Evaluation of the Orange County Information Technology Cluster Competitiveness Project

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December 30, 2015

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I. Introduction

The Orange County Workforce Investment Board (OCWIB) has a longstanding partnership with the Orange County Business Council (OCBC) to conduct an annual study of local workforce indicators, to monitor and identify trends in the local economy. The 2009 report showed that, unlike many industries that had been negatively impacted by the Great Recession, the Information Technology (IT) sector was growing. Major Orange County businesses such as Toshiba, Integrated Digital Technologies, and Cox Communications, which represent a "vertical" IT presence, signaled expected strong growth. IT also cuts "horizontally" across virtually every industry, and major Orange County employers in healthcare, tourism, and advanced manufacturing also reported growth projections in IT positions.

The "cluster" of industries with high concentrations of IT jobs in the County was viewed as having tremendous potential to catalyze economic growth. Yet, despite an abundance of open IT jobs, many were going unfilled due to an insufficient local pool of skilled candidates. The OCBC and OCWIB questioned businesses about this trend and their response was straightforward: there was a disconnect between the IT skills that businesses needed and the education and training programs available in and around Orange County — both in terms of relevant content and capacity. Furthermore, from the perspective of businesses, communications between the business and education communities on this issue had been insufficient and less than fully effective.

In 2012, the OCWIB applied for and was awarded a grant from the U.S. Department of Labor (DOL) Workforce Innovation Fund (WIF) to implement the Orange County Information Technology Cluster Competitiveness Project (ITCCP). The ITCCP sought to establish mechanisms to ensure that businesses and educational organizations worked together to address the shortage of local talent and take full advantage of the opportunities that the IT cluster represents for Orange County's economy. The project aimed to address the fast-changing workforce training needs of businesses within Orange County's IT industry cluster by creating resources that would build a pool of skilled workers and increasing capacity of the region's workforce development system to respond to businesses' needs.

The project relied on two main types of interventions: (1) an intensive, business-led stakeholder planning process; and (2) pilot projects to address the need for developing a local workforce with specific IT skills and to initiate change in the workforce development services system. The initiative convened business and education stakeholders in a process designed to produce a roadmap plotting a course of action to address IT training needs critical to the success of companies in the cluster. The roadmap identified in-demand

skills and recommended a range of pilot projects that were later implemented to achieve project goals.

DOL Workforce Innovation Fund

The DOL Workforce Innovation Fund aims to transform systems, support innovations in programs, and contribute to the evidence base of best practices. The Fund supports programs that restructure and redesign workforce service delivery strategies as well as improvements in systems that lead to positive outcomes for workforce system customers. DOL's objectives were to fund projects that seeded innovation at the systems level, through policies, organizational structures, planning processes, performance measurement, procurement, investment priorities, and information management systems to support service delivery strategies that result in better outcomes and lower costs.

DOL awarded grants to three types of projects on a continuum from those proposing new ideas that had never been tried to those implementing well-tested ideas adapted to new contexts. The ITCCP received an award of approximately $3 million for a Project Type A to develop new and untested ideas. Type A projects are those that proposed new or emerging structural and/or service-delivery reform ideas that had been tried only in limited circumstances (if at all), but were supported by strong logic models and/or preliminary successful outcome data. By focusing on change at both the service-delivery and systems levels, and by requiring rigorous evaluation of each investment, DOL sought to ensure that WIF investments form the basis for broader change and continuous improvement in the operation of the public workforce system.

In addition, the DOL required that WIF grant–funded projects include an evaluation by a third party evaluator. WestEd was awarded the contract to conduct the evaluation of the Orange County Information Technology Cluster Competitiveness Project. This evaluation includes: (1) a formative study of the stakeholder convening process and one pilot project aimed at bridging the digital divide, (2) an outcome study of pilot projects providing education, training, and work experience, and (3) a cost analysis.

Summary of Key Evaluation Findings

The following is a brief overview of some of the key findings presented in this evaluation report:

Formative Study

Stakeholder Convening Process

- **OCBC and OCWIB successfully convened key business and education stakeholders who were knowledgeable about IT training needs in Orange County and who had decision-making authority to provide support for**

and implement new and revised training programs. The OCBC and OCWIB collaborated with and engaged a diverse array of stakeholders from business and education in an effort to identify areas where new or additional IT training and curriculum were necessary and to develop a roadmap for implementing pilot projects to enhance IT training in Orange County.

- **Project leaders and stakeholders generally held positive perceptions of the convening format and process, with business stakeholders holding more positive perspectives on the process than education stakeholders.** Both project leaders and stakeholders reported that the format of the convening meetings developed by the OCBC facilitated open communication and the sharing of ideas — two central goals of the first phase of the ITCCP. Business stakeholders consistently and overwhelmingly expressed positive feedback on all aspects of the convening process and a wish to continue to be engaged, and both project leaders and stakeholders shared suggestions that could help improve future convening processes.
- **Participants in the education stakeholder workgroup held divergent views on the convening process, but consistently provided feedback that direct communication with business stakeholders earlier in the process would have been helpful.** The education and business stakeholder groups were managed differently, and some education members did not respond well to the facilitation strategy until questions and concerns about the process had been addressed.

Bridging the Digital Divide Pilot

- **The provider's experience as a trusted intermediary in Orange County and its capacity to tap existing relationships and leverage resources was instrumental to the pilot's success.** The trust that partners have in the intermediary organization leading the pilot was an important factor in promoting the extensive collaboration necessary to the pilot's success.
- **Engaging teachers by meeting their interests and building their capacity helped to support the pilot.** Teachers took on new responsibilities such as helping to develop curriculum, attending workshops and training to learn the curriculum, learning technology, and taking part in organizing events.
- **The pilot helped to transform teachers' approach to career awareness, exposure, and education.** Teachers developed strategies to support mixed-grade teams rather than being restricted by grade-level benchmarks. Pilot activities also helped foster the understanding that many students do well outside of academics, such as in project-based "maker" programs.
- **The pilot created successful intersections between employers, schools, and colleges by engaging businesses in a number of ways, including as exhibitors and judges in competitions featuring students' products.** The pilot provider leveraged relationships to engage businesses in ways that built on their interests and capacity, and helped coordinate their participation across events.
- **By engaging parents and students, the pilot both promoted career awareness and exploration and established a foundation for action.** Scheduling pilot activities in the evening and on weekends created

opportunities for parents and students to learn together, for students to educate parents, and to connect them with information resources about IT careers and education programs in their communities.

Outcome Study

New and Improved Training Pilot

Participants successfully completed training courses. However, the number of training courses and the number of courses passed were not significantly related to employment or increases in wages.

- The greatest number of courses taken were in the Leadership and Business Administration program area.
- The fewest number of courses taken were in the Business Data Analytics and Process Analysis Level 1 –Foundation program area.
- Unemployed workers enrolled in a significantly greater number of courses, compared to incumbent workers.

The incumbent workers who took courses were still employed at follow-up. Further, 67 percent of unemployed participants were employed at follow-up.

- The training courses will continue to be offered after the term of the grant.

Internship Pipeline Pilot Project

Overall the Internship Pipeline Pilot Projects were successful in placing students and veterans in internships and ensuring a high completion rate for the internships.

- The Internship Matching System met its target to serve 50 student interns.
- The Veterans' Pipeline did not meet its target of serving 30 veteran interns. Although the Veterans' Pipeline (VP) did not meet the target, the program was able to place 21 veterans into internships (representing 70 percent of the target).
- All internships were paid positions.

The biggest facilitators to accomplishing the project's goals were the existing relationships the pilot providers had in Orange County.

- Providers successfully engaged employers in noticing available internship opportunities through their existing networks.
- The online website developed for the Internship Matching system pilot will continue as a fee-for-membership site.

Project Overview

The Information Technology Cluster Competitiveness Project (ITCCP) was designed to address the fast-changing workforce training needs of businesses within Orange County's IT industry cluster (which includes IT companies and businesses in other industries that employ IT professionals) by engaging business and education stakeholders in an intensive planning process and testing pilot projects. The project's goals were to (1) improve alignment between employer demand and education supply; (2) improve a pipeline (i.e., career pathways) for youth, students, and veterans; and, (3) increase collaboration among workforce development, education, economic development, and business stakeholders.

Two Types of Interventions

Two types of project interventions established mechanisms to ensure that stakeholders worked together toward meeting the IT skills needed within Orange County. The first included a **convening process** led by OCBC to develop a roadmap that would set a course of action for innovative pilots. The second involved designing and implementing **pilot projects** that were recommended as a result of the stakeholder engagement process.

Convening process. The convening process was a key innovation of the ITCCP that represented a fundamental shift in the strategic approach to identifying Orange County businesses' workforce training needs. OCBC's identity as an extension of the business community and its position as the leader of the convening process communicated a strong message to industries in the cluster that their perspectives were at the center of the process. Further, businesses from across the IT cluster were convened in a forum consisting exclusively of businesses, an approach which provided "ample room to identify and discuss any 'failings' they perceive in the products and services of the education and workforce systems." [1]

In Year 1 of the ITCCP, the OCBC, supported by the OCWIB, convened stakeholders who represented regional businesses and education organizations. The stakeholders met separately (one group for business stakeholders, one group for education stakeholders) for six meetings between November 2012 and March 2013. Next, stakeholders convened together for two joint meetings conducted in April and May 2013.

