SOCIAL POLICY RESEARCH
ASSOCIATES

ICE Third-Party Evaluation

Final Evaluation Plan
May 18, 2015

Prepared by:
Social Policy
Research
Associates

Prepared for:
Christy A. Doyle, M.Ed.
Dean of Instruction
Health Professions and Nursing
North Idaho College
Coeur D'Alene, ID

Project No. 3116

1330 Broadway, Suite 1426
Oakland, CA 94612
Tel: (510) 763-1499
Fax: (510) 763-1599
www.spra.com

I. CONTENTS

II. INTRODUCTION

Working as a consortium composed of three community colleges in Idaho (North Idaho College, Lewis-Clark State College, and Idaho State University College of Technology), the Idaho Center of Excellence Healthcare Partnership (ICE) aims to transform educational delivery methods and accelerate credential attainment in the healthcare field for three distinct pathways—diagnostic services, health informatics, and therapeutic services. ICE will serve 360 Trade Adjustment Assistance (TAA)-eligible workers, veterans, and other individuals from across the state.

ICE has selected Social Policy Research Associates (SPR) to conduct the third-party evaluation of this Trade Adjustment Assistance Community College and Career Training (TAACCCT) Round 4 grant. Their evaluation, outlined in this report, will focus on the major aspects of the ICE initiative, including the administrative and partnership structures established to guide the initiative, the development and launch of the initiative's major components, and the initiative's outputs, outcomes, and impacts.

Within the larger evaluation, the implementation study is designed to provide essential information on the design and implementation of ICE at both the college level and the consortium level. SPR will document what was accomplished with regard to the following: building partnerships to support the initiative; managing and operating the initiative; engaging employers, designing and rolling out new curricula; developing online and technology-enhanced instructional materials; obtaining faculty buy-in; training faculty on new course materials; assessing and addressing the needs of students; teaching students healthcare skills in the targeted pathways; and providing students with needed supports. The evaluation will identify factors that have impeded or facilitated project implementation, how challenges were overcome, and promising practices. Data sources for the implementation study will include a full-day site visit to each college, telephone interviews and check-in calls, and the review of planning documents and curricular materials.

In addition to the implementation study, SPR will conduct an outcomes study and an impact study. For the outcomes study, SPR will draw on data obtained by the consortium from systems of participating colleges to measure the number of students who enrolled; the number who completed grant-funded programs of study; the number who were retained in each field of study; the number who earned college credit, degrees, or certificates (by type); the number who were retained in their programs; and the number of credits earned. For the impact study, due to challenges related to using a random assignment-based experimental design, SPR has opted for a quasi-experimental design using matched comparison groups. This design will compare program participants with comparison groups of similar individuals who have received no services from the intervention being studied. The comparison groups will be selected via statistical methods, such as propensity score matching, to be as similar as possible to the treatment groups, based on a set of individual-level variables.

III. INTERVENTION

ICE aims to transform training in the healthcare field through five main strategies:

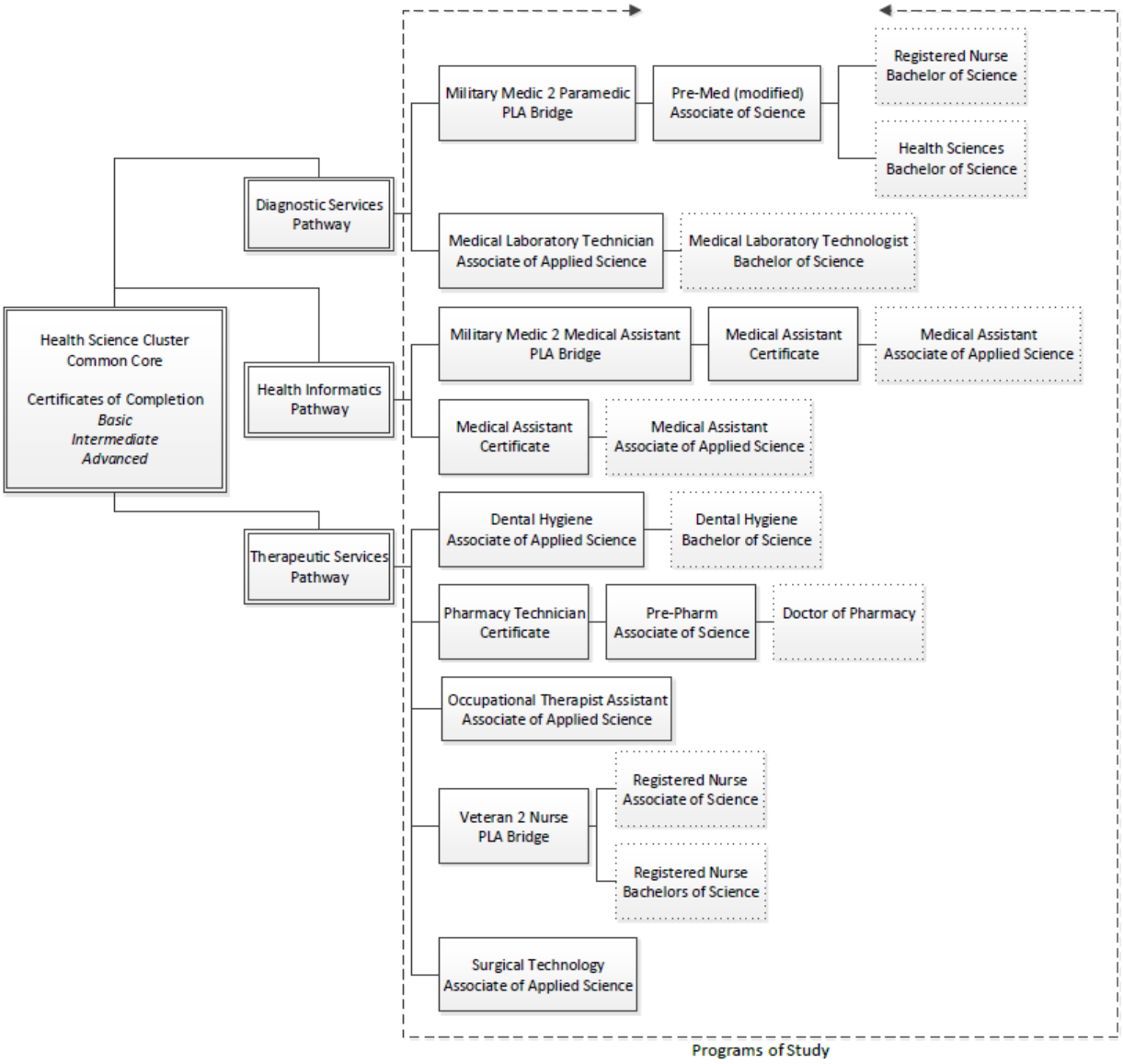
- Evidence-based design will enhance student services and facilitate the development of standard practices for awarding credit in prior learning.
- Diagnostic services, health informatics, and therapeutic services career pathways will be created through the development and enhancement of associate of science (AS) degrees, associate of applied science (AAS) degrees, and certificate programs that align with industry standards and credentials.
- Students' access to training will be maximized by building on existing and creating new online technology-enabled courses and host-provider model curricula.
- Emerging competency-based pathways will be linked across colleges through new memoranda of understanding (MOU) that facilitate access and accelerate paths toward credential attainment.
- Sector strategies will be enhanced by engaging employers and introducing or expanding clinical sites.

