

Integrated Basic Education Skills and Training (I-BEST)

Intervention Report | Postsecondary Career and Technical Education

WHAT WORKS
CLEARINGHOUSE™

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Rising employer demand for skilled workers has driven efforts to better align occupational training programs to industry needs.¹ Yet, even as the demand for skilled workers increases, less than half of students who enter occupational training programs receive a credential within six years.² Community colleges are working to find faster and more effective ways to train those in need of basic skills instruction in math, reading, or job skills. Traditionally, basic skills courses are offered in a sequence that must be completed before students can begin college-level occupational training. However, most students referred to basic skills training never enroll in college-level courses.³ As its name implies, Washington State's *Integrated Basic Education Skills and Training (I-BEST)* provides integrated basic skills and occupational training that allows students to complete their training program faster, and provides supports designed to ensure students stay engaged in training. Washington State's *I-BEST* program was developed by the Washington State Board of Community and Technical Colleges (SBCTC) and was first implemented in the 2006-2007 school year.⁴ Since its creation, *I-BEST* has been replicated in other locations, sometimes under different names. *Accelerating Opportunity*

was launched in four states in 2011 with funding from the Bill & Melinda Gates Foundation. With support from the U.S. Department of Labor's Workforce Innovation Fund (WIF), the *Accelerating Connections to Employment (ACE)* program was implemented in four states in 2013. Both *Accelerating Opportunity* and *ACE* programs note that they are based on the *I-BEST* model, with the same core commitment to integrated basic skills and occupational training. Supports provided by these programs differ slightly, and these differences are described in this report.

This What Works Clearinghouse™ (WWC) report, part of the WWC's Postsecondary Career and Technical Education topic area, explores the effects of *I-BEST* on education and labor market outcomes. The WWC identified 12 studies of *I-BEST*. Three of these studies meet WWC standards.⁵ The evidence presented in this report is from studies of the impact of *I-BEST* on students in career and technical education programs—including African-American, Hispanic, Asian, Native Hawaiian, and White students—in a variety of school settings, including urban, suburban, and rural community colleges.

What Happens When Students Participate in *I-BEST*?⁶

The evidence indicates that implementing *I-BEST*:

- is likely to increase industry-recognized credential, certificate, or license completion
- may increase short-term employment
- may increase short-term earnings
- may result in little or no change in credit accumulation

Findings on *I-BEST* from three studies that meet WWC standards are shown in Table 1. The table reports an effectiveness rating, the improvement index, and the number of studies and students that contributed to the findings. The improvement index is a measure of the intervention's effect on an outcome. It can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention.

Table 1. Summary of findings on *I-BEST* from studies that meet WWC Standards

Outcome domain	Effectiveness rating	Study findings	Evidence meeting WWC standards (version 4.0)	
		Improvement index (percentile points)	Number of studies	Number of students
Industry-recognized credential, certificate, or license completion	Positive effects	+18	3	44,367
Short-term employment	Potentially positive effects	+10	1	2,064
Short-term earnings	Potentially positive effects	0	2	2,519
Credit accumulation	No discernible effects	-1	1	42,894

Note: The improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +18 means that the expected percentile rank of the average comparison group student would increase by 18 points if the student received *I-BEST*. The improvement index values are generated by averaging findings from the outcome analyses that meet WWC standards, as reported by Glosser et al. (2018), Modicamore et al. (2017), and Anderson et al. (2017). A positive improvement index does not necessarily mean the estimated effect is statistically significant. Industry-recognized credential, certificate, or license completion outcomes reported in these studies include receipt of a credential from any source; receipt of a vocational, technical, or professional license or certificate; and receipt of any credential from a college. The short-term employment outcome reported in one study was employed in the first year after program completion. Short-term earnings outcomes included working in a job paying \$12 or more after 18 months and earnings one year after program completion. The credit accumulation outcome was the percentage of students earning more than 12 credits. The effects of *I-BEST* are not known for other outcomes within the Postsecondary Career and Technical Education topic area, including technical skill proficiency, postsecondary degree attainment, medium-term employment, long-term employment, medium-term earnings, and long-term earnings.

BOX 1. HOW THE WWC REVIEWS AND DESCRIBES EVIDENCE

The WWC evaluates evidence based on the quality and results of reviewed studies. The criteria the WWC uses for evaluating evidence are defined in the [Procedures and Standards Handbooks](#) and the [Review Protocols](#). The studies summarized in this report were reviewed under WWC Standards (version 4.0) and the Postsecondary Career and Technical Education topic area protocol (version 4.0).

To determine the effectiveness rating, the WWC considers what methods each study used, the direction of the effects, and the number of studies that tested the intervention. The higher the effectiveness rating, the more certain the WWC is about the reported results and about what will happen if the same intervention is implemented again. The following key explains the relationship between effectiveness ratings and the statements used in this report:

Effectiveness rating	Rating interpretation	Description of the evidence
Positive (or negative) effects	The intervention is likely to change an outcome	Strong evidence of a positive effect, with no overriding contrary evidence
Potentially positive (or negative) effects	The intervention may change an outcome	Evidence of a positive effect with no overriding contrary evidence
No discernible effects	The intervention may result in little to no change in an outcome	No affirmative evidence of effects
Mixed effects	The intervention has inconsistent effects on an outcome	Evidence includes studies in at least two of these categories: studies with positive effects, studies with negative effects, or more studies with indeterminate effects than with positive or negative effects

How is *I-BEST* Implemented?

The following section provides details of how *I-BEST* was implemented. This information can help educators identify the requirements for implementing *I-BEST* and determine whether implementing this intervention would be feasible in their colleges. Information on *I-BEST* presented in this section comes from the studies that meet WWC standards (Glosser et al., 2018; Modicamore et al., 2017; and Anderson et al., 2017) and from correspondence with the developer.

Comparison group: In the three studies that contribute to this intervention report, students in the comparison group received the regular supports provided by their community college. In the *ACE* study (Modicamore et al., 2017), students who entered the program through a WIB had access to regular WIB services which included training referrals, career counseling, and job search assistance.

