore the field of healthcare and get a feel for what it means to go back to school. According to the college, this effort resulted in about one-fourth of academy participants enrolling in ACT for Healthcare programs or other programs at the college.

- Moraine Park Technical College brought its local Workforce Investment Board (WOW) to the table early to recruit clients to the college's grant-funded bootcamps and are involved with the Medical Assistant students from recruitment through its training and job placement. WOW also screened participants to determine eligibility for WIOA supports—providing them if eligible—and used Individual Training Accounts to pay for this training and related certification fees. Additionally, WOW leveraged other resources to help pay for related supports such as transportation and childcare for eligible participants. The strong partnership between the college and WOW is in large part due to strong communication systems that were implemented during the Round 2 TAACCCT grant in manufacturing, as well as the continuity of the project lead at the college across rounds 2, 3, and 4.

Wisconsin technical colleges have forged deep and committed relationships with local employers on several levels, from program design including curricular modifications, to providing internships and offering tuition assistance. Colleges' collaborations with local employers are critical for both entities and as a result are likely to be sustained.

Section V: Conclusion—Impact and Sustainability

The technical colleges participating in the ACT for Healthcare consortium implemented a wide variety of curricular and instructional innovations, delivered both academic and non-academic support services to participants, and strengthened their partnerships with employers. This conclusion summarizes the impact of these efforts on participant outcomes, provides an evaluative assessment on the sustainability of these strategies after the grant sunsets, and discusses six factors that influenced sustainability.

Impact of the ACT for Healthcare Consortium on Participants

The impact evaluation of Wisconsin's TAACCCT Round 4 ACT for Healthcare grant focused on participants receiving various grant-funded academic and non-academic support services. The development and enhancement of these services was the most widespread and robust strategy pursued across the consortium—reaching more than two-thirds of participants in 14 of 15 colleges—and aligns with other national efforts by community and technical colleges to bolster success for their students. **Analyses revealed large, statistically significant impacts on credential attainment, within-institution retention, employment, and earnings gains for participants receiving grant-funded support services** compared to a matched comparison group of healthcare students.

- 74% of treatment students earned a postsecondary credential, versus 51% for a matched comparison group;
- Treatment students were eight percentage points more likely to be retained into the next semester, and seven percentage points more likely to be retained one year later, compared to a matched comparison group;
- 45% of treatment students who were unemployed at the start of their program had gained employment one quarter after program exit, compared to 37% for a matched comparison group of non-incumbent workers; and
- Treatment students who were incumbent workers were six percentage points more likely to experience quarterly earnings gains following program exit, compared to a matched comparison group of incumbent workers. Earnings gains experienced by participants receiving grant-funded supports were non-trivial, representing an average 20% increase with respect to baseline quarterly earnings.

The credential completion impacts were consistently positive across key healthcare programs and across a variety of credential types. The most commonly earned credentials for ACT for Healthcare participants were shorter-term technical diplomas or certificates of one year or less, which is consistent with the TAACCCT grant objective of helping adult students earn credentials with labor market value more quickly. In addition, within-institution retention impacts were particularly pronounced for participants receiving non-academic supports outside of a regular classroom setting, as well as for nursing participants who accessed out-of-class academic supports targeted to challenging first-year Nursing courses. Lastly, the employment and earnings gains experienced by participants who received support services suggests the benefits of these supports extend beyond the classroom and into the labor market.

In short, **providing support services for healthcare students generates benefits for students, colleges, and employers—suggesting that this approach to enhanced education and training should be an essential aspect of institutional reform efforts** with potential replicability to sectors beyond healthcare. By investing in academic and non-academic support services, colleges can increase the number of healthcare students with the skills needed to enter the labor market prepared for employment and upward mobility; while enhancing their revenue through improved institutional

retention and completion rates. Moreover, these supports help colleges better serve adult students who need additional skills and re-training, and who reflect an increasingly diverse pool of potential students and workers.

What Strategies Will the Consortium Colleges Sustain?

Curricular and Instructional Innovations

With rare exception, **the curricular and instructional innovations implemented among consortia colleges will be sustained after the grant**.

- The consortium-developed Augmented Reality Integrated Simulation Education scenarios that were adopted and utilized by all colleges will be sustained—primarily in Nursing, Medical Assistant, and Respiratory Therapy programs.

- The statewide VA Medic to RN pathway developed by the consortium with Gateway Technical College's leadership will also be sustained: 10 of 14 project leads that responded to a spring 2017 survey indicated their college plans to offer this pathway for veterans.

- The two new courses in Digital Literacy and Culture of Healthcare are approved in the Wisconsin Instructional Database, and many colleges have already incorporated these courses into their Medical Assistant program or offered them as electives to students in healthcare programs.

- Colleges also plan to sustain the new programs, degrees and diplomas, embedded credentials, and local certificates developed and implemented during the grant. These new healthcare programs (e.g., Gerontology, Office Receptionist-Medical, and Medical Coder) and existing programs incorporated flexible learning approaches such as online and hybrid instruction, short-term bootcamps, cohort-based delivery, eight-week block scheduling, and team teaching—all of which will be sustained by the consortium colleges that implemented them, barring unforeseen drops in employer or student demand.

Notably, these curricular and instructional innovations were implemented in credit-based programming rather than as non-credit, customized training approaches; and accordingly went through a formal review process to assure these innovations met quality standards and would result in employment opportunities and career advancement. This approach yielded faculty buy-in and ownership. Additionally, the instructional practices and revamped curricula are aligned with the standard business models of colleges that use programs to generate sustained revenue through tuition and fees charged to students.

Employer Partnerships

The enhanced and strengthened partnerships with employers will also be sustained after the grant; whereas college partnerships with the workforce system were not notably enhanced during the grant.

- Wisconsin technical colleges have longstanding employer advisory committees for their programs. Additionally, healthcare programs generally include required clinical rotations as part of training, so program faculty have relationships with local employers to serve as sites for these work-based experiences. These two pre-existing mechanisms for employer engagement provided a strong foundation for colleges to enrich their employer partnerships.

- College partnerships with employers were enhanced, in part, because new and modified healthcare programs were designed with employer input to meet their demands for new workers and upskilled incumbent workers. Almost 80% of project leads that responded to a spring 2017 survey reported that employers were involved at least a moderate amount in their ACT for Healthcare efforts.

- Enhanced employer relationships spanned many aspects of the ACT for Healthcare programs, ranging from input on curricular and instructional innovations (including new programs and credentials); to recruitment support, job shadowing, and providing mock interviews; and to provide student internships and job placement. In several instances, employers even paid tuition for students to complete a healthcare program if they agreed to work for them when they finished.

For the most part, colleges did not effectively engage the workforce system to recruit or enroll clients into the ACT for Healthcare programs, and only 226 participants in healthcare programs were enrolled in either WIOA Title I or TAA for Workers during the grant period. Although the share of total grant participants in these targeted workforce programs is low (7% of grant participants in healthcare programs), it is a relatively higher percentage compared to enrollment in all healthcare programs statewide.

Support Services

Most support services delivered by colleges will *not* be sustained after the grant. These supports spanned academic, personal, and career services; and were provided in the classroom or lab setting as well as outside class through workshops or 1:1 interaction. Students almost universally spoke very favorably about these support services, and faculty and deans expressed anecdotally they believed the supports were helping to improve student performance.

The evaluation identified three primary reasons why many support services will not be sustained:

- Support services were generally seen by senior leaders and budgetary officers as a *cost* to the college that was a lower priority than other needs such as additional faculty lines;

- Data were infrequently collected or analyzed that documented the corresponding revenue that may have resulted from these supports through increased retention. Among the small number of colleges that documented results from support services, institutional budget challenges often trumped arguments in favor of sustaining supports that had been grant funded; and

- Colleges' organizational infrastructures around support services rarely had engagement and ownership in these efforts, in part because staff providing supports to grant participants were almost always grant-funded.

