Impacts of Key Community College Strategies on
Non-Degree Credential Completion by Adult Learners

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program. This program supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a growing option for education and training that includes certificates and technical diplomas that can be completed in two years or less.

With support from Lumina Foundation and coordination by DVP-PRAXIS LTD, several evaluators came together over the last year to conduct analyses of data deriving from individual TAACCCT grants. The objective was to explore the potential for different community college strategies to improve student attainment of non-degree credentials, and to examine labor market outcomes for adults earning these credentials. For these studies, evaluators focused on adult students between the ages of 25 and 64, who had no prior college experience or who had attended college but had not earned a credential of any kind. More than half of Americans between the ages of 25 and 64 do not hold a postsecondary credential, which significantly limits their labor market opportunities.

Independent analyses of TAACCCT datasets by evaluators, using a standard and coordinated methodological approach, found that non-degree credentials have significant and positive labor market outcomes for adult learners. Even short-term credentials had demonstrated value in terms of employment gains, whereas there is a larger and more consistent earnings payoff for adults completing longer-term credentials (those taking six months or more to complete). A synthesis of these results can be found in this July 2019 summary brief examining the relationship between non-degree credentials and employment and earnings outcomes.

In light of these findings pointing to the labor market benefits of many non-degree credentials, it is important that research continue to explore key strategies colleges can employ to help more adult learners earn them. The following series of reports produced by the evaluators involved in this project use rigorous quasi-experimental statistical approaches to measure the impact of three key strategies being used by two-year colleges to improve adult completion of non-degree credentials—academic and non-academic student supports, career pathways, and prior learning assessment. Findings across these reports point almost universally to positive impacts of these strategies on non-degree credential completion. Given increasing attention by colleges nationwide to the importance of more intentional academic and non-academic supports to improve outcomes for adult learners, and the concentration of evaluator studies focused on the impacts of this particular strategy, a companion November 2019 summary brief synthesizes findings across the four studies focused on the impacts of student supports.

November 2019

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RUTGERS EDUCATION AND EMPLOYMENT RESEARCH CENTER

HEATHER A. MCKAY AND WILLIAM MABE | AUGUST 2019

Credit for Prior Learning for Non-Degree Credentials:
An Example from the Colorado Community College System

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a broad category that includes certificates and technical diplomas that can be completed in two years or less. This brief is one of six in a series providing evidence on the impact of innovative strategies on the completion of non-degree credentials among a sample of adults aged 25-64 who had not earned any prior postsecondary credential. Analysis was conducted with financial support from Lumina Foundation and was coordinated by DVP-PRAXIS LTD. An earlier brief developed through this project (July 2019), based on independent analyses by researchers who had been third-party evaluators on various TAACCCT initiatives, found that non-degree credentials can have significant and positive labor market outcomes for adult learners.

INTRODUCTION

Between 2013 and 2017, the Colorado Community College System (CCCS) implemented the TAACCCT-funded Colorado Helps Advanced Manufacturing Programs (CHAMP). The $24.9 million consortium grant was intended to facilitate the redesign or creation of certificate and degree programs that respond effectively to the needs of the 21st-century manufacturing sector. At CCCS, one goal of the grant was to redesign the system's credit for prior learning (CPL) model, a policy designed to accelerate students' progress toward a credential. The Education and Employment Research Center (EERC) at Rutgers, the State University of New Jersey, conducted the third-party evaluation of the CHAMP grant. The research presented below results from that work.

This brief looks at CPL during the CHAMP redesign effort. Our analysis focuses on adult—particularly nontraditional—certificate seekers from across all 13 CCCS institutions. Research on CPL, which often examines its use in the achievement of two- and four-year degrees, has consistently found that adult students with CPL credit are more likely to earn a postsecondary degree than are similar students who do not receive CPL.[i] With this brief, we hope to expand on that work by providing some insight into the impact of earning CPL on adult learners seeking shorter-term, non-degree credentials (e.g., certificates).

Non-degree credentials are of growing importance in the marketplace. Increasing numbers of individuals are seeking credentials that are less expensive and can be earned more quickly than traditional postsecondary degrees and that may help them enter or advance in an industry or sector. Non-degree credentials may be particularly important for the over 50 percent of Americans aged 25 to 64 who do not hold a credential beyond high school.[ii]

CPL, a model through which college credit is granted to individuals who are able to demonstrate certain competencies they have gained outside of the classroom, saves both time and money,[iii] and therefore could be an important tool for adults seeking non-degree credentials.

This brief considers the following research question:

Does the attainment of Credit for Prior Learning increase the probability that a student with no prior postsecondary credential will earn a less-than-two-year certificate?

The CHAMP analysis found that CPL had a significantly positive impact on the completion rate of all certificate seekers at CCCS colleges. For adult learners between the ages of 25 and 64, CPL also had a positive impact on certificate attainment, although the impact was smaller. This difference was likely due to sample size.

CREDIT FOR PRIOR LEARNING AT CCCS

As noted above, one of the key strategies implemented under the CHAMP grant was the redesign of the model CCCS used for awarding CPL credits. CPL protocols recognize and grant academic credit for skills and knowledge individuals have gained outside the classroom. As such, CPL is not awarded for experience itself but for the college-level learning—the knowledge, skills, and competencies—that students gain as part or as a result of their experience.[iv]

CCCS colleges have used CPL as an alternative means for awarding academic credits for over 40 years, but historically its use lacked uniformity. Institutions varied in how CPL was administered as well as in the extent to which students were aware of CPL policies and were able to access the CPL process. CCCS used the CHAMP grant to completely overhaul its CPL model. This effort involved making changes to policy and practice, including making the policy clearer and setting standards across the system; increasing systemwide awareness of the policy among students, faculty, and staff; and improving data collection. These policy and process changes were determined by a committee made up of representatives from all 13 CCCS colleges and led by a staff member from the CCCS administration.

Once the new policy was put into place, colleges were tasked with implementing it. Implementation timelines varied by institution, and for many, full implementation did not occur until close to or after the close of the grant. It is therefore important to understand that because this brief looks only at CPL outcomes accomplished within the grant period, it should not be viewed as a complete reflection of the full scope of the work accomplished under the redesign.

In total, during the grant period, 9,611 unique CCCS students received CPL credits. Table 1 presents the age distribution of those unique individuals who earned CPL credit between 2013 and 2017.

TABLE 1

CPL Award Rates by Age within the Colorado Community College System, 2013-2017[v]

QUANTITY	YOUNGER THAN 25	AGE 25 TO 64	ALL STUDENTS < AGE 65
STUDENTS NOT AWARDED CPL CREDIT	134,302	104,071	238,373
STUDENTS AWARDED CPL CREDIT	5,511	4,089	9,600
PERCENT AWARDED CPL	3.9	3.8	3.8

Table 1 shows that students in all age groups earned CPL credit, though the CPL award rate was marginally higher among students younger than 25 than it was among the older group. However, though members of both groups took advantage of CPL, the rate at which they did so was quite low: In both groups, fewer than 4 percent of the population earned CPL credit. So despite the fact that this policy has been in place for over 40 years, very few students are accessing it.

Though the over/under-25 age gap in CPL award rates was marginal, the difference in award rates was more pronounced with respect to gender. Data in Table 2 reveal that male students were two-thirds more likely than female students to have earned credit from CPL during the grant period.

TABLE 2

CPL Award Rates by Gender within the Colorado Community College System, 2013-2017

QUANTITY	FEMALE	MALE	TOTAL
STUDENTS NOT AWARDED CPL CREDIT	132,896	105,477	238,373
STUDENTS AWARDED CPL CREDIT	4,061	5,539	9,600
PERCENT AWARDED CPL	3.0	5.0	3.9

There were also some modest differences in CPL recipiency across racial and ethnic groups, and between non-resident-alien (international) students and those who were U.S. citizens. International and Hispanic students were the most likely to have received CPL credit compared to other groups of students. Of note, there is some overlap between the race/ethnicity categories and the non-resident alien (International) category.

TABLE 3

CPL Award Rates by Race, Ethnicity, and Residency Status within the Colorado Community College System, 2013-2017

QUANTITY	STUDENTS WHO DID NOT EARN CPL CREDIT	STUDENTS WHO EARNED CPL CREDIT	ALL STUDENTS	PERCENT OF STUDENTS EARNING CPL CREDIT
AMERICAN INDIAN OR ALASKAN NATIVE	2,221	65	2,286	2.8
ASIAN	6,933	250	7,183	3.5
BLACK OR AFRICAN AMERICAN	16,789	606	17,395	3.5
HISPANIC	41,869	1,933	43,802	4.4
MULTIPLE RACES	10,283	378	10,661	3.5
NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER	725	30	755	4.0
NON-RESIDENT ALIEN (INTERNATIONAL)	4,623	286	4,909	5.8
UNKNOWN	9,935	368	10,303	3.6
WHITE	144,995	5,684	150,679	3.8
TOTAL	238,373	9,600	247,973	3.9

STUDY DESIGN

To estimate the impact of CPL on students' academic attainment, the academic outcomes of the CPL recipients must be compared with those of similar students who did not earn any CPL credit. If the only difference between the comparison students and CPL credit recipients is that they did not earn CPL credit, then we can attribute the differences in academic outcomes to CPL. In experiments, the credible counterfactual group is achieved through random assignment, but this is not possible in observational studies. It is possible, however, to build a credible counterfactual sample using careful research design and appropriate statistical methods such as Propensity Score Matching [vi] (PSM) and Coarsened Exact Matching [vii] (CEM).[viii] Both methods take into account the mechanisms through which students receive the treatment—in this case, CPL credit—then construct a counterfactual control sample similar to the treated group except for the treatment status. These steps reduce the possibility of bias arising from selection into treatment. The differences in academic outcomes between the CPL and non-CPL groups can then be explained primarily by the treatment.

The literature suggests that multiple factors are associated with CPL earning, including age, gender, and race. There are also some unmeasurable characteristics that play a role in receipt of CPL, such as finding out about the availability of the program and being able or willing to navigate the process. To build a valid comparison group, the observable factors were included in the matching models, and the study was designed to mitigate the confounding effect of unobservable characteristics.

To ensure that the students in the treatment and comparison groups were truly comparable, comparison-group students were included in the data set only if they were identical to CPL recipients in all of the following ways: They (i) earned academic credit, (ii) in the same subject, (iii) during the same academic year, (iv) at the same college. We excluded students who had previously earned any type of postsecondary credential from the analysis. The dataset used for this analysis was pulled by the Colorado Community College System in fall 2018 from the CCCS student information systems.

RESULTS

We ran both matching models—PSM and CEM—and parametric statistical analyses on two subsets drawn from a larger data set consisting of enrollments at all 13 CCCS colleges between 2013 and 2017: (i) all certificate seekers and (ii) adult (ages 25-64) certificate seekers. The matching models and parametric statistical analyses included controls for whether the student was a returning student or a new student, whether the student was dual enrolled, various demographic categories, the CCCS college in which the student enrolled, and the year in which CPL credit was earned.

The outcome analyzed (dependent variable) was whether the student earned a certificate. Results presented here are from the CEM models.[ix] After matching, EERC used a logit model to estimate the impact of CPL on student attainment.