- **Goal:** *I-BEST* was developed by SBCTC to increase the rate at which adults in need of basic skills enter and succeed in postsecondary occupational training. It is designed to integrate adult basic education and occupational skills training, so students can learn literacy, math, work, and college-readiness skills and move into living wage jobs faster. It provides an alternative to the traditional track of providing adult basic education prior to students entering occupational training, which generally results in low rates of advancement between basic skills and occupational training.
- **Target population:** *I-BEST* allows individuals with skill levels that are lower than normally required to enroll in college-level programs to pursue credit-bearing, short-term certificate programs as well as college degrees.
- **Method of delivery:** *I-BEST*'s signature feature is its team teaching approach, which involves a basic skills instructor and an occupational instructor co-teaching during at least 50 percent of occupational training class time. The *Accelerating Opportunity* model calls for a minimum of 25 percent team teaching, while the *ACE* model prescribes a 50 percent minimum of team teaching. In addition, a dedicated *I-BEST* navigator (coach) is available to students who can provide career counseling and help students access “fill-the-gap” financial support for tuition and course materials; funding for support services (e.g., uniforms, transportation, licensure testing); clinical placements (for nursing students); and internships. Both *Accelerating Opportunity* and *ACE* had partnerships with Workforce Investment Boards (WIBs) that connected students to employers.
- **Frequency and duration of service:** Some *I-BEST* programs require full-time enrollment while others are offered part-time in the evenings or weekends. The duration of students’ participation in *I-BEST* depends on their course of study. For example, as reported in Glosser et al. (2018), automotive, electrical, and certified nursing assistant trainings lasted one quarter while precision machining, welding, and sustainable office skills trainings lasted two quarters.
- **Intervention components:** Refer to Table 2 for additional details.

Table 2. Components of *I-BEST*

Key component	Description
Team teaching	<p><i>I-BEST</i> offers students integrated basic skills and occupational skills training. Both the basic skills instructor and the occupational training instructor are required to be present in class for at least half of the total instructional time in an <i>I-BEST</i> course—or 25 percent of total instructional time in <i>Accelerating Opportunity</i>. Instructors collaborate to identify joint learning outcomes for students in their class and both take part in leading discussions and managing student projects. Team teaching can take on different forms:</p> <ul style="list-style-type: none"> • Traditional team teaching, where two or more teachers share instructional responsibilities in the same classroom at the same time with the same group of students. • Collaborative teaching, where teachers exchange and discuss ideas in front of learners, instead of engaging in usual direct instruction. • Complementary-supportive teaching, where one teacher is responsible for teaching content and the other is responsible for providing follow-up activities or study skills. • Parallel instruction, where the class is divided into two groups and each teacher is responsible for teaching the same material to each group. • Differentiated split class, where the class is divided into smaller groups according to learning needs, and each teacher provides instruction to their respective group. • Monitoring teacher, where one teacher instructs the entire class and the other teacher circulates in the classroom and monitors student understanding and behavior. <p>In the <i>Accelerating Opportunity</i> evaluation (Anderson et al., 2017), all six types of team teaching models were used, with the complementary-supportive model being most popular, followed by monitoring teacher, traditional, and collaborative. In the <i>ACE</i> study (Modicamore et al., 2017), the complementary-supportive model was described as being typical. In the <i>I-BEST</i> study (Glosser et al., 2018), collaborative teaching was implemented, as were two variants of traditional team teaching: (1) basic skills instructors delivered instruction for part of the class period, then turned over instruction to the occupational skills instructor, and (2) both instructors delivered class content together.</p> <p><i>I-BEST</i> uses a contextualized instruction approach, where students learn basic skills in the context of their course of study. For example, in an <i>I-BEST</i> nursing program, increased emphasis is placed on learning medical terms in addition to mastering everyday vocabulary. This instructional model aims to improve the motivation and achievement of students by providing them experiences where they can see the usefulness of basic skills instruction in their chosen field.</p>
Career navigation	<p><i>I-BEST</i> provides students with a career navigator, who provides intake, orientation, job readiness, mentoring, and job placement services. <i>I-BEST</i> offers multiple tracks from its traditional program, to either provide additional vocational education that can lead to a college degree, or provide additional academic instruction to help students advance on a career pathway.</p>
Financial supports	<p><i>I-BEST</i> students in Washington can receive Opportunity Grants when they enroll in <i>I-BEST</i> professional technical pathways. The grant covers up to 45 credits of tuition and up to \$1,000 a year for books and supplies.</p>
Additional supports	<p><i>I-BEST</i> students also receive tutoring, career advising, emergency child care, emergency transportation, and college success classes.</p>
Job placement assistance	<p>Both the <i>Accelerating Opportunity</i> and <i>ACE</i> implementation of the <i>I-BEST</i> model included partnerships with local WIBs to place students in jobs. <i>I-BEST</i> as studied in Glosser et al. (2018) did not include specific employment and job placement services.</p>

What Does *I-BEST* Cost?

This preliminary list of costs is not designed to be exhaustive; rather, it provides educators with an overview of the major resources needed to implement *I-BEST*. The program costs described below are based on information available as of March 2020. The total cost of *I-BEST* was reported in a SBCTC cost-benefit analysis to be \$2,417 in direct student costs and \$7,279 in state costs as of January 2013. The total cost of *ACE* as of May 2017 ranged from \$4,828 to \$13,033 per student across the nine sites. The total cost of *Accelerating Opportunity* as of November 2017 ranged from \$2,635 to \$7,128 per student across four states. Below is a breakdown of the costs reported in the SBCTC study.

- **Equipment and materials costs:** The SBCTC cost-benefit analysis reported that enrollment support, which includes both direct and indirect costs of instruction, was \$4,396 per *I-BEST* completer. Washington State provided an average of \$2,883 in financial aid support per *I-BEST* completer.
- **Personnel costs:** The SBCTC cost-benefit analysis reported that enrollment support, which includes both direct and indirect costs of instruction, was \$4,396 per *I-BEST* completer.

- **Facilities costs:** No additional facilities costs were reported beyond the facilities costs normally associated with college attendance.
- **Costs paid by students or parents:** The SBCTC cost-benefit analysis reported that tuition minus the weighted average financial aid per student completer was \$1,114. The cost of books was listed as \$1,000 and the cost of fees was \$300 per student completer. Students can use Opportunity Grants when they enroll in *I-BEST* professional technical pathways, which cover up to 45 credits of tuition and up to \$1,000 a year for books and supplies.
- **In-kind supports:** *I-BEST* students also receive tutoring, career advising, emergency child care, emergency transportation, and college success classes.
- **Sources of funding:** *I-BEST* is funded by SBCTC. The *Accelerating Opportunity* program was funded by the Bill & Melinda Gates Foundation. The *ACE* program was funded through a U.S. Department of Labor Workforce Innovation Fund grant with additional support from the Annie E. Casey Foundation.

For More Information:

About *I-BEST*

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About the cost of the intervention

Web: <https://www.sbctc.edu/resources/documents/colleges-staff/programs-services/basic-education-for-adults/InvestmentsinI-BESTPrograms.pdf>

See also

Modicamore, D., Lamb, Y., Taylor, J., Takyi-Laryea, A., Karageorge, K., & Ferroggiaro, E. (2017). *Accelerating Connections to Employment, volume 1: Final evaluation report*. Fairfax, VA: ICF International.