To meet the workforce demand of the healthcare industry in Idaho, the consortium will collaborate to create and adapt certificates and degrees in three pathways: diagnostic services, health informatics, and therapeutic services. At least six degree programs will be introduced, at least two certificate programs will be enhanced, and three prior learning assessment bridge opportunities will be created. ICE will build on the existing strength of each college in order to develop competency models and corresponding credentials that will be validated by industry and shared with other member colleges. These stackable and latticed credentials will address the uniform need of employers for increased technical skills; they will also use technology-based and online learning strategies to reach students across the colleges and in rural regions. Each new or enhanced program will be developed by

one consortium college but shared with others through memoranda of understanding (MOU) and the host-provider delivery model. Several healthcare groups, including but not limited to the Idaho Hospital Association, Kootenai Health, Heritage Health, and Idaho Rural Health Consortium, will serve as ICE's industry representatives in a key advisory role, as well as provide feedback on curriculum and program design.

As indicated in **Exhibit 1** below, all students entering the targeted career pathways will complete a set of common core prerequisites. Upon passing the prerequisites, students will select a pathway and continue their coursework. Programs offered within the pathway can lead to national and state recognized certifications and to further degrees in the identified disciplines, such as associate of applied science (AAS), associate of science (AS), bachelor of science (BS), and doctoral degrees.

Exhibit 1: ICE's Stackable Credential Model



ICE is building its career pathways strategy on an existing evidentiary base. It seeks to harness the known advantages of sectoral-based training[i] by developing diagnostic services, health informatics, and therapeutic services curricula that are aligned with industry-driven competencies. In addition, the consortium plans to integrate accelerated and contextualized remediation into the project, for example using co-requisite courses rather than prerequisites, based on existing research showing that students participating in accelerated models have higher rates of completion.[ii] Simulations developed as part of the initiative are aimed at increasing student knowledge and retention, as supported by existing

research.[iii]

While the three colleges are each expected to serve as the "lead" for enhancing and developing curricula for specific programs, North Idaho College (NIC) will take on the majority of this work. NIC will benefit from the services of a grant-funded curriculum development and faculty support specialist and an instructional designer, both of whom will be supervised by the eLearning director at the college. This team will assist faculty from all consortium members in preparing and enhancing curricula using the Quality Matters model of peer-based curriculum review to ensure the consistency and quality of the new material (see a detailed description of the model at https://www.qualitymatters.org/). A partnership with the Idaho Simulation Network will ensure that clinical work can be supervised remotely, allowing students in rural areas to learn in their communities.

A prior learning assessment coordinator will assist ICE colleges in establishing a prior learning assessment strategy based on Council for Adult and Experiential Learning (CAEL) standards. Once developed, these standards will be applied uniformly across the consortium colleges and maintained electronically. This will enable students, especially veterans, to receive credit for prior learning, and thus to advance more quickly through their chosen pathways.

Students will also benefit from a variety of student support staff. Student success navigators will be housed on at least two campuses, and they will assist students in navigating complex educational systems and overcoming barriers as they arise. An employment transition coordinator will also support students as they seek clinical or externship placements and, eventually, employment. This coordinator will work closely with grant staff, faculty, employers, and regional Idaho Department of Labor offices to connect students to their next steps.