All Certificate Seekers

First, EERC researchers estimated the effect of CPL on certificate completion for the full sample of certificate seekers. CPL had a highly significant positive impact the completion rate of certificate seekers, meaning that students who received CPL credits were more likely to complete certificates than were certificate seekers who did not earn any CPL credits.

To translate the statistical outcomes into more readily understandable quantities, we then ran Monte Carlo simulations using Zelig[x] to generate estimates of the effect of earning CPL credit on certificate attainment. Among the sample of all certificate seekers, holding all variables in the model at their means, earning CPL credit increased the probability of earning a certificate from 16.2 percent to 25.7 percent, an increase that is both statistically significant and substantively meaningful.

Adult Certificate Seekers

The second analysis looked at adult learners between the ages of 25 and 64, our target population of interest. Table 4 shows the raw attainment rates (prior to statistical matching) for CPL versus non-CPL recipients for this group. Two important differences between the CPL group and the non-CPL group stand out. First, CPL students have a 10-percentage-point advantage in terms of credential attainment compared to the non-CPL students. Second, the number of credential earners—55 students—in the CPL sample is quite small in relation to the number of credential earners who did not receive CPL credit.

TABLE 4

Differences in Credential Attainment Rates, CPL Versus non-CPL, Aged 25 to 64

CPL STATUS	NUMBER EARNED A CREDENTIAL (N=452)	PERCENT EARNED CREDENTIAL
NO CPL AWARDED	397	15.9
RECEIVED CPL	55	25.9

Using the same statistical models that we ran on the full sample of credential seekers, our analysis of the age-limited group found that CPL had a positive impact on non-traditional certificate seekers' probability of attainment, and this difference, despite the small sample size, approached statistical significance. The Monte Carlo simulations showed that when we held the values of all variables at their means, earning CPL credit increased the probability of earning a certificate nearly two percentage points, from 18.1 percent to 19.8 percent, for the average student between the ages of 25 and 64.

These results show that earning CPL has a positive effect on certificate attainment. While the magnitude of the effect appears to be smaller for our population of interest, adult learners, we believe this may simply be a result of the small sample size.

CONCLUSION

Our analysis shows that CPL has a strongly positive effect for certificate seekers generally, and a more modest effect when the analysis is restricted to nontraditional students aged 25 to 64. These results demonstrate that CPL can play an important role in the completion of non-degree credentials for non-traditional students. Unfortunately, less than 4 percent of the nontraditional CCCS student population received CPL during the CHAMP-grant period. This rate of CPL use, which is similar to those of other institutions around the country, resulted in a very small sample size to work with, particularly in our age-limited analysis.

The key takeaway here is that, while EERC's findings suggest that CPL has great value when it comes to the completion of certificates, very few people are benefiting from it. Attention should be paid to this lack of use, and therefore to the implementation of the new CPL policy at CCCS institutions. The Consortium worked hard to change its CPL policy and practices under its TAACCCT grant. In the years to come, as more data become available, research should be done to better understand the impact of that work.

[i] Klein-Collins, R. (2010, March). *Fueling the race to postsecondary success: A 48-institution study of prior learning assessment and adult student outcomes.* Chicago, IL: Council for Adult and Experiential Learning. Retrieved from http://www.cael.org/pla/publication/fueling-the-race-to-postsecondary-success; Hayward, M. S., & Williams, M. R. (2015). Adult learner graduation rates at four U.S. community colleges by prior learning assessment status and method. *Community College Journal of Research and Practice, 39*(1), 44-54. doi: 10.1080/10668926.2013.789992; McKay, H., Cohn, B., & Kuang, L. (2016). Prior learning assessment redesign: Using evidence to support change. *The Journal of Continuing Higher Education, 64*(3), 196-201. doi: 10.1080/07377363.2016.1229506; Klein-Collins, R., & Hudson, S. (2017, September). *What happens when learning "counts"? Measuring the benefits of prior learning assessment for the adult learner--A CAEL self-study of the academic outcomes of Learning Counts students*. Chicago, IL: Council for Adult and Experiential Learning. Retrieved from https://www.cael.org/adult-learning/publication/when-learning-counts.

[ii] Lumina Foundation. (n.d.). Tracking America's progress toward 2025. Retrieved from the *A stronger nation* website at http://strongernation.luminafoundation.org/report/2019/#nation.

[iii] ibid

[iv] Council for Adult and Experiential Learning. (2013). *Competency-based education* (CAEL Forum & News). Chicago, IL: Author. Retrieved from https://www.cael.org/cbe/publication/competency-based-education-cael-forum-and-news

[v] Eleven of these students were older than 64 and therefore are not represented in the tables that follow.

[vi] Rosenbaum, P. R., & Rubin, D. B. (1983, April). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55. doi: 10.1093/biomet/70.1.41

[vii] Iacus, S., King, G., & Porro, G. (2012). Causal inference without balance checking: Coarsened exact matching. *Political Analysis, 20*(1), 1-24. doi:10.1093/pan/mpr013

[viii] EERC researchers ran separate statistical analyses on 96 different data sets.

[ix] Because CEM consistently produced samples with better matches between the treatment and comparison groups, this brief presents results based only on the CEM matching. Results from PSM were substantively similar.

[x] Imai, K., King, G., & Lau, O. W. (2008). Toward a common framework for statistical analysis and development. *Journal of Computational and Graphical Statistics, 17*(4) ,892-913. doi: 10.1198/106186008X384898

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a broad category that includes certificates and technical diplomas that can be completed in two years or less. This brief is one of six in a series providing evidence on the impact of innovative strategies on the completion of non-degree credentials among a sample of adults aged 25-64 who had not earned any prior postsecondary credential. Analysis was conducted with financial support from Lumina Foundation and was coordinated by DVP-PRAXIS LTD. An earlier brief developed through this project (July 2019), based on independent analyses by researchers who had been third-party evaluators on various TAACCCT initiatives, found that non-degree credentials can have significant and positive labor market outcomes for adult learners.

Embedding Non-Degree Credentials within Stacked and Latticed Pathways to Improve Education Outcomes for Adults

By Jessa Lewis Valentine and Derek Price, DVP-PRAXIS LTD

Introduction

This report examines the impact of a career pathways strategy pursued by a consortium of Wisconsin public two-year technical colleges to improve postsecondary credential completion for adult students within the manufacturing field. As part of a Trade Adjustment Assistance Community College and Career Training (TAACCCT) Round 2 grant implemented from 2012 – 2016 and funded by the Department of Labor, WI institutions restructured several programs within manufacturing, embedding short-term, non-degree credentials within longer-term educational programs leading to technical diplomas and associate's degrees. Results from this analysis, which are focused on adults aged 25-64 who had not earned any prior postsecondary credential, indicate that students enrolled in career pathway programs with stacked and latticed credentials were far more likely to complete non-degree credentials of various lengths, and were also more likely to earn multiple credentials.

Wisconsin's *Making the Future* initiative in advanced manufacturing

In 2012, Wisconsin's technical colleges received nearly $15 million from the U.S. Department of Labor to increase attainment of industry-recognized certifications, certificates, diplomas, and other credentials to better prepare adults for high-skill, high-wage employment in advanced manufacturing careers. Wisconsin's TAACCCT 2 grant, called *Making the Future,* was a collaborative and coordinated effort of the 16 technical colleges that together make up the Wisconsin Technical College System (WTCS), which serves every urban and rural community in Wisconsin through nearly 50 campuses plus additional outreach facilities across the state.

Making the Future colleges engaged in various strategies to close the skills gap within the advanced manufacturing sector including enhancements to academic and non-academic student supports, development of processes to award credit for prior learning, and innovative engagement of regional employers and workforce development partners. The most prominent strategy across the consortium – and the focus of this brief—was the development and expansion of stacked and latticed pathway programs, often called career pathways. During the grant period (2012-2016), consortium colleges created new manufacturing pathways and modified existing pathways to enable participants to earn short-term credentials (less than one year) that stack toward one-year and two-year technical diplomas, and in some instances, associate's degrees.

The Strategy: Stacked and Latticed Credentials within Career Pathways

The implementation of stacked and latticed career pathways was the most common strategy implemented across the *Making the Future* consortium, which were concentrated in the area of machine tool/CNC, welding, and industrial maintenance. Stacked and latticed pathways are a package of credit-based courses and competencies that connect and build on each other within a program of study, and that yield a series of credentials for students. The "stacking" aspect of the pathway denotes vertical movement along a pathway, with each credential building on previously learned content, while "latticing" refers to the mobility of students to move in and out of the labor market at each level of credentialing. Existing research on stacked and latticed career pathways suggests these types of programs can yield better education and employment opportunities for students, especially adults with no prior postsecondary credential who need new skills to compete for jobs in a high-tech economy.[1]

The focus on stacked and latticed pathways for TAACCCT 2 was not new to Wisconsin.[2] The *Making the Future* strategy emerged from several years of activities focusing on adult career pathways in Wisconsin, building on work of the Regional Industry Skills Education initiative (RISE) that began in 2007 as part of the Joyce Foundation's multi-state Shifting Gears initiative. Importantly, during Shifting Gears, WTCS changed its policies and procedures manual for program approval and modification, so that colleges could more easily develop and implement career pathways – specifically the "chunking" of program curricula and stacking of credentials, as well as the development of adult education bridges intended to accelerate the transition to postsecondary coursework and programs by adults with a high school diploma or less.[3]

Wisconsin's approach to stacked and latticed pathways consists of embedding short-term certificates or credentials within longer-term "parent" programs. The most common curricular modifications in *Making the Future* consisted of bundling existing courses, credits, and competencies into smaller packages of credentials, such as short-term local certificates, embedded technical diplomas, or pathway certificates. Some non-degree credentials were designed as first credentials to help adults transition into longer term programs; others were employer-informed, shorter-term credentials created within existing two-year programs. One of the key benefits of the stacked and latticed approach is thus the opportunity for students to earn more credentials and do so earlier in the educational pathway.

Data and Methods

Data for this analysis are based on term-level student administrative records obtained from each participating technical college for the period 2012 through 2016. Records were obtained for all manufacturing students enrolled during this period, including those participating in stacked and latticed pathway programs developed during the *Making the Future* initiative, as well as manufacturing students not affected by *Making the Future* strategies. The sample was restricted to 4,000 older adult students, those aged 25-64, who had no prior college experience or who had attended college previously but had not earned any postsecondary credential or degree. Of these students, close to 1,000 were enrolled in manufacturing programs that were enhanced or newly developed to embed shorter-term credentials within a career pathway framework—this group of students comprises the treatment group.