Kuehn, D., Anderson, T., Lerman, R., Eyster, L., Barnow, B., & Briggs, A. (2017). *A cost-benefit analysis of Accelerating Opportunity*. Washington, DC: Urban Institute. Retrieved from <https://www.urban.org/sites/default/files/publication/94876/ao-cba-report.pdf>

Research Summary

The WWC identified 12 studies that investigated the effectiveness of *I-BEST* (Figure 1):

- Two studies meet WWC group design standards without reservations
- One study meets WWC group design standards with reservations
- Three studies do not meet WWC group design standards
- Six studies are ineligible for review

The WWC reviews findings on the intervention's effects on eligible outcome domains from studies that meet standards, either with or without reservations. Based on this review,

the WWC generates an effectiveness rating, which summarizes how the intervention impacts, or changes, a particular outcome domain. The WWC reports additional supplemental findings, such as state-by-state results for credit accumulation (Anderson et al., 2017), on the WWC website (<https://whatworks.ed.gov>).

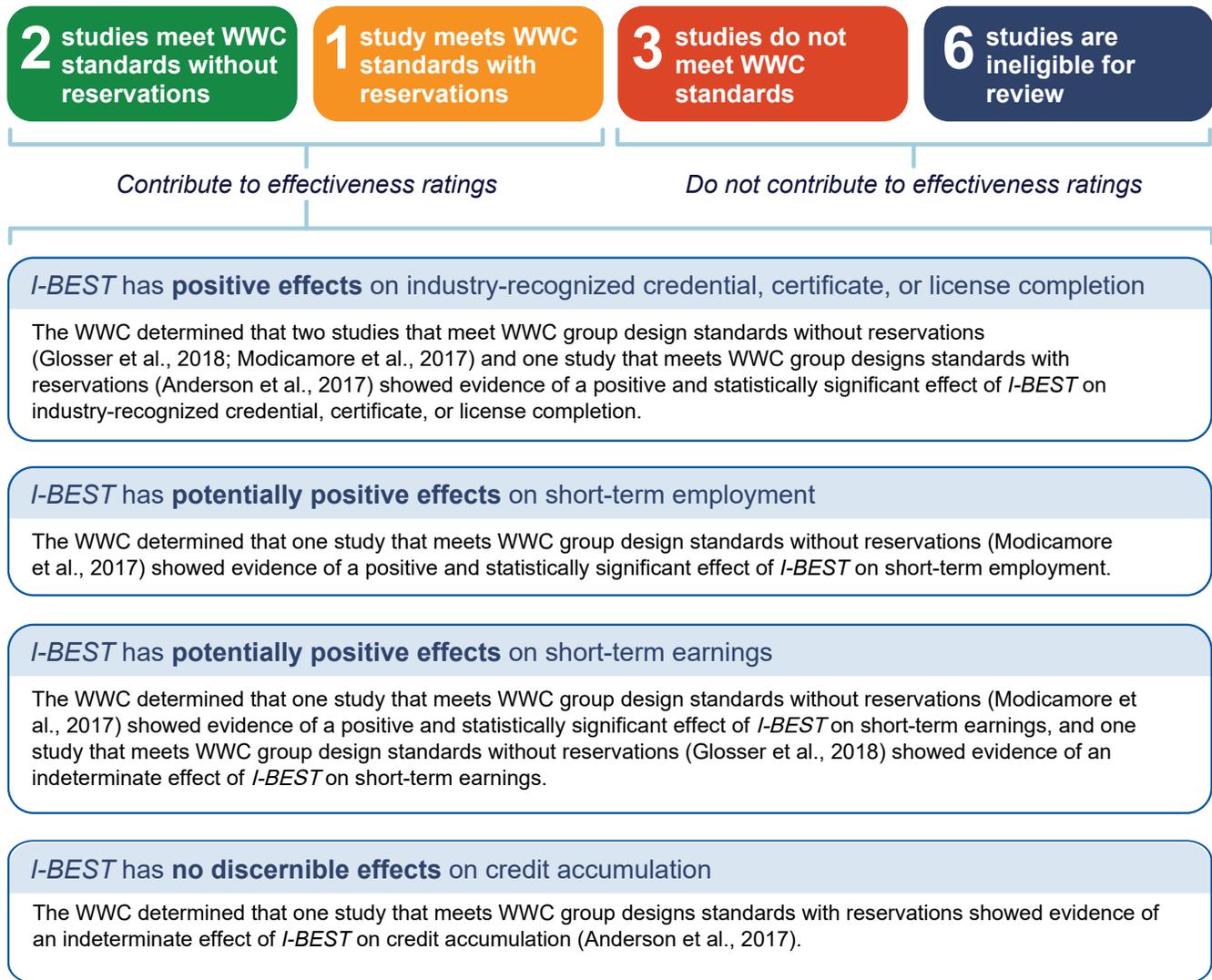
These supplemental findings and findings from studies that either do not meet WWC standards or are ineligible for review do not contribute to the effectiveness ratings.

The three studies of *I-BEST* that meet WWC group design standards reported findings on industry-recognized credential, certificate, or license completion; short-term

employment; short-term earnings; and credit accumulation. No other findings in the studies meet WWC group design standards within any outcome domain included in the Postsecondary Career and Technical Education topic area. Citations for the three studies reviewed for this report are

listed in the References section, which begins on page 13. Citations for the six studies that are ineligible for review and the reasons the WWC determined they were ineligible are also listed in the References section.

Figure 1. Effectiveness ratings for *I-BEST*



Main Findings

Table 3 shows the findings from the three *I-BEST* studies that meet WWC standards. The table includes WWC calculations of the mean difference, effect size, and performance of the intervention group relative to the comparison group. Based on findings from the three studies that meet WWC standards, the effectiveness rating for the industry-recognized credential, certificate, or license completion domain is *positive effects*, indicating strong evidence of a positive effect with no overriding contrary evidence. These findings are based on 44,367 students. The effectiveness rating for

the short-term employment domain is *potentially positive effects*, indicating evidence of a positive effect with no overriding contrary evidence. This finding is based on 2,064 students. The effectiveness rating for short-term earnings is *potentially positive effects*, indicating evidence of a positive effect with no overriding contrary evidence. These findings are based on 2,519 students. The effectiveness rating for the credit accumulation domain is *no discernible effects*, indicating no affirmative evidence of effects. This finding is based on 42,894 students.