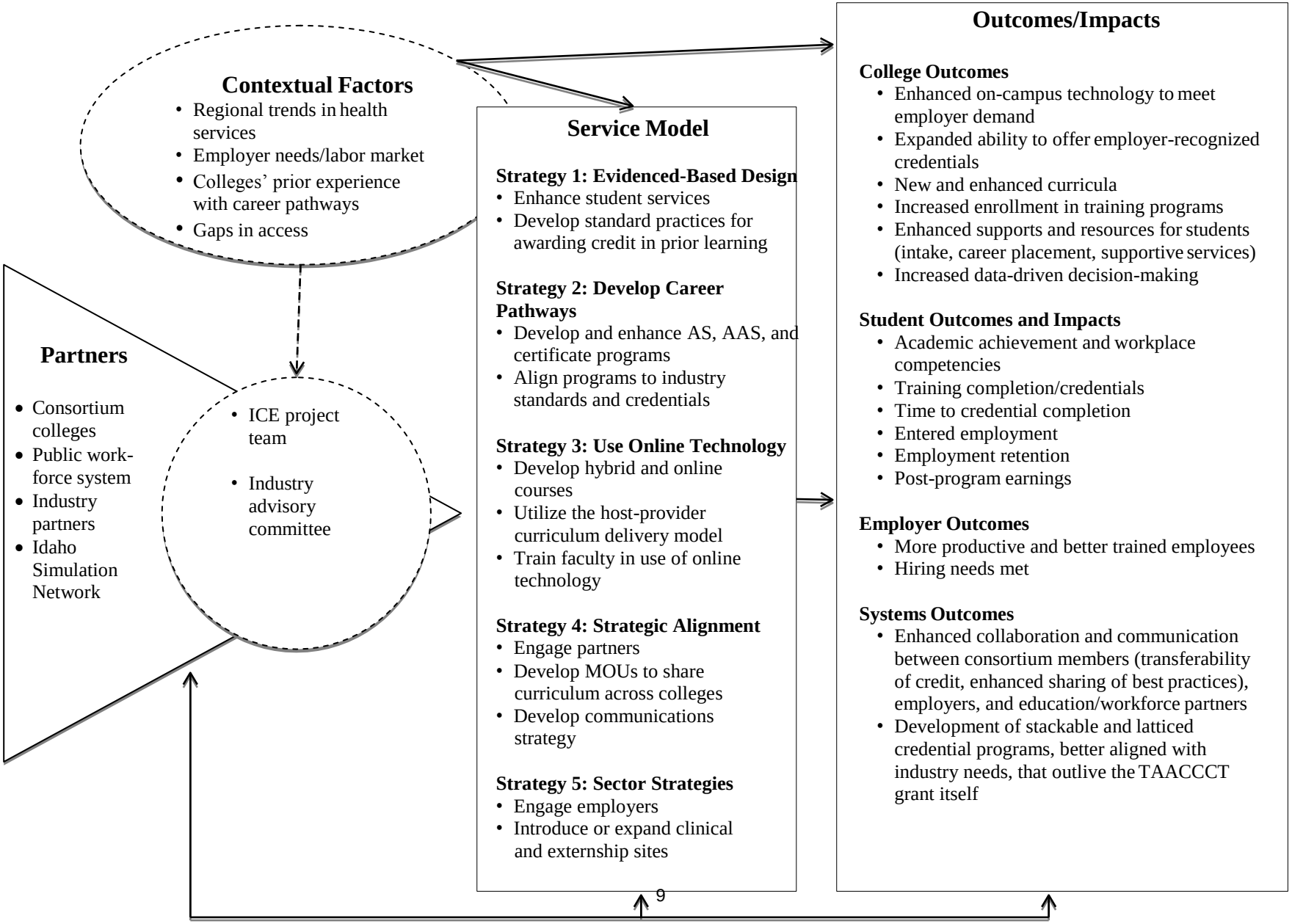
IV. IMPLEMENTATION ANALYSIS DESIGN

The implementation study will provide essential information on the design and implementation of the initiative at both the college level and the consortium level. The logic model presented in **Exhibit 2** below provides an overview of the initiative, including core partners, the service model, and anticipated outcomes and impacts. This logic model acknowledges contextual factors that may influence implementation and outcomes such as regional trends in health services, labor market conditions (including, but not limited to, employers' difficulty in finding job-ready workers), and strengths or gaps in the ability of each of the colleges to implement the core grant strategies.

Among the strengths that consortium members bring to the ICE initiative are: the experiences of each college with hybrid and online programs and distance-delivered instruction; prior participation in Round 1 and 2 TAACCCT programs; the involvement of employer partners, the Idaho Simulation Network, and the public workforce system; as well as support from the Idaho Board of Education and the Idaho Division of Professional-Technical Education. Gaps include the need to achieve approval for a large number of new curricula in an abbreviated time period, the challenge of making existing training programs more accessible to students in rural areas and better aligned with industry needs, and the need to share programs of instruction in order to facilitate transferability despite each consortium member operating independently.

The left side of the exhibit shows the partners most likely to be central players in the initiative's success. These partners include member colleges, the public workforce investment system, industry partners, and employers. The model also shows the primary vehicles for partner communication and collaboration, including the ICE project team.

Exhibit 2: Logic Model



The middle panel of the exhibit shows five key components of the initiative that map onto the ICE work plan. These strategies focus on using evidence-based design to enhance student services, creating supportive career pathways for students by developing stacked and latticed credential and degree pathways, building online and technology-enabled courses to facilitate student access, linking pathways through MOUs to facilitate and speed student access, and promoting health sector strategies by engaging employers and connecting them to students.

The far right of the exhibit shows potential outcomes at the college, student, employer, and systems levels. At the college level, potential outcomes include enhanced technology and curricula, expanded credential programs, better alignment between training programs and industry needs and standards, and increased supports and resources for students. At the student level, potential outcomes include completion of relevant credentials, expedited pathways to certificates and degrees, and improved job prospects upon program completion. At the employer level, potential outcomes include access to more productive employees, which should yield benefits in the form of decreased time needed to fill vacant positions with qualified workers and improved work performance. At the systems level, potential outcomes include the development of stackable and latticed credential programs that are better aligned with industry needs and outlive the TAACCCT grant.

IV.A. Implementation Analysis Research Questions

The logic model just described gives rise to key questions that the evaluation will address. These questions relate to the influence of contextual factors, the nature of partnerships and project management, the service model, and the outcomes and impacts derived from the intervention. Research questions pertaining to outcomes and impacts will be described in a subsequent section; all other key research questions are presented below.

Exhibit 3: Implementation Study Research Questions

What contextual factors influenced the implementation of the initiative?

- What factors facilitated implementation? What factors inhibited implementation?
- What contextual challenges did ICE partners face? How did they address these challenges?

What administrative and partnership structures were established to guide the initiative?

- What was the program and administrative structure? What was each college's role? What activities did North Idaho College take on in order to coordinate and provide oversight for the ICE program?
- What were the reasons behind the division of grant staff into administrative and program functions?
- What roles did partners (workforce partners, employers, philanthropic organizations, etc.) play in program design, curriculum development, recruitment, training, placement, program management, leveraging of resources, and commitment to program sustainability?
- How did partners communicate and coordinate their activities?
- What factors contributed to partners' involvement or lack of involvement in ICE consortium efforts?
- Which contributions from partners were most critical to the success of the program? Which contributions from partners had a more minor role?