The process resulted in two documents produced by the OCBC with stakeholder input: the Orange County Education Scan (the "education scan") and the Information and Communication Technology Cluster Competitiveness Project Stakeholder Directed IT Roadmap (the "roadmap"). Both documents are publicly available and contain information resources and recommendations that were used to guide development of pilot projects.

[1] OCITCCP Technical Proposal to U.S. DOL Workforce Innovation Fund.

Pilot projects. Early in Year 2 of the ITCCP (between September–November 2013), the OCWIB conducted a competitive procurement process and awarded contracts to a range of education and nonprofit organizations to provide the pilot programs that had been outlined in the ITCCP roadmap. This evaluation focuses on the following pilots:

- **Bridging the Digital Divide Pilot Project:** Planning documents for the ITCCP identified a critical lack of women, Latinos, and African Americans in IT education, training, and employment. The purpose of the pilot was to help bridge the digital divide by providing events, open houses, contests, and other forms of public outreach and engagement to expose diverse youth to an array of career awareness and exploration activities designed to encourage their interest in IT-related careers.
- **New and Improved Training Pilot Project:** During the stakeholder convening process, business stakeholders identified six skill areas with notable growth opportunities: IT security, mobile application development, business process analytics, business intelligence and predictive analysis, understanding cloud computing, and healthcare IT. This pilot developed new curricula to address unmet needs in several of these skill areas and updated existing curricula to better meet the needs of local businesses.
- **Internship Pipeline Pilot Project:** The business stakeholders agreed that creating a pipeline for veterans and students to obtain internship positions would help satisfy the long-term demand for IT expertise in Orange County. This pilot project sought to expand internship capacity and infrastructure, and to formalize a consistent internship and alumni network.

During the early months of 2014, the pilot providers developed implementation plans for the pilot projects. On March 14, 2014, providers presented these plans in a joint meeting of the business and education stakeholder convening groups for questions and feedback. Following the March 2014 convening, the pilot providers began implementing their respective projects.

Evaluation Overview

In 2012 WestEd was awarded a contract to evaluate the ITCCP initiative. WestEd's evaluation focused on two types of interventions (described above): (1) The convening process that engaged business and education stakeholders to identify and address the skills needed by businesses in the IT cluster and to develop a roadmap for meeting these needs; and (2) a series of pilot initiatives focused on bridging the digital divide through career awareness and exploration activities, developing new and updated IT training programs, and developing internship pipelines for students and veterans.

The evaluation involved three main components. First, WestEd conducted a **formative study** to assess the stakeholder convening process, as well as a pilot project seeking to bridge the digital divide by providing career awareness and exploration activities for

school-aged youth. Second, WestEd conducted an **outcome study** of two pilot projects providing services to adults through new education and training programs and internships. Finally, the evaluation included a **cost study** that examined how grant funds were spent across pilot activities.

The goal of this evaluation report is to:

- Describe the development, conduct, and results of the business and education stakeholder convening group process, and examine how the pilot to bridge the digital divide through career awareness educational events unfolded, to discover which approaches were effective and can inform future efforts.
- Present outcome findings for pilot projects providing education, training, and internship services to adults by examining completion, employment, retention in employment, and wages for individuals who participated in the programs.
- Situate the findings in the context of existing evidence in economic and workforce development concerning regional cluster competitiveness, sector strategies, and career pathways and pipelines.

The formative, outcome, and cost studies are briefly described here and are further described in detail in the main body of the report.

Formative Studies: Convening Process and Bridging the Digital Divide Pilot

WestEd conducted a formative evaluation of the ITCCP's convening group process and the pilot project to Bridge the Digital Divide. The evaluation included gathering and reporting information to inform program improvements. The evaluation answered the formative research questions by documenting a clear picture of starting points and assumptions, pivotal decisions and their rationales, operational structures and resources, implementation activities, and results and lessons learned.

Research Questions

The research questions guiding the formative evaluation were:

Convening Group Process

1) What are the most effective practices in convening local business leaders? Educators?
2) Did the process that was used to convene the stakeholders produce the intended results?
3) How do stakeholders perceive the value of the convening(s)?
4) How has collaboration between business and education stakeholders to address IT skills and training needs changed over the course of the project?
5) What progress has ITCCP made on project goals and milestones?

Bridging the Digital Divide Pilot Project

1) How does OCWIB develop targeted and effective career awareness events to inspire youth to pursue careers in IT?

Data Sources

To answer the research questions for the formative studies, WestEd researchers used a variety of methods to collect and analyze the data and develop the findings:

- **Observation:** WestEd observed and documented stakeholder convening group meetings and a March 2014 presentation of pilot project plans presented to business and education stakeholders that had participated in the convening process. WestEd also met regularly with OCWIB staff to learn and gather information about pilot plans and to identify appropriate data collection points.
- **Interviews:** WestEd researchers conducted one-on-one in-person and telephone interviews with key project leaders from the OCWIB, OCBC, and pilot providers to follow developments related to the convening and planning process, and to the development and implementation of pilot projects.
- **Surveys:** WestEd administered and collected surveys from stakeholders at the end of the convening process during spring 2013.
- **Document review:** WestEd researchers reviewed program documentation developed during the course of the convening process and for the pilot to bridge the digital divide.

A complete description of data sources is included in Appendix A: Methodology.

Outcome Studies: Pilot Projects

WestEd also conducted outcome evaluations of pilot projects providing education, training, and internship services to adults. The pilot projects were generated from and informed by the convening process and roadmap. The purpose of the New and Improved Training pilot was to develop new information technology (IT) curricula and to retrofit existing curricula to fill existing gaps in IT training. The Internship Pipeline pilot focused on creating a pathway for students and veterans to obtain work-based IT experience, such as internships, in Orange County. This pilot consisted of two separate projects: the Veterans' Pipeline and the Internship Pipeline.

Research Questions

The outcome evaluation of these pilot interventions addressed the following research questions (the bolded questions represent the primary research questions):

New and Improved Training Programs

1) Are individuals who complete new or updated programs placed in information technology (IT)-related jobs?

2) Do incumbent workers who complete the new or updated training programs retain their current position or show wage gains?
3) Do individuals who participate in new or updated training programs pass and complete courses?

Internship Pipeline Project

1) Are students and veterans placed in IT internships?
2) Do students and veterans complete IT internships?

Data Sources

The outcome data consisted of a comparison of pre- and post-training course employment and wages (for the New and Improved Training pilot), a descriptive outcome analysis of the internship projects, and feedback from interviews with pilot project leaders.

Data sources for the outcome evaluation included administrative data and interviews with pilot providers.

- **Administrative data:** Data for the new and improved training pilot included enrollment and assessment data, and characteristics of individuals enrolled in the curricula or training (e.g., standard demographics, indicators of socio-economic status, academic preparation, employment and wages, and course completion). For the Internship Pilot, data included background information on participants at the time of placements. Providers also provided information at the end of internships as to whether or not participants completed internships.
- **Interviews:** WestEd conducted interviews with pilot providers shortly after program implementation had begun and near the end of grant-funded activities (approximately 16–18 months after the first interviews).

A complete description of data sources is included in Appendix A: Methodology.

Cost Study

WestEd's cost study examined how grant funds were allocated to support the development and service delivery for each pilot project, based on information collected from both the OCWIB and the pilot vendors. WestEd also obtained information on the number of participants served by the Bridging the Digital Divide project, the New and Improved Training project, and the Internship Pipeline project, to be able to estimate a cost-per-participant for these pilots.

Research Questions

The cost study addressed the following two research questions:

1) What are the costs of the overall ITCCP?
2) What is the per-participant cost of each of the two pilot projects providing direct services to individuals?

Data Sources

Data sources for the cost study were the following:

Expenditure data: WestEd obtained cost data from OCWIB and each of the pilot providers. Data was broken down by pilots for development costs and service-delivery costs.

Initiative administrative data: WestEd obtained data on the number of participants from each initiative. Participants included individuals who enrolled in and completed the education, training, and internship pilots.

Limitations of the Evaluation and Threats to Validity

The ITCCP was intended to address the fast-changing workforce training needs of businesses within Orange County's IT industry cluster, and to test innovative strategies in engaging business, education, and others in collaborative processes that informed and generated pilot interventions. The evaluation design and methods selected were intended to be flexible and appropriate to the initiative's activities and available data as the interventions developed over time.

The design and methods selected for this evaluation limit the ability to generalize findings presented in this report to other contexts or populations, as they are specific to this particular initiative. However, the findings can serve as a source of information for stakeholders in the workforce development field who may be interested in adopting similar practices. The findings can also suggest areas for future research to continue to build the body of evidence on the type of IT workforce development interventions evaluated by this study.

The primary threats to validity in the ITCCP's evaluation design concern history and maturation effects. Because researchers were unable to randomly assign participants to treatment or control conditions, there was not a defined comparison group. Thus, participants' pre-intervention characteristics had to serve as the comparison. A limitation to this design is that it is not possible to distinguish the effects of the interventions from other events that might have occurred during the course of the study (e.g., fluctuations in employment, additional training received by participants, a participant receiving a job applied to before completing training). In addition, events other than the pilot projects could account for stakeholders' perceptions of the utility of the pilot projects' opportunities; changes in employment, wages, and retention; or students' awareness of IT education, training, and careers.

Structure of the Report

This report presents evaluation findings based on WestEd's analysis of the data, along with summaries that offer interpretations of the findings and lessons learned from the

ITCCP. The report concludes with a summary of the key findings and a discussion of lessons learned. While the research team consulted project leaders, staff, and stakeholders in the process of developing the data and drafts of this report, the interpretations and conclusions in the report represent the perspective of the research team.