Table 3. Findings by outcome domain from studies of *I-BEST* that meet WWC Standards

Measure (study)	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Received a credential from any source (%) (Glosser et al., 2018) ^a	Full Sample	424	33.5	18.2	15.3	0.49	+19	<.01
Earned a vocational, technical, or professional certificate or license (%) (Modicamore et al., 2017) ^b	Full Sample	1,049	53.5	35.4	18.1	0.45	+17	<.01
Received any credential from a college (%) (Anderson et al., 2017) ^c	Full Sample	42,894	52.6	33.0	19.6	0.49	+19	<.01
Outcome average for industry-recognized credential, certificate, or license completion across all studies						0.48	+18	
Employed in the first year after program completion (%) (Modicamore et al., 2017) ^b	Full Sample	2,064	62.6	51.9	10.7	0.27	+10	<.01
Outcome average for short-term employment across all studies						0.27	+10	
Working in a job paying \$12 an hour or more (%) (Glosser et al., 2018) ^a	Full Sample	455	23.0	23.8	-0.8	-0.03	-1	.85
Earnings one year after program (Modicamore et al., 2017) ^b	Maryland and Texas Sample	1,513	\$12,897.00	\$11,601.80	\$1,295.20	0.13	+5	<.01
Earnings one year after program (Modicamore et al., 2017) ^b	Connecticut Sample	348	\$14,125.19	\$12,578.79	\$1,546.40	0.15	+6	.12
Earnings one year after program (Modicamore et al., 2017) ^b	Georgia Sample	203	\$5,783.50	\$7,154.60	-\$1,371.10	-0.22	-9	.08
Outcome average for short-term earnings across all studies						0	0	
Earned more than 12 credits (%) (Anderson et al., 2017) ^c	Full Sample	42,894	45.7	46.9	-1.2	-0.03	-1	.13
Outcome average for credit accumulation across all studies						-0.03	-1	

Notes: For mean difference and effect size values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on outcomes, representing the average change expected for all individuals who are given the intervention (measured in standard deviations of the outcome measure). An indicator of the effect of the intervention, the improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +4 means that the expected percentile rank of the average comparison group student would increase by 4 points if the student received *I-BEST*. A positive improvement index does not necessarily mean the estimated effect is statistically significant. Some statistics may not sum as expected due to rounding.

^a Glosser et al. (2018) did not require corrections for clustering or multiple comparisons nor difference-in-differences adjustments. Findings from the 18-month follow-up survey, with imputed cases removed, were presented by the author in response to a WWC author query. The p-value for receipt of a credential from any source was calculated by the WWC since the author provided the results of a one-tailed test. This study is characterized as having a statistically significant positive effect on industry-recognized credential, certificate, or license completion because the estimated effect is positive and statistically significant. The study is characterized as having an indeterminate effect on short-term earnings because the estimated effect reported is not statistically significant.

^b Modicamore et al. (2017) did not require corrections for clustering nor difference-in-differences adjustments. A correction for multiple comparisons was needed but did not affect whether any of the contrasts were found to be statistically significant. The p-value for employment in the first year after program completion was not presented in the original study and was calculated by the WWC. Authors did not report standard deviations of earnings outcomes; however, they did report the effect size using the Hedges' g formula and conducted a Benjamini-Hochberg correction for multiple comparisons. This study is characterized as having a statistically significant positive effect on (a) industry-recognized credential, certificate, or license completion, (b) short-term employment, and (c) short-term earnings because the estimated effect is positive and statistically significant.

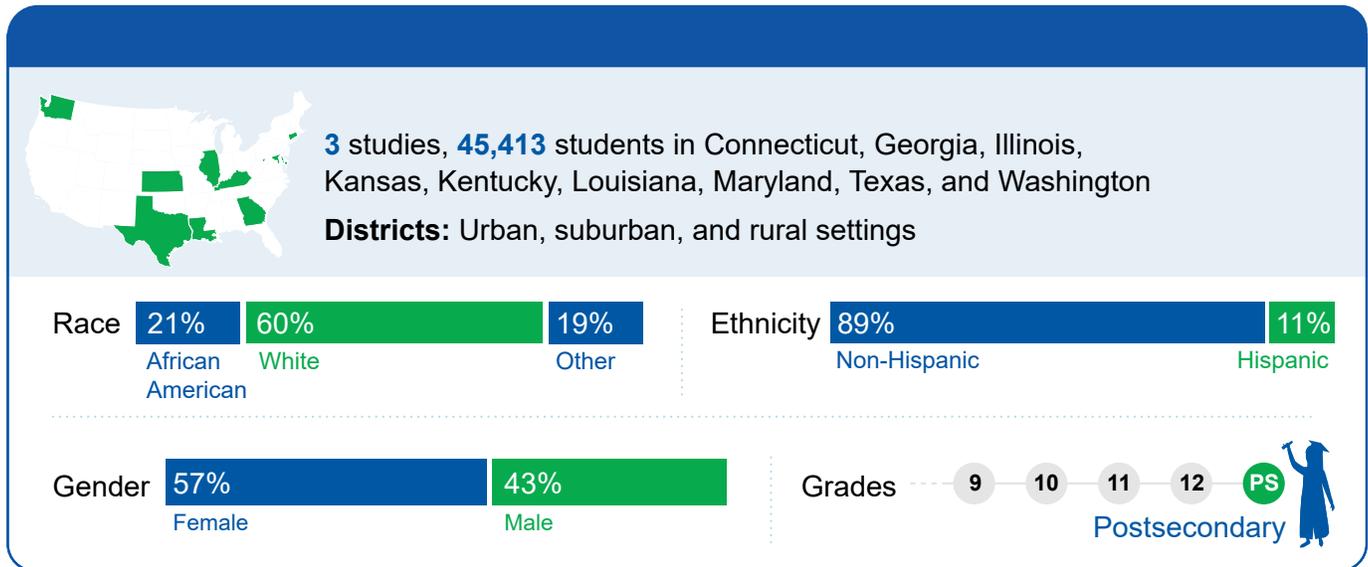
^c Anderson et al. (2017) did not require corrections for clustering or multiple comparisons nor difference-in-differences adjustments. The outcomes for earning any credential from a college and earning more than 12 credits were aggregated across subsamples by the WWC, and the p-values for these outcomes were calculated by the WWC based on the aggregated sample. This study is characterized as having a statistically significant positive effect on industry-recognized credential, certificate, or license completion because the estimated effect is positive and statistically significant. This study is characterized as having an indeterminate effects on credit accumulation because the estimated effect is not statistically significant.

For more information, please refer to the WWC Procedures Handbook, version 4.0, page 22.

In What Context Was *I-BEST* Studied?