In order to assess the impact of stacked and latticed pathways on the completion of non-degree credentials, propensity score matching (PSM) was used 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 as well as the outcome. 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.[4]

Results

Characteristics of the analytic treatment sample are summarized in the box on this page. Students enrolled in stacked and latticed pathways were predominantly male, reflecting the gender dynamics of the manufacturing sector. Although the treatment sample is nearly three-quarters non-Hispanic white, this reflects greater diversity than Wisconsin's broader population.[5] More than 50 percent of the adult sample enrolled in stacked and latticed manufacturing programs were enrolled during their first term in an adult basic education or developmental education courses designed to provide basic skills

> **Characteristics of Analytic Sample of Adult Students Enrolled in Stacked and Latticed Manufacturing Pathways**
>
> - Average age: 36 years old
> - 92% male
> - 74% non-Hispanic white, 10% African American, 8% Hispanic
> - 51% enrolled in adult basic education or developmental education course
> - 76% never enrolled in college previously; 24% with prior college enrollment but no credential
> - 46% received Pell during first term of enrollment
> - 62% were working students
> - 54% in welding, 39% in machine tool, 14% in industrial maintenance program areas

education and remediation for academically underprepared students. In addition to their academic needs, nearly 50 percent of students received a Pell grant during their first term of enrollment, indicating a high economic need reflective of most community college students.

Propensity score analyses compared outcomes for the treatment group—adult students in stacked and latticed pathways—with outcomes of a statistically similar group of adult manufacturing students who were not enrolled in these pathways. Analyses suggest that **adults in stacked and latticed pathways were much more likely to complete a non-degree credential (43 percent) compared to adult students in the matched comparison group (24 percent)**. This finding held true for all non-degree credential types—students in stacked and latticed pathways were more likely than a matched comparison group to complete short-term technical diplomas or certificates (most of which can be completed in a single semester), one-year technical diplomas, and two-year technical diplomas (see Figure 1).

Figure 1: Impact of Stacked & Latticed Pathways on Non-Degree Credential Completion
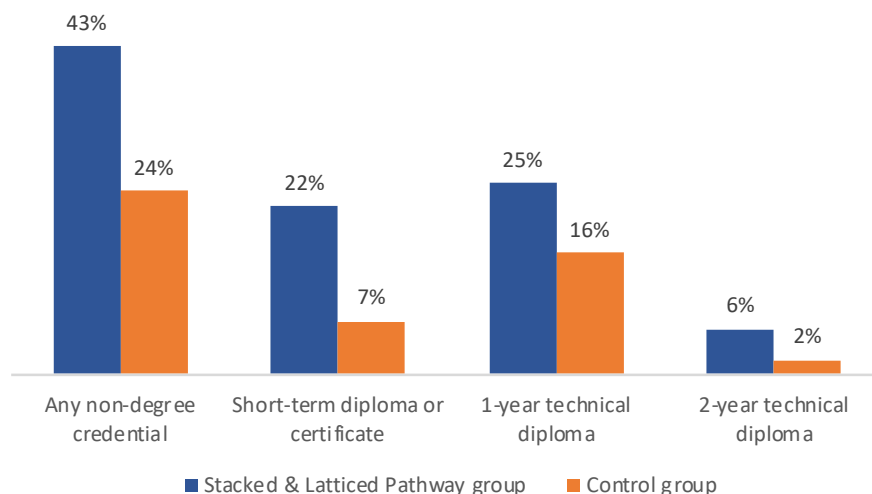
*All differences between treatment and control group significant at p<.05

Notably, in addition to being more likely to complete individual non-degree credential types, **adults in stacked and latticed pathways were also significantly more likely to complete *multiple* non-degree credentials**. Propensity score analyses suggest that 10 percent of adults enrolled in stacked and latticed manufacturing pathways completed two or more non-degree credentials during the study period, compared to just one percent of the matched comparison group. Among students enrolled in stacked and latticed pathways who attained non-degree credentials, 24 percent completed more than one credential. Importantly, more than one-third (35 percent) of adults who completed a short-term certificate or diploma went on to complete a one-year or two-year technical diploma as well.

Conclusion

Analyses of student data from a consortium of Wisconsin technical colleges suggests that stacked and latticed career pathways can significantly improve adults' completion of non-degree credentials. Results in this brief show that the likelihood of completing a non-degree credential nearly doubled for manufacturing students in stacked and latticed pathways, compared to a statistically matched comparison group. These non-degree credentials – in the Wisconsin case, certificates and technical diplomas that can take as little as one semester and up to two years to complete – have important labor market value. Earlier analyses conducted for the same sample of Wisconsin manufacturing students aged 25-64 with no prior postsecondary credential suggest that non-degree credentials improve the likelihood of employment post-completion by six percentage points, and boost quarterly earnings over non-completers by 23 percent.[6]

Importantly, results presented in this brief suggest not only that adults enrolled in stacked and latticed pathways are more likely to complete credentials, but also that many adults enrolling in these pathways complete more than one credential. Some college practitioners – particularly faculty – raised understandable concerns during implementation that embedding shorter-term credentials within longer-term programs would result in students stopping out and not returning.[7] The completion data in this brief suggest this is not the case. It is possible that attaining shorter-term credentials along a pathway provides additional incentive and motivation for students to continue on to the next credential; this hypothesis merits additional study.

As noted in a recent series of reports commissioned by the Department of Labor, not all career pathway initiatives are created nor defined equally, and additional research is needed to understand which elements of career pathways connect most strongly with improved education and employment outcomes for adult learners.[8] It is these essential elements of career pathways that should be incentivized by federal funds moving forward. The Wisconsin career pathway model – which involves the intentional embedding of shorter-term non-degree credentials within longer career pathways, and which is promoted by a system of two-year technical colleges that is closely connected to the needs of regional employers – is a robust example of this model and the types of frameworks that federal dollars should continue to support.[9]

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Endnotes

[1] Alssid, J. L., Gruber, D., Jenkins, D., Mazzeo, C., Roberts, B., & Stanback, R. (2002, August). Building a career pathways system: Promising practices in community college-centered workforce development. New York: Workforce Strategy Center
Helmer, M., & Blair, A. (2011, February). Courses to employment: Initial education and employment outcomes findings for students enrolled in Carreras en Salud Healthcare Career Training 2005– 2009. Washington, DC: The Aspen Institute.
Hinckley et al. (2011), *Adult Career Pathways: Providing a Second Chance in Public Education*, CORD.

[2] Roberts, B., Price, D., Roach, R., Valentine, J.L., & Sedlak, W. (2018). Advancing Career Pathway Development in Wisconsin Technical Colleges: Final Evaluation Report.
http://www.skillscommons.org/bitstream/handle/taaccct/18247/ACT-WisconsinReport-092618.pdf?sequence=3&isAllowed=y

[3] Roberts, B. and Price, D. (2012). *Strengthening State Systems for Adult Learners: An Evaluation of the First Five Years of Shifting Gears.* Chicago: Joyce Foundation.

[4] 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.
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

[5] According to the U.S. Census Bureau (2018), 81% of Wisconsin's population is non-Hispanic white.
https://www.census.gov/quickfacts/fact/table/WI/PST045218.

[6] Valentine, J. & Clay, J. (2019). *Non-Degree Credentials Provide Value for Adults in the Labor Market*. DVP-PRAXIS LTD.

[7] Price, D., Sedlak, W, Roberts, B, & Childress, L. (2016). Making the Future: The Wisconsin Strategy. DVP-PRAXIS LTD, Brandon Roberts + Associates, & Equal Measure.

[8] Schwartz, D, Strawn, J, & Sarna, M. (2018). Career Pathways Design Study.
https://www.abtassociates.com/sites/default/files/2018-06/2-Career-Pathways-Research-and-Evaluation-Synthesis.pdf

[9] Roberts et al. (2018). Advancing Career Pathways in Wisconsin Technical Colleges: Final Evaluation Report. Brandon Roberts + Associates, DVP-PRAXIS LTD, Equal Measure.

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a broad category that includes certificates and technical diplomas that can be completed in two years or less. This brief is one of six in a series providing evidence on the impact of innovative strategies on the completion of non-degree credentials among a sample of adults aged 25-64 who had not earned any prior postsecondary credential. Analysis was conducted with financial support from Lumina Foundation and was coordinated by DVP-PRAXIS LTD. An earlier brief developed through this project (July 2019), based on independent analyses by researchers who had been third-party evaluators on various TAACCCT initiatives, found that non-degree credentials can have significant and positive labor market outcomes for adult learners.

The Impact of Holistic Student Supports on Credential Attainment for Diverse Adult Learners in the Health Professions Pathways Consortium

Debra D. Bragg and Matt S. Giani
June 24, 2019

The Health Professions Pathways (H2P) consortium funded by a Round One Trade Adjustment Act Community College Career Training (TAACCCT) grant enabled nine community and technical colleges to implement programs for adult learners seeking to enter or advance in healthcare careers. This brief examines credential attainment for adults who participated in healthcare curriculum that was supplemented with holistic student supports. Drawing on data gathered on demographically diverse adult learners enrolled in three H2P colleges, we observed the following results:

- Use of holistic student supports has an overall positive impact on the likelihood of adult learners attaining any credential (very short-term certificate, short-term certificate, long-term certificate, or associates degree).
- Of all student supports considered part of the H2P consortium's holistic approach, career services and employment services has the strongest positive effect on the likelihood of credential attainment, suggesting services that assist adult learners to choose a healthcare path aligned with their career interests contributes to the likelihood of their attaining a credential.
- Credential attainment rates differ by racial/ethnic group, pointing to the need to better understand how holistic student services intended to improve student outcomes perform to address the needs of demographically diverse student sub-groups.

Introduction

This brief describes results of a multi-faceted career pathway approach that integrated holistic student supports with healthcare occupation core curriculum and other strategies to prepare adult learners having little or no prior college experience to enter or advance in employment. Funded by a Round One TAACCCT grant, the Health Professions Pathway (H2P) consortium funded nine colleges in five states to implement improved health career pathways for adult learners. We begin this brief by describing eight strategies implemented by the H2P consortium colleges, then provide a fuller description of the intervention of primary focus to this study: holistic student supports. The remainder of the brief presents our research question, methods, major results, and implications. To keep this document concise, we urge readers to reach out to us for further details on our analytical approach.

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The H2P Consortium Strategies

The H2P consortium was comprised of nine community and technical colleges located in five states (IL, KY, MN, OH, and TX). These colleges committed to use Round One TAACCCT federal funding to reform healthcare education using a career pathways approach to prepare students for healthcare employment (Bragg & Krismer, 2016). The grant focused on 41 programs of study that culminated in 8 very short-term certificate programs (less than or equal to 12 credits), 14 short-term certificate programs (more than 12 and less than or equal to 30 credits), 8 long-term certificate programs (more than 30 credits but less than associates degree), and 11 associates degree programs. Most of the grant funds were dedicated to improving credit but also some non-credit programs, and some new programs were created as well. The highest enrollments were in certified nursing assistant, practical nursing, registered nursing, medical assisting, pharmacy technician, and emergency medical technician. By the end of the grant in September 2015, the nine colleges served more than 6,500 participants, with nearly 5,000 students enrolling in one or more of the 41 programs and the remaining students participating in one or more of the other TAACCCT grant-funded interventions, mostly holistic student supports (Bragg, Giani, Fox, Bishop & Bridges, 2015).