The remaining sections of this report are organized as follows:

- Chapter 2 presents a **literature review** to frame the evaluation findings on the ITCCP within the broader context of research on regional cluster competitiveness, sector strategies, and career pathways and pipelines.
- Chapters 3 and 4 present the **formative studies** of the convening process and the pilot to bridge the digital divide.
- Chapters 5 and 6 present the findings of the **outcome studies** that WestEd conducted for the ITCCP's New and Improved Training, and Internship Pipeline pilots, respectively.
- Chapter 7 presents the **cost study** findings.
- The eighth and final chapter presents **conclusions and lessons learned** drawn from careful review and analysis of the findings and discussion with project and pilot leaders.

II. Literature Review: Evidence Supporting Project Interventions

Introduction

Evidence supporting the design of this WIF Type A project is drawn from research literature in several related areas: the economic and workforce benefits of regional cluster competitiveness and sector strategies, collaboration among role-alike and diverse stakeholders, and career pathways and pipelines. This chapter discusses relevant themes and practices in each of these areas, which can help contextualize study findings and lessons learned.

Regional Cluster Competitiveness

Literature concerning regional cluster competitiveness primarily examines economic development strategies within a defined geography that are both organic and cultivated. A report by The Brookings Institution Metropolitan Policy Program defines an industry cluster as "a group of firms and related economic actors and institutions located near one another that draw productive advantage from their mutual proximity and connections" (Cortright, 2006, p. 1). The benefits of industry clusters, which occur in "healthy regions" through the concentration of specialized competitiveness and innovation, include increased production, services, and jobs, both locally within the region and across the nation (Porter, 2001). Clusters offer "value chains" which can leverage and bolster different stakeholders, to promote further competitiveness and opportunities within and across sectors in order to impact productivity (Martin & Flinn, 2003; Hoey, 2011).

Research on industry clusters gained momentum in the late 1990s with Harvard Professor Michael E. Porter's work (Porter, 1998; see Ketels, 2013 for comprehensive history). More recent work conducted by the Institute for Strategy and Competitiveness at the Harvard Business School and elsewhere evaluates the role of regional cluster competitiveness in the economic performance of various industries, clusters, and regions (Delgado, Porter, & Stern, 2011; Ketels, 2013). Research has also been conducted on clusters and economic development at micro, meso, and macro levels (Ribbers & Milis, 2008; Fieldsteel, 2013).

The study of clusters has led to increased interest in, and calls to encourage, cluster development through federal involvement (Mills, 2008). Federal intervention is viewed as an important catalyst to expanding clusters across states, nationally, and even globally

(Seline, 2006), and to incorporating more players in the value chain (Seline, 2006; Martin & Flinn, 2003).

The federal government and different stakeholders within a variety of industries have adopted a cluster competitiveness framework to guide economic development planning. For example, The federal budget for fiscal year 2012 (the time the ITCCP project began), lists enhancing regional economic competitiveness as one of its key objectives alongside building jobs, building infrastructure, strengthening communities and focusing on education and training for the country's workforce (The White House, n.d.). The ITCCP responds to all four of these goals while concentrating on building a successful IT cluster.

IT Clusters and Collaboration

Cluster frameworks help outline the ways that representatives from the business, education, and workforce development sectors collaborate on strategies to meet industry needs within a targeted cluster. Information Technology (IT) clusters are of interest to the federal government. A recent report from the Environmental Protection Agency (EPA) entitled *Building a Successful Technology Cluster* synthesizes information about successful sector partnerships and prerequisites for technology clusters (Fieldsteel, 2013). The report describes clusters made up of actors in seven sectors, including "1) established companies, 2) start-up businesses, 3) universities or other research institutions, 4) support groups or champions, and 5) state, 6) local, and 7) federal government" (Fieldsteel, 2013, p. 1). The report stresses that collaboration among the sectors — including advising partners, engaging stakeholders, creating educational training efforts, or being able to "foster workforce mobility" — is important to clusters, including IT clusters, such as the successful Silicon Valley Cluster (Fieldsteel, 2013, pp. 1 & 3). In that cluster, success was attributed to a "business culture that encouraged a collaborative approach" and promoted innovation, interaction, and relationships among stakeholders and competitors (Fieldsteel, 2013, p. 3).

Research has examined the function of collaboration in many successful cluster initiatives. For example, a regional model of cluster competiveness was used to understand partnerships involving community colleges and industry in responding to the market and its changes (Seline, 2006). Collaboration has also been found to be a key element in technology clusters, such as the highly successful CONNECT effort in San Diego's Innovation Economy (Hoey, 2011). Noting that "a cluster cannot be created in a vacuum," CONNECT adopts a "holistic approach" through a collaboration developing resources, services, and mentors (Hoey, 2011, pp. 84–85). While CONNECT is a cluster involving high-tech, business, and life sciences, elements of its success — from collaboration between industries to efforts responding to its clusters' workforce needs through education and student STEM initiatives — are relevant to the ITCCP (Hoey, 2011).

Sector Strategies

Sector strategies also focus intensively on collaboration and the needs of a specific industry or a cluster of related industries over a sustained period, customizing solutions for multiple employers within a regional labor market. While cluster strategies revolve around economic development, sector strategies emphasize workforce development. They stress alignment across partner agencies and organizations within collaborative efforts to influence employment outcomes and initiate vertical as well as horizontal system change (National Network of Sector Partners, 2010).

Sector strategy development has attracted attention at state and federal levels because of benefits to employers, workers, and communities. The Aspen Institute (2002), for example, examined six well-established sector initiatives and Public/Private Ventures (P/PV) looked at nine newly formed initiatives (Roder, Clymer, & Wyckoff, 2008); both studies found gains for working participants in median earnings and employment consistency. P/PV conducted further research showing positive results for participant earnings, hours worked, and employment in jobs with benefits (Maguire, Freely, Clymer, Conway, & Schwartz, 2010).

Additionally, the Government Accountability Office (GAO) released a report in 2012 characterizing sector-based partnerships as a vital workforce strategy for addressing the skills needs of workers and employers within local or regional economies (United States Government Accountability Office, 2012). After reviewing 14 different sector partnership projects, the report indicated six common factors to their success, all of which overlap with the ITCCP approach:

- Focusing on the needs of multiple employers
- Strong leadership from all partners
- Successful leveraging of public and private resources
- Employer-responsive services
- Minimizing administrative burdens on employers and partners
- Demonstrating results that help sustain collaboration over time

Along with stakeholder and partner collaboration, a key focus for sector strategies is engaging employers to address business and hiring needs. Their engagement is a critical element in competitiveness and sector strategies, because employers are sources of information on occupations with immediate hiring needs, where growth is occurring, and the changing nature of skill demands and expectations for IT companies (NOVA Workforce Board, 2011). Employers are also motivated to engage with a view toward advancing social and corporate responsibility goals, including promoting regional and workforce development, as strategic factors in the long-term success of their firms (Council on Competitiveness, 2008). Employer engagement can also help support regional

sectors and federal efforts regarding pathways for job seekers to gain skills and find jobs. In a recent update on the progress of job-driven training and apprenticeships, for example, the White House noted that for every problem related to the "employment ecosystem" across the nation, issues were "being addressed somewhere in America, usually through a purposeful collaboration between employers and local and state governments" (The White House, September 2015, p. 7).

Career Pathways and Pipelines

Improving pathways to IT careers was a central aim of the ITCCP, from creating new education and training programs for adults to establishing an IT pipeline in the K–12 system. Both career pathways initiatives and sector strategies promote economic growth and industry competitiveness by developing pipelines into targeted industries, especially for low-income and underserved populations. They also seek to meet employers' needs for a skilled workforce and support workers with education and training that can help secure and advance jobs.

Pathway evaluations have noted positive results for employers, youth, and adult job seekers, and have outlined evidence of success and best practices (Aspen, 2002; Conway, Blair, & Helmer, 2012; Maguire, Freely, Clymer, Conway, & Schwartz, 2010; Roder, Clymer, & Wyckoff, 2008; Roder & Elliot, 2014; U.S. Department of Labor et al., July 2014). A report sponsored by the U.S. DOL and Departments of Education, Commerce, and Health and Human Services, for example, found that the following were all important strategies in job training among adult populations: postsecondary education and certification; employer and industry engagement; and flexibility, innovation, and support (U.S. Department of Labor et al., July 2014). For youth, effective training included early exposure to career information and jobs, and industry-based training opportunities such as with "career academies" or internships (U.S. Department of Labor et al., July 2014).

Although career pathways are widely recognized as a promising strategy for increasing postsecondary attainment and labor market outcomes for low-income and low-skill adults, the model is fairly new and yet to be rigorously studied (Fein, 2012). The most comprehensive studies have been conducted on models designed to provide more coherent pathways for youth as they move into adulthood (Offenstein, Moore, & Shulock, 2009). These include three longitudinal studies conducted by The National Research Center for Career and Technical Education, which assessed the impact of programs of study on high school academic and technical achievement. Findings showed increases in achievement on academic measures by the end of grade 10 and suggested school cultures around programs of study appeared to explain improved engagement and achievement (Castellano, Sundell, Overman, & Aliaga, 2012). Models such as WorkReady in

Philadelphia also successfully incorporate youth experience, internships, and education in training and career opportunities (Philadelphia Youth Network, Inc., 2012).