There were exceptions to this outcome, especially when support services were integrated into the curriculum or offered as part of a newly developed course. For example, test prep support courses will be sustained at Western, Moraine Park, and Mid-State; and the success courses implemented at Mid-State will also be sustained as a college-wide effort rather than program-specific. Similarly, faculty tutors at Waukesha and academic specialists at Lakeshore will be sustained. These exceptions for sustainability of support services are closely aligned with curriculum and were supported by faculty and program deans.

Evaluative Assessment: Key Factors That Contributed to Sustainability

The evaluation team identified five *institutional* factors that influenced the sustainability of curricular and instructional innovations, support services, and employer partnerships. Each factor is discussed in the context of ACT for Healthcare implementation, and an evaluative assessment is provided regarding how each factor contributed to sustainability.

1. **Faculty buy-in and support**. The evaluation documented extensive faculty leadership on the design and implementation of curricular and instructional innovations, which generated faculty ownership for new programs and for modifications to existing programs. Faculty also leveraged existing and new employer partnerships through longstanding advisory committees and relationships with clinical rotation sites, and through professional affiliations with local and regional employers. Thirdly, where faculty were advocates for support services, those services were more likely to be sustained—specifically those offered in the classroom or tied to the curriculum and delivered by program experts and specialists.

2. **Administrative ownership and support, especially among program or divisional deans**. Program deans supported faculty leadership in the development and implementation of curricular and instructional innovations, including augmented reality simulations and a new VA medic to RN pathway, through professional development in-service training, course release time, and enabling participation on consortium committees. By comparison, support service deans were less involved in grant activities, in part because grant-funded support services staff seldom reported organizationally within the support services division; rather, these temporary support staff reported to grants administration. The result was limited buy-in and support from existing support services administrative leaders who did not usually advocate strongly for sustaining grant-funded supports.

3. **Budgetary issues**. Wisconsin technical colleges face the cyclical pattern of declining enrollment as the local and regional economy heats up and unemployment is down. As a result, senior leaders are wary of adding costs to the college budget unless a revenue stream to offset those added costs is identified. Thus, decisions to sustain curricular and instructional innovations are more readily made as education and training programs do not add costs to the delivery of instruction once the startup and training costs are expended; and the costs for these programs are covered by tuition and fees paid by students and employers. By comparison, senior leaders expressed uncertainty about sustaining support services positions—which are seen as additional costs to institutional budgets—in light of declining enrollments.

4. **The use of data to build awareness and support for grant-funded strategies**. Although colleges provided performance data to the consortium lead, collected support services data for the evaluation, and provided administrative data for the evaluation, they collected and used these data inconsistently to build awareness and support for grant-funded strategies. This limited use of data institutionally had an uneven influence on sustainability. On the one hand, senior leaders often noted that data and evidence were not needed to sustain curricular and instructional innovations that would be delivered by existing faculty and staff, and that these "academic" strategies would be sustained as long as students and employers demanded them. This perspective reflects a standard business model of colleges to provide education and training programs that are paid for by customers through tuition and fees. On the other hand, decisions about sustaining support services were affected by the lack of "return on investment" data that were needed to justify college expenditures for additional support

services staff. Moreover, as noted above, in a constrained budgetary environment, even when colleges did conduct data analysis that suggested support services were yielding better student outcomes, these improvements were deemed an insufficient return on investment to support sustaining these grant-funded positions.

5. **Employer engagement and buy-in**, **especially for new programs and credentials, and innovative ways to deliver curriculum and instruction**. Colleges were proactive in their outreach to employers, gathering input and guidance for new programs and for shorter term credentials that would result in more qualified new workers and upskilled incumbent workers. The result was a stronger, enhanced relationship between employers and the college around the growing demand for healthcare workers, and new opportunities for the college to provide training for incumbent workers. Engagement with employers around support services, and their value in growing the number of qualified workers who completed healthcare programs was rare.

In sum, ACT for Healthcare colleges effectively implemented a diverse set of curricular and instructional innovations that enhanced existing programs and developed new programs and credentials to meet growing labor market demand in the healthcare field. These innovations will be sustained due to administrative ownership and support for these efforts, including from the president, as well as faculty buy-in and employer support. Consortium colleges also delivered a wide variety of academic and non-academic supports to participants—and these supports contributed to significant positive outcomes for students, including retention, credential attainment, and employment. Yet, in most cases, these support services will not be sustained—even when institutional data were collected and analyzed to show their effectiveness—largely due to budgetary constraints and the grant-funded nature of many support service staff. To overcome this challenge, future grant efforts need to engage the administrators with responsibility and authority for managing support services at the onset of the grant and embed grant-funded support service roles and positions within these decisions and departments. In doing so, colleges are more likely to galvanize an internal constituency for sustaining support services.

Implications for Future Workforce Education and Training Programs and Evaluation

The evaluation identified three implications for future workforce and education programs and evaluation:

First, workforce education and training programs need to strike an appropriate balance between targeting resources for high-demand jobs, often requiring mid-to-high-level skills, and providing resources to enhance opportunities for lower-skilled workers and people who are unemployed. The Round IV TAACCCT guidelines de-emphasized the latter, which resulted in a limited focus on important career pathway onramps for WIOA Title I clients and for Adult Basic Education programming. Future efforts could enhance upward mobility for participants and address important equity goals by encouraging an intentional focus on lower-skilled adults through postsecondary program onramps, such as those offered by adult education bridges.

Second, access to publicly reported employment and earnings data should be more readily available—especially when necessary for evaluation and performance reporting on federally-funded grants. The Wisconsin Technical College System and Wisconsin Department of Workforce Development were exceptional partners in our efforts, collaborating to provide quarterly employment and earnings data on a timetable conducive to our evaluation requests that included historical and contemporaneous records. Their efforts to support the evaluation can serve as a notable example of how such data sharing and reporting should be done for all federal grant programs when employment and earnings are essential outcomes.

Finally, the end-result of the time-bound nature of federal grant programs and the inflexibility of reporting timelines and deliverables is a lack of longer-term employment and earnings outcomes. Often, the payoff of education and training programs does not appear during the first three quarters of earnings; a longer time horizon for reporting these outcomes for participants could yield critical insight into the value-add of these grant programs.

Appendix A: Technical Information on Propensity Score Matching and the Impact Analysis

Appendix A: Technical Information on Propensity Score Matching and the Impact Analysis

This appendix— a supplement to Section 3 of this report (Impact Study)—provides additional information about the evaluation's quantitative data collection strategies as well as the statistical methodology used to generate educational and labor market impact estimates for participants in the *ACT for Healthcare* TAACCCT Round 4 grant.

Data Sources

The evaluation team collected data from multiple sources to inform the impact study.

First, we partnered with each of the 15 technical colleges participating in ACT for Healthcare to gain access to deidentified student administrative records. Data were provided on all ACT for Healthcare participants, and on all students who were *not* grant participants but who *were* enrolled in healthcare programs during the grant period (Fall 2014 through Spring 2018 terms). These student-level administrative records provided a host of demographic information on healthcare students, as well as term-specific information on students' academic enrollment, program progression, and educational outcomes.

Second, we partnered with the Wisconsin Technical College System (WTCS) and the Department of Workforce Development (DWD) to gain access to Unemployment Insurance records –which provide information on employment and earnings on a quarterly basis—as well as data on participation in various workforce programs (WIOA Title 1, TAA, and Veteran's programs). These data were provided for three quarters preceding the grant period through the January-March 2018 calendar quarter.