What was the nature of outreach to and assessment of eligible participants?

- What strategies did colleges use to recruit eligible participants? What were the characteristics of those engaging in each of the ICE training programs?
- What role did workforce partners play in referring potential students to the program?
- Were in-depth assessments of participants' abilities, skills, and interests conducted to select or enroll participants into ICE? What assessment tools and processes were used? Who conducted the assessments, and how were the results used? Were the results useful in determining the appropriate programs and course sequences for participants?
- What role did student success navigator and other grant staff play in helping to identify stacked educational pathways for students?

How was each of the initiative's major components developed and launched?

- How were programs and program designs improved or expanded using grant funds? What delivery methods were offered?
- How were curricula selected, used, and/or created? What role did the Quality Matters model play in the process? What professional development opportunities did instructors need in order to learn how to use the new curricula? How was it shared across consortium members?
- What career guidance was provided? How were career guidance methods enhanced by the grant (e.g., enhanced use of Labor Market Information; increased use of assessments; hiring of employment transition coordinator, etc.)? What effect did career guidance have on student experiences?
- What employment opportunities were created? How were these developed? How did they differ across consortium colleges?
- What support or other services were offered? Did the use of PLA increase due to the grant?
- What technology-enabled courses, simulations, or host-provider curriculums were created? How were these developed? Did these expand access to educational pathways and opportunities for students?
- How successful were colleges at creating MOUs to share curricula? What influence did these linkages have on students' experiences?

What key lessons were learned?

- What new programs of study (leading to what credentials) were developed, and which of these will be sustained after grant funding expires?
- What other key grant-related elements will be sustained after grant funding expires?
- What factors contributed to the success of the grant initiative overall? What lessons were learned? What implementation challenges were encountered and how were they overcome?

IV.B. Implementation Analysis Data Strategies

Qualitative data collection activities for the implementation study will include a full-day site visit to each consortium college, telephone interviews and regular check-ins, document reviews, and attendance at project convenings. Each of these activities is described below.

Site Visits. SPR will conduct a site visit to each of the consortium colleges during the fall term of 2016. By visiting the colleges midway through the grant, SPR will be able to ask questions about any implementation challenges experienced and also observe the maturation of the grant initiative. The site visits will include a mix of the following activities:

- Semi-structured interviews with college administrators and ICE grant administrators or leads to learn about program management, start-up, sustainability, and college-level activities.
- Semi-structured interviews with ICE staff members, faculty, and curriculum support staff to learn about design and delivery of the training program, faculty training, student recruitment, student support, and job placement activities. The visit will also include interviews with staff members from any training programs selected as comparison programs for the impact study, to learn about how these programs compare with ICE in terms of length, intensity, job market outlook, and support services provided.
- Brief phone interviews with partners, such as representatives from the local workforce investment system or employers, to learn how ICE works with them.

A sample schedule for the first round of site visits is shown in **Exhibit 4**. Note that the schedule will be customized to accommodate the availability of respondents and the schedule of activities at each college. In addition, visits to North Idaho College will include interviews with consortium-level staff such as the overall project director, grant financial technician, prior learning assessment coordinator, and any student support or curriculum development support staff members who are housed only at North Idaho College.

Exhibit 4: Sample Schedule for Early Implementation Visits

8:30 – 10:00 am	Interview Project Director/Grant Lead
10:00 – 11:00 am	Interview College Administrator Involved with Grant
11:00 am – 12:00 noon	Interview College Admissions and Intake Staff
12:00 – 1:00 pm	Lunch
1:00 – 2:30 pm	Interview Student Support Staff
2:30 – 4:00 pm	Interview Instructors and Curriculum Development Staff
4:00 – 4:30 pm	Conduct Wrap-up Interview with Grant Administrator

At the Conclusion of each site visit, site visitors will prepare detailed internal write-ups summarizing visit findings. These write-ups will be used in a cross-site analysis that will inform preparation of reports for the consortium.

Telephone Interviews and Check-Ins. To supplement the face-to-face data collection that will occur during site visits, SPR will conduct formal telephone interviews and shorter check-in calls with the consortium and college grant leads. These calls will be conducted by a dedicated evaluation liaison who will also conduct the site visits, ensuring familiarity with the colleges. The phone interviews will take place annually, and will enable SPR to stay abreast of project progress and the evolution of project initiatives, as well as to solicit input on guidance requested for continuous quality improvement. These will be supplemented by shorter check-in calls every other month, which will enable SPR to maintain relationships with the colleges and understand day-to-day project workings.

Document and Instrument Reviews. Another implementation study data collection

activity will be to conduct regular reviews of key ICE documents. These documents will include the proposal submitted to the U.S. Department of Labor for the TAACCCT grant, notes from consortium conference calls and in-person meetings, and relevant curricula documents such as the core competencies for each training program, Quality Matters curricular review materials, and MOUs among consortium members. Finally, the document review will include any materials SPR collects during site visits, such as staffing and organization charts, program policies, class schedules and curricula, case planning and service delivery documentation and tracking, and data collection tools. The evaluation team will review these materials when preparing for each of the site visits, developing internal site visit write-ups, and preparing evaluation deliverables such as reports.

Attendance at Convenings. Consortium members will come together periodically to plan and discuss the unfolding of the TAACCCT initiative. SPR will send a representative of the evaluation team to these convenings to deepen understanding of the dynamics of the consortium, to examine at close-hand the collaboration of consortium members, and to observe the ongoing design and adjustment of the ICE model over the lifetime of the TAACCCT grant. Observations recorded during these retreats will be captured using specially designed protocols. Another purpose of the evaluation team's attendance at these meetings will be to keep consortium members abreast of evaluation activities and to report on evaluation findings. For example, at any convenings that follow the completion of draft evaluation deliverables, the evaluation team member will present a briefing on the key findings of that deliverable. At all convenings, SPR will also provide updates on the progress of the evaluation and upcoming evaluation activities.