Regarding adult students and career pathways, the U.S. Department of Health and Human Services is currently conducting the first large-scale, experimental study of career pathway models focusing on adult students (the Innovative Strategies for Increasing Self-Sufficiency evaluation). Final results are not expected, however, until 2017 (Fein, 2012).

The ITCCP evaluation also contributes to literature on building access to job opportunities for adult populations, in particular with veterans. A population facing unique barriers and challenges, veterans often experience difficulties entering the civilian workforce because employers may not understand how veterans' skills and licensing transfer, even if they have considerable training and experience. Government initiatives are currently seeking to advance the career opportunities available to veterans through education and workforce development programs (Executive Office of the President, 2012 & 2013; House Committee on Veterans' Affairs, n.d.).

Best practices noted in evaluations of career pathways efforts for veterans and their spouses include a focus on streamlining credentialing, supporting prior job experience and portability of educational attainment; endorsements or temporary licenses; and bridge programing to analyze gaps between military training and experience and state licensing and other skills requirements to help address gaps (Executive Office of the President, 2013). Attempts to construct better online tools to help veterans with job searches, and career matching that crosswalks military and civilian skills or experiences have led to increased employment opportunities for veterans (SOLID, n.d.; Rosenberg et al., 2015, p. xiv). Lessons learned from collaborative initiatives geared toward promoting job opportunities for veterans, such as accelerated pathways for veterans, include: (1) legislation and proposals toward veteran workforce development "should be as specific as possible" to promote stakeholder accountability; (2) states struggle with gathering veteran population data to support program planning and track outcomes; and (3) veterans' expectations for career mobility and salary might not align with opportunities for advancement and compensation offered by employers in the civilian workforce (Dunker, Parton, & Simon, 2015).

Contribution to Knowledge Base

The information derived from the ITCCP evaluation will contribute to the workforce development system's knowledge base concerning cluster competitiveness, sector strategies, and career pathways as pipelines for differing populations by:

- Emphasizing the investment in promoting cluster competitiveness as a workforce and economic development strategy through engaging in collaborative processes that address needs beyond a single sector focus.
- Providing a model for effective, simultaneous engagement of business and education in responding to and addressing businesses' skills needs through education and training programs or offerings.
- Demonstrating through pilot projects that educational institutions at all levels can develop, implement, and adapt business- and career-responsive programs that reflect both immediate and long-range needs for a variety of populations.

III. Formative Study: Stakeholder Convening Process

Introduction

The Orange County Information Technology Cluster Competitiveness Project (ITCCP) sought to address the fast-changing workforce training needs of businesses within Orange County by convening business and education stakeholders in an intensive and collaborative planning process. The ITCCP focused on the IT industry cluster, which includes high-tech businesses as well as businesses in other important local industries, such as healthcare, that employ large numbers of IT professionals. The objective of the planning process for the ITCCP was to produce a detailed "roadmap" plotting a course of action to meet IT workforce training needs that are critical to the success of businesses in the cluster, including improving the IT skills of the local workforce to meet emerging and long-term needs.

In this chapter, we describe the results of a formative study[2] that tracked the ITCCP's convening process and progress toward increasing collaboration among workforce development, education, and business stakeholders. ITCCP convened these stakeholders with the goal of improving alignment between the skills employers demand and the availability of local education and training opportunities to help job seekers develop those skills. The following sections outline the intervention, the study methods used to evaluate the intervention, and the findings of WestEd's evaluation. The chapter then discusses specific successes, challenges, and lessons learned, and presents conclusions and recommendations for future action.

Convening Process Overview

In Year 1 of the ITCCP, the Orange County Business Council (OCBC) and the OCWIB convened stakeholders who represented Orange County businesses and education organizations. The purpose of the convening process was to confirm the workforce needs of businesses in the IT cluster outlined in the WIF grant application; identify skills gaps and growth opportunities in the IT cluster; and develop ideas that would inform a roadmap to increase IT training opportunities, with a long-term view toward increasing skills in the local IT talent pool.

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[2] Preliminary formative findings were presented to the OCWIB in two previously published reports: *Year 1: Summary of Findings* (January 2013) and *Summary of Findings from Year 2 Formative Evaluation* (January 2015).

The convening process was the central innovation proposed by the ITCCP and it represented a new and innovative approach in two ways. First, it was managed by the OCBC, a respected industry intermediary representing the interests of many businesses across the region. Second, the two groups of stakeholders (i.e., business and education) were convened separately over a period of five months; the two groups were convened together twice, after information and feedback about business needs and existing education resources had been obtained from and shared with each group separately.

Members in each stakeholder group attended six meetings between November 2012 and March 2013; then the two groups were convened together for meetings in April and May 2013. The OCBC produced an internal working document (The Orange County Environmental Scan) which the project team used to inform their work. The key outcomes of the convening group process are two publicly available documents developed with stakeholder input and produced by OCBC: the Orange County IT Education Scan (the "education scan"), and the Information and Communication Technology Cluster Competitiveness Project Stakeholder Directed IT Roadmap (the "roadmap").

Formative Study

WestEd conducted a formative evaluation to generate information that could help project leaders and stakeholders better understand how the convening process unfolded. The formative evaluation had two objectives. First, to provide the project team and participating stakeholders with feedback over the course of the project's planning and early implementation phases. Second, to document key benchmarks, successes, challenges, and lessons learned with respect to fostering collaborative stakeholder engagement and participation in a cluster-focused workforce development planning process.

The formative study followed two dimensions of project activity:

- The project team's efforts to plan and implement the convening process.
- Stakeholder perceptions of the process and its results.

Research Questions

The research questions guiding the formative evaluation were:

1) What are the most effective practices in convening local business leaders? Educators?
2) Did the process that was used to convene the stakeholders produce the intended results?
3) Did the convening process affect communication among stakeholders with respect to IT skills development and training?
4) How do stakeholders perceive the value of the convening(s)?

5) How has collaboration between business and education stakeholders to address IT skill and training needs changed over the course of the project?
6) What progress has ITCCP made on project goals and milestones?

Data Sources

Data to answer these questions were obtained from multiple sources.

Interviews: During Project Year 1, when the stakeholders were being convened, WestEd interviewed the project leaders. During Project Years 2 and 3, WestEd conducted interviews with project leaders and a small group of stakeholders who participated in the convening process and who had also been selected through a competitive procurement process to run pilot projects implementing recommendations contained in the road map.

Document Review: WestEd conducted a document review of materials provided to stakeholders during the convening process. WestEd also reviewed the environmental scan, education scan, and roadmap produced during and as a result of the process. The research team also reviewed the solicitation for pilot providers and subsequent pilot project work plans.

Observation: During Project Year 1, WestEd attended two separate stakeholders meetings (one for education stakeholders and one for business stakeholders) and one joint stakeholder meeting. WestEd also attended a joint stakeholder meeting in March 2014, when pilot providers presented their work plans for discussion and feedback.

Surveys: WestEd collected survey data from business and education stakeholders involved in the convening group process. Of the 25 business stakeholders who attended workgroup meetings, 12 responded to the stakeholder survey (48% response rate). Of the 32 education stakeholders who attended workgroup meetings, 14 responded to the stakeholder survey (44% response rate).

The business and education stakeholders who responded to the survey mostly represented individuals who actively participated in the convening process. The group of stakeholders who responded to the survey represents slightly less than half of the stakeholders who attended at least one stakeholder meeting. Because the respondents were more involved in the convening process compared to non-respondents (i.e., they attended more meetings), the results of the stakeholder survey — specifically the results related to feedback on the convening groups — might not be generalizable to the larger stakeholder groups.

WestEd synthesized and analyzed information from these sources to answer the research questions. A full description of the methodology can be found in Appendix A.

Summary of Findings

The main formative evaluation findings are summarized below.

OCBC and OCWIB successfully convened key business and education stakeholders who were knowledgeable about IT training needs in Orange County and who had decision-making authority to provide support for and implement new and revised training programs. The OCBC and OCWIB collaborated with and engaged a diverse array of stakeholders from business and education in an effort to identify areas where new or additional IT training and curriculum were necessary and to develop a roadmap for implementing pilot projects to enhance IT training in Orange County. Based on the data collected from project leaders and stakeholders, the convening process was successful in providing opportunities to reflect current gaps in IT training and creatively brainstorm methods to address them.

Project leaders and stakeholders generally held positive perceptions of the convening format and process, with business stakeholders holding more positive perspectives on the process than education stakeholders. Both project leaders and stakeholders reported that the format of the convening meetings developed primarily by the OCBC facilitated open communication and the sharing of ideas — two central goals of the first phase of the ITCCP. Business stakeholders consistently and overwhelmingly expressed positive feedback on all aspects of the convening process and a wish to continue to be engaged, and both project leaders and stakeholders shared suggestions that could help improve future convening processes.

Participants in the education stakeholder workgroup held divergent views on the process, but consistently provided feedback that direct communication with business stakeholders earlier in the process would have been helpful. The education and business stakeholder groups were managed differently, and some education members did not respond well to the facilitation strategy until questions and concerns about the process had been addressed. These included suggestions to allow education stakeholders to voice their goals and perspectives at the beginning of the process; addressing some education stakeholder motivations to be procured as pilot providers early in the process so that motivations wouldn't hinder collaboration; and incorporating more trust-building activities into future convening processes.