A comprehensive intervention involving eight strategies thought integral to improving healthcare pathways were conceived by the H2P consortium, with four strategies being implemented by all nine colleges (Bragg et al., 2015). The first strategy was health occupations core curriculum (HOCC) focused on expanding access to foundational knowledge and skills to prepare students for health careers. Linked closely to this strategy was the strategy of holistic student supports (discussed more fully below due to the importance of this strategy to our research) that involves academic, career, employment, and personal support services intended to increase credential attainment. The third strategy is industry-recognized stackable credentials that strengthen the link between education and employment by accelerating time to completion, and the fourth strategy, prior learning assessment (PLA), recognizes previous learning to facilitate students' starting college and accelerating toward completion. The fifth and sixth strategies implemented by most but not all H2P colleges were developmental education reform to improve students' foundational academic knowledge and skills, and incumbent-worker training to help advance already-employed healthcare employees into more advanced career opportunities.

Two additional strategies focused on enhancing the capacity of the H2P consortium colleges to implement and scale the comprehensive H2P approach. These are enhanced data and accountability to enable community colleges to disaggregate and use data to promote more equitable student outcomes and scaling strategies to promote health career pathways beyond the H2P consortium through enhanced networking and connections to national professional groups. Consistent with these latter to strategies, this brief provides a means of sharing results of research made possible because of the H2P consortium's commitment to enhancing data quality and scaling healthcare reform.

Primary Research Question

The primary question that this study sought to address was: **What impact did holistic student supports have on credential attainment for demographically diverse adult learners in the H2P Consortium**? In conducting this analysis, we attempted to measure the impact of the Round One TAACCCT grant-funded interventions on credential attainment of varying lengths. In viewing student supports comprehensively, the H2P consortium considered academic, career, employment, and personal advising as vital to enabling students to complete credentials needed to enter employment or advance in healthcare career pathways. Building on research showing the positive impact that enhanced student services on student retention and completion (see, for example, Bettinger & Baker, 2014; Edgecombe, Jaggars, & Bailey, 2013; and Scrivener & Weiss, 2009), all nine H2P colleges employed staff focusing on student supports to perform a variety of functions. A sub-set of the nine colleges adopted technology solutions to

facilitate these professionals capacity to record their delivery of serves to H2P participants, and it is this feature of the grant that enabled us to gather student-level data to conduct this study.

The primary goal of the H2P colleges was to offer a complimentary range of support services that create a holistic approach to student success (Karp, 2016). The framework conceptualized by McDonnell, Soricone, and Sheen (2014) seemed closest to the comprehensive approach to student support services taken by the H2P colleges. Five discrete categories of student support services included in this framework are: academic advising, non-academic advising, career services, financial services, and social services and counseling. In addition to these five categories we added two categories, assessment and employment services, to more fully represent the support services offered by the H2P colleges. We then used this modified framework to code the student services data for our third-party evaluation (Giani, Fox, & Bragg, 2018), and we conducted a secondary analysis of these data for this study.

A brief description of the seven categories included in the modified framework follows:

- **Academic Advising** assists student to navigate and engage in academic pathways, including advising on program planning, academic progress and goal setting.

- **Assessments** enable measurement of students' academic- and employment-related skills, including the National Career Readiness Certificate (NCRC) Profile (fit, talent, or performance) and ACT KeyTrain.

- **Career Services** engage students in selecting career pathways and setting career goals, including career counseling, career workshops, and career exploration through the Virtual Career Network (VCN).

- **Employment Services** support student transitions into employment along healthcare career pathways, including job counseling/job seeking, job coaching, resume writing, job search, and mock interviews.

- **Financial Services** assist students to navigate the financial aid system, build their financial skills, and finance their postsecondary studies, including financial aid counseling and financial literacy.

- **Non-academic Advising** fosters student abilities to navigate and access college resources and build a sense of connection to the college, including supporting non-academic online resources.

- **Social Services and Counseling** assist students in managing their personal lives to support their persistence and completion, including linking students to social services and personal counseling.

Using this framework, we provide examples of the holistic support services offered by the three H2P colleges included in our analysis to give the reader a sense of the supports being offered as part of the TAACCCT grant. These three colleges were chosen because they collected detailed student-level data on the services that each student received and were able to link student records to the state Unemployment Insurance (UI) system so we could assess students' labor outcomes. Table 1 shows variation as well as considerable commonality in the support services provided by the three colleges involved in this study. However, we did find considerable difference in the scale of delivery of student support services among the three colleges, with college (A) serving three times or more students than College B and C. Also, the average hours of service documented per student varied as well, with College A averaging 5.2 hours, College B averaging 1.0 hours, and College C averaging 3.4 hours. Variation in mode of delivery was also documented for the three colleges with the primary mode of delivery being one-on-one for College

A, phone for College B, and email for College C (Bragg et al., 2015). We were unable to assess the effects of this institution-level variation due to sample size and understand this variation may impact results in unknown ways.

Table 1. Details of the H2P Consortium College Holistic Student Supports

Community College	Holistic Student Support Services		
	Professional Provider	**Technology**	**Sample of Holistic Student Supports**
College A	• Student Success Advisor • Job Coaches • Tutors • Business Developer	• Blumen • Starfish	• Proactive advising • Academic alerts • Tutoring • Academic assessments • Career counseling and online advising • Financial literacy • Goal setting • Retention advising • Resume assistance • Job placement
College B	• Retention Specialist • Career Coach	• Blumen • Banner add on	• Intrusive advising • Supplemental instruction • Academic alerts • Study skill workshops • Career exploration, counseling, and advising • Job placement • ISEEK Career Assessment • Financial aid counseling
College C	• Student Success Coach • Employment and Education Advisor	• Blumen • State College System Testing Services	• Academic alerts • Academic planning • Revised orientation • Cohort advising sessions • Resume assistance and mock interviews • Online career advising through VCN • ISEEK Career Assessment • Job counseling • Semester potlucks • Shared support service resources with students • FAFSA assistance

Discussion of Results

This study utilized a sub-set of the original TAACCCT evaluation sample in that we identified participants who had not received any college degree and who were between the ages of 25-65 when they first enrolled in a TAACCCT-impacted program one of three H2P colleges ($n = 630$). All members of the sample reported their highest level of educational attainment to be "some college, no degree", including students who dropped out of high school, who had a high school diploma or GED as their highest

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educational credential, or who had attended college but had not completed an associates or baccalaureate degree.

Demographically, the sample was predominantly female (82%), Pell-eligible (63%), and either White (64%) or Black (31%). The mean age of the sample was roughly 36 years, and nearly two-thirds of students (64%) were employed in the quarter before enrolling in H2P. More than a third (38%) of students enrolled in at least one developmental course, and four out of five received some type of holistic student service. The final sample was 609 students, excluding 21 students from the original sample of 630 who had missing data on at least one variable used in the analysis.

The credentials conferred by the H2P colleges were categorized into four levels: very short-term certificate (less than or equal to 12 credits), short-term certificate (more than 12 and less than or equal to 30 credits), long-term certificate (more than 30 credits but less than an associates degree), and associates degree. Based on these categories we modeled our statistical analysis around four outcome variables:

- Outcome #1) attainment of any certificate (very short-term, short-term, or long-term)
- Outcome #2) attainment specifically of a long-term certificate
- Outcome #3) attainment of a long-term certificate or associates degree
- Outcome #4) attainment of any credential (very short-term, short-term, long-term, or associates degree)

Results of our analysis suggests that exposure to holistic student supports had a significant positive impact on credential attainment across each of these four outcomes. We employed a type of matching technique (augmented inverse probability weighting; see Scharfstein, Rotnitzky, & Robins 1999) to account for the non-randomized nature of our sample. This "doubly robust" approach was used because it can produce unbiased estimates of the treatment effect if either the treatment model or the outcome model is mis-specified. The models first predicted students' likelihood of receiving holistic student supports (their "propensity score") using their demographic characteristics, program of study, developmental education enrollment, and pre-H2P employment as covariates, then used the propensity scores to create weighted estimates of their mean outcomes in separate regression models predicting attainment. Using this approach, we found a positive effect of holistic student supports on the attainment of any certificate in general (13.3 percentage point increase) and on long-term certificate attainment in particular (10.6 percentage point increase). The likelihood of attaining either a long-term certificate or associates degree increased by 10.8 percentage points relative to students not participating in holistic student supports. Most broadly, we found exposure to holistic student supports is associated with an increased likelihood of attaining any credential by 12.2 percentage points.

We used linear regression models based on each outcome to look more deeply at these outcomes relative to student demographics. The linear regression analysis also revealed positive associations – to the magnitude of around a 7 percentage point increase – between holistic student supports and the likelihood of attaining credentials. Importantly, these results found that career services and employment services had the strongest positive relationship with students' likelihood of receiving a credential. In contrast, support services such as academic advising and non-academic advising were not found to significantly relate to credential attainment. Although these findings are not causal – students more likely to complete a credential may be more likely to seek out career or employment services, for example – they suggest that providing students with greater support in choosing a pathway aligned with their career interests and preparing for the transition to the labor market may be related to an increased likelihood of completing a credential.

At the same time, these linear regression models revealed concerning patterns that suggest the likelihood of attaining credentials varies by race. To this point, African American students were 10.1% less likely to earn any credential, respectively, than white students. Whereas the numbers are quite small, we found

similar disparities for the American Indian, Alaska Native and multiracial student sub-groups relative to the white sub-group, and we believe these results need to be reported and better understood given their importance to the implementation of holistic student supports to improve credential attainment for diverse adult learners.

Implications

This study provides evidence of a positive impact of holistic student supports on attainment of credentials of all lengths – very short, short term, long term, and associates degree for the overall sample of H2P participants in three colleges. The statistical modeling employed in our analysis reveals results consistent with previous studies on the H2P consortium (Bragg et al., 2015; Giani et al., 2018), suggesting the likelihood of holistic student supports impacting credential attainment. The results suggest career services and employment services are especially important to the credential attainment outcome. Of cautionary note, however, our study reveals a concerning pattern in credential attainment by demographic sub-group. Comparing white participants to students of African American, American Indian, Alaska Native American, and multiracial background, we found these students were less likely than white students to earn a credential. Whereas these overall results are promising and suggest the importance of holistic student supports, we recommend further research to understand how holistic student supports intended to improve student outcomes are implemented for student sub-groups."

References

Bettinger, E., & Baker, R. (2014). The effects of student coaching: An evaluation of a randomized experiment in student mentoring. *Educational Evaluation and Policy Analysis, 36*(1), 3-19.

Bragg, D. D., Giani, M., Fox, H., Bishop, C., & Bridges, K. (2015). *Third party evaluation of the impact of the Health Professions Pathways (H2P) Consortium*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Bragg, D. D., & Krismer, M. (2016). Using career pathways to guide students through programs of study. *New Directions for Community Colleges, 176*, 63-72.

Edgecombe, N., Jaggars, S., Baker, E., & Bailey, T. (2013). *Acceleration through a holistic support model: An implementation and outcomes support analysis of FastStart@CCD.* New York: Community College Research Center, Teachers College, Columbia University. https://files.eric.ed.gov/fulltext/ED539910.pdf

Giani, M. S., Fox, H. L., & Bragg, D. D. (2018). *Which services matter? Examining the Relationship between Enhanced Support Services and Community College Students' Postsecondary and Labor Market Outcomes*. Unpublished working paper, Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Karp, M. M. (2016). A holistic conception of nonacademic support: How four mechanisms combine to encourage positive student outcomes in the community college. *New Directions for Community Colleges. 175*, 33-34.