Third, the evaluation team guided consortium colleges in the systematic collection of student-level data on academic and non-academic support services delivered to TAACCCT participants outside of a regular classroom setting; these data collection efforts began systematically in the summer 2016 term. In addition, we gathered supplementary course enrollment data in order to identify student exposure to support services delivered within particular courses. As noted in Section 3, the impact study focused on ACT for Healthcare participants enrolled in healthcare programs of study who received grant-funded support services, including supplementary analyses of impacts for subgroups of these students receiving certain types of supports. The delivery of support services was the most widespread strategy implemented across the consortium to improve participant outcomes, affecting the majority of participants. These data collection efforts allowed the evaluation team to identify exposure by participants to a variety of academic and non-academic supports delivered both outside of and within classrooms.

Definition of Outcomes

Definitions for the primary educational and labor market outcomes presented in the impact study are described in detail below.

- **Credential attainment** is defined as institution-recorded completion of a program, resulting in the awarding of an associate's degree or a variety of shorter-term technical diplomas or certificates. Primary analyses focus on receipt of *any* credential, regardless of credential type. The supplementary analysis on registered nurse program participants focuses on associate's degree completion.

- **Within-institution retention** is defined as continued program enrollment in the subsequent academic term (one-semester retention) and in the subsequent academic year (one-year retention). Enrollment is defined as non-zero attempted credits in the term of interest. One-

year retention is restricted to students that could be observed in the subsequent academic year (specifically, students enrolling in the spring 2017 term or earlier).

- **Employment** is defined as non-zero earnings in the quarter immediately following the last term in which a student is enrolled at the institution. Analyses are restricted to students who have zero earnings during the term in which they are first enrolled (i.e., non-incumbent workers), and who have exited the institution during the grant period (i.e., are not still enrolled).

- **Earnings gains** is defined as quarterly earnings averaged across up to three quarters following program exit, minus quarterly earnings averaged across up to three quarters preceding program entry. The outcome measure is binary, with a positive outcome defined as a difference between post-enrollment and pre-enrollment earnings that is greater than zero. Analyses of earnings gains are restricted to students who have non-zero pre-enrollment *and* post-enrollment earnings, and who have exited the institution during the grant period (i.e., are not still enrolled).

Methodology for Impact Estimates: Propensity Score Matching

To generate impact estimates for ACT for Healthcare participants receiving grant-funded support services, the evaluation team conducted propensity score matching (PSM) to identify a comparison group of non-participant healthcare students that were similar to the treatment group along a set of characteristics theorized to affect the likelihood of receiving treatment as well as the outcome of interest. According to Rosenbaum & Rubin (1983), propensity score matching is "the conditional probability of assignment to a particular treatment given a vector of observed covariates."[53] The propensity score—generated in our analyses via a probit regression of treatment assignment on these covariates—reflects the probability of receiving treatment based on a set of observed characteristics thought to affect assignment to treatment. PSM is common approach in evaluation studies to account for factors that may influence receipt of treatment as well as outcomes, thus confounding analysis and biasing impact estimates. By generating a comparison group that resembles the treatment group on these potentially confounding factors, researchers can infer that the subsequent observed impact is the result of the treatment, and not the result of different characteristics among the treatment and control groups.[54]

All observational (i.e., non-experimental) studies are limited by the phenomenon of selection bias, in which receipt of treatment may result from meaningful differences in characteristics between the treatment and comparison groups.[55] Because the treatment is not randomly assigned, "baseline characteristics of treated subjects often differ systematically from those of untreated subjects."[56] Balancing on propensity scores is the approach taken in this evaluation to account for differences between treated and untreated cases. PSM uses a set of variables that may influence the receipt of treatment to create propensity scores, which are used to match each individual that actually received treatment with individuals that did not receive treatment but that had similar propensities for treatment receipt. This approach controls for observable confounds in treatment receipt that can bias impact estimates.[57] After statistical balance has been achieved among the predictor variables

[53]Rosenbaum, P.R. & Rubin, D.B. (1983).The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika,* 70(1), pp. 41-55.
[54] Ibid.; Guo, S. & Fraser, M. (2010). *Propensity Score Analysis: Statistical Methods and Applications*. Los Angeles: Sage Publications; and, Austin, P.C. (2011). An introduction to Propensity Score Methods for Reducing the Effect of Confounding in Observational Studies. Multivariate Behavioral Research,46(3), 399-424
[55] Austin, P.C. (2011) and Rosenbaum, P.R.& Rubin, D.B. (1983).
[56] Austin, P.C. (2011).
[57] As with all observational studies, PSM can balance only on observed characteristics; thus, unobserved differences between the treatment and control groups can bias results. Results of PSM do not provide the most robust level of

(variables that could influence receipt of treatment), outcomes for the treatment and matched control group should not differ systematically in the absence of treatment on these observed characteristics.[58]

The evaluation team conducted separate PSM analyses for each outcome and each treatment of interest. Thus, there are separate PSM models for the treatment group being considered (i.e., the primary treatment of any grant-funded support service receipt, as well as receipt of specific types of support services for the subgroup analyses) for each educational and labor market outcome being assessed. Each PSM model balances on characteristics that could be related to receipt of treatment and the outcome of interest (see below).

The PSM approach to generating a matched comparison group enabled the evaluation to meet standards of rigor for non-experimental research studies as defined by the Clearinghouse for Labor Evaluation and Research (CLEAR)[59] and the Institute of Education Sciences What Works Clearinghouse (WWC).[60] PSM is a quasi-experimental design methodology that can achieve a moderate rating from CLEAR as well as meet WWC standards with reservations. For each outcome, impact is measured by estimating the average treatment effect on the treated (ATT), which is the average difference in the outcome between the treated and matched comparison groups. As Zeidenberg, Cho, and Jenkins (2010) state, "the ATT is the average effect of the treatment on the sort of person who participates in the program."[61] In other words, the ATT is the difference in outcomes between two groups that have similar probabilities of receiving the treatment (based on the set of covariates used to generate the propensity score).

We used the *teffects psmatch* program in Stata to estimate the ATT using a PSM approach. The *Teffects psmatch* command was designed to address a significant limitation of most propensity score matching programs, which do not account for the fact that propensity scores are estimated when producing standard errors. *Teffects psmatch* adjusts for the fact that propensity scores are estimated rather than known when calculating standard errors. The result is a more accurate standard error of the ATT, which improves confidence in tests of statistical significance.

Covariates Used for PSM

As noted above, a separate PSM model was generated for each outcome and for each treatment group. For each PSM model, the treatment group consists of participants that received the treatment of interest, and the matched comparison group is drawn from the pool of non-participant healthcare students enrolled across participating institutions during the concurrent time period.

The covariates used in PSM models include demographic and other background variables as well as a host of enrollment characteristics and term-cohort indicators, all of which could affect likelihood of treatment and the outcome of interest. The variables included, and their parameterizations, differed slightly across models depending on the outcome of interest, the treatment group of focus, and considerations of overall model balance. For example, a measure of pre-enrollment average earnings was included only in the PSM model for earnings gains, given that pre-enrollment earnings were theorized to affect this outcome and not the educational outcomes (and was irrelevant to the model of employment gains focused on non-incumbent workers). Indicators for term of first enrollment were included in models for outcomes that could be affected by varying time horizons (e.g., students starting in earlier terms would have a longer time horizon to attain a credential), but were excluded

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evidence for causality between the treatment and outcome, which can only be obtained through well-designed experimental studies.

[58]Guo, S. & Fraser, M. (2010); and, Monaghan, D.B., & Attewell,P. (2014). The Community College Route to the Bachelor's Degree. *Educational Evaluation and Policy Analysis*

[59]Clearinghouse for Labor Evaluation and Research. *Causal Evidence Guidelines*, Version 2.1, December 2015.

[60] Institute of Education Services, What Works Clearinghouse. WWC Standards Brief for Baseline Equivalence, n.d.