The implementation evaluation will include the analysis of cross-site data using both

descriptive and analytic methods. Taking a descriptive approach, the evaluation will document what was accomplished, including with regard to the following: building partnerships to support the initiative; managing and operating the initiative; engaging employers; designing and rolling out new curricula; developing online and technology-enhanced instructional materials; obtaining faculty buy-in; training faculty on new course materials; assessing and addressing students' academic needs; teaching students healthcare skills in their chosen pathways; and providing other supports to students.

Analytically, the evaluation will use the logic model presented earlier in this evaluation plan to identify the factors that have impeded or facilitated project implementation, how challenges were overcome, and promising practices. To assist in this cross-site analysis, the research team will develop ways to characterize each of the colleges on a consistent set of dimensions such as the nature of the target population, the nature and quality of services, the extent of relationships with partners, and others. The study team will also use administrative data to build an understanding of what participant support services look like at each member college, as well as to examine enrollment patterns. The colleges are likely to vary from each other in multiple ways. As such, given the small number of sites, such an analysis can be only suggestive.

V. OUTCOMES/IMPACT ANALYSIS DESIGN

As part of its evaluation of ICE, SPR will conduct both an outcomes study and a quasi-experimental impact study. For the purpose of both these components, the evaluation will divide ICE participants into research groups based on services received. Since, for example, a one year certificate is not comparable with the coursework necessary to earn an associate's degree, outcomes and impacts of these programs have to be analyzed separately. Given the incipient stage of the ICE implementation, it is premature to make a definitive decision about the number or nature of these program groupings. Many of the programs funded by the initiative are still in the planning stages, and approval of new or enhanced programs of study is often a complex process that depends on factors largely outside the control of the grant team.

The goals of the outcomes study are to tabulate the outcomes of the ICE initiative at the participant, employer, and college levels, and to identify the features of ICE that are associated with positive outcomes. The evaluator will analyze data provided by the consortium from the colleges' data systems to measure the number of students enrolled in each participant group, the number who completed grant-funded programs of study, the number who were retained in particular fields of study, the number who earned college credit, degrees, or certificates (by type), the number who were retained in their programs of study, and the number of credits earned.

The impact study will enrich the findings of the outcomes study by attempting to establish whether the student outcomes associated with ICE are significantly different overall from the outcomes that would have occurred in the absence of the initiative. The strongest impact study design for the evaluation would have been one based on random assignment of

study participants. Such a design would have compared outcomes of a treatment group of ICE participants with a control group of eligible and interested applicants who were randomly assigned not to be provided with any ICE services. The use of this design would have ensured that the treatment and control groups were virtually identical (except by chance) on almost every possible characteristic up to the time of random assignment.

In the case of ICE, however, the use of a random assignment design is infeasible for two reasons. First, a substantial number of participants may be either TAA participants or veterans served with federal funds—groups that, because of federal law or policy, cannot be denied services to which they are entitled. Second, randomly assigning tuition-paying students would effectively deny some of them the services of their choice, which, in the absence of a capacity constraint, would be highly problematic and likely unethical.

Due to the challenges related to using a pure experimental design, SPR has opted for a quasi-experimental design using matched comparison groups. This design will compare program participants with one or several comparison groups of individuals who attend similar programs of study not affected by the intervention being studied. Using statistical methods such as propensity score matching, the comparison groups will be selected to be as similar as possible to the treatment group based on a set of individual-level variables.

V.A. Outcomes/Impact Analysis Research Questions

Drawing on the logic model presented above, the key questions to be answered by the outcomes study include the following.

Exhibit 5: Outcomes/Impact Study Research Questions

How many participants were enrolled in each of the ICE training programs?

- How many participants entered each program?
- How many participants actually completed their programs during the study period?

How many individuals discontinued their studies before program completion?

- How many participants earned credentials? What credentials did they earn?

What were the outcomes for participants, as measured by average program completion rate, average post-program employment status, and average quarterly earnings after program completion?

What features of the intervention were positively associated with participant outcomes, controlling for other variables? Were these factors different for different groups of participants?

What outcomes did the colleges achieve?

- What new curricula were disseminated beyond the consortium?
- How were partnerships developed and enhanced as a result of the initiative and how many of those partnerships will be sustained after the grant ends?

What were employers' experiences with the initiative?

- How well did the initiative succeed in meeting employers' hiring needs?
- Are employers satisfied with the students they hired? How do these new employees compare to others, with respect to level of skills upon hire, ability to advance, and retention?

For the impact study, two key questions will guide the data collection:

- After controlling for baseline characteristics, are there statistically significant differences between students in the program and comparison groups in terms of credit hours earned, program/certificate completion, transition to further educational programs (to the extent such transitions are reliably captured across partner colleges), employment, and earnings after exit?
- Does the size of the impact vary according to socio-demographic characteristics or program of study?
    - Is there variation by sex, age, race/ethnicity, previous employment history, previous educational history, receipt of remedial education or financial aid, and/or veteran status?
    - How do impacts vary for students in each of the major types of programs of study (bridge, one year certificates, two year degrees)?

V.B. Outcomes Analysis

To the extent that data are made available to SPR, all the participant outcomes presented in Appendix F of the Solicitation for Grant Applications (SGA) will be tabulated and presented: number served, number who have completed a grant-funded program of study, number retained in their programs of study, number of credit hours earned, credentials and skill competencies attained, number pursuing further education after ICE completion, number who are employed after program completion, and average earnings after program completion. Additional system-level outcomes, such as program sustainability after grant completion, student support elements retained after grant completion, and diffusion of the curriculum developed under the grant to

other colleges, will be tabulated and reported.

V.D. Non-experimental Design

The design for the impact evaluation of ICE takes into consideration that the consortium is preparing several distinct tiers of training programs (as described in Section III). However, further distinctions are possible within these tiers of programs based on the extent of grant-funded interventions (for example, for programs at different colleges). If a type of program is expected to have only a small number of participants, the evaluation team may consider folding those participants into an existing tier, or not conducting an impact analysis for that program.