McDonnell, R. P., Soricone, L., & Sheen, M. (2014). *Promoting persistence through comprehensive student supports.* Boston, MA: Jobs for the Future. https://files.eric.ed.gov/fulltext/ED561305.pdf

Scrivener, S., & Weiss, M. J. (2009). *More guidance, better results? Three-year effects of an enhanced student services program at two community colleges*. New York, NY: MDRC. Retrieved from http://www.mdrc.org/sites/default/files/full_450.pdf

Scharfstein, D. O., Rotnitzky, A., and Robins, J. A. (1999). Rejoinder to adjusting for nonignorable drop-out using semiparametric nonresponse models. *Journal of the American Statistical Association*, 94, 1135–46.

The technical appendix is available on request from the corresponding author at bragg.associates.inc@gmail.com.

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a broad category that includes certificates and technical diplomas that can be completed in two years or less. This brief is one of six in a series providing evidence on the impact of innovative strategies on the completion of non-degree credentials among a sample of adults aged 25-64 who had not earned any prior postsecondary credential. Analysis was conducted with financial support from Lumina Foundation and was coordinated by DVP-PRAXIS LTD. An earlier brief developed through this project (July 2019), based on independent analyses by researchers who had been third-party evaluators on various TAACCCT initiatives, found that non-degree credentials can have significant and positive labor market outcomes for adult learners.

Exploring the Impact of Intrusive Student Support Practices on Non-Degree, Short-term Credential Completion

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I.   Background--Missouri's Manufacturing Workforce Innovation Network

In 2012, Missouri received a $14.9 million Round Two TAACCCT grant to meet the State's growing demand for manufacturing related workers. Eight Missouri community colleges and the State's technical college came together under the Missouri Community College Association's (MCCA) leadership to form the Missouri Manufacturing Workforce Innovation Network (MMW) Consortium. Upon receipt of the TAACCCT award, Missouri was still recovering from the Great Recession of 2008 with a 6.9% statewide unemployment rate for October 2012. Further analysis for 2012 revealed a 16% unemployment rate for adults with less than a high school credential, while adults with only a high school diploma had an unemployment rate of 9.0%.[1]

Consortium colleges recognized the imperative to improve both instructional programs and support services to better meet the needs of adult learners and employers. To support employer and adult-student needs, colleges designed a stackable credential model connecting credit and non-credit program awards to industry certifications. This model provided a faster response to employer needs and created multiple entry and exit points giving students options for training in accelerated and condensed increments. To further support this model, colleges developed a learning framework offering students basic academic skills through contextualized courses as well as intrusive support services to help students prepare for and persevere to completion and employment. MoManufacturingWINs' theory of change, depicted graphically in Figure 1 below, captures how the Consortium colleges understood the essential steps needed to implement its grant strategies.

In this brief, we examine one of these strategies more closely—intrusive academic and support strategies—and find that receipt of intrusive services increases the likelihood of certificate completion, especially longer-term certificates, for adult students aged 25-64 who had no prior postsecondary credential.

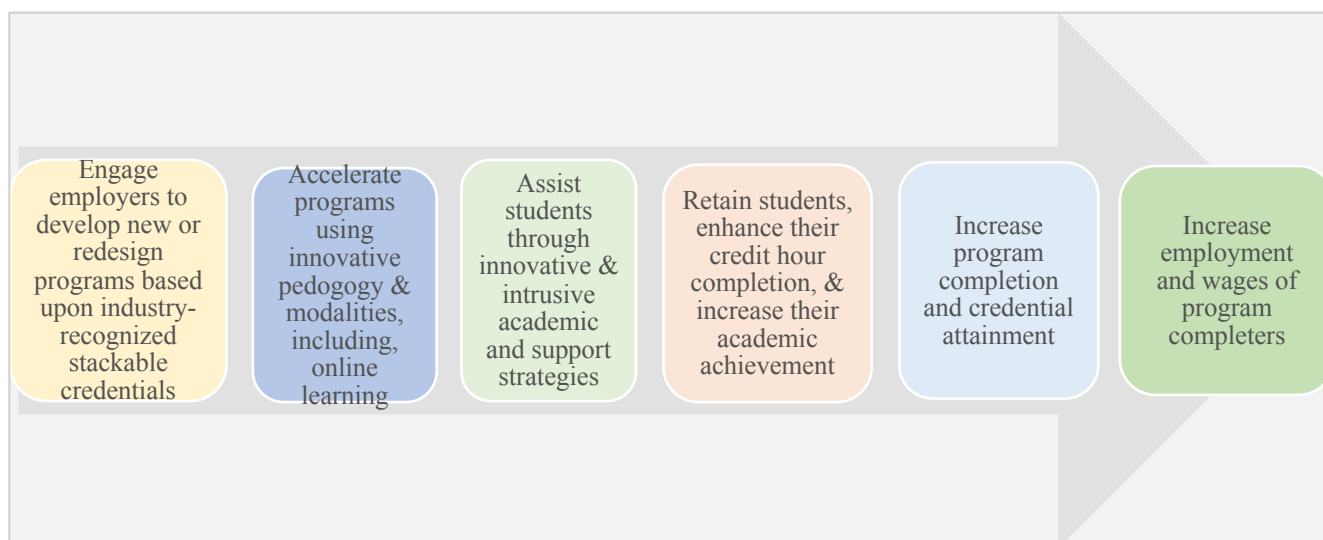[1] Missouri Economic Research Information Center

Figure 1: MoManufacturingWINs Theory of Change

II.   MMW Strategies & Intrusive Student Support

Colleges acknowledged from the onset accelerated and non-traditional program structures, although important, were not enough to help adult-learners enroll in and complete their programs of study. In fact, given the challenging nature of the advanced manufacturing related curriculum, accelerated formats required students to be at their best to complete the required courses. Building upon evidence-based strategies associated with adult learner support,[2] consortium colleges understood the importance of connecting classroom faculty, advisors, and instructional support staff; and, how intrusive advising should reflect a continuous process from recruitment to program completion and onto employment.

Given the focus of this program on un- and under-employed adults who faced significant life challenges, consortium colleges hypothesized they could increase retention, program completion, and employment by connecting intrusive student support strategies to instructional program of study.

These student support strategies implemented included on-boarding/orientation customized by program; intrusive support connected to classroom instruction; and career coaching/job placement activities.

III.   Methods

With support from Lumina Foundation and coordination by DVP-PRAXIS LTD, this analysis uses data from the MMW consortium to more fully examine the extent to which instructional and support strategies impacted program completion and post-completion employment and wages. In addition, we explored the degree to which the use of intrusive student support efforts and program length helps explain variance in program completion and post-completion employment and wages.

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[2] Ross-Gordan, J. Research on Adult Learners: Supporting the Needs of a Student Population that Is No Longer Nontraditional. AACU Peer Review, Winter 2011, Vol. 13 #1.
Wlodkowski, Raymond J. 2003. "Accelerated Learning in Colleges and Universities." In "Accelerated Learning for Adults: The Promise and Practice of Intensive Educational Formats,"
edited.by R. J. Wlodkowski and C. Kasworm, special issue, New Directions for Adult and Continuing Education 97: 5–15.

Unit-record participant and outcome (academic and employment) data were collected for each grant participant. Such data were recorded, tracked, and analyzed on a term-to-term and quarterly basis. For the purposes of this investigation we selected only students who were 25-64 years of age when they started their program of study and had not yet achieved a post-secondary education award/credential (N = 1,899).

Sixty-two percent of this group were not employed when they started their program, and 74% were less than college-ready in at least one academic area.[3] Eighty-six percent of this sample were male. Sixty-one percent were white, 28% were black, less than 2% each were American Indian/Alaskan Native, Asian, or Hispanic, and roughly 5% did not disclose their race. More than half of the sample (53%) had never attended college, and the remaining 47% had some college but no degree. The mean age of the sample was 40 years old. Nearly one in five participants (19%) was also a military veteran.

Earlier analyses explored the impact of degree/credential completion (two year- degree, less than a year certificate, and less than six months certificate) on: post-completion employment and post-completion wage gains. OLS regression examined the association and possible explanatory power between a background set of independent variables including program completion, level of program award, ethnicity, gender, pre-program employment status, age, pre-program educational level (no college or some college), and academic skills readiness at program start-up, and dependent variables related to post-program employment; earnings gains between pre-program start and post-grant enrollment. Results showed positive impacts on post-program outcomes (see Sidebar).

The completion of non-degree credentials has a positive impact on post-program employment

- Non-degree certificate completers were more likely to be employed compared to those who did not earn a credential by five percentage points.

- OLS results from this analysis suggest those students who completed a two-year degree or a certificate of at least six months were most likely to be employed post-grant.

- As a set, the independent variables provided positive, moderate explanatory power in regard to post-grant program wages.

To fully explore the impact of intrusive student support on program completion, the analysis reported in this brief used OLS regression and Augmented Inverse Propensity Weighted (AIPW)[4] models to investigate the relationship between program completion, program completion type (two-year degree, less than one-year certificate, and less than six-month certificate), and the student's use of intrusive student support services. Both models controlled for students' demographic characteristics, employment prior to enrollment, and the program of study.

A word of caution related to this analysis is noteworthy. Colleges in the MMW consortium struggled to maintain unit-record data related to the use, frequency, and scope of student support services. The intervention variable (use of student support) is less robust than desired, as colleges only recorded this variable in a dichotomous format (Used Intrusive Support Services or Did Not Use Student Support Services). Thus, the estimates of the treatment variable represent the contrast between students who did not receive intrusive support services to students who received any level of services, regardless of the frequency or intensity.

[3] Participants were assessed in reading, English, and mathematics at program entry.
[4] Glynn, A. & Quinn, K. An Introduction to the Augmented Inverse Propensity Weighted Estimator, 2009
https://scholar.harvard.edu/files/aglynn/files/NeAIPW.pdf

IV.   Results

Results from OLS regression suggest students who received intrusive advising were roughly eight percentage points more likely to complete a certificate, controlling for their demographic characteristics, the program of study they enrolled in, and the college they attended. This was a statistically significant difference in attainment rates (p <0.00).

Although we cannot rule out the possibility students who received intrusive advising differed systematically from students who did not in ways we cannot sufficiently control for, we also used the AIPW method to better account for selection into treatment and created a sample of treated and controlled cases that are more balanced on observed covariates. The AIPW results (see Figure 3) produced similar estimates of the treatment effect: students who received intrusive advising were roughly 11 percentage points more likely to earn a certificate of any kind (p < 0.00).

Further AIPW analyses suggest that intrusive supports increase the likelihood of earning all credential types, regardless of length, though there is stronger evidence of a relationship between intrusive supports and longer-term credential receipt. The alignment of the findings from these two methods provides further evidence of the positive relationship between intrusive advising and attainment.