[61] Zeidenberg, M., Cho, S.W., & Jenkins, D. (2010). Washington State's Integrated Basic Education and Skills Training Program (I-BEST): New Evidence of Effectiveness. CCRC Working Paper No. 20, Teachers College,Columbia University.

from models examining outcomes with identical time horizons (e.g. term-to-term retention). The following list includes all variables considered across the various models:

- Gender
- Race/ethnicity
- Age during first term
- Highest credential received prior to first enrollment
- Previous postsecondary credits earned (i.e. prior to first enrollment in grant period)
- Number of credits attempted in first term
- Enrollment in Adult Basic Education course during first term
- Pell receipt during first term
- Employment status during first term
- WIOA Title I program receipt
- Enrollment in key healthcare programs (Nursing Assistant, Registered Nurse/Practical Nurse, Medical Assistant)
- Academic term in which student was first enrolled during grant period
- Pre-enrollment earnings

PSM Model Balance and ATT Results (Including Post-Estimation Analyses)

The following tables display a comparison of means between the treatment group and matched comparison group on each variable included in the PSM model for that analysis. This information on baseline equivalence between treatment and control groups is presented for each treatment and each outcome examined in Section 3, including the subgroup analyses, for a total of 11 PSM models.

The treatment and matched comparison groups were well balanced overall on the variables used in the PSM models. In the limited cases in which a variable did not meet standards for demonstrated baseline equivalence as specified by CLEAR, post-estimation regression analysis was conducted on the matched sample to statistically adjust for the potential confounding impact of this variable or set of variables.[62] All impact analysis results meet CLEAR standards for regression studies using matching techniques. Notably, in the limited cases in which post-estimation regression was required, there were no substantive differences in the estimated impact (see Tables A6, A10, & A14).

[62] According to CLEAR standards, any variable included in PSM models that does not meet baseline equivalence standards (i.e., $p<.05$ indicating a statistical difference in a baseline characteristic between treatment and matched control group) must be adjusted for in post-estimation regression analysis.

Table A1: Baseline Equivalence for Credential Attainment PSM Model
(Treatment group = participants receiving grant-funded support services)

	Unmatched comparison pool (n=33, 644)	**Matched comparison group (n=2,289)**	**Treatment group (n=2,289)**	P-value
Age during first term	27.3	28.3	28.4	0.72
Age during first term (squared)	831.4	892.9	903.7	0.59
Female	0.83	0.90	0.88	*0.05*
Non-Hispanic White	0.73	0.82	0.81	0.43
Asian/Pac Isl./Amer. Ind.	0.06	0.07	0.07	0.96
Black	0.10	0.04	0.04	0.71
Hispanic	0.08	0.05	0.05	0.35
Enrolled in Adult Basic Ed in first term	0.04	0.04	0.04	0.50
Prior credits earned (pre-grant enrollment)	9.6	15.0	16.2	0.08
Prior Ed: high school diploma or less	0.51	0.37	0.37	0.88
Pell recipient in first term	0.31	0.32	0.31	0.61
WIOA Title I recipient	0.03	0.08	0.07	0.16
Credits attempted in first term	7.00	7.55	7.55	1.00
Enrolled in Nursing Assistant	0.25	0.42	0.40	0.13
Enrolled in Registered/Practical Nursing	0.27	0.31	0.33	0.10
Enrolled in Medical Assistant	0.06	0.13	0.13	0.83
Employed during first term of enrollment	0.70	0.71	0.69	0.33
First Term of Enrollment: Summer 2015	0.06	0.02	0.02	0.69
First Term of Enrollment: Fall 2015	0.18	0.17	0.17	0.48
First Term of Enrollment: Spring 2016	0.11	0.15	0.14	0.74
First Term of Enrollment: Summer 2016	0.05	0.09	0.08	0.71
First Term of Enrollment: Fall 2016	0.16	0.21	0.20	0.71
First Term of Enrollment: Spring 2017	0.09	0.15	0.16	0.51
First Term of Enrollment: Summer 2017	0.05	0.08	0.07	0.58
First Term of Enrollment: Fall 2017	0.15	0.12	0.12	0.49

Table A2: Baseline Equivalence for 1-Semester Within-Institution Retention PSM Model (Treatment group = participants receiving grant-funded support services)

	Unmatched comparison pool (n=33, 644)	**Matched comparison group (n=2,289)**	**Treatment group (n=2,289)**	P-value
Age during first term	27.3	28.7	28.4	0.36
Age during first term (squared)	831.4	922.3	903.7	0.36
Female	0.83	0.88	0.88	0.72
Non-Hispanic White	0.73	0.82	0.81	0.29
Asian/Pac Isl./Amer. Ind.	0.06	0.07	0.07	0.61
Black	0.10	0.05	0.04	0.62
Hispanic	0.08	0.05	0.05	0.35
Enrolled in Adult Basic Ed in first term	0.04	0.04	0.04	0.94
Prior credits earned (pre-grant enrollment)	9.6	14.7	16.2	*0.04*
Prior Ed: high school diploma or less	0.51	0.38	0.37	0.76
Pell recipient in first term	0.31	0.32	0.31	0.73
WIOA Title I recipient	0.03	0.07	0.07	0.68
Credits attempted in first term	7.0	7.5	7.6	0.55
Enrolled in Nursing Assistant	0.25	0.43	0.40	*0.03*
Enrolled in Registered/Practical Nursing	0.27	0.31	0.33	0.17
Enrolled in Medical Assistant	0.06	0.13	0.13	0.48
Employed during first term of enrollment	0.70	0.69	0.69	0.97

Table A3: Baseline Equivalence for 1-Year Within-Institution Retention PSM Model (Treatment group = participants receiving grant-funded support services)

	Unmatched comparison pool (n=26,940)	**Matched comparison group (n=1,840)**	**Treatment group (n=1,840)**	P-value
Age during first term	27.5	28.9	28.7	0.53
Age during first term (squared)	842.9	930.6	918.2	0.59
Female	0.83	0.88	0.88	0.69
Non-Hispanic White	0.73	0.82	0.82	0.61
Asian/Pac Isl./Amer. Ind.	0.06	0.07	0.07	0.61
Black	0.10	0.04	0.04	0.68
Hispanic	0.08	0.05	0.05	0.60
Enrolled in Adult Basic Ed in first term	0.04	0.04	0.04	0.94
Prior credits earned (pre-grant enrollment)	10.2	14.0	15.3	0.10
Prior Ed: high school diploma or less	0.51	0.35	0.37	0.27
Pell recipient in first term	0.31	0.30	0.32	0.35
WIOA Title I recipient	0.03	0.05	0.07	*0.01*
Credits attempted in first term	6.9	7.4	7.5	0.30
Enrolled in Nursing Assistant	0.25	0.42	0.40	0.20
Enrolled in Registered/Practical Nursing	0.27	0.32	0.32	0.97
Enrolled in Medical Assistant	0.06	0.12	0.12	0.61
Employed during first term of enrollment	0.69	0.71	0.70	0.64

Table A4: Baseline Equivalence for Employment Gains PSM Model
(Treatment group = participants receiving grant-funded support services)