The challenge for the design of the impact evaluation is identifying one or more suitable comparison groups for each tier. There are several possibilities. First, other health-focused programs of study at the same colleges may provide adequate comparison pools of participants. In this way, there will be some assurance that the comparison group students are pursuing training that is geared towards helping them achieve employment in the same industry and general labor market as the ICE program students. A challenge to this approach is that there may not be such health programs of study at consortium colleges not affected by ICE, or that the numbers enrolled in these programs may be too small to identify a matched pool. The evaluation of bridge programs in particular is likely to be confronted with such a challenge, as participating colleges may not currently offer similar programs. In this case, the evaluator will consider broadening the pool to include students in other technical fields of study with a stackable credential model and/or in programs of similar length and perceived difficulty. Another alternative is to seek matches from other colleges in the state (ideally in the

same local labor markets) not participating in the consortium; however, this option poses challenges for data access, and therefore may be infeasible. If these options prove unsatisfactory, SPR will explore selecting comparisons from TAA or Workforce Investment Act (WIA) participants served in the state. In general, the evaluator's preference is to find matches from the same participating colleges in the same periods of time in similar technical fields of study as TAACCCT participants; the other options become alternatives to consider if this preferred approach proves infeasible.

Once an appropriate pool is identified, the comparison group should be selected to be similar to the program group on a set of matching variables, including demographics, educational background, and, ideally, employment history. The specific matching variables used will be constrained by the pool from which the selection is made as well as the associated data systems. Drawing from whatever variables are available, propensity score matching will be used to select comparison group members who are most like ICE group members.[iv] A logit model will be estimated whereby a binary dependent variable that equals "1" for an ICE group member and "0" for potential comparison group members is regressed on the matching variables discussed above. The propensity score is the predicted probability from the logit model, a single number that is a function (weighted sum) of the individual's values for the matching variables.

For each type of participant, a comparison group member with the closest absolute propensity score, the "nearest neighbor," will be selected. The selection process will be done with replacement, so that a potential comparison group member can be matched to several ICE sample members. SPR will also explore the use of other matching approaches such as caliper matching where, for each ICE participant, comparison group members are selected with

propensity scores within a fixed band of the participant's propensity score. Thus, the primary approach will be to use the simplest "nearest neighbor" method, although SPR will assess the sensitivity of the matches using caliper matching and possibly other methods.

V.E. Outcomes/Impact Data Collection and Analysis

The primary sources of outcomes/impact data will be college records, Unemployment Insurance (UI) data on employment and earnings, and possibly additional sources such as student intake forms or surveys.

Outcomes Data Collection and Analysis

SPR will work with the consortium colleges to access educational data for participating students. Although the colleges use different systems (e.g., Banner, Colleague, ELLucian) to maintain student-level records, the Idaho State Board of Education (SBE) maintains a Statewide Longitudinal Data System (SLDS) where postsecondary educational institutions from Idaho upload data. The data dictionary published by the SBE's Data Council includes several data fields that are potentially useful for the evaluation, including (for students enrolled in credit programs) the programs in which students enroll, courses and tests taken, degrees and certifications awarded, financial aid, and socio-demographic information. For students enrolled in professional technical education programs, several data fields are collected as well, including number of training hours and certificate completion. SPR will work with ICE's data analyst to gain access to these data sources, and will provide technical assistance to the consortium in its efforts to collect educational data across all consortium colleges.

SPR will also work with ICE to obtain approval to access participant employment and post-program earnings data, possibly from the Idaho Department of Labor (IDOL). Initial conversations between the evaluator and the ICE consortium indicate that a data sharing

agreement between IDOL and SBE to access wage records already exists, and the consortium could potentially utilize it for this purpose (although so far no data transfer seems to have actually occurred). Although UI data have certain drawbacks, including a typical six-month lag between when a quarter ends and data are populated in state UI data systems, UI wage records are generally considered a more reliable source of employment and earnings information compared to other methods such as self-reported data through surveys or employer-supplied information.

Although data captured in the UI system vary by state, at a minimum the employment status of students (employed or not employed) and the amount they earned in each calendar quarter should be available from these data sources. Given that the evaluation has a projected end date of September 2018, employment and earnings data should be available starting from each student's date of enrollment in TAACCCT through approximately the end of calendar year 2017. SPR will offer technical assistance to ICE in its attempt to obtain the necessary UI wage data from IDOL. However, another promising avenue will be to obtain data from the DOL's Workforce Data Quality Initiative (WDQI), which supports the development of longitudinal databases that link workforce and education (including community college) management information systems.

To assess the relationships between various program components and participant outcomes, a series of multiple regression models will be developed where the dependent variable is an outcome of interest, measured at the individual level. The focus of these models will be on individual-level outcomes because the alternative—to develop program-level or college-level aggregate models—is infeasible due to expected small sample size. The analysis will focus on three ICE participation outcomes: program completion, post-program

employment, and post-program earnings. Using multivariate regression will allow SPR to calculate the association between various program features and outcomes while controlling for covariates, thus improving the precision of estimates.

Another important feature of the planned multivariate analysis of participant outcomes is that it will be conducted using data collected at least at the student level and program level, and possibly at the college level, as well. The dependent variables, all of which will be measured at the individual level, will be regressed on a set of independent variables measured at all levels. The result will be a series of multilevel models where individual characteristics are labeled as level-1 variables, program characteristics are labeled as level-2 variables, and college characteristics are considered level-3.

Multilevel models are necessary for both methodological and analytical reasons. Methodologically, one of the basic requirements of multivariate regression is that individual observations be independent of each other.[v] Since participants are clustered into programs that differ in specific ways (such as length), however, it is reasonable to assume that student-level outcomes will be influenced by program-level factors, thus potentially violating the principle of independent observations. In addition, the colleges in which programs are nested differ in their organizational cultures, governance, and educational foci. Likewise, the regions in which these colleges are located may differ in regional economic conditions. Multilevel modeling can account for this hierarchical data structure by adjusting the standard error of estimates. Finally, multilevel modeling will also allow SPR to estimate the association between both individual- and program-level interventions and participant outcomes, which could produce analytically interesting findings.