The following section provides information on the setting of the three studies of *I-BEST* that meet WWC standards, and a description of the participants in the research. This

information can help educators understand the context in which the studies of *I-BEST* were conducted, and determine whether the program might be suitable for their setting.



Details of Each Study that Meets WWC Standards

This section presents details for the studies of *I-BEST* that meet WWC standards. These details include the full study reference, findings description, findings summary, and description of study characteristics. A summary of domain findings for each study is presented below, followed by a description of the study characteristics. These study-level details include contextual information about the study setting, methods, sample, intervention group, comparison group, outcomes, and implementation details. For additional information, readers should refer to the original studies.

Training (I-BEST) Program in three colleges: Implementation and early impact report (OPRE Report No. 2018-87). Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

Findings from Glosser et al. (2018) show evidence of a statistically significant positive effect of *I-BEST* industry-recognized credential, certificate, or license completion. The study showed evidence of an indeterminate effect on short-term earnings (Table 4). These findings are based on an outcome analysis that includes 455 students.

Research details for Glosser et al. (2018)

Glosser, A., Martinson, K., Cho, S. W., & Gardiner, K. (2018). *Washington State's Integrated Basic Education and Skills*

Table 4. Summary of findings from Glosser et al. (2018)

		Meets WWC group design standards without reservations		
		Study findings		
Outcome domain	Sample size	Average effect size	Improvement index	Statistically significant
Industry-recognized credential, certificate, or license completion	424 students	0.49	+19	Yes
Short-term earnings	455 students	-0.03	-1	No

Table 5. Description of study characteristics for Glosser et al. (2018)

WWC evidence rating	Meets WWC Group Design Standards Without Reservations. This is a randomized controlled trial (RCT) with low attrition. ⁷ For more information on how the WWC assigns study ratings, please see the WWC Procedures and Standards Handbooks (version 4.0) and WWC Standards Briefs , available on the WWC website.
Setting	The study took place at three public community colleges in Washington state: Bellingham Technical College, Everett Community College, and Whatcom Community College.
Methods	<i>I-BEST</i> program applicants first took the Comprehensive Adult Student Assessment System (CASAS) math and reading assessment. Students with CASAS scores within the eligibility range of their desired program then met with <i>I-BEST</i> staff to confirm their interest and address program-specific requirements, such as tuberculosis screening for applicants to nursing assistant programs. Students who consented to be in the study were then given a baseline questionnaire, completed a baseline information form, and were randomly assigned by an online system to either receive <i>I-BEST</i> or to serve in a comparison group. Altogether, 632 study participants were randomly assigned to intervention or comparison conditions between November 2011 and September 2014. The baseline sample included 315 students in the intervention group and 317 students in the comparison group. One student in the comparison group dropped out of the study. The study included data that were imputed using a method that did not meet WWC standards. In response to a WWC author query, the author provided findings from the study's 18-month follow-up survey with imputed data removed. The analytic sample for the credential receipt outcome includes 214 students in the intervention group and 210 students in the comparison group. The analytic sample for the working in a job paying \$12 an hour or more outcome includes 235 students in the intervention group and 220 students in the comparison group.
Study sample	Thirty-one percent of students had yet to obtain a high school diploma or equivalent, and 58 percent of students were female. Approximately 10 percent reported having attended one or more years of college. Study participants also had lower incomes and were older than traditional college students: almost two-thirds of students (63 percent) were age 25 or older. Slightly more than half (55 percent) were non-Hispanic White, and about one quarter (26 percent) identified as Latino or Hispanic. Two-thirds (67 percent) of study participants were not working at the time of random assignment, with only 13 percent working 35 hours or more per week.
Intervention group	<p>The <i>I-BEST</i> program includes courses that are part of a structured pathway. Integrated team-teaching of basic skills and occupational skills was done in most courses on the pathway. Team teaching took several forms. In some courses, the basic skills instructor sat in class with students and stopped the occupational instructor to ask clarifying questions or to explain a concept further. In other courses, the basic skills instructor would either deliver a designated portion of the instruction or would jointly deliver instruction with the occupational instructor.</p> <p><i>I-BEST</i> students had access to dedicated advisors, called navigators, who provided guidance on academic issues, helped students navigate the college's procedures, and helped with career planning. <i>I-BEST</i> also provided "fill the gap" funds for books, tools, other course materials, and transportation. This funding ensured that all members of the intervention group would pay no tuition.</p>
Comparison group	Comparison group members could not access <i>I-BEST</i> programs and courses at the three colleges; however, they could access other education and training opportunities available to them, including non- <i>I-BEST</i> courses and <i>I-BEST</i> programs at other colleges. Both intervention and comparison group members could access general college advising, tutoring, and financial aid services that were available to all students at the colleges. Both intervention and comparison group members could potentially access financial support through Pell grants, Washington State's Opportunity Grants, Washington's Basic Food Employment and Training (BFET) program, veteran's benefits, and Temporary Assistance for Needy Families (TANF), depending on eligibility. Both intervention and comparison group members could access their college's employment and job placement services designed to help program completers find jobs. Whether they enrolled in college classes or not, they also could access other employment assistance in the community, such as the job search and job readiness services at local American Job Centers.
Outcomes and measurement	<p>Study authors reported findings on four outcome measures that are eligible for review under the Postsecondary Career and Technical Education topic area. These findings include receipt of a credential from any source (industry-recognized credential, certificate, or license completion domain), working in a job paying \$12 an hour or more (short-term earnings domain); academic and workforce credits earned (credit accumulation domain); and received an associate's degree or higher (postsecondary degree attainment domain).</p> <p>Because the author imputed data using an unacceptable method for the academic and workforce credits earned outcome, as well as the received an associate's degree or higher outcome, these outcomes were not able to meet WWC standards. The author shared findings from the 18-month follow-up survey after removing imputed data points from the calculations. Survey outcomes that meet WWC standards included receipt of a credential from any source and working in a job paying \$12 an hour or more.</p> <p>The study also reported findings for receipt of a credential broken down by whether the credential was received from a college, another education-training institution, or from a licensing or certification body. Summaries of these findings are available on the WWC website (https://whatworks.ed.gov). The supplemental findings do not factor into the intervention's rating of effectiveness.</p>

Outcomes and measurement (continued)	Other findings were included in the study that were not eligible in the Postsecondary Career and Technical Education topic area, including enrollment in college, type of organization providing a credential, enrollment in developmental courses, completion of developmental courses, receipt of a certificate or degree, employment in a job requiring at least mid-level skills or higher, and a number of attitudinal and perception measures.
Additional implementation details	<i>I-BEST</i> was designed by the Washington State Board for Community and Technical Colleges (SBCTC) and operates at all 34 public community and technical colleges in the state. The three colleges included in this study received additional funding for program enhancements from the Open Society Foundations.