	Unmatched comparison pool (n=7,066)	**Matched comparison group (n=468)**	**Treatment group (n=468)**	P-value
Age during first term	28.2	28.1	28.5	0.59
Age during first term (squared)	897.7	890.0	919.0	0.53
Female	0.81	0.81	0.83	0.31
Non-Hispanic White (v. non-white)	0.76	0.85	0.85	0.71
Enrolled in Adult Basic Ed in first term	0.04	0.03	0.04	0.61
Prior credits earned (pre-grant enrollment)	8.1	8.9	9.5	0.69
Prior Ed: high school diploma or less	0.47	0.38	0.38	0.89
Pell recipient in first term	0.26	0.24	0.25	0.54
WIOA Title I recipient	0.04	0.07	0.06	0.59
Credits attempted in first term	6.4	6.3	6.6	0.37
Enrolled in Nursing Assistant	0.34	0.59	0.56	0.29
Enrolled in Registered / Practical Nursing	0.20	0.19	0.18	0.74
Enrolled in Medical Assistant	0.05	0.09	0.11	0.34
First Term of Enrollment: Summer 2015	0.08	0.05	0.04	0.44
First Term of Enrollment: Fall 2015	0.19	0.18	0.19	0.61
First Term of Enrollment: Spring 2016	0.13	0.15	0.15	0.93
First Term of Enrollment: Summer 2016	0.06	0.09	0.08	0.72
First Term of Enrollment: Fall 2016	0.12	0.16	0.18	0.34
First Term of Enrollment: Spring 2017	0.09	0.15	0.14	0.58
First Term of Enrollment: Summer 2017	0.09	0.16	0.16	1.00
First Term of Enrollment: Fall 2017	0.05	0.02	0.02	0.82

Table A5: Baseline Equivalence for Earnings Gains PSM Model
(Treatment group = participants receiving grant-funded support services)

	Unmatched comparison pool (n=15,215)	**Matched comparison group (n=951)**	**Treatment group (n=951)**	P-value
Age during first term	27.2	28.0	28.2	0.71
Age during first term (squared)	828.8	889.3	899.3	0.76
Female	0.82	0.90	0.89	0.71
Non-Hispanic White (v. non-white)	0.74	0.84	0.84	0.95
Enrolled in Adult Basic Ed in first term	0.04	0.05	0.04	0.36
Prior credits earned (pre-grant enrollment)	11.3	12.0	13.5	0.14
Prior Ed: high school diploma or less	0.53	0.41	0.41	1.00
Pell recipient in first term	0.28	0.26	0.27	0.60
WIOA Title I recipient	0.03	0.07	0.09	0.08
Credits attempted in first term	6.6	7.1	7.0	0.86
Enrolled in Nursing Assistant	0.28	0.51	0.48	0.16
Enrolled in Registered / Practical Nursing	0.23	0.21	0.22	0.34
Enrolled in Medical Assistant	0.06	0.14	0.15	0.43
Average quarterly earnings (baseline)	5412.3	5060.2	5051.2	0.97
First Term of Enrollment: Summer 2015	0.07	0.02	0.03	0.10
First Term of Enrollment: Fall 2015	0.21	0.23	0.23	1.00
First Term of Enrollment: Spring 2016	0.13	0.19	0.19	0.60
First Term of Enrollment: Summer 2016	0.06	0.13	0.12	0.21
First Term of Enrollment: Fall 2016	0.16	0.19	0.21	0.27
First Term of Enrollment: Spring 2017	0.09	0.13	0.12	0.37
First Term of Enrollment: Summer 2017	0.02	0.05	0.04	0.42
First Term of Enrollment: Fall 2017	0.08	0.03	0.04	0.53

Table A6: Summary of Outcomes - ATT and Post-Estimation ATT
(Treatment group = participants receiving grant-funded support services)

Outcome	Treatment Group	Comparison Group	**ATT**	P-value	**Post-estimation ATT**	P-value
Credential Attainment	74%	51%	23%	0.00	23.5%	0.00
1-Semester Retention	63%	55%	8%	0.00	7%	0.00
1-Year Retention	48%	41%	7%	0.00	7.5%	0.00
Employment	45%	37%	8%	0.02	n/a	n/a
Earnings	66%	60%	6%	0.01	n/a	n/a

Table A7: Baseline Equivalence for Credential Attainment PSM Model
(Treatment group = participants receiving out-of-class, non-academic support services)

	Unmatched comparison pool (n=26,846)	**Matched comparison group (n=500)**	**Treatment group (n=500)**	P-value
Age during first term	27.2	30.6	30.9	0.62
Age during first term (squared)	828.0	1038.7	1071.3	0.49
Female	0.83	0.89	0.88	0.69
Non-Hispanic White (v. non-white)	0.74	0.79	0.77	0.59
Enrolled in Adult Basic Ed in first term	0.04	0.05	0.04	0.88
Prior credits earned (pre-grant enrollment)	8.9	18.2	20.5	0.18
Prior Ed: high school diploma or less	0.52	0.39	0.40	0.95
Pell recipient in first term	0.32	0.36	0.37	0.79
WIOA Title I recipient	0.03	0.12	0.10	0.37
Credits attempted in first term	7.2	8.3	8.3	0.98
Enrolled in Nursing Assistant	0.23	0.29	0.26	0.36
Enrolled in Registered /Practical Nursing	0.26	0.33	0.37	0.16
Enrolled in Medical Assistant	0.06	0.18	0.17	0.51
Employed during first term of enrollment	0.70	0.62	0.65	0.21
First enrolled Summer 2016 or earlier	0.43	0.27	0.27	1.00

Table A8: Baseline Equivalence for 1-Semester Within-Institution Retention PSM Model (Treatment group = participants receiving out-of-class, non-academic support services)

	Unmatched comparison pool (n=26,846)	**Matched comparison group (n=500)**	**Treatment group (n=500)**	P-value
Age during first term	27.2	31.6	30.9	0.31
Age during first term (squared)	828.0	1127.5	1071.3	0.27
Female	0.83	0.87	0.88	0.44
Non-Hispanic White (v. non-white)	0.74	0.79	0.77	0.44
Enrolled in Adult Basic Education in first term	0.04	0.05	0.04	0.46
Prior credits earned (pre-grant enrollment)	8.9	20.1	20.5	0.80
Prio Ed: high school diploma or less	0.52	0.43	0.40	0.34
Pell recipient in first term	0.32	0.39	0.37	0.52
WIOA Title I recipient	0.03	0.11	0.10	0.68
Credits attempted in first term	7.2	8.3	8.3	0.92
Enrolled in Nursing Assistant	0.23	0.28	0.26	0.44
Enrolled in Registered /Practical Nursing	0.26	0.31	0.37	*0.03*
Enrolled in Medical Assistant	0.06	0.18	0.17	0.56
Employed during first term of enrollment	0.70	0.64	0.65	0.69

Table A9: Baseline Equivalence for 1-Year Within-Institution Retention PSM Model (Treatment group = participants receiving out-of-class, non-academic support services)

	Unmatched comparison pool (n=20,142)	**Matched comparison group (n=348)**	**Treatment group (n=348)**	P-value
Age during first term	27.4	32.2	32.1	0.92
Age during first term (squared)	842.2	1153.8	1149.6	0.95
Female	0.83	0.89	0.88	0.81
Non-Hispanic White (v. non-white)	0.74	0.79	0.81	0.39
Enrolled in Adult Basic Ed in first term	0.04	0.06	0.06	0.87
Prior credits earned (pre-grant enrollment)	9.4	21.2	21.8	0.81
Prior Ed: high school diploma or less	0.51	0.36	0.36	0.94
Pell recipient in first term	0.32	0.43	0.40	0.44
WIOA Title I recipient	0.03	0.14	0.11	0.36
Credits attempted in first term	7.2	8.6	8.6	0.92
Enrolled in Nursing Assistant	0.23	0.17	0.18	0.69
Enrolled in Registered / Practical Nursing	0.26	0.41	0.43	0.59
Enrolled in Medical Assistant	0.06	0.14	0.12	0.65
Employed during first term of enrollment	0.70	0.67	0.68	0.94

Table A10: Summary of Outcomes - ATT and Post-Estimation ATT (Treatment group = participants receiving out-of-class, non-academic support services)

Outcome	Treatment Group	Comparison Group	**ATT**	P-value	**Post-estimation ATT**	P-value
Credential Attainment	65%	43%	22%	0.00	n/a	n/a
1-Semester Retention	72%	61%	11%	0.00	10%	0.00
1-Year Retention	57%	47%	10%	0.01	n/a	n/a