Figure 3: Impact of Intrusive Student Supports on Certificate Completion Rate (Percentage Point Increase)
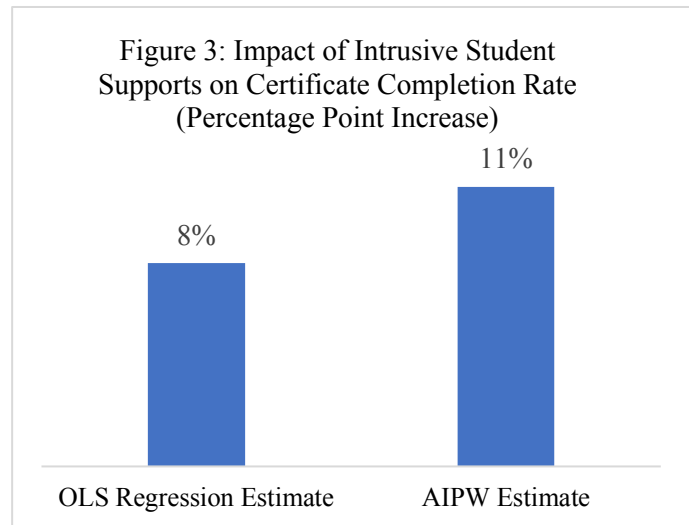
V.   Conclusions & Discussion of Second-Order Effects

While colleges anticipated the value of accelerated/condensed programs, they also foresaw the importance of intrusive support services for adult learners. Analysis of the impact of intrusive support services on retention and program completion, suggests such efforts hold potential, as students who received intrusive support were roughly 8 to 11 percentage points more likely to complete a certificate. Advice from faculty and student support practitioners who developed and implemented this strategy (see Sidebar) may be useful for colleges seeking to scale the use of intrusive support services for adult-populations.

Despite some initial reservations by faculty to connecting student support strategies to their classroom, once this strategy was in place, they consistently acknowledged its value and often indicated this approach is now their preferred instructional format. However, further research related to the definition, scope and appropriate timing of such services is needed. Regardless, colleges unanimously found it imperative to connect these services to the natural instructional process rather than provide them as a separate or additional endeavor.

Advice on scaling intrusive supports from faculty and staff

Given the accelerated nature of condensed programs of study and life-issues of adult populations, *it is important to intentionally link student support services to classroom instructional activities*.

Adult students don't participate in optional services and don't have time to engage in services not directly connected to classroom instruction and expected learning outcomes.

The outcomes associated with Missouri's MMW are encouraging, but they do not capture the full impact of the Consortium's TAACCCT experience. When the Consortium looked beyond their Department of Labor outcomes they discovered a set of second-order effects and realized they had grown in regard to individual and Statewide collaboration, communication, capacity and confidence. By looking beyond the outcomes[5] Missouri's community colleges used their enhanced collaboration, communication, capacity, and confidence to secure additional Round 4 TAACCCT funding to enhance STEM program development and further scale successful student support and instructional innovations.

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[5] Gino, F. What We Miss When We Judge a Decision by the Outcomes, Harvard Business Review, September 2016.

Issue Brief

THE EFFECT OF INTRUSIVE ADVISING ON NONDEGREE PROGRAM COMPLETION

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a broad category that includes certificates and technical diplomas that can be completed in two years or less. This brief is one of six in a series providing evidence on the impact of innovative strategies on the completion of non-degree credentials among a sample of adults aged 25-64 who had not earned any prior postsecondary credential. Analysis was conducted with financial support from Lumina Foundation and was coordinated by DVP-PRAXIS LTD. An earlier brief developed through this project (July 2019), based on independent analyses by researchers who had been third-party evaluators on various TAACCCT initiatives, found that non-degree credentials can have significant and positive labor market outcomes for adult learners.

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SUMMARY OF BRIEF

The study examined the impact of intrusive advising on academic outcomes for older students without a prior college degree enrolled in eight community colleges in Michigan. The study finds that after matching on individual characteristics, students who received intrusive advising were 15 percentage points more likely to complete a nondegree credential program than typical students enrolled in similar programs. A dose-response model showed other things being equal, more meetings between students and case managers result in higher credential attainment.

Nationally, only about 40 percent of community college students complete their programs of study within six years of enrolling (Juszkiewicz, 2014: 5). As a result, a significant proportion of students fail to earn a credential to help improve their outlook in the labor market.

Low-income older community college students, who are much more likely to drop out, require a coherent set of support services to successfully balance family, financial and life issues along with going to school. Ideally, the various services needed should be coordinated to provide the full range of support that many students need and to assist struggling students in hopes of avoiding dropout. In addition, many individuals may need services that community colleges are generally not well equipped to provide, such as childcare, drug treatment, health care, family counseling and transportation (Alssid et al., 2002). Although many community colleges offer case management, students often need to seek out these services on their own or because instructors suggest they do so. In addition, use of advising services has been shown to be inversely correlated with age (Roessger et al., 2019).

In recent years, practitioners and academics have renewed their focus on the role of student coaching and advising at community colleges in improving student outcomes. A particularly promising model of advising is the so-called enhanced advising (also known as intrusive advising), which achieves a deeper interaction between college staff and students than the typical service provided in traditional advising. Major components of the model are required meetings, lower counselor-student ratios, assigned counselors or mentors, and longer, more intensive counseling sessions (Mechur Karp, 2011). Random assignment evaluations, in which students participated in required advising over the course of two semesters, showed positive impacts on students' probability to register for subsequent semesters and on the number of credits attempted (Scrivener & Au, 2007). A Stanford University study that examined the impact of coaching on college persistence found that students receiving coaching services were more likely to persist and complete their education than those not receiving coaching services (Bettinger & Baker, 2014). Similarly, Bahr (2008) finds that advising increases the likelihood of remediating successfully.

The study summarized in this briefing paper examined the impact of receiving intrusive advising for a group of students who experienced multiple barriers—older students without a prior college degree. Study participants were students enrolled in one of eight community colleges that were a part of the Michigan Coalition for Advanced Manufacturing (M-CAM), an initiative that was designed to help older workers gain the skills required to fill available jobs in Michigan's advanced manufacturing sector.

Background and Study Design

The M-CAM initiative was funded by the U.S. Department of Labor's (DOL) Employment and Training Administration (ETA) under Round 3 of the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program. M-CAM promoted improvements in noncredit and credit programs in four advanced manufacturing pathways: production technology; mechatronics, welding, and computerized numeric control (CNC) machining.

Prior to receiving TAACCCT funding, the M-CAM consortium colleges recognized that the career coaching and support services available to students interested in enrolling in advanced manufacturing programs were insufficient. To address this gap, all eight colleges instituted, as part of the M-CAM initiative, an intrusive case management and career coaching model under which students received a wide variety of counseling and support services, including academic advising, help with educational planning, career coaching, job search and job placement assistance, and referrals for supportive services.

Each M-CAM college reported working closely with an array of on- and off-campus partners— mainly college admissions, advising and job placement offices, Michigan Works, Public Welfare Department, employer associations, and community- and faith-based organizations— to provide student assistance. This level of staff assistance was arguably much higher compared to the level of services that were typically received by students enrolled at the same community colleges but not enrolled in the M-CAM initiative.

An earlier study that compared the employment outcomes for M-CAM students to a comparison group of students from the same colleges but who did not participate in M-CAM found that M-CAM students had significantly higher employment rates and higher earnings than those in comparison groups (Lewis-Charp et al., 2017). The current study, which was a follow-up funded by Lumina Foundation, examined the impact of M-CAM's intrusive advising on the academic outcomes of M-CAM participants. The outcomes of M-CAM students who benefitted from intrusive advising were compared to those of non-participating students enrolled in similar

programs at the same colleges to estimate whether the provision of intrusive advising led to better academic outcomes (completion of a program of study).

Methodological Approach

The study employed two techniques to estimate the impact of the receipt of intrusive advising on academic outcomes. In the first step, the academic outcomes of the treatment group of participants were compared with the academic outcomes of a comparison group of similar students who were selected through propensity score matching (PSM) to resemble the treatment group as closely as possible. This approach estimates the impact of receiving intrusive advising (regardless of its length and frequency) on the completion of a program.[1]

One limitation of the PSM analysis is that although it estimates the overall impact of receiving intrusive advising, it does not estimate the impact of receiving various levels of the treatment (dosage). To assess the impact of the dosage of intrusive advising, a series of dose-response models were conducted that estimated the impact of a continuous treatment variable (in our case, number of interactions between a student and a staff member) that was designed to handle situations when individuals are likely to react heterogeneously to observable confounders, and when the selection into treatment may be endogenous. This type of model is appropriate for our analysis since it might be interesting to see which intensity of services appears to have the largest effect on the outcome.[2]

Data and Measures

Data for students in comparison programs were provided by the M-CAM colleges and included students enrolled in automotive and heating, ventilation, and air conditioning (HVAC) programs.

For both M-CAM and comparison students, sociodemographic variables including age at enrollment, gender, race and ethnicity, and previous educational history were available. In addition, completion of an academic program after M-CAM started was available.

One of the distinctive aspects of M-CAM was its use of a common technology platform (Efforts-to-Outcomes, or ETO) to record participant-level data, including sociodemographic characteristics, program enrollment and outcomes, and service receipt. At least two ETO "touchpoints" collected data that could be used to construct measures of intrusive case management. One touchpoint (Service Report) collected the date when a service occurred, the type of service provided, and the duration of the service. Another touchpoint collected case management notes that grant staff members recorded during their interactions with students. Data from the two sources mentioned above were combined and service receipt information for 320 MCAM participants (fewer than 10 percent of the total number of M-CAM participants) was extracted. This constitutes the treatment group that was used in all analyses. Although the study team suspected that many M-CAM students received intrusive advising that was not recorded (because the use of the two touchpoints was not mandatory), researchers were convinced that the receipt of services was adequately measured for the subsample of 320 participants.

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[1] For the PSM analysis, we used Treatment Effects (teffects), a class of procedures available in Stata 15 that use baseline characteristics of individuals (e.g., age, gender, previous educational achievement, etc.). After we condition on these baseline covariates, any differences in outcomes between M-CAM and comparison students

would be related only to the treatment (receipt of intrusive advising from M-CAM).

[2] To estimate the dose-response models, we utilized ctreatreg, a user-written command available in Stata (Cerulli, 2015).

For all impact analyses, the dataset was restricted to students who enrolled after October 1, 2013 because that is when the M-CAM project started. In addition, all analyses were restricted to Lumina's priority populations: students aged 25-64 who had no prior postsecondary experience (no PSE) or had prior experience but no credential (SCNC). Unfortunately, the comparison group had extremely few students enrolled in noncredit programs. Therefore, impact of intrusive advising on the completion of noncredit could not be examined. Therefore, the main outcome of interest was completion of any nondegree credit program with expected length between 6 months and 2 years (excluding degrees).

Findings

Because of the relatively small number of students for whom advising service receipt was recorded among the group of M-CAM participants, it was important to assess if this subgroup was different from the main group of M-CAM students. To this end, the study team calculated the distribution of several sociodemographic characteristics for the treatment participants (M-CAM students who were recorded as receiving intrusive advising from M-CAM staff members) and M-CAM students who were not recorded as having received the services. The results are presented in Exhibit 1.