Research details for Modicamore et al. (2017)

Modicamore, D., Lamb, Y., Taylor, J., Takyi-Laryea, A., Karageorge, K., & Ferroggiaro, E. (2018). *Accelerating Connections to Employment: Final evaluation report*. Fairfax, VA: ICF International.

Findings from Modicamore et al. (2017) show evidence of a statistically significant positive effect of *I-BEST*, called *Accelerating Connections to Employment* in this study, on industry-recognized credential, certificate, or license completion; short-term employment; and short-term earnings (Table 6). These findings are based on an outcome analysis that includes 2,064 students.

Table 6. Summary of findings from Modicamore et al. (2017)

Meets WWC group design standards without reservations				
Study findings				
Outcome domain	Sample size	Average effect size	Improvement index	Statistically significant
Industry-recognized credential, certificate, or license completion	1,049 students	0.45	+17	Yes
Short-term employment	2,064 students	0.27	+10	Yes
Short-term earnings	2,064 students	0.02	+1	Yes

Table 7. Description of study characteristics for Modicamore et al. (2017)

<p>WWC evidence rating</p>	<p>Meets WWC Group Design Standards Without Reservations. This is a randomized controlled trial (RCT) with low attrition.⁸</p>
<p>Setting</p>	<p>The study took place at nine sites, including six sites in Maryland (Anne Arundel County, Baltimore City, Baltimore County, Montgomery County, Prince George’s County, and the Upper Shore), one site in Connecticut (New Haven), one site in Georgia (Atlanta), and one site in Texas (Austin).</p>
<p>Methods</p>	<p>Study participants were recruited by a community college, One-Stop center, or both. In order to be eligible for the study, incoming students had to (a) possess sufficient basic skills to benefit from the <i>Accelerating Connections to Employment (ACE)</i> training, (b) have sufficient English language proficiency to participate in <i>ACE</i> training, and (c) have no other impediments to the successful receipt of <i>ACE</i> training. Eligible students met with a career counselor who administered a skills assessment (CASAS or Test of Adult Basic Education–TABE), assessed career interests, and identified needs for training. If a student met the established range of CASAS or TABE scores to participate in a given program, they were invited to participate in the study. Students who consented to be in the study were then randomly assigned to either participate in <i>ACE</i> training (n=1,175) or seek alternative services on their own at the One-Stop center (n=993). Prior to randomization 83 veterans were automatically enrolled in <i>ACE</i> training, as required by the Jobs for Veterans Act of 2002. These veterans were not enrolled in the study. The sample loss after random assignment (or attrition) was within the acceptable threshold for the review.</p> <p><i>ACE</i> study participants were recruited across five cohorts and randomized prior to the start of the intervention. In early cohorts, sites were allowed to randomize more study participants into the intervention group than the comparison group to promote enrollment. Later cohorts entailed balanced random assignment. Adjusted weights were therefore included in the analyses for each cohort to address differences in balance between study conditions.</p>
<p>Study sample</p>	<p>Random assignment resulted in an intervention group of 1,175 students and a control group of 993 students. Some outcomes were drawn from Unemployment Insurance (UI) records in each state, so attrition was minimal on employment and earnings outcomes; however, UI data were not available for the final quarter of the <i>ACE</i> program in quarter 4 of 2015. Study authors administered a survey to study participants one year and two years after program completion. The year 1 follow-up survey had 691 survey respondents in the intervention condition and 521 in the comparison condition. The year 2 follow-up survey had 280 survey respondents in the intervention condition and 207 respondents in the comparison condition.</p> <p>The 2,168 study participants were 71.3 percent African American, 15.4 percent White, 1.2 percent Native American, 2.5 percent Asian, 0.5 percent Native Hawaiian, and 9.1 percent other. Moreover, 11 percent of study participants were Hispanic, and 70.5 percent of study participants were female. Almost two-thirds of study participants (64.9 percent) were unemployed at baseline, 34.5 percent were employed, and 0.6 percent were not in the labor force. On average, study participants were 35.5 years of age. Almost half of study participants (48.2 percent) had a high school diploma or GED, 18.0 percent had yet to obtain a high school diploma, 28.8 percent had some college or an Associate’s degree, and 5.0 percent had a Bachelor’s degree or higher.</p>
<p>Intervention group</p>	<p><i>ACE</i> is based in part on Washington State’s <i>I-BEST</i> model. Like <i>I-BEST</i>, <i>ACE</i> provides integrated basic skills and occupational skills training, with at least 50 percent of total training hours using a co-teaching model. <i>ACE</i> also engages employers, industry partners, and Workforce Investment Boards (WIBs) to assess labor market demands, determine basic skills requirements, and design programs that prepare job seekers for high-demand occupations. <i>ACE</i> also provides a career navigator to students. Initially, the <i>ACE</i> career navigator was involved in all aspects of recruitment, onboarding, job readiness training, and job placement. Later, sites added a job developer position, which afforded career navigators more time to focus on forming strong relationships with participants and guiding them through the training program.</p>
<p>Comparison group</p>	<p>Comparison group members had access to alternative services at the WIB. As with any non-<i>ACE</i> WIB customer, control group members generally had to navigate these alternative services on their own.</p>

Research details for Anderson et al. (2017)

Anderson, T., Kuehn, D., Eyster, L., Barnow, B., & Lerman, R. I. (2017). *New evidence on integrated career pathways*. Washington, DC: Urban Institute. Retrieved from https://www.urban.org/sites/default/files/publication/91436/ao_final_impacts.pdf

Findings from Anderson et al. (2017) show evidence of a statistically significant positive effect of *I-BEST*, implemented in this study as *Accelerating Opportunity*, on industry-

recognized credential, certificate, or license completion, and a statistically significant negative effect on credit accumulation (Table 8). These findings are based on an outcome analysis that includes 42,894 students. The findings and research details summarized for this study come from six related citations, including the primary study listed above. See the References section, which begins on page 13, for a list of all related publications.