Table A11: Baseline Equivalence for Associate's Degree Attainment PSM Model (Treatment group = Nursing participants receiving out-of-class, academic support services)

	Unmatched comparison pool (n=4,367)	**Matched comparison group (n=199)**	**Treatment group (n=199)**	P-value
Age during first term	27.6	30.4	29.2	0.18
Age during first term (squared)	832.0	1006.0	928.8	0.21
Female	0.89	0.94	0.93	0.69
Non-Hispanic White (v. non-white)	0.65	0.88	0.89	0.75
Prior credits earned (pre-grant enrollment)	12.8	22.4	19.6	0.31
Prior Ed: high school diploma or less	0.50	0.14	0.14	0.89
Pell recipient in first term	0.45	0.34	0.38	0.41
Credits attempted in first term	7.6	7.6	8.0	0.19
Employed during first term of enrollment	0.73	0.73	0.75	0.65
First Term of Enrollment: Spring 2016	0.22	0.15	0.14	0.67
First Term of Enrollment: Summer 2016	0.08	0.14	0.12	0.46
First Term of Enrollment: Fall 2016	0.34	0.47	0.51	0.48

Table A12: Baseline Equivalence for 1-Semester Within-Institution Retention PSM Model (Treatment group = Nursing participants receiving out-of-class, academic support services)

	Unmatched comparison pool (n=6,819)	**Matched comparison group (n=445)**	**Treatment group (n=445)**	P-value
Age during first term	27.5	29.5	29.6	0.92
Age during first term (squared)	831.2	937.5	942.7	0.89
Female	0.89	0.91	0.92	0.47
Non-Hispanic White (v. non-white)	0.64	0.84	0.86	0.35
Prior credits earned (pre-grant enrollment)	11.6	26.3	26.9	0.77
Prior Ed: high school diploma or less	0.51	0.14	0.16	0.31
Pell recipient in first term	0.44	0.35	0.36	0.94
Credits attempted in first term	7.6	8.4	8.4	0.90
Employed during first term of enrollment	0.74	0.75	0.72	0.32

Table A13: Baseline Equivalence for 1-Year Within-Institution Retention PSM Model (Treatment group = Nursing participants receiving out-of-class, academic support services)

	Unmatched comparison pool (n=5,066)	Matched comparison group (n=324)	Treatment group (n=324)	P-value
Age during first term	27.8	29.4	29.7	0.68
Age during first term (squared)	846.5	924.7	947.6	0.59
Female	0.89	0.94	0.93	0.64
Non-Hispanic White (v. non-white)	0.65	0.88	0.88	0.90
Prior credits earned (pre-grant enrollment)	12.4	20.7	22.4	0.39
Prior Ed: high school diploma or less	0.50	0.11	0.15	0.16
Pell recipient in first term	0.44	0.34	0.35	0.81
Credits attempted in first term	7.6	8.1	8.3	0.30
Employed during first term of enrollment	0.73	0.72	0.70	0.67

Table A14: Summary of Outcomes - ATT and Post-Estimation ATT (Treatment group = Nursing participants receiving out-of-class, academic support services)

Outcome	Treatment Group	Comparison Group	**ATT**	P-value	**Post-estimation ATT**	P-value
Credential Attainment	40%	14%	26%	0.00	n/a	n/a
1-Semester Retention	95%	74%	21%	0.00	n/a	n/a
1-Year Retention	88%	59%	29%	0.00	n/a	n/a

Appendix B: Logic Model

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Goal One: Career Pathways				
Area of Focus: *Pathway Structure*				
- College and WTCS existing educational programs - College and WTCS staff - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Employer Advisory committees - Selected healthcare occupational area for focus - Healthcare partners - Prior TAACCT project efforts	• Clarify *ACT Healthcare Pathway structure* relative to: - Bridges - Short term sets of courses/programs - One and two year programs • Undertake WTCS program modification process for Career Pathways and credentials • Establish articulation within program structures and across institutions	• *ACT Healthcare Pathway structure* implemented with fidelity to agreed upon components, and serving participants, and with support of local employers, industry and workforce system partners • Courses, programs, credentials, and articulation mapped and transparent for college, participant, and industry use	• *ACT Healthcare Pathways* incorporated and sustained into college's established program offerings • Increased student enrollment in *ACT Healthcare Pathways*	College has expanded and sustained capacity to offer *ACT Healthcare Pathways* that are highly regarded by industry and adult learners/workers Industry uses college *ACT Healthcare Pathways* to upgrade workforce and remain economically competitive

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Area of Focus: *Credentials*				
- Colleges and WTCS Existing Educational Programs - Colleges and WTCS staff - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Employers, industry associations and workforce partners - Prior TAACCT project efforts	• *Identify credentials to be awarded in ACT Healthcare Pathways*: - Local certificates - WTCS embedded certificates/diplomas - One and two year diplomas - Associate degrees - Industry certified credentials • Clarify financial aid rules for embedded credentials and train college staff accordingly	• Credentials established for *ACT Healthcare Pathways* that meet industry needs, are college and system-recognized, and are valued in the labor market • *ACT Healthcare Pathways* are eligible for student financial aid	• Participants in *ACT Healthcare Pathways* earn credentials valued in the labor market	Industry values *ACT Healthcare Pathway* credentials and uses them in hiring and employment practices

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Goal Two: Curriculum and Instruction				
Area of Focus: *Curriculum development and modifications (internal and external)*				
- College and WTCS existing educational programs - College and WTCS staff - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Employer Advisory committees - Prior TAACCT project efforts - Selected healthcare occupational areas for focus - Healthcare partners - WTCS Curricula Bank (WIDS) - CAEL	• Develop and modify healthcare curriculum to be packaged along *ACT Healthcare Pathways* relative to: - Contextualization (including remedial coursework) - Modularized and stacked courses - Competency-based learning (including industry standards) - Technology literacy - Prior Learning Assessments (PLA) - Articulation to four year colleges • Determine professional development needs and implement offerings for faculty involved with *ACT Healthcare Pathways*	• *ACT Healthcare Pathway* curricula developed or modified with appropriate college and WTCS approvals • *ACT Healthcare Pathway* courses offered with new or modified programs and credentials • PLA practices used as part of *ACT Healthcare Pathway* • Articulation agreements developed in cooperation with four year colleges • Faculty involved with *ACT Healthcare Pathway* participate in professional development activities	• *ACT Healthcare Pathway* curricula incorporated and sustained into college's established program offerings • Students accessing technology literacy courses as part of *ACT Healthcare Pathway* • PLA and Articulation Agreements firmly established and effectively utilized by students, faculty, and administrators within college and across institutions • Regular faculty professional development opportunities are available, and with majority of healthcare faculty (both full-time and adjunct) participating	College has expanded and sustained capacity to offer *ACT Healthcare Pathways* that are highly regarded by industry and adult learners/workers Industry uses college *ACT Healthcare Pathways* to upgrade workforce and remain economically competitive

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
- Existing articulation agreements				
Area of Focus: *Instruction*				
- Colleges and WTCS Existing Educational Programs - Colleges and WTCS staff - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Employers and workforce partners - Healthcare partners - Prior TAACCT project efforts	• Develop and implement new instructional methods and technology to be used in *ACT Healthcare Pathways*: - Augmented reality - Simulations - New equipment purchases • Develop/expand work-based learning opportunities for participants in *ACT Healthcare Pathways* • Establish protocols and timeline for applying new instructional methods, including on-line technology based instructional tools	• New instruction methods/technology adopted and used in *ACT Healthcare Pathway* courses • Staff capacity and protocols for work-based learning established within the college and with identified employers • Faculty and staff involved with *ACT Healthcare Pathways* participate in professional development activities	• New instruction methods/technology more broadly incorporated into college healthcare programs and sustained • Participants in *ACT Healthcare Pathways* effectively engaged in work-based learning opportunities made available by local employers • Faculty and staff involved with *ACT Healthcare Pathways* effectively trained to use new instructional methods and technology	Faculty, staff, students, employers and industry value new approaches to instruction and work-based learning