As stated above, the planned design involves participants nested within programs that

are in turn nested within colleges. The level-1 model specifies how participant-level predictors relate to participant-level outcomes. At level 2, each of the regression coefficients defined in the level-1 model, including the intercept, may be predicted by program-level predictors, and each may additionally have a random component of variation.

Mathematically, at level 1, the outcome Y_{ij} for student i in program j (i = 1…n; j = 1…n) varies as a function of student characteristics, X_{ij}, and a random error r_{ij}, according to the linear regression model

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + r_{ij} \quad (1),$$

where β_{0j} is the intercept and β_{1j} is a regression coefficient indicating the strength of the association between each participant-level predictor and the participant outcome within program j. For the sake of simplicity, the model is restricted to just one predictor, although for the actual modeling several will be used.

At level 2 (the program level), the regression coefficients defined by the level-1 model become outcome variables to be predicted by a program-level characteristic Z_j, according to the regression models

$$\beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + u_{0j} \quad (2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}Z_j + u_{1j} \quad (3)$$

where γ_{00} and γ_{10} are intercepts, γ_{01} and γ_{11} are regression coefficients, and u_{0j} and u_{1j} are program-level random error terms.[vi]

Substitution of (2) and (3) in (1) gives:

$$Y_{ij} = \gamma_{00} + \gamma_{10}X_{ij} + \gamma_{01}Z_j + \gamma_{11}Z_jX_{ij} + u_{1j}X_{ij} + u_{0j} + \varepsilon_{ij} \quad (4)$$

In addition to these two levels (individual and program), a third level (college) may be added to the multivariate analysis. However, SPR will defer the decision to include this third

level to a later time, after more data are available. An analysis of variance will allow the calculation of an intraclass correlation coefficient (ICC) for each of the three levels of analysis. A large ICC indicates strong association between the members of the same group, suggesting that that the multilevel model is most appropriate.

Impact Data Collection and Analysis

A successful quasi-experimental evaluation using matched comparison must attempt to minimize all potential sources of difference between the study groups other than participation in ICE. Following the literature,[vii] comparisons should be drawn from the same local labor markets using a rich set of matching variables, and variables for treatments and controls should be measured using the same data sources over the same points in time. This requirement can pose considerable challenges in designing data collection activities. In addition, these challenges may be different for different groups of participants.

For example, some TAACCCT-funded programs might not be similar, in terms of length and focus, to programs that are already being offered by the partner colleges. It might therefore be difficult to select a valid comparison group using participants enrolled in other programs at the same college, which is otherwise the preferred strategy for collecting comparison data. However, if comparable programs are identified, the potential availability of SLDS and IDOL data might facilitate building adequate comparison groups.

If this option is infeasible, SPR will explore selecting comparisons from TAA or WIA participants served in the state; this option would require making use of Trade Act Participant Records (TAPR) or Workforce Investment Act Standardized Record Data (WIASRD). This option will give SPR the ability to build comparison groups, but only to the extent that most participants are co-enrolled in either TAA or WIA; otherwise, data on the participant and

comparison groups would come from different sources.

The main problem anticipated in using college administrative records for the impact study is that it might affect the evaluator's ability to obtain complete labor market outcomes data. While ICE participants might sign a waiver giving the college (and, by extension, evaluators) access to their data, partner colleges might be unwilling to release data for participants in training programs selected as comparison groups who did not sign such a waiver. To prevent such objections, SPR proposes to receive only de-identified data (i.e., data that have been stripped of any Personally Identifiable Information) from ICE. In addition, SPR plans to submit its research procedures for review and approval to all partner colleges, and to execute a data sharing agreement with ICE that will describe procedures SPR will use to protect student information. Such safeguards often help to overcome concerns that schools and agencies have regarding the sharing of data.

Theoretically, because the procedure used to select the comparison groups will have yielded well-matched comparison groups, it will be possible to estimate the impact of ICE as a simple difference in outcomes between groups. However, for two reasons, regression procedures will be used to estimate these impacts. First, these procedures produce more precise impact estimates. Second, they can adjust for any differences in the observable characteristics of ICE and comparison group members due to residual differences after matching.

To conduct the regression, variants of the following model will be estimated:

$$y = \propto + \gamma ICE + \beta X + \varepsilon \quad (5)$$

In this model, y is an outcome variable at a specific point in time, ICE is a dummy variable equal to "1" for ICE group members and "0" for comparison group members, Xs are

explanatory variables used in the matching process that are associated with key outcome measures, ε is a mean zero error term, and α, γ, and β are parameters to be estimated. The estimate of γ represents the regression-adjusted impact estimate of ICE on the outcome variable, and the associated t-statistic can be used to gauge the statistical significance of the impact estimate. All the models will be estimated as multilevel models, in a manner similar to the approach designed for the outcomes study.

VI. LIMITATIONS

Limitations and challenges of this evaluation stem from difficulties in obtaining administrative data and from data analysis issues that include uncertainty regarding the appropriate counterfactual, small sample sizes, and the absence of random assignment.

Data Collection

Obtaining College Administrative Data

The evaluation team will endeavor to collect college administrative data for both program and comparison group members. Several potential challenges in collecting these data could pose limitations for the analysis:

- *Ability to access data for those in the comparison group*. TAACCCT participants might be asked to sign a permission form that authorizes the release of their college records (and other data) to the third-party evaluator. However, the identities of comparison group members will be known only well after they begin their programs of study, and therefore these students are unlikely to have signed permission forms. Due to colleges' interpretations of the Family Educational Rights and Privacy Act (FERPA), college administrators may be unwilling to provide college records for comparison group members to the evaluator. In this case, the ability of SPR to conduct individual-level analysis in order to estimate impacts, as described earlier in this report, could be severely compromised. One alternative would be for colleges to provide de-identified data for those in the comparison group, but some colleges might still view this solution as unsatisfactory. Another alternative might be for the evaluators to conduct aggregate-level analysis. However, this strategy compromises the use of statistical controls and would make the hierarchical models described

above infeasible.