Exhibit 1: Sociodemographic Characteristics

	M-CAM intrusive advising receipt	
	Yes	No
White	63.2%	65.9%
Black	29.1%	26.9%
Female	17.1%	15.1%
Average preprogram quarterly wages§***	$3,917	$7,090
Average age at enrollment	38.4	39.3

|	M-CAM intrusive advising receipt	
	Yes	No
No prior college experience**	57.5%	51.2%
Enrolled in nondegree credit program***	49.1%	18.8%

Sources: M-CAM ETO Database; Michigan Talent Investment Agency (for earnings data).
Notes: § average quarterly wages during three quarters before enrollment; *** statistically significant at 0.001; ** statistically significant at 0.05.

M-CAM students who were coded as receiving intrusive advising had on average much lower earnings compared to those who were not, and they were also significantly more likely to not have had any prior college experience. It appears, therefore, that the treatment group had been more likely to experience barriers that would impede learning and, therefore, would have been more likely to benefit from intrusive advising.

Whereas most of the M-CAM participants who received intrusive advising attended fewer than five advising sessions, a small group of participants (about 12 percent) attended many more (between five and 40).

Exhibit 2: Frequency of Intrusive Advising
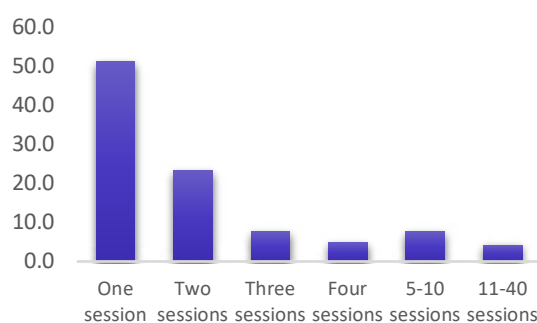
Analysis of Impacts

The analysis of impacts began by estimating the PSM models. As explained above, the study team restricted the sample to treatment and comparison group members who enrolled in a for-credit program. The matching criteria used

were age at enrollment, race, gender, average pre-enrollment earnings (average of the three most recent pre-enrollment calendar quarters), the quarter of program enrollment, and educational achievement at enrollment. Together with the estimation strategy based on PSM (the main strategy), another set of models used inverse probability weighting (IPW) regressions, which allow for the matching criteria to be used as predictors. IPW models were conducted for sensitivity purposes.

The results from these models are shown in Exhibit 3.

Exhibit 3: Estimates of the Impact of Receipt of Intrusive Advising on Completion

	Average Treatment Effect	90% Confidence Interval
PSM	15.0%**	5.8% - 24.2%
IPW	15.5%*	2.6% - 28.5%

*Source: M-CAM ETO Database. *** statistically significant at 0.001; ** statistically significant at 0.05; * statistically significant at 0.10.*

After matching on individual characteristics, M-CAM participants who received intrusive advising were 15 percentage points more likely to complete a nondegree credential program than typical students enrolled in similar programs. The 90% confidence interval of the impact suggests that its value was imprecisely estimated (due to the small sample size) since the estimate could range in practice from three to 29 percent. This finding suggests that intrusive advising, regardless of dosage, resulted in an increased likelihood of academic success for older students with barriers. However, these models do not tell us anything about the relationship between service dosage and the outcome.

Dose-Response Model

Dose-response models respond to the question of whether the dosage of the treatment (rather than its simple receipt) has any bearing on the outcome. ETO recorded the number of times a participant interacted with a staff member, and the nature of the service provided—academic counseling, advice on life issues, job placement/resume writing, and regular check-ins. For analysis, interactions that were dedicated to job search, resume writing, or other employment-related activities were removed to keep focus on case management interactions that were more likely to be directly related to academic outcomes. Consistent with the estimation technique recommended in Cerulli (2015), intrusive advising dosage was rescaled to take values from 0 (lowest value) to 100 (highest value).

The findings from the dose-response model, shown in Exhibit 4, suggest that "more is better"—in other words, that other things being equal, more meetings between students and case managers (the dose) result in higher completion rates for older, disadvantaged students (the response). The impact of intrusive advising stays relatively flat until the dosage reaches about half of its maximum intensity (dose=50), and then slowly climbs upward as the dose increases.

Exhibit 4: Dose-Response Function
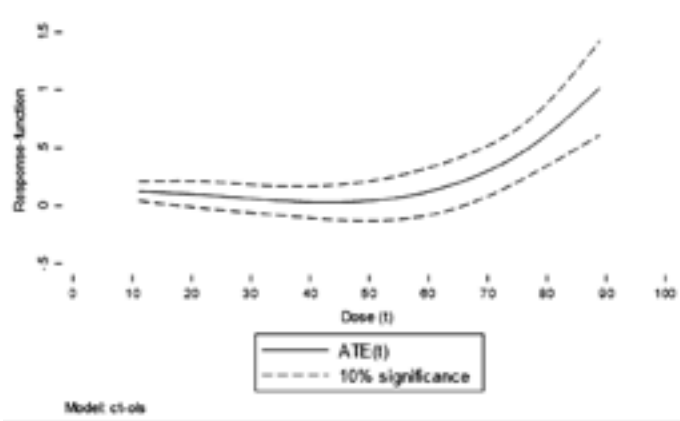
Source: M-CAM ETO Database.

Main Takeaways and Limitations

Our analysis suggests that intrusive advising was associated with an increase in the likelihood of obtaining a nondegree credential for students aged 25 and above and who had no prior degree. This finding is consistent with similar studies

(Richburg-Hayes, 2008; Kolenovic et al., 2013) which suggest that intrusive (or enhanced) advising is associated with an increase in academic outcomes. While academic-focused advising certainly plays a role in these outcomes, the literature also suggests that there might be non-academic mechanisms through which intrusive advising promotes higher academic outcomes. Among these are the creation of social relationships that make nontraditional students feel more anchored to college life and clarifying students' aspirations which promotes commitment to a college education (Mechur Karp, 2011).

Our study had several limitations, some of which have already been described. First, because recording student services was an optional feature of M-CAM, intrusive advising services were measured with a certain amount of error. In other words, it is likely that M-CAM students received advising without having been recorded as such. If this took place frequently, the results of the study (particularly the findings from dose-response models) may be biased. However, the fact that the students who were recorded as having received advising services appeared to have higher participation barriers is reassuring, and suggests that there may have been a targeting effect at work whereby staff members chose to focus more closely on students with participation barriers.

Despite these drawbacks, the study contributes to a growing literature on the role of intrusive advising on student outcomes. In future research, focusing on additional outcomes such as credits accumulated and the rate of dropout (which were not available for this study) might offer a more complete picture of the role of intrusive advising.

In addition, a future research agenda may attempt to deepen our understanding by using additional indicators—for example, the length of time rather than the number of interactions—to better understand "what works" for nontraditional student success.

REFERENCES

Alssid, J. L., Gruber, D., Jenkins, D., Mazzeo, C., Roberts, B., & Stanback-Stroud, R. (2002). *Building a career pathways system: Promising practices in community college-centered workforce development*. San Francisco, CA: Workforce Strategy Center.

Bahr, P. R. (2008). Cooling out in the community college: What is the effect of academic advising on students' chances of success? *Research in Higher Education, 49*(8), 704–732.

Bettinger, E. P., & Baker, R. B. (2014). The effects of student coaching: An evaluation of a randomized experiment in student advising. *Educational Evaluation and Policy Analysis, 36*(1), 3-19.

Cerulli, G. (2015). ctreatreg: Command for fitting dose–response models under exogenous and endogenous treatment. *The Stata Journal, 15*(4), 1019-1045.

Jenkins, P. D., & Cho, S.-W. (2014). *Get with the program and finish it: Building pathways to accelerate student completion* (Working Paper No. 66). New York, NY: Community College Research Center.

Juszkiewicz, J. (2015*). Trends in community college enrollment and completion data, 2015*. Washington, DC: American Association of Community Colleges.

Karp, M. M. (2011). Toward a new understanding of non-academic student support: *Four mechanisms encouraging positive student outcomes in the community college* (Working Paper No. 28). New York, NY: Community College Research Center.

Kolenovic, Z., Linderman, D., & Karp, M. M. (2013). Improving student outcomes via comprehensive supports: Three-year outcomes from CUNY's Accelerated Study in Associate Programs (ASAP). *Community College Review, 41*(4), 271-291.

Lewis-Charp, H. et al. (2017*). Evaluation of the Michigan Coalition for Advanced Manufacturing (M-CAM): Final Report*. Oakland, CA: Social Policy Research Associates.

Richburg-Hayes, L. (2008). Helping Low-Wage Workers Persist in Education Programs: Lessons from Research on Welfare Training Programs and Two Promising Community College Strategies. MDRC Working Paper. MDRC.

Roessger, K. M., Eisentrout, K., & Hevel, M. S. (2019). Age and academic advising in community colleges: Examining the assumption of self-directed learning. *Community College Journal of Research and Practice, 43*(6), 441-454.

Scrivener, S., & Au, J. (2007). *Enhancing Student Services at Lorain County Community College: Early Results from the Opening Doors Demonstration in Ohio*. MDRC.

Between 2011 and 2018, the U.S. Department of Labor invested $2 billion to fund the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program, which supported colleges across the country to design and implement innovative strategies to improve adult learners' completion of "non-degree credentials," a broad category that includes certificates and technical diplomas that can be completed in two years or less. This brief is one of six in a series providing evidence on the impact of innovative strategies on the completion of non-degree credentials among a sample of adults aged 25-64 who had not earned any prior postsecondary credential. Analysis was conducted with financial support from Lumina Foundation and was coordinated by DVP-PRAXIS LTD. An earlier brief developed through this project (July 2019), based on independent analyses by researchers who had been third-party evaluators on various TAACCCT initiatives, found that non-degree credentials can have significant and positive labor market outcomes for adult learners.

Enhancing Student Supports to Improve Completion of Non-Degree Credentials for Adult Learners

By Jessa Lewis Valentine and Derek Price, DVP-PRAXIS LTD

Introduction

This brief examines the impact of receiving enhanced student supports on non-degree credential completion by adult healthcare students enrolled in Wisconsin technical colleges. Between 2014 and 2018, Wisconsin two-year technical colleges enhanced existing and developed new academic and non-academic student supports as part of a Trade Adjustment Assistance Community College and Career Training (TAACCCT) Round 4 grant, with the goal of improving academic and employment outcomes for adults in the healthcare field. Results from this analysis, which are focused on adults aged 25-64 who had not earned any prior postsecondary credential, indicate that adults receiving academic and non-academic supports were significantly more likely to complete non-degree credentials of various lengths, and were also more likely to complete associate's degrees.