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
	• Determine and implement professional development for faculty and staff involved with *ACT Healthcare Pathways*			

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Goal Three: Student Recruitment, Comprehensive Supports and Employment				
Area of Focus: *Recruitment*				
- College and WTCS program staff - Workforce partners and their resources - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Employers and local industry associations	• Determine and identify participant eligibility for pathway offerings • Identify and develop marketing materials for targeted participants, such as adult learners • Engage college marketing staff and secure support in targeted recruitment efforts • Establish goals and protocol to recruit priority populations (i.e., TAA and Veterans) • Identify appropriate assessment instruments	• College roles, relationships and responsibilities for participant recruitment to *ACT Healthcare Pathways* established • Materials and processes for recruitment for by college staff finalized as well as plan for outreach, especially with priority populations • Assessment instruments for prospective students determined and adopted for use by college staff	• *ACT Healthcare Pathways* are serving students at capacity • Targeted populations are being served • Assessments instruments have proven effective in guiding student placements	Overall demand for *ACT Healthcare Pathways* is robust among diverse groups of potential students and by employers

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Area of Focus: *Comprehensive and Personal Supports*				
- College program staff and student services - Existing support services - College, WTCS and other public agency human resource informational materials/systems - Local workforce organizations/boards and their resources - Local human and social service agencies and non-profit groups - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Employers and local industry associations	• Define and determine comprehensive support services to provide for participants in *ACT Healthcare Pathways*: - Supplemental instruction - Tutoring - Learning communities - Career guidance - Intrusive advising - Coaching • Clarify responsibility of college staff to provide comprehensive services and/or refer students to external partners	• Comprehensive support services (both academic and personal supports) that college staff will provide participants in *ACT Healthcare Pathways* are clearly identified, including how these supports will be delivered • Comprehensive support services are incorporated into *ACT healthcare pathways* via courses, workshops or other mechanisms	• Comprehensive support services beyond the college norm are available and reaching participants in *ACT Healthcare Pathways* • Student retention, persistence and completion improves	College commitment to providing comprehensive and personal supports for students in *ACT Healthcare Pathways* are sustained, and expanded to other programs College budgets and staff assignments reflect commitment to providing comprehensive and personal supports for students

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Area of Focus: *Employment*				
- College and WTCS staff - College, WTCS and DWD Job banks and other web-based employment resources - CVTC staff - TAACCCT grant - WI Career Pathway initiative - Local employer and industry/employer groups - Local workforce development boards, and Job Service	• Define expectations and activities for colleges to assist participants in *ACT Healthcare Pathways* with job development, preparation and employment services • Clarify role of college staff in providing job development and employment assistance to participants in *ACT Healthcare Pathways* • Identify available employment resources (job development banks, etc.) and determine how colleges will use to support participants in *ACT Healthcare Pathways*	• College staff providing job development and employment assistance for participants *ACT Healthcare Pathways* are clearly identified along with resources for delivering assistance • Job preparation and employment opportunity materials and resources, such as on-line job banks, are made available for participants in *ACT Healthcare Pathways*	• Job development, preparation and employment services are firmly established as a support service provided by college staff, and available to all *ACT Healthcare Pathway* participants	College commitment to providing comprehensive and personal supports for students in *ACT Healthcare Pathways* are sustained, and expanded to other programs College budgets and staff assignments reflect commitment to providing comprehensive and personal supports for students

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
Goal Four: Alignment with External Partners				
Area of Focus: *To support above three goals of career pathways, curriculum development and instruction, and comprehensive and personal supports*				
- WTCS Existing Educational Programs - WTCS staff - CVTC staff - College staff - TAACCCT grant - WI Career Pathway initiative - WI curriculum bank - Employer Advisory committees - Healthcare partners - Third-party credential certifications (e.g., ….) - Employers and industry associations - CAEL	• Engage local employer, industry representatives, and advisory boards to determine their roles in *ACT Healthcare Pathways* regarding: - Career pathway structure and credentials - Curriculum development and instruction - Comprehensive supports and employment services • Develop communication and feedback processes for employer, industry and workforce system input into *ACT Healthcare Pathways* design, implementation and sustainability	• Employer, industry representatives, and workforce boards/staff verify the value of *ACT Healthcare Pathways*, including curriculum and instruction, credentials, prior learning assessment, new technology, and equipment • Role of local workforce system organizations to provide comprehensive support services, such as recruitment and assessment, personal supports, job development, and employment services, is clarified – with necessary protocols, processes and agreements in-place	• Appropriate external partners systematically and regularly recruit participants for *ACT Healthcare Pathways* • Appropriate external partners systematically and regularly provide comprehensive supports and employment services for participants in *ACT Healthcare Pathways*	External partners have an accepted and ongoing role in the development and operations of *ACT Healthcare Pathways* WTCS, local colleges, workforce development organizations, and employers collaborate more seamlessly to provide high-demand educational and training programs, and comprehensive supports and employment services for students Public and private resources used more effectively and efficiently in preparing students to

Wisconsin ACT Healthcare Pathway Logic Model

Inputs	Activities	Short Term Outcomes (within 9 months)	Outcomes (3 years)	Long Term Impacts (Beyond the Grant)
- Local workforce organizations/boards, Job Service and their resources - Local human and social service agencies and non-profit groups				earn credentials and meet industry needs.

Appendix C: Outcomes and Indicators

Appendix C: ACT for Healthcare Implementation Evaluation Framework, Outcomes and Indicators[63]

Career Pathways with Stacked and Latticed Credentials

Outcome: College develops, modifies and/or enhances healthcare and healthcare-related programs of study to incorporate stacked and latticed credentials along a career pathway, enroll grant participants, and offer these programs, courses and credentials on an ongoing basis after the grant period.	
Implementation Stages	**Indicators**
Stage 1: Exploration and Design	• College identifies new or existing programs, curricula and credentials for development and/or modification in consultation with employers • College collects data and information to support development, modification and/or enhancements to ACT for healthcare programs of study • Faculty, staff and administrators charged to review "best practices" and evidence on career pathways to inform program design and modification • Faculty develops new or modified curricula and credentials aligned with employer/industry demand and career pathway best practices • College determines criteria for student participants and establishes strategies and capacity to recruit and assess students • College, and WTCS (if applicable), approve new or modified programs, curricula and credentials
Stage2: Early Implementation	• College identifies internal leadership structure to manage program implementation with clearly defined roles and responsibilities • College allocates resources (e.g., financial, space, technology) to deliver career pathways to grant participants • College hires or assigns faculty and staff to teach and provide supports for new or modified courses • College provides training and professional development for faculty and staff in new or modified courses • College hires or assigns a career pathway coordinator to support career pathway development for ACT programs and across the college • College markets program, courses and credentials to targeted grant populations through a variety of platforms • Grant participants enroll in career pathway programs and courses • College develops or enhances the necessary data system(s) to collect and report information on grant participants

[63] ACT for Healthcare Outcomes and Indicators developed by DVP-PRAXIS LTD, Equal Measure, and Brandon Roberts + Associates. Utilization with attribution is acceptable. Implementation stages were adapted from the National Implementation Research Network (http://nirn.fpg.unc.edu).