Findings

This section details the findings of the formative evaluation. The first part of the findings describes how the ITCCP's approach to convening local business and education leaders developed over the course of the process; the evaluation findings then discuss specifically the groups' progress toward major milestones of project activity, including development of the roadmap. The next section examines stakeholders' perspectives on successes and

challenges associated with the process. The final section synthesizes findings and discusses lessons learned.

Developing the Convening Groups

The first year of the ITCCP was focused on planning for and implementing the convening process. This subsection presents findings from the planning and development of the convening groups; it specifically refers to the period prior to convening the business and education stakeholders. This subsection discusses the origin of the idea for the convening groups (including the format of convening groups separately and together), how stakeholders were recruited, and stakeholders' reasons for attending the convening group meetings.

Stakeholder involvement in the design of the ITCCP at the time the grant proposal was being written facilitated project planning and recruitment of participants in the convening process. In addition, choosing OCBC, a respected and trusted intermediary, to plan and facilitate the convening process facilitated recruitment of business stakeholders.

To develop the preliminary project design proposed in the grant application, the project team leveraged considerable knowledge of the regional business and education landscape and invited key stakeholder input.

IT is a major industry cluster in Orange County and data showed workforce gaps in IT positions across multiple industries. A small workgroup comprising individuals from the three partnering WIBs, OCBC, and several nonprofit organizations assembled to discuss the content of the grant proposal. This proposal workgroup developed the ideas for the convening groups and possible pilot projects.

The ideas for the pilot projects were based on the proposal workgroup's collective understanding of areas in need of new or revised curriculum. The workgroup decided to convene business and education stakeholders because both groups are integral to addressing and resolving IT workforce gaps. However, from the perspective of the proposal workgroup, the two groups of stakeholders lacked experience working together to address IT training and workforce issues.

Convening business and education stakeholders separately was intended to help bridge differences in culture and communication, provide an opportunity to build within-group relationships, and increase productivity over a short timeframe.

The proposal workgroup members believed business and education stakeholders operate in institutional cultures that are very different from one another. They believed the pace at which the groups operate is different — education organizations tend to move at a slower pace than businesses — and that the two groups have different patterns and methods of communication. The workgroup thought it was necessary to build a bridge between the

two groups, and conceived the convening process as the bridging mechanism and OCBC as the liaison between the two groups of stakeholders.

The proposal workgroup decided to conduct six separate meetings for the two groups of stakeholders (i.e., business stakeholders meet together and education stakeholders meet together) followed by two co-convened meetings. The workgroup thought it was necessary to have separate meetings in order to allow the business stakeholders time to think constructively about deficiencies in IT training and education, and where additional training could be added. Further, because the project leaders believed business and education stakeholders have different communication styles and some misperceptions about one another, OCBC and OCWIB thought it would be beneficial and increase productivity to initially conduct the convenings separately, allowing each group to build relationships within their convening group before building relationships with members of the other group.

> ***"Hosting the separate meetings allowed OCBC to be the liaison between the groups and build trust. Serving as a liaison in a friendly and digestible way was helpful to both groups and built a strong foundation. In some ways, OCBC was like a mediator between the two groups."***
>
> *–Project Leader*

Early communication and targeted strategies were used to successfully recruit a diverse membership to each stakeholder group.

OCWIB contracted OCBC to serve as the lead liaison for the convening process because OCBC is an independent entity that has previous experience convening stakeholders and is well respected in the business community. Further, project leaders reported that when OCBC participates in a project, the business leaders perceive the project as a worthwhile investment of time and energy. Working with OCBC leveraged OCWIB's existing relationships with businesses and education organizations.

OCBC and OCWIB worked together to recruit business and education stakeholders to participate in the convening groups. OCBC led the recruitment and was supported by OCWIB, which also recruited stakeholders. Recruitment began in August 2012 and lasted approximately one month. During the recruitment phase, OCBC and OCWIB developed an email distribution list used to invite stakeholders to the convening meetings and distribute meeting materials. The following section discusses the creation of the distribution lists — one list for business stakeholders; one list for education stakeholders.

Business Stakeholder Recruitment

The OCBC identified businesses of all sizes that employed IT workers and had differing IT needs. The primary goal was to form a stakeholder group consisting of employers in both

the vertical and horizontal IT clusters. Companies belonging to the vertical IT cluster are those in which IT is traditionally considered the company's primary business product and/or service, including companies such as Toshiba and Blizzard Entertainment. Those belonging to the horizontal cluster are companies whose core business is not IT-related, but depend on IT as a significant driver of their internal business operations. This would include companies such as Boeing and St. Joseph Health System. A secondary focus was to recruit representatives from a diverse range of businesses (i.e., small, medium, large, and very large). In particular, OCBC wanted to recruit representatives who had decision-making power within their organizations.

First, OCBC approached its board of directors, which has approximately 50 representatives from a variety of industries. OCBC informed the board of directors of the project and asked for letters of commitment for the project. Individuals from 13 businesses who serve on the OCBC Board of Directors agreed to participate during this initial recruitment phase. OCBC also approached businesses that were not part of the OCBC board of directors, such as Blizzard Entertainment, which have a large presence in Orange County and employ IT workers. During the next phase of recruitment (after the grant was awarded), OCWIB identified companies that OCWIB was familiar with and that had workforce IT needs. OCWIB approached their membership though email and recruited approximately half of their contacts (30 of 60 businesses). The final distribution list included 35 business stakeholders.

Education Stakeholder Recruitment

The process for recruiting education stakeholders was very similar to the process for recruiting business stakeholders. OCBC and OCWIB have long histories of working with education organizations; thus, they were able to reach out personally to many education organizations. Again, the goal was to recruit representatives from a diverse mix of education organizations (e.g., K–12 organizations, community colleges, universities) from within Orange County. Additionally, in August 2012, OCWIB held a community meeting — which included OCWIB contacts representing education and business communities — to introduce the concept of the convening group process and the pilot projects. Approximately 65 people attended the meeting. According to project leaders, attendees from that meeting formed the bulk of the education group. OCBC recruited three additional representatives from education organizations represented on the OCBC board of directors. The final distribution list included 45 education stakeholders.

Business stakeholders were motivated to participate in the convening by the opportunity to build workforce capacity; education stakeholders were motivated by this goal as well as by opportunities for networking and potential business development.

As part of the business and education stakeholder surveys, stakeholders were given a list of possible reasons they attended the convenings, and were asked to identify the reasons they attended. Respondents were able to supply additional reasons for attending not already listed. Exhibit 1 includes the number of business and education stakeholders who endorsed each reason for attending the stakeholder meetings. None of the respondents wrote in additional reasons. As Exhibit 1 shows, the majority of stakeholders attended meetings because they believed their input was influential in building the capacity of the workforce.

Exhibit 1. Reasons for Attending Stakeholder Meetings

	Business Stakeholders (n = 12)	Education Stakeholders (n = 14)
My input can help shape or influence the capacity of the workforce.	10 (83%)	10 (71%)
The goals of the workgroup are important or interesting.	6 (50%)	11 (76%)
I or my organization believe in "giving back" to the community.	8 (67%)	5 (36%)
There is an urgent need for more workers with IT skills.	7 (58%)	7 (50%)

Note. Results are from stakeholder survey; respondents could select more than one response.

Project leaders thought that it was easier to recruit education stakeholders because education stakeholders were more familiar with stakeholder convening processes; there was more interest in participating in such a process; and education stakeholders were more eager to network, compared to business stakeholders. Additionally, although participating in the stakeholder groups was independent of the procurement process for the grant's pilot projects, project leaders believe that many education stakeholders thought that attending the stakeholder groups would give them an advantage in the procurement process.

> ***"It was easier to recruit education members [compared to business members] because they want to network and they want to see what the opportunities are."***
>
> *–Project Leader*

Summary

The original idea to hold separate convening groups for business and education stakeholders was rooted in the notion that the two groups have different communication styles, and that it was necessary to build relationships and establish project norms within each group before combining the groups. In order to gain buy-in from the business stakeholders, it was necessary to select a leader who was trusted and respected in the community; because of their history of working with businesses and educational

institutions in Orange County, the WIBs thought OCBC was an obvious choice to serve as a liaison and facilitator of the convening process.

Using existing contacts and forging new contacts, OCWIB and OCBC attempted to recruit a diverse group of business and education stakeholders who represented major business with IT needs and education organizations in Orange County. Findings from the project leader interviews and the stakeholder surveys indicate that motivation for attending the convening differed between the two groups: whereas businesses were more likely to participate at the urging of OCBC and contribute to solving their own company's IT workforce challenge by contributing to a community-wide solution, education organizations might have viewed participating as a business opportunity. That is, in addition to the desire to provide input, education stakeholders were also interested in networking and the procurement of providers for the pilot programs.

Implementation of the Convening Groups: Attendance and Format

The following section discusses implementation of the convening groups and refers to the period between November 2012 and April 2013, when the stakeholder groups were meeting.

Executive-level decision makers attended the stakeholder convening process. The most frequent reason cited for missing meetings was a time conflict.

Business Stakeholders

Based on attendance rosters, 25 out of the 35 business stakeholders invited to participate in the convening process attended at least one workgroup meeting and, on average, attended 3.6 of the 8 meetings. Although none of the stakeholders attended all eight meetings, 10 stakeholders attended more than half of the meetings. WestEd was unable to contact the 10 business stakeholders who were invited to participate in the convening process, but did not attend a meeting; it is unknown why those individuals chose not to participate.