- *Potential non-comparability of data available across the colleges*. SPR is still investigating what data elements can be accessed from each of the colleges. At a minimum, they will include information on courses taken, credits earned, and credentials, certificates, and degrees awarded. However, the success of propensity score matching hinges on the availability of rich matching variables measured in the pre-program period, and it is still uncertain exactly which variables will be made available. If there were to be only a few matching variables available in college databases or the SLDS data, or if the variables that were available differed across the colleges, the evaluator's ability to match on a rich set of variables would be undermined.

Employment and Earnings Data

- *Difficulty in obtaining UI data*. The evaluation relies on data provided by IDOL to the ICE consortium to conduct its outcome and impact analyses. However, each state agency has its own rules regarding when and to whom UI data can be released, and it is possible that IDOL will be unwilling to extract UI data for study subjects. If this were to be the case, the evaluation team would attempt to access UI data from the state's WDQI data manager. If both sources were to prove unwilling to cooperate, reliable measures of employment and earnings for study subjects might not be available.

Data Analysis

There are several potential limitations to the impact analysis, beyond those that could be caused by inadequate access to data, as described above:

- *Uncertainty regarding the appropriate counterfactual*. Conceptually, the net impact analysis should measure the effect of enhancements to the colleges' curriculum as a

result of TAACCCT grant funding. An optimal research design, then, would require that some TAACCCT applicants be randomly assigned to undertake health programs untouched by TAACCCT, and that others undertake ICE-enhanced versions of these courses. However, for reasons already described, a random-assignment design is not feasible for the study of the ICE initiative. Further, the colleges plan to enhance their programs comprehensively, such that no unaffected programs might remain. Given this, the evaluation design will attempt to identify comparison courses in closely related fields. This approach is less than ideal, however, because ICE courses will be compared to related courses that could be equally likely to lead to credentials and employment at good wages. An impact analysis could therefore mistakenly suggest that ICE courses were not effective, when in fact they might be very effective in yielding good-quality training leading to employment at high wages, but not stronger than comparison programs in related fields.

- *Small sample sizes.* Small sample sizes may affect the study's ability to detect an impact, should one exist. This happens because small sample sizes are associated with large sampling errors, which in turn tend to cause most significance tests to fail to reject the null hypothesis of no impact, unless the impact is very large. Evaluation plans customarily include a power analysis—an analysis that indicates the size of the impacts needed in order to detect an impact, given anticipated sample sizes. However, as explained above, at the time of writing many ICE programs are still at the development stage, making it difficult to anticipate the size of each of the program and comparison groups. Given the relatively small number of expected enrollments (360), and especially given that only around 200 participants are expected to complete a

TAACCCT-funded program of study, we anticipate that small sample size will be a significant issue.

- *Absence of random assignment.* The absence of random assignment creates the possibility that the treatment and comparison groups may differ in ways that are unaccounted for, thus potentially leading to bias in measuring impact. Although the availability of a rich set of matching variables potentially reduces the amplitude of this problem, it cannot completely eradicate it. In addition, as shown in the data collection section above, a rich set of matching variables is often difficult to obtain.

VII. REPORTS AND DELIVERABLES

Finalization of the evaluation plan began with an in-person start-up meeting held at North Idaho College to affirm the consortium goals and preferences for the evaluation; refine the logic model, key research questions, and data collection and analysis tasks; and explore issues around data availability and access. This Evaluation Plan represents a blueprint for conducting the remainder of the evaluation. Subsequent reports include an Interim Report and a Final Report.

The Interim Report will be delivered in September 2016 and will include findings from the first round of telephone interviews, as well as regular check-ins and document review. These findings will provide the consortium with information it can use to support its goal of continuous program improvement. The report will describe promising practices as well as challenges with regard to staffing, recruitment of participants, curriculum development, and linkages with employers and the workforce development system.

The final report will be delivered at the project's conclusion, in September 2018. It will feature a full implementation study focused on project maturation and sustainability, along with findings from both the outcomes and the impact study. All reports will be provided in draft and final form, giving consortium members a chance to comment on drafts before the reports are finalized. SPR will provide briefings at ICE's convenience.

VIII. REFERENCE LIST

[i] Sheila Maguire, Joshua Freely, Carol Clymer, Maureen Conway, and Deena Schwartz, *Tuning in to Local Labor Markets: Findings from the Sectoral Employment Impact Study* (Philadelphia: Public/Private Ventures, 2009).

[ii] Davis Jenkins, Matthew Zeidenberg, John Wachen, and Craig Hayward, *Educational Outcomes of Cabrillo College's Digital Bridge Academy: Findings from a Multivariate Analysis* (New York: Community College Research Center, Columbia University, 2009).

[iii] Traci Sitzmann, "A Meta-Analytic Examination of the Instructional Effectiveness of Computer-Based Simulation Games," *Personnel Psychology* 64, no. 2 (2011): 489–528.

[iv] Rajeev H. Dehejia and Sadek Wahba, "Causal Effects in Non-Experimental Studies: Re-Evaluating the Evaluation of Training Programs," *Journal of the American Statistical Association* 94 (December 1999): 1053–62.

[v] Joop Hox, "Multilevel Modeling: When and Why," in *Classification, Data Analysis, and Data Highways*, eds. Ingo Balderjahn, Rudolf Mathar, and Martin Schader (New York: Springer Verlag, 1998), 147–54.

[vi] Stephen W Raudenbush and Anthony S. Bryk, *Hierarchical Linear Models: Applications and Data Analysis Methods* (Thousand Oaks, CA: Sage Publications, 2001).

[vii] James Heckman, Robert LaLonde, and Jeffrey Smith, "The Economics and Econometrics of Active Labor Market Programs," in *Handbook of Labor Economics*, eds. Orley Ashenfelter and David Card, vol. 3 (New York: Elsevier, 1999), 1865–2097.

This workforce solution was funded $6,438,050 (100% of its total cost), from a grant awarded under the Trade Adjustment Assistance Community College and Career Training Grants, as implemented by the U.S. Department of Labor's Employment and Training Administration.(#TC-26479-14-60-A-16).The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information linked on sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability or ownership.