Table 8. Summary of findings from Anderson et al. (2017)

Meets WWC group design standards with reservations				
Outcome domain	Sample size	Study findings		
		Average effect size	Improvement index	Statistically significant
Industry-recognized credential, certificate, or license completion	42,894 students	0.49	+19	Yes
Credit accumulation	42,894 students	-0.03	-1	No

Table 9. Description of study characteristics for Anderson et al. (2017)

WWC evidence rating	Meets WWC Group Design Standards With Reservations. This is a quasi-experimental design (QED) with baseline equivalence established on the analytic sample. ⁹
Setting	The intervention was delivered in community college and adult education settings in four states: Illinois, Kansas, Kentucky, and Louisiana.
Methods	The study used a quasi-experimental design. Authors used administrative data to match 4,760 students enrolled in a for-credit course at a participating <i>Accelerating Opportunity</i> college to other students in the state who were drawn from the same recruitment pool. In Illinois and Louisiana, colleges recruited mainly from the adult education population. In Kansas, recruitment focused on students in adult education and current career and technical education (CTE) students; in Kentucky, recruitment focused on students in adult education and developmental education students. Propensity score matching procedures were used to match students enrolled between calendar years 2012 to 2014 in Illinois, Kansas, and Kentucky. In Louisiana, the analytic sample includes students enrolled between fall 2012 and summer 2015. Seventeen variables were used in the propensity score matching model, including student demographics, prior educational experience, prior employment status, socioeconomic status, local job conditions, and academic performance as measured by basic skills and other postsecondary assessments. Authors used a propensity score matching procedure that matched comparison group students within a range of propensity scores to an intervention group member, so each <i>Accelerating Opportunity</i> student may have multiple comparison students.
Study sample	The sample sizes for the intervention and comparison groups, respectively, are: 867 and 4,129 in Illinois, 1,698 and 12,595 in Kansas, 1,356 and 18,794 in Kentucky, and 440 and 3,015 in Louisiana. The total sample size is 42,894, with 4,361 students in the intervention group and 38,533 students in the comparison group. The analytic sample is 56 percent female, 62 percent White, 19 percent Black, and 11 percent Hispanic. Thirty-six percent of the analytic sample was eligible to receive a Pell grant.
Intervention group	<i>Accelerating Opportunity</i> is based on the <i>I-BEST</i> model, and is designed to help low-skilled students earn occupational credentials, obtain employment, and sustain careers. Community and technical colleges that were in the intervention condition developed or modified existing programs that offered career pathways for in-demand jobs. A major component of <i>Accelerating Opportunity</i> was integrated instruction, where both basic skills and CTE instructors taught the same class with at least 25 percent overlap. Students also received additional services, including tutoring, academic advising, college navigation, job search assistance, job placement, and case management. <i>Accelerating Opportunity</i> programs partnered with Workforce Investment Boards (WIBs) to connect students to employment.
Comparison group	The comparison condition entailed standard, business-as-usual instruction and support. The comparison group students were drawn from the same recruitment sources—including adult education, developmental education, or CTE—as the intervention group, but they did not have the opportunity to participate in <i>Accelerating Opportunity</i> .
Outcomes and measurement	Study authors reported findings on two outcome measures that are eligible for review under the Postsecondary Career and Technical Education topic area. These outcomes include earned any credential from a college (industry-recognized credential, certificate, or license completion domain) and earned more than 12 credits (credit accumulation domain). The study also reported supplemental findings for Illinois, Kansas, and Kentucky programs. Supplemental findings in the industry-recognized credential, certificate, or license completion domain include the average number of credentials received and percentage of students receiving credentials. Supplemental findings in the credit accumulation domain include total credits earned and the percentage of students who received more than 12 credits. Summaries of these findings are available on the WWC website (https://whatworks.ed.gov). The supplemental findings do not factor into the intervention's rating of effectiveness. Employment and earnings outcomes for Louisiana and Illinois for three and four quarters, respectively, after program entry were eligible to receive a rating of Meets WWC Group Design Standards with Reservations; however, these outcomes were measured less than one year after the earliest program completion and were therefore ineligible for review as short-term outcomes according to the Postsecondary Career and Technical Education protocol. Baseline equivalence could not be established on subsequent data collection time points. Labor market outcomes for Kansas and Kentucky do not meet WWC group design standards because baseline equivalence could not be established on the sample used in the analysis. In Louisiana, the intervention and comparison group students were not balanced on Pell eligibility, so education outcomes from this state do not meet standards.
Additional implementation details	No additional implementation details were reported.

References

Studies that meet WWC group design standards

Glosser, A., Martinson, K., Cho, S. W., & Gardiner, K. (2018). *Washington State's Integrated Basic Education and Skills Training (I-BEST) Program in three colleges: Implementation and early impact report* (OPRE Report No. 2018-87). Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

Modicamore, D., Lamb, Y., Taylor, J., Takyi-Laryea, A., Karageorge, K., & Ferroggiaro, E. (2018). *Accelerating Connections to Employment: Final evaluation report*. Fairfax, VA: ICF International.

Study that meets WWC group design standards with reservations

Anderson, T., Kuehn, D., Eyster, L., Barnow, B., & Lerman, R. I. (2017). *New evidence on integrated career pathways: Final impact report for Accelerating Opportunity*. Washington, DC: Urban Institute. Retrieved from https://www.urban.org/sites/default/files/publication/91436/ao_final_impacts.pdf

Additional sources:

Anderson, T., Eyster, L., Lerman, R. I., Clymer, C., Conway, M., & Montes, M. (2014). *The first year of Accelerating Opportunity: Implementation findings from the states and colleges*. Washington, DC: Urban Institute. Retrieved from <https://eric.ed.gov/?id=ED559305>

Anderson, T., Eyster, L., Lerman, R. I., Conway, M., Jain, R., & Montes, M. (2016). *Implementation of Accelerating Opportunity: Lessons for the field*. Washington, DC: Urban Institute. Retrieved from <https://www.urban.org/sites/default/files/publication/80626/2000791-implementation-of-accelerating-opportunity-lessons-for-the-field.pdf>

Anderson, T., Eyster, L., Lerman, R. I., O'Brien, C., Conway, M., Jain, R., & Montes, M. (2015). *The second year of Accelerating Opportunity: Implementation findings from the states and colleges*. Washington, DC: Urban Institute. Retrieved from <https://eric.ed.gov/?id=ED559322>

Eyster, L., Anderson, T., Lerman, R., Kuehn, D., Barnow, B., Conway, M., Jain, R., & Montes, M. (2018). *Findings from the Accelerating Opportunity Evaluation*. Washington, DC: Urban Institute. Retrieved from <https://www.urban.org/research/publication/findings-accelerating-opportunity-evaluation>

Kuehn, D., Anderson, T., Lerman, R., Eyster, L., Barnow, B., & Briggs, A. (2017). *A cost-benefit analysis of Accelerating Opportunity*. Washington, DC: Urban Institute. Retrieved from <https://www.urban.org/sites/default/files/publication/94876/ao-cba-report.pdf>

Spaulding, S., & Martin-Caughey, A. (2015). *Accelerating Opportunity: A portrait of students and their program experiences from the 2014 Student Survey*. Washington, DC: Urban Institute. Retrieved from <https://eric.ed.gov/?id=ED559315>