Stage 3: Mature Implementation	• College collects and monitors data on implementation, including curricula development and approval, support services delivery, program and credential approvals, and participant outcomes • College shares data and evidence on program implementation and participant outcomes with internal and external stakeholders • College uses data and evidence to inform continuous improvement efforts around program implementation • Implementation efforts for ACT career pathway programs utilize evidence-based practice/knowledge; incorporate key career pathway components (e.g., support services); and align with college-wide career pathway vision and WTCS career pathway standards • Career pathway participants meet or exceed projected goals, including enrollment, earned credits, awarded credentials, and employment • Senior administrators, deans and department chairs communicate regularly and publicly in support of career pathway programs, courses and credentials
Stage 4: Institutionalization and Sustainability	• College aligns career pathways with institutional priorities through strategic planning, accreditation, or other accountability mechanisms • College enacts or adapts policies and processes to support ongoing program operations (e.g., course coding) • College identifies new and/or allocates existing financial and other resources (e.g., space, technology) needed to support ongoing program operations • College provides non-grant resources (e.g., tax levy or state formula dollars) to support faculty and staff needed to deliver programs and support services to students • College provides non-grant resources (e.g., tax levy or state formula dollars) to support continued career pathway development, alignment, and institutionalization • College incorporates career pathway programs, courses and credentials into catalog and includes career pathway participants in college student record and measurement systems • College provides regular marketing and outreach to potential students beyond the targeted grant populations • Students pursue career pathways after grant period ends at enrollment levels necessary to sustain programs and courses

Student Support Services

Outcome: College identifies and provides support services – academic and/or non-academic - for grant participants, and offers these support services to students after the grant period.	
Implementation Stages	**Indicators**
Stage 1: Exploration and Design	• College identifies new or existing academic and/or non-academic support services for grant participants • College develops internal leadership structure to manage support services implementation with clearly defined roles and responsibilities • Leadership and staff determines when and how student supports will be provided (e.g., in class, workshops, one-on-one) to grant participants • Leadership and staff determines who will provide support services (e.g., new or existing staff; external partners such as workforce or social service agencies)
Stage2: Early Implementation	• College allocates resources (e.g., financial, space, technology) to provide support services to grant participants • College hires or assigns staff to provide supports to grant participants • College provides training and professional development to staff hired or assigned to deliver support services to students • College develops formal mechanisms to refer grant participants to external partners, such as workforce or social service agencies, to receive support services • Staff communicates to grant participants that support services are available and when/how to access them • Staff communicates to program faculty that support services are available, and when/how students can access them • Grant participants receive c support services • College establishes or adapts a data management system to monitor uptake of support services by grant participants
Stage 3: Mature Implementation	• College collects and monitors data on implementation of support services and uptake by grant participants • College shares data and evidence on grant participants' utilization of support services with internal and external stakeholders • College uses data and evidence to inform continuous improvement efforts around support services delivery and uptake • College examines data on support services utilization and grant participant outcomes • Senior administrators, project staff and external stakeholders are aware of these support services, and where to refer grant participants to receive them • Increased numbers of grant participants receive support services

Stage 4: Institutionalization and Sustainability	• College enacts or adapts policies and processes to support ongoing delivery of support services to students • College identifies new and/or allocates existing financial and other resources (e.g., space, technology) needed to provide and deliver support services to students • College provides non-grant resources (e.g., tax levy or state formula dollars) to support staff to provide support services beyond the grant period • College provides regular communication about support services to students beyond the targeted grant populations • Students receive support services developed/offered during grant after grant ends

Consortium Strategies

(Digital Literacy/Culture of Healthcare courses; Augmented Reality; Credit for Prior Learning; VA Medic-Nursing Pathway)

Outcome: College identifies consortium strategies most relevant for their campuses and implements these strategies for grant participants, and for students after the grant ends.	
Implementation Stages	**Indicators**
Stage 1: Exploration and Design	• College reviews consortium strategies and identifies those relevant for their campus • College identifies key leadership (e.g., Deans, faculty, staff) to be responsible and accountable for implementing consortium strategies • Project leadership determines what policies and processes to enact and/or amend to support implementation of consortium strategies • Project leadership engages key campus stakeholders and/or external partners to implement consortium strategies
Stage2: Early Implementation	• College allocates resources (e.g., financial, space, technology) to develop and/or deliver consortium strategies • College hires or assigns faculty and/or staff to develop and/or deliver consortium strategies for grant participants • College provides training and professional development for faculty and/or staff responsible for delivering consortium strategies to students • Project leadership communicates availability of consortium strategies to grant participants and other students • Grant participants receive consortium strategies • College establishes or adapts a data management system to capture utilization of consortium strategies by grant participants
Stage 3: Mature Implementation	• College collects and monitors data on implementation of consortium strategies, including participant utilization • College shares data and evidence on implementation of consortium strategies with internal and external stakeholders • College uses data and evidence to inform continuous improvement efforts around delivery and uptake of consortium strategies • Senior administrators, faculty, staff and external stakeholders are aware of consortium strategies, and where students can receive them • Increased numbers of grant participants receive consortium strategies

Stage 4: Institutionalization and Sustainability	• College enacts or adapts policies and processes to support ongoing provision of consortium strategies after grant • Senior administrators, deans and department chairs communicate regularly and publicly in support of consortium strategies • College identifies new and/or allocated existing financial and other resources (e.g., space, technology) needed to support ongoing provision of consortium strategies • College provides non-grant resources (e.g., tax levy or state formula dollars) to support faculty and/or staff needed to provide consortium strategies after the grant ends • College provides regular marketing and outreach to students about consortium strategies • Students receive consortium strategies after grant ends

Partnership Engagement (Employers and Workforce System)

Outcome: College identifies and engages external partners to support grant-funded program of study design and implementation via feedback on curricula and credentials; recruiting and referring students; providing support services and/or providing work-based learning opportunities for grant participants.	
Implementation Stages	**Indicators**
Stage 1: Exploration and Design	• College identifies new or existing employers to provide guidance on grant-funded programs of study, including competencies, credentials, and work-based learning opportunities • College identifies workforce system partners (e.g., Job Centers) to recruit and refer clients to grant-funded programs of study • College identifies workforce system and/or other external partners, such as social service agencies or community based organizations, to provide support services to grant participants • College identifies staff to manage partnership engagement for grant programs of study and/or coordinate support services for grant participants
Stage 2: Early Implementation	• College receives guidance and feedback from local employers on curricula and credentials developed for grant-funded programs of study via existing and/or new advisory boards • College engages local employers to provide new or additional work-based learning opportunities for grant participants (e.g., internships; job shadows; plant tours; priority interviewing or hiring) • College leverages employers and other external partners to contribute financial resources for equipment and other program needs • Workforce system administrators and staff markets and refers clients to grant-funded programs of study • Workforce system and/or other external partners provide support services to grant participants • College establishes or adapts a data management system to collect information on workforce system clients and incumbent workers enrolled in ACT for Healthcare programs of study and grant-funded courses
Stage 3: Mature Implementation	• College collects and monitors data on workforce system clients and incumbent workers enrolled in grant-funded programs of study • College documents workplace learning opportunities provided by employers to grant participants • College shares data and evidence on workforce system clients' progress and outcomes with internal and external stakeholders • Senior administrators, faculty in grant-funded programs, and project staff are aware of employer and workforce system partners' role in grant implementation and participant outcomes • Employers and workforce system partners are aware of grant-funded programs of study that meet labor market demands (e.g., skills and credentials needed by industry) • Grant participants are aware of industry expectations for employee skills and behaviors

Stage 4: Institutionalization and Sustainability	• College enacts or adapts policies and processes to support partnerships with employers and the workforce system after the grant ends • College provides non-grant resources (e.g., tax levy or state formula dollars) to support administrators, faculty and/or staff needed to manage partnerships with employers and the workforce system • Senior administrators examine how to expand partnerships with employers and the workforce system beyond grant-funded programs of study • Employers and the workforce system allocate financial and other resources (e.g., space, technology, personnel) to support their partnerships with college