The majority of business stakeholders that responded to the survey represented businesses with horizontal IT needs; four responders represented organizations in the IT industry (i.e., vertical IT occupations). The business stakeholders reported being at their current organization for an average of 10 years (range = 0–21 years). The majority of business responders held positions in either executive management or human resources.

When those who responded could not attend meetings, the majority of the time it was because of a time conflict (n = 9). Other reasons for missing meetings were travel or vacation (n = 2), someone else from their organization attended (n = 1), or a family emergency (n = 1).

Education Stakeholders

Based on attendance records, 32 out of the 45 education stakeholders invited to participate in the convening process attended at least one workgroup meeting. Two stakeholders attended all eight meetings; 14 stakeholders attended more than half of the meetings. On average, education stakeholders attended 3.8 of the 8 meetings. WestEd received feedback from 2 of the 13 education stakeholders who were on the distribution list but did not attend the convening meetings. The two respondents cited time conflicts or the fact that someone else from their organization was able to attend the meetings as the primary reason they chose not to attend the meetings. WestEd was unable to contact the 11 education stakeholders who were invited but did not participate.

The education stakeholders who responded to the survey (n = 9) represented universities, community colleges, or K–12 education organizations. Education stakeholders also represented career schools, nonprofits or volunteer organizations, and training organizations. The education stakeholders reported being in their current organization for an average of nearly 7 years (range = 1–20 years). Most of the education stakeholders held administrator, executive management, or faculty positions.

Education stakeholders most frequently reported missing meetings because of time conflicts. One education stakeholder reported that they were not aware of the convening meetings until later in the process, so had missed some meetings.

Stakeholders who responded to the survey thought the groups were representative, cohesive, and knowledgeable about workforce needs.

WestEd queried project leaders and stakeholders on their opinions regarding the representativeness of the stakeholder groups. Specifically, WestEd was interested in determining whether the stakeholders believed that the groups comprised members who were knowledgeable of the IT workforce needs in Orange County, and represented the business and education organizations in the County.

Project leaders were pleased with the stakeholder recruitment process and thought the groups represented Orange County businesses and education organizations. Despite broad representation from a mix of businesses, one project leader thought that additional representatives from other technology companies (such as Broadcom) could have been useful. Even though representatives from technology companies and private postsecondary education agencies did participate in the convening groups, this individual believed that additional representatives from both of these sectors might have further benefitted the process.

Business stakeholders reported that the business stakeholder group was cohesive, members were knowledgeable of the IT needs in the community, and the group members represented businesses and organizations that could help inform pilot programs to increase the IT skills of the Orange County workforce. The majority of education

stakeholders who responded to the survey agreed that their group was cohesive and that members were knowledgeable of IT needs in the County.

Stakeholders reported on the types of organizations they thought might have been missing from the workgroups whose participation would have helped inform the pilot programs to increase the IT skills of the workforce. Six business stakeholders thought there were additional representatives in the Orange County business community who were not involved but whose participation would have helped inform the pilot programs. Business stakeholders believed that there was a lack of representation of small- and mid-sized businesses and from Big 5 consulting firms. Business stakeholders also thought that there needed to be greater representation from major employers in Orange County, such as Broadcom, Kaiser, and Western National. One stakeholder thought that there should have been more representation from each industry.

Multiple education stakeholders reported that the workgroup did not represent all of the community college districts in Orange County. Education stakeholders who thought there were additional individuals who could have participated in the workgroups suggested increased representation from high-performing high school IT teachers, and from K–12 organizations, community colleges, and research universities.

Meetings were well-planned and conducted in an "organic" way to integrate insights and feedback, promote dialogue, and capitalize on learning opportunities.

The OCBC team had extensive experience facilitating stakeholder groups, which allowed the format for the convening group process to be flexible or, as one project leader described, "organic." That is, prior to each meeting, the OCBC leaders met to discuss the outcomes of the previous meeting and set agenda items for the next meeting. As one project leader said, "Because the meetings were monthly, the project leaders were able to reflect on the process after each meeting and see what they needed to gain from each group [at the next meeting]." The underlying focus of each meeting was to vet the ideas about workforce IT skills needed by the cluster (outlined in the original grant proposal), refine ideas for the pilot projects, determine which pilots would be the most useful, and share ideas that had been generated in one stakeholder group with the other. As one project leader said, "The ideas for the pilot projects grew naturally out of the stakeholder meetings."

> ***"The goal of each meeting was always to gain a better understanding of what the IT needs of the business sector were. This approach was done in different ways, with many meetings continuing down a path that grew out of the [meeting] conversations."***
>
> *–Project Leader*

To develop the ideas for the pilot projects, the OCBC facilitated each of the stakeholder groups with a specific purpose. The purpose of the business stakeholder group was to identify the areas within IT for which there was a need for new or revised training for the local workforce. For the business stakeholder meetings, OCBC presented current issues and data describing the state of IT training and the IT workforce in Orange County. Business stakeholders provided feedback on how the data did or did not reflect their needs. The business stakeholders then brainstormed strategies to address the gaps in training.

Based on document reviews of meeting materials (e.g., agendas, minutes), Exhibit 2 includes meeting attendance and the discussion topics for each business stakeholder meeting.

Exhibit 2. Business Stakeholder Meeting Topics

Meeting Number	Number of Attendees	Agenda Items
1	*17*	• Welcome and Introductions • Overview of ITCCP • Initial Stakeholder Feedback on Project • Discussion of Stakeholder Group Roles, Timeline, Expectations, and Process
2	*12*	• SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis of Geographical Location, Current IT Pipeline, Quality/Fit of Education/Training
3	*11*	• Presentation on OC IT Workforce • Prioritization of Potential New IT Programs
4	*11*	• Discussion of Pilot Projects
5	*8*	• Discussion of Pilot Projects
6	*10*	• Review and Affirmation of Pilot Projects • Prioritization of Pilot Projects

Note. Number of attendees only includes the number of attendees that were present at each meeting who were on the stakeholder distribution list. In some cases, there were additional attendees, but they might have been substitutes for stakeholders who could not attend.

The purpose of the education stakeholder meetings was to critically review the existing IT curricula and hear feedback (provided through OCBC from the business stakeholders) on areas where the current IT curricula were deficient. OCBC approached the education meetings with sensitivity to how information was presented, as many of the meetings were focused on discussing the deficiencies in current IT education training programs. For the education meetings, OCBC asked the education stakeholders to acknowledge the deficiencies and then move forward in planning methods to address the deficiencies. One

of the project leaders said that education stakeholders had varying responses to hearing the negative feedback on the current IT curricula but, because hearing about the deficiencies "was the premise of the grant, there was no way to get around it other than directly addressing it."

One example of how OCBC facilitated the process in an "organic" and flexible way is that the project leaders had not originally intended to include information on the upcoming pilot project procurement process as part of the convening group discussions. However, based on informal feedback received from education stakeholders that they were interested in the procurement process, and questions about this process perhaps interfered with the work they were being asked to do in the convening sessions, the project leaders decided to discuss the procurement process during one of the education stakeholder meetings (Meeting 6).

Exhibit 3 includes meeting attendance and discussion topics for each education stakeholder meeting.

Exhibit 3. Education Stakeholder Meeting Topics

Meeting Number	Number of Attendees	Agenda Items
1	*21*	• Welcome and Introductions • Overview of ITCCP • Initial Stakeholder Feedback on Project • Discussion of Stakeholder Group Roles, Timeline, Expectations, and Process
2	*18*	• SWOT (Strengths, Weaknesses, Opportunities, and Threats) Development of New IT programs, Retrofitting Existing IT Curricula, IT Pipeline Initiative
3	*18*	• Introduction to Appreciative Inquiry Methodology (Dr. David Gatewood facilitated)
4	*16*	• Trends and Barriers for IT in Higher Education • Orange County Information and Communications Technologies Initiative (TICTOC) Review and Update • Midpoint Review
5	*14*	• Discussion of Pilot Projects
6	*10*	• Overview of Workforce Innovation Fund Procurement Process • TICTOC Review and Update • Review Barriers to Implementation of Pilot Projects

Note. Number of attendees only includes the number of attendees that were present at each meeting who were on the stakeholder distribution list. In some cases, there were additional attendees, but they might have been substitutes for stakeholders who could not attend.

After the groups convened separately for six meetings, OCBC brought the groups together for two co-convened meetings. During the co-convened meetings, the business and education stakeholders engaged in a roundtable discussion of each pilot project. Business stakeholders shared their thoughts on the projects, and education stakeholders asked clarifying questions. The co-convening offered the opportunity for business stakeholders to explain specific aspects of the pilot projects directly to education stakeholders and for the education stakeholders to ask clarifying questions of the business stakeholders. Because both groups have different ways of communicating, this process was important for developing a common understanding of workforce and workplace needs.

Stakeholders thought the meeting format was successful, with business stakeholders having somewhat more positive perspectives on the format than education stakeholders. Recommendations to improve the format addressed scheduling, remote participation, and convening groups jointly earlier in the process.

Project Leaders

Project leaders and stakeholders were generally pleased with the meeting formats. The project leaders thought that the meetings fulfilled their purpose and were respectful of stakeholders' busy schedules. All project leaders thought conducting six separate stakeholder meetings and then two co-convened meetings worked well and was efficient.