Advancing Careers and Training for Healthcare Initiative

In 2014, 16 colleges from the Wisconsin Technical College System (WTCS) embarked on a project to develop, improve, and expand adult education and training for healthcare-related occupations. The focus on healthcare was driven by tremendous growth in the healthcare industry in the state and associated growth in demand for qualified healthcare workers.[1] Nearly one-half of projected healthcare job openings in Wisconsin require workers with postsecondary training or credentials beyond a high school diploma but less than a bachelor's degree.[2] Financially supported by a $15 million TAACCCT grant from the U.S. Department of Labor, Wisconsin's technical colleges launched the Advancing Careers and Training for Healthcare (*ACT*

for Healthcare) project to meet this growing demand. Participating colleges pursued various strategies to achieve this goal, including developing innovative healthcare curriculum and instructional techniques; embedding shorter-term credentials within existing healthcare programs along a career pathway; introducing new simulation technologies; and expanding engagement with local employers to ensure alignment of training programs with industry needs.[3] The most widespread strategy pursued by *ACT for Healthcare* colleges—and the focus of this brief—was the delivery of various student supports intended to improve healthcare students' academic success. Across the consortium, approximately 70 percent of TAACCCT participants aged 25 to 64 and with no prior postsecondary credential were beneficiaries of enhanced or newly-developed academic and non-academic student supports.

Enhanced Academic and Non-Academic Student Supports

Colleges and universities across the country have increasingly invested in the development and expansion of support services to improve student success and increase completion rates. In addition to challenges related to academic preparation, many community and technical college students 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 and how to prepare and search for employment.[4]

The delivery of student supports was the most widespread strategy implemented by *ACT for Healthcare* colleges to improve outcomes for adult learners in targeted healthcare programs. Support strategies pursued by the consortium included academic supports such as enhanced classroom instruction, tutoring, and test preparation, as well as non-academic supports like personal counseling and case management, job search and placement, and study skills and time management. Some of these supports were integrated into program curriculum or embedded in the classroom, while others were delivered outside of class through both one-on-one and group-level sessions.

Table 1 provides a simple typology to document and classify the various approaches to implementing student supports across the *ACT for Healthcare* consortium of colleges.[5] Student supports are organized along two primary dimensions: service *location* (in class vs. out of class) and support *content area* (academic vs. non-academic). Distinguishing supports according to service location is important given that most in-class supports are inherently mandatory— pending absences, all students in the class have exposure to the support—whereas out-of-class supports are rarely required. Research suggests that making support services a mandatory part of the college experience can lead to more positive outcomes for students,[6] since not all students are equipped with the knowledge and time to seek out the supports they need.[7]

Table 1: ACT for Healthcare Student Supports Typology

| | In-Class | | Out-of-Class | |
	Academic	Non-Academic	Academic	Non-Academic
Type	In-Class / Academic	In-Class / Non-Academic	Out-of-Class / Academic	Out-of-Class / Non-Academic
Description	In-Class/Academic (ICA) supports are delivered by 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 ICA supports.	In-Class/Non-Academic (ICNA) supports are provided by 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. ICNA supports are mandatory for students attending class.	Out-of-Class/Academic (OCA) supports are provided out of class by program faculty or support instructors. Group-level OCA supports tend to focus on a particular academic topic or skill, or on exam preparation, whereas individual OCA supports are less structured. OCA supports are typically optional for students, though at some colleges OCA supports are mandatory for all or a subset of students.	Out-of-Class/Non-Academic (OCNA) supports generally consist of non-academic advising or counseling sessions with support service staff or licensed counselors. These out-of-class sessions are typically voluntary and mostly provided on a 1:1 basis.
Examples	• Concurrent basic skills support course • Academic Specialist embedded in class for clinical skills practice • Preparation for industry certification exams embedded within course	• Information session on resources for students (on- and off- campus) • Resume writing workshops • Program-tailored College Success courses	• 1:1 Tutoring • Topic-specific review sessions or exam preparation at group level	• Personal counseling or advising sessions • Career coaching sessions • Study skills & time management workshops

Data and Methods

Data for this analysis are based on term-level student administrative records obtained from each participating WI technical college between 2014 and 2018. Records were obtained for all healthcare students enrolled during this period, including those receiving enhanced student supports during the *ACT for Healthcare* initiative and those unaffected by *ACT for Healthcare* strategies. Course enrollment data was used to determine exposure to student services embedded within specific courses, and data on supports provided outside of class were collected by those providing services using a common template. The sample was restricted to 11,250 older adult students, those aged 25-64, who had no prior college experience or who had attended college previously but had not earned any postsecondary credential or degree. Of these students, 770 received at least one newly developed or enhanced student support—this group of students comprises the treatment group.

Propensity score matching (PSM) was conducted in order to assess the impact of student supports on the completion of non-degree credentials. PSM uses a matching algorithm 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 as well as the outcome. 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.[8]

Results

Characteristics of adult learners receiving at least one enhanced academic or non-academic support –the treatment group—are summarized in the box on page 5. Treatment students are predominantly female, reflecting the gender dynamics of the healthcare field in general and of the nursing field in particular (the majority of students were enrolled in registered nursing or nursing assistant programs). Eighty percent of the treatment sample is non-Hispanic white, which aligns with the racial and ethnic characteristics of Wisconsin's broader population.[9] About 45 percent of students received a Pell grant during their first term of enrollment, indicating a high economic need reflective of most community college students, and three-quarters of students were balancing their study with work responsibilities.

> Characteristics of Analytic Sample of Adult Students Accessing Enhanced Student Supports
>
> - Average age: 35 years old
> - 88% female
> - 80% non-Hispanic white, 6% African American, 6% Hispanic
> - 57% had prior college enrollment but no credential, 43% had never attended college
> - 44% received Pell during first term of enrollment
> - 74% were working students
> - 36% in Registered Nurse program, 35% in Nursing Assistant program, 14% in Medical Assistant program

Among the sample of adults receiving at least one student support, the most common type of support was academic in nature and was provided in class—53 percent took a course in which an academic support was embedded within the classroom. Across the consortium, embedding in-class academic supports was particularly prevalent in nursing assistant programs; some colleges developed concurrent basic skills support courses for nursing students, and other colleges embedded additional academic preparation for industry certification exam within existing courses. The second most commonly-accessed support type—and a strategy that was prevalent in registered nursing programs—was academic support provided outside of class (38 percent). Roughly equal percentages of the treatment sample received non-academic supports provided

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outside the classroom (27 percent) or inside the classroom (28 percent). One-third of the treatment sample received more than one support type.

Using propensity score analysis, non-degree completion outcomes for the treatment group—adult students receiving at least one enhanced academic or non-academic support—were compared with outcomes of a statistically similar group of adult healthcare students not receiving these supports. Analyses show that **adults receiving student supports were much more likely to complete a non-degree credential (64 percent) compared to adult students in the matched comparison group (40 percent)**. This finding held true for all non-degree credential types—students accessing enhanced academic and non-academic supports were more likely than a matched comparison group to complete short-term technical diplomas or certificates (most of which can be completed in a single semester) as well as one-year technical diplomas; students receiving enhanced supports were also more likely to complete associate's degrees (see Figure 1).

Figure 1: Impact of Enhanced Student Supports on Credential Completion
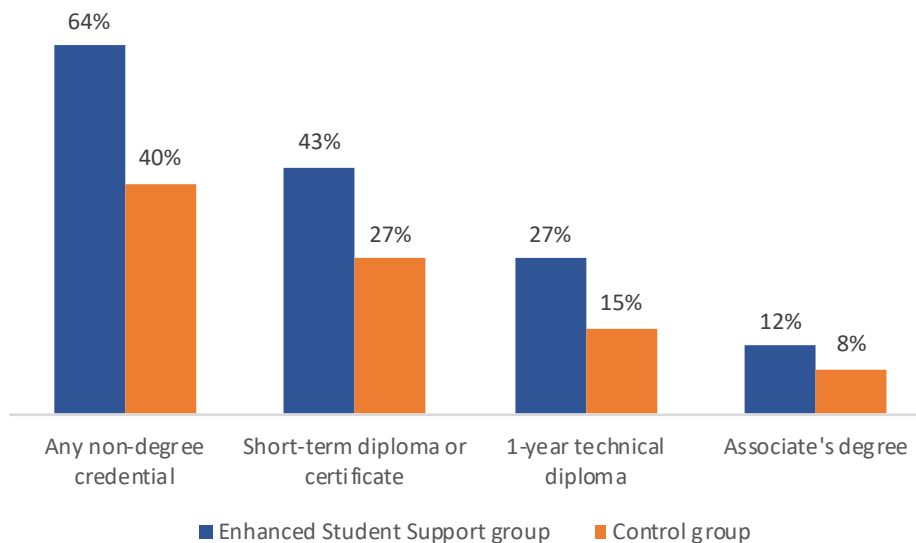
*All differences between treatment and control group significant at p<.05

In addition to examining outcomes for adult learners receiving any enhanced student support, supplementary PSM analyses were conducted to examine outcomes for students that *only* received supports within classrooms. In-class supports can be more equitable, because providing services within classrooms can help ensure that supports reach all students as opposed to the subset of students who seek out supports on their own. Similar to analyses of outcomes for students receiving any type of support, PSM analyses suggest a high "boost" to non-degree credential completion rates for adult learners exposed to in-class supports.

Conclusion

Analyses in this brief, based on data from a consortium of Wisconsin technical colleges, suggests that enhanced academic and non-academic supports can notably improve adult learners' completion of non-degree credentials, as well as associate's degrees. Results show that the likelihood of completing a non-degree credential was 24 percentage points higher for healthcare students receiving these supports, compared to a statistically matched comparison group. These non-degree credentials – in the Wisconsin case, certificates and technical diplomas that can take as little as one semester and up to two years to complete – have important labor market value. Earlier analyses conducted for the same sample of Wisconsin healthcare students aged 25-64 with no prior college credential suggest that non-degree credentials improve the likelihood of employment post-completion by seven percentage points, and that non-degree credentials of six months or longer in length boost quarterly earnings over non-completers by 14 percent.[10]

Making student supports mandatory can help promote more equitable access to these resources, offering all students the opportunity to benefit from them. Our supplementary analyses focused on impacts of receipt of in-class supports in particular suggest that these types of in-class, required supports can provide real academic benefit to adult learners.

Endnotes

[1] Between 2014 and 2024, healthcare jobs are projected to grown faster than any other major Wisconsin industry. Office of Economic Advisors, Wisconsin Department of Workforce Development. (2016) "Wisconsin Long Term Industry Employment Projections, 2014-2024."

[2] Carnevale, P., Smith, N., Gulish, A., Beach, B. (2012). *Healthcare State Report*. Georgetown University Public Policy Institute. https://georgetown.app.box.com/s/c8xqd81dcq8hzd53blqh.

[3] Price, D et al. (2018). Advancing Careers and Training for Healthcare: Final Evaluation Report. DVP-PRAXIS LTD, Equal Measure, Brandon Roberts + Associates.

[4] 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. Community College Research Center (2013). *What We Know About Nonacademic Student Supports*. Community College Research Center, Teachers College, Columbia University.

[5] See also, Valentine, J et al. (2017). Advancing Careers and Training for Healthcare through Student Support Services. DVP-PRAXIS LTD, Equal Measure, Brandon Roberts + Associates.

[6] 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.

[7] 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.

[8] 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.
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

[9] According to the U.S. Census Bureau (2018), 81% of Wisconsin's population is non-Hispanic white. https://www.census.gov/quickfacts/fact/table/WI/PST045218.

[10] Valentine, J. & Clay, J. (2019). *Non-Degree Credentials Provide Value for Adults in the Labor Market*. DVP-PRAXIS LTD.

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