Studies that do not meet WWC group design standards

Bloomer, T., & Prince, D. (2005). *I-BEST: A program integrating adult basic education and workforce training* (No. 05-2). Research Report. Olympia, WA: Washington State Board for Community and Technical Colleges. Retrieved from <https://eric.ed.gov/?id=ED496215>. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Ginther, D., & Oslund, P. (2016). *An evaluation of the labor market impact of AO-K*. Lawrence, KS: Center for Science, Technology, and Economic Policy, the University of Kansas. Retrieved from https://www.kansasregents.org/resources/KBOR_AOKReport2016.pdf. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Zeidenberg, M., Cho, S. W., & Jenkins, P. D. (2010). *Washington State's integrated basic education and skills training program (I-BEST): New evidence of effectiveness*. CCRC Working Paper No. 20. New York: Community College Research Center (CCRC). Retrieved from <https://eric.ed.gov/?id=ED512261>. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Additional sources:

Jenkins, P. D., Zeidenberg, M., & Kienzl, G. S. (2009). *Building bridges to postsecondary training for low-skill adults: Outcomes of Washington State's I-Best Program*. CCRC Brief No. 42. New York: CCRC. Retrieved from <https://eric.ed.gov/?id=ED505705>

Jenkins, P. D., Zeidenberg, M., & Kienzl, G. S. (2009). *Educational outcomes of I-BEST, Washington state community and technical college system's integrated basic education and skills training program: Findings from a multivariate analysis*. CCRC Working Paper No. 16. New York: CCRC. Retrieved from <https://eric.ed.gov/?id=ED505331>

Wachen, J., Jenkins, P. D., & Van Noy, M. (2010). *How I-BEST works: Findings from a field study of Washington State's integrated basic education and skills training program*. New York: CCRC. Retrieved from <https://eric.ed.gov/?id=ED512276>

Studies that are ineligible for review using the Postsecondary Career and Technical Education Protocol

Couch, K. A., Ross, M. B., & Vavrek, J. (2018). Career pathways and integrated instruction: A national program review of I-BEST Implementations. *Journal of Labor Research*, 39(1), 99-125. The study is ineligible for review because it does not use an eligible design.

- Dailey, C. R., Mean, M., Charner, I., Jordan, K. A., & Klein, S. (2017). *Engaging employers in community college workforce education programs: Examples from the field*. Washington, DC: U.S. Department of Education, Office of Career, Technical, and Adult Education. The study is ineligible for review because it does not use an eligible design.
- Fox, H. L. (2015). Six workforce development initiatives that are laying the pathway to success. *Community College Journal of Research and Practice*, 39(8), 727-740. <https://eric.ed.gov/?id=EJ1059466> The study is ineligible for review because it does not use an eligible design.
- Fox, R. W., & Williams, M. R. (2011). The Integrated Basic Education and Skills Training (I-BEST) Program: Equipping all adults for the global economy. *Online Journal for Workforce Education and Development*, 5(2). The study is ineligible for review because it does not use an eligible design.
- Sitkiewicz, B. (2016). *Support services perceived by adult basic skills learners as essential while transitioning from secondary to postsecondary education* (Doctoral dissertation, Capella University). Available from ProQuest Dissertations and Theses database (UMI No. 10151209). The study is ineligible for review because it does not use an eligible design.
- Wachen, J., Jenkins, D., Belfield, C., & Van Noy, M. (2012). *Contextualized college transition strategies for adult basic skills students: Learning from Washington State's I-BEST program model*. New York: Community College Research Center. Retrieved from <https://eric.ed.gov/?id=ED538999> The study is ineligible for review because it does not use an eligible design.

Endnotes

- ¹ Carnevale, A. P., Cheah, B., Ridley, N., & Strohl, J. (2017). *Good jobs that pay without a BA*. Washington, DC: Georgetown University, Center on Education and the Workforce.
- ² Shapiro, D., Ryu, M., Huie, F., Liu, Q., and Zheng, Y. (2019). *Completing College 2019 National Report* (Signature Report 18), Herndon, VA: National Student Clearinghouse Research Center.
- ³ Bailey, T., Jeong, D. W., & Cho, S-W. (2010). Referral, enrollment, and completion in developmental education sequences in community colleges. *Economics of Education Review*, 29(2), 255-270.
- ⁴ The descriptive information for this intervention comes from SBCTC's I-BEST website, as well as Glosser et al. (2018), Modicamore et al. (2017), and Anderson et al. (2017). The What Works Clearinghouse (WWC) requests developers review the intervention description sections for accuracy from their perspective. The WWC provided the developer with the intervention description in October 2019 and the WWC incorporated feedback from the developer. Further verification of the accuracy of the descriptive information for this intervention is beyond the scope of this review.

- ⁵ Absence of conflict of interest: This intervention report includes a study conducted by staff from Abt Associates (Glosser et al., 2018). Because Abt Associates is a contractor that administers the WWC, this study was reviewed by staff members from a different organization.
- ⁶ The literature search reflects documents publicly available by August 2019. Reviews of the studies in this report used the standards from the WWC Procedures and Standards Handbook (version 4.0) and the Postsecondary Career and Technical Education review protocol (version 4.0). The evidence presented in this report is based on available research. Findings and conclusions could change as new research becomes available.
- ⁷ Attrition rates were negligible for Glosser et al. (2018): only one student dropped out of the control group.
- ⁸ Attrition rates were low according to WWC standards. Attrition rates for the first-year follow-up survey were low, and were deduced from baseline equivalence tables provided in the report. Findings from the second-year follow-up survey had high attrition and did not demonstrate baseline equivalence; therefore, they did not meet WWC group design standards.
- ⁹ WWC reviewers were able to establish baseline equivalence on at least one outcome for all four states. These findings receive a WWC rating of Meets Standards With Reservations. In Louisiana, the intervention and comparison group students were not balanced on Pell eligibility, so education outcomes from this state do not meet standards. Louisiana is included in the aggregate education outcomes since the aggregated sample is balanced on required baseline measures. The analytic sample sizes for the labor market outcomes in Kansas and Kentucky do not match up with the samples for which the WWC had baseline information. Therefore, in Kansas and Kentucky, only the education outcomes meet standards and are coded in this review. The follow-up period for the percent employed outcome for Illinois and Louisiana differs, so the results are not aggregated. In response to a query, the author reported that standard deviations of continuous outcome variables are not available.

Recommended Citation

What Works Clearinghouse, Institute of Education Sciences, U.S. Department of Education. (2020, September). *Integrated Basic Education Skills and Training (I-BEST)*. Retrieved from <https://whatworks.ed.gov>.