On reflection, project leaders had some recommendations for improvements, should they hold similar convening groups in the future. One recommendation was to hold the meetings on separate days. Business stakeholders met in the morning and education stakeholders met in the afternoon on the same day. Project leaders thought it might have been helpful to hold the meetings on separate days to allow more time to reflect on the business stakeholders' discussions prior to meeting with the education stakeholders. A second recommendation was to convene the business stakeholders over a longer period. As the purpose of their meetings was to identify the areas that needed improvement and then brainstorm improvements, project leaders thought it could have been useful to allow this group more time to provide feedback and guidance on the IT landscape. One project leader thought that additional co-convened meetings would be beneficial for nurturing the relationships between the business and education stakeholders.

Business and Education Stakeholders

Both groups of stakeholders reported positive feedback on the meeting format. As Exhibit 4 shows, all or most of the stakeholders thought they could voice their views and concerns during the meetings. In general, the business stakeholders had relatively more positive views of the meetings compared to education stakeholders. For instance, all business stakeholders thought that time spent in the meetings was well used, whereas only half of

the education stakeholders agreed that time was well used — and four stakeholders disagreed or strongly disagreed that time was well used.

Exhibit 4. Meeting Format

	Business Stakeholders (n = 12)		Education Stakeholders (n =14)	
	Strongly Agree or Agree	Strongly Disagree or Disagree	Strongly Agree or Agree	Strongly Disagree or Disagree
I could voice my true views and concerns during the workgroup meetings.	12 (100%)	0 (0%)	12 (86%)	2 (14%)
The time spent in the meetings was well used.	12 (100%)	0 (0%)	8 (57%)	4 (29%)
The format (scheduling, agenda, materials, and meeting space) of the workgroup meetings encouraged group members to interact and communicate with each other.	12 (100%)	0 (0%)	8 (57%)	3 (21%)
The way the meetings were conducted (facilitation, activities, time allocations) encouraged members to interact and communicate with each other.	11 (92%)	0 (0%)	8 (57%)	2 (14%)

Note. Respondents were also able to select "Neither Agree nor Disagree" or "Don't Know" as response options. Those responses are not shown on the table, but in cases where the combined responses for Strongly Agree or Agree and Strongly Disagree or Disagree do not equal the number of respondents, the remaining responses were "Neither Agree nor Disagree" or "Don't Know."

The survey asked stakeholders to suggest improvements to the meeting formats. Suggestions from business stakeholders included varying the meeting times (e.g., alternating morning or afternoon meetings) to allow stakeholders who might have had standing time conflicts to attend; hosting the meetings virtually to allow stakeholders who could not physically attend the meeting to attend; and conducting more small break-out groups. One stakeholder thought that some of the meetings were too focused on long-term goals that fell outside the term of grant funding and might have steered the discussion off course. Another stakeholder would have liked more information on the pilots, but noted that this might not have been possible at the time.

Suggestions offered by the education stakeholders included co-convening the business and education stakeholders earlier in the process. The education stakeholders who recommended co-convening sooner found it difficult to see the larger picture and understand the business stakeholders' concerns without having the opportunity to interact with the business stakeholders. Some education stakeholders (n = 4) said that they were unclear what the pilot projects would be or found it difficult to understand the purpose of the convening.

One education stakeholder suggested using a workshop or summit approach where stakeholders would meet less frequently, but for longer periods of time (e.g., three half-day meetings). This stakeholder thought the summit approach would be more conducive to building lasting relationships between the education and business stakeholders and allow for a better understanding of the grant and the pilot projects. Education stakeholders also recommended creating a website for the convening process, where stakeholders could interact by posting questions, and where agendas, meeting minutes, and handouts could be posted. One education stakeholder suggested dedicating time at the end of each meeting to review the action items and the next steps.

Summary

In general, project leaders and convening group stakeholders agreed that convening group membership well represented the businesses and education organizations of Orange County and that the workgroups included decision makers and those with expertise necessary to advance the ITCCP. Stakeholders suggested participation by additional major IT businesses, large employers, and community college districts could have strengthened group membership.

Project leaders and stakeholders had positive feedback on the convening format. The project leaders thought the meetings engaged stakeholders in an honest dialogue, which was corroborated by the survey finding that nearly all stakeholders reported they could voice their true thoughts and concerns during the meetings. The most common suggestion to improve future convenings was to adjust the timing of the meetings; for example, hold the meetings on varying days, varying times, or offer a virtual meeting space in order to accommodate busy schedules.

Convening Group Functioning

This section discusses project leaders' and stakeholders' feedback on the convening group process, specifically how the workgroups functioned. Business and education stakeholders held positive perceptions of workgroup functioning. Project leaders viewed the business stakeholder group as particularly successful, a perspective that was confirmed by stakeholder feedback. Education stakeholders expressed more dissatisfaction with the group dynamics and facilitation.

Creating an open forum to share ideas facilitated within- and cross-group communications. Barriers to successful workgroup functioning included: insufficient time to discuss ideas; varying interests of diverse members; and, among education stakeholders, possible competition for funding and lack of clarity about purpose and outcomes.

Project Leader Perceptions

Project leaders thought the convening groups functioned well, as evidenced by the engagement (e.g., attendance at meetings, discussions during meetings, informal feedback on meetings throughout the process) from business and education stakeholders. Moreover, the internal dynamics of the business stakeholder group extremely impressed one of the project leaders; in his experience, he has not seen a group "gel" as quickly and naturally as the business stakeholder group. The project leader attributes this to the stakeholders' genuine interest in the project, including the direct benefit the project would have on businesses, and the fresh idea of bringing education and business stakeholders together in a new way. One project leader remarked that the business stakeholder group practically "ran itself," in that the business stakeholders had open communication and worked together toward a common goal.

> ***"They [the business stakeholder group] got the outcome and point of the meetings right away and did a tremendous amount of work."***
>
> *–Project Leader*

One method OCBC used to increase stakeholder group functioning was to allow time for the business stakeholders to "sing their aria" during the first meeting. During the first meeting, OCBC allotted time for each stakeholder to tell the group why they were attending the meetings, their ideas for the meetings, and what they hoped to get out of the meetings. After everyone had shared, the group moved forward together. One of the project leaders thought that this process worked particularly well for the business stakeholder group.

In contrast, project leaders noted the education stakeholder group did not cohere as quickly as the business stakeholder group. Project leaders attributed this to several reasons; chief among them was the possible competition among members of the stakeholder group to be procured as providers for the pilot projects at the conclusion of the convening process. In some cases, organizations represented by the education stakeholders are in direct competition with each other to obtain students and secure funding. Additionally, the education stakeholder group was more heterogeneous in terms of both roles of stakeholders and organizations represented by stakeholders, compared to the business stakeholder group. Further, project leaders anticipated that the process in education stakeholder meetings would be more "tenuous" because the education stakeholders were tasked with hearing business stakeholders' perceptions of the current IT training curricula and acknowledging areas of deficiency.

Stakeholder Perceptions

Business and education stakeholders held positive perceptions of workgroup functioning. When asked to describe catalysts for communication, the business stakeholders described the convening process as "open," a "healthy challenging of ideas," and "respectful." The business stakeholders thought that everyone had an opportunity to voice their opinion and that opinions were respected. Most of the business stakeholders attributed the success of the workgroup meetings to the OCBC facilitator, describing the facilitator as setting the norm for open and interactive dialogue.

Similar to the responses reported by business stakeholders, the education stakeholders most frequently reported that having an open forum for ideas and creativity were the biggest catalysts for communication. Small group interactions, convening the business and education stakeholders together, distributing materials in advance of the meetings, and including a variety of participants in the workgroups were other catalysts for communication mentioned by education stakeholders.

When asked to describe barriers to communication, the business stakeholders reported few barriers. Two thought that the group could have used more time to discuss ideas. Two other business stakeholders reported that the meeting space was a barrier because the room was too long and narrow, which made it difficult to see and hear others. One business stakeholder reported having representatives from businesses that have different uses for IT was a barrier. Another stakeholder reported that the large size of the group might have been intimidating for some individuals who are not as comfortable in such a large group; that stakeholder recommended using small breakout sessions in the future.

More than half (n = 9/14) of the education stakeholders who responded to the survey reported barriers to communication in the workgroup meetings. Specifically, these education stakeholders reported a lack of a clear purpose for the workgroups, a lack of focus during the workgroup meetings (including differing objectives among stakeholders), and working separately from business stakeholders as the greatest barriers to communication during the workgroup meetings. Some education stakeholders reported additional barriers, such as members holding "private agendas," and that stakeholders did not receive materials (such as agendas or meeting minutes) in advance of the meetings. One education stakeholder reported the lack of team-building as a barrier.

Perceived Value of the Convening Process

This section discusses project leaders' and stakeholders' feedback on the convening group process, specifically the value of the process and its results. Business and education stakeholders held positive perceptions of the value of the process, while education stakeholders were divided on the value and possible outcomes.

At the conclusion of the convening process, stakeholders generally held positive perceptions of its value, as well as generally positive perceptions of the short- and possible longer-term results.

Project Leader Perceptions

According to the project leaders, without the meetings, the pilot projects recommended in the grant proposal would have been based on assumptions and anecdotal information regarding the gaps in IT training. Through the convening process, OCWIB and OCBC gained validation for the project from the stakeholders, learned what the business community is looking for in IT employees, and identified gaps in IT training. For example, one of the originally proposed pilot projects was a web-design curriculum. However, the business stakeholders expressed that there was not a demand for this type of training; instead, the business stakeholders suggested an internship pipeline, which became the focus of a pilot project.

Project leaders viewed the business stakeholders' desire for continued engagement as one of the major successes of the convening process, interpreting their engagement as "buy-in" for the convening process and the project. Further, the convening process inspired the education stakeholders to form their own consortium; the consortium will continue to brainstorm solutions to the training gaps identified in the convening process.

Another major success of the convening process was the development of the roadmap and the education scan. The roadmap outlined pilot projects vetted by the business and education stakeholders and that were implemented in Years 2 and 3 of the grant. The education scan provided a source document of all IT courses (and course descriptions) available in Orange County. The education scan is a valuable resource for the business and education communities because prior to the development of the education scan, there was not a single place where individuals could see course offerings and topics. The education scan was used, and will continue to be used, by education and business stakeholders as well as the project leaders to identify duplication in courses and to confirm gaps in training identified by the business stakeholders.

Business Stakeholder Perceptions

At the conclusion of the convening process, WestEd surveyed stakeholders on their perceptions of the value of the workgroups and the potential outcomes of the workgroup meetings. The business stakeholders held positive perceptions of the value of the workgroup meetings. For example, the business stakeholders thought the workgroups included goals and priorities for both education and business stakeholders, that the workgroup meetings were a

> *"We are so thankful that Orange County [Business Council] has started this project and hope to see it continue and flourish."*
>
> *–Business Stakeholder*

worthwhile investment of time, and that the results of the workgroup will benefit their organizations. When responding to an open-ended question for feedback on the process, business stakeholders who responded to the question had very positive things to say about the workgroups. For example, one respondent wrote, "I thoroughly enjoyed my participation on this team and hope to continue contributing to this effort sometime in the future."

Education Stakeholder Perspectives

In contrast, the education stakeholders had mixed responses. Most responses were positive, citing the inclusion of new businesses and joint meetings as beneficial outcomes. One example of divergence between perceptions of business and education stakeholders was that the majority of business stakeholders reported a lack of collaboration with education providers in Orange County prior to the convening process. In contrast, almost all of the education stakeholders reported prior collaboration with businesses in Orange County on issues surrounding workforce IT training and skills.

Further, some education stakeholders disagreed that the meetings would result in pilot projects that would help improve training programs for IT in Orange County, and some thought that the workgroups were not a worthwhile investment of their time.

Moreover, when given the opportunity to respond to an open-ended question for feedback, a larger number of education stakeholders provided negative feedback on the conduct and utility of the process. Quite a few expressed the wish to meet directly with businesses much earlier in the process. For example, one stakeholder wrote, "It is difficult to learn from best practices, build shared models, develop collaborations, and create sustainable solutions using the facilitation approach which was selected." Another stakeholder wrote, "In the end, it felt like more of the same…more career exploration fairs, more marketing, more meetings, but the real need of giving high school students the hands-on apprenticeship-type of opportunities was not addressed. Business wants to write a purchase order for education to 'fix it' but they are not yet willing to roll up their sleeves to be an active participant in the training of students."

Perceptions over Time

In Project Years 2 and 3, WestEd interviewed project leaders and stakeholders who had participated in the convening process and had also led and participated in pilot projects. Feedback expressed in interviews with this smaller group of stakeholders was consistent with the results from the survey administered at the conclusion of the convening process.

Stakeholders reported that the value of the convening process included involving new businesses; fostering new relationships; creating helpful information resources; accelerating the process of identifying skills businesses need; and improving the relevance of training and employment opportunities.

Project leaders reported that relationships between the business and education stakeholders had strengthened after the convening process. They observed that, through the co-convened meetings, business and education stakeholders had the opportunity to work together, achieve a shared understanding of the challenges facing Orange County, and develop strategies to address those challenges.

Participants in the education stakeholder workgroup who also led and participated in pilot projects continued to report that inviting new businesses to the table was valuable. They also reported that the convening process helped to foster new and stronger relationships, including with the OCWIB. This subgroup of convening participants also reported that the convening process added value by accelerating the tasks of identifying training needs and planning strategies to meet them. For example, a community college indicated that it routinely engaged employers in advisory committees before the convening process and could have arrived at a similar result, but noted that the convening process cast a wider net and led to results more quickly than its process might have.

Summary

Project leaders and stakeholders agreed that the workgroups functioned well. Stakeholders reported that the workgroup format facilitated communication and that the workgroups created open forums for discussion. Project leaders were particularly impressed by the collaborative group dynamic of the business stakeholder group.

In general, the business stakeholders held positive perceptions of the convening group process; responses to survey items were positive, and open-ended responses praised the format and facilitation of the meetings. In contrast, results show greater variability among education stakeholder responses. While the majority of responses to survey items were positive, responses to open-ended questions were less positive and expressed concerns about the utility of the convening process. Further, a small share of education stakeholders offered negative feedback about the approach. These results suggest that additional efforts might be necessary to gain buy-in from education stakeholders as the project moves forward.

Interviews with project leaders and a small sub-set of representatives in the education stakeholder group who also led and participated in pilot projects show perceptions remained stable across the grant term. Preliminary ideas about the value of the process were confirmed in subsequent years of the project.

Discussion of Findings and Lessons Learned

The main formative evaluation findings and the lessons learned related to the convening process are described below.

OCBC and OCWIB successfully convened key business and education stakeholders who were knowledgeable about IT training needs in Orange County and who had decision-making authority to provide support for and implement new and revised training programs.

During Year 1 of the ITCCP, OCBC and OCWIB engaged business and education stakeholders in an effort to identify areas where new or additional IT training and curriculum were necessary and to develop a roadmap for implementing pilot projects to enhance IT training in Orange County. OCBC and OCWIB collaborated to recruit a diverse array of representatives from the business and education communities within Orange County. Based on interviews with project leaders and results of a stakeholder survey, the convening process was successful in providing an opportunity for stakeholders to reflect on the current gaps in IT training and creatively brainstorm methods to address them.

Project leaders and stakeholders generally held positive perceptions of the convening format and process. Business stakeholders held more positive perspectives on the process than education stakeholders.

Project leaders and stakeholders both reported that the format of the convening meetings (developed primarily by OCBC) facilitated open communication and the sharing of ideas — two central goals of the first phase of the ITCCP. Though initially more difficult to recruit to the process compared to education stakeholders, business stakeholders consistently and overwhelmingly expressed positive feedback on all aspects of the convening process and a wish to continue to be engaged.

Both project leaders and stakeholders shared suggestions that could help improve future convening processes. Project leaders and stakeholders noted that varying meeting schedules and including a virtual meeting option could help increase attendance and improve the quality of meeting preparation.

Participants in the education stakeholder workgroup held divergent views on the process, but consistently provided feedback that direct communication with business stakeholders earlier in the process would have been helpful.

The education stakeholder group was managed differently than the business stakeholder group, and some members did not respond well to the facilitation strategy until questions and concerns about the process had been addressed.

- Because the education stakeholder group was large and diverse, it could have been helpful to allow members to voice their motivation, perspectives, and

goals at the beginning of the process, as OCBC did with the business stakeholders.

- In addition, as some education stakeholders might have been motivated to participate in the stakeholder groups in order to be procured as a provider for the pilot projects, it could have been helpful to have a separate meeting on this subject early in the convening process to address questions or concerns that may have hindered the full participation or collaboration among members of the education stakeholder group.
- Further, stakeholder survey results indicated there may have been a lack of trust among the education stakeholders; project leaders noted that competitiveness among the education organizations potentially dampened the ability for education stakeholders to truly collaborate. It could be helpful to incorporate more trust-building activities into any future convening process.

Lessons Learned

- When convening diverse groups of stakeholders, it may be productive to create opportunities for them to express their interests and motivation, and to address questions and concerns, early in the process.
- When convening groups separately and then jointly, it could be helpful to bring both groups of stakeholders together much sooner, so each group could share perspectives that would help set the agenda for their separate and collective work.
- Relying on an experienced and respected business intermediary organization, such as the OCBC, to lead a planning process and foster collaboration can leverage and strengthen existing relationships among stakeholders and introduce new ones.
- Both the convening process and the experience of continuing to collaborate on implementing specific pilot projects were seen as useful new ways to foster relationships and action between the business and education stakeholders.
- Though many education stakeholders had a history of working with local businesses to develop workforce education and training, they acknowledged that the convening processes helped inform what types of IT programs to build, brought more businesses to the process, and helped outcomes result faster.

IV. Formative Study: Bridging the Digital Divide Pilot Project

WestEd conducted a formative evaluation of two system-level interventions implemented by the ITCCP: the stakeholder convening process (described above in Chapter III) and a pilot project seeking to bridge the digital divide for K–12 students. The formative evaluation was intended to gather and report information; provide feedback on key project milestones in the planning and implementation process; and document how specific strategies unfolded. The overall objective of the formative study[3] was to build the evidence base on previously untested strategies to change and improve the public workforce system and to provide ongoing feedback during the ITCCP project.

This chapter examines the pilot project "Bridging the Digital Divide" (BDD). The purpose of the pilot was to help bridge the digital divide by providing events, open houses, contests, and other forms of public outreach and engagement to expose K–12 students to an array of career awareness and exploration activities designed to encourage their interest in IT-related careers. The chapter describes how the pilot project developed, engaged stakeholders, and conducted events. The chapter also outlines the successes, challenges, and lessons learned from the pilot project's efforts to leverage industry and educators' expertise and resources to create change in the workforce development system.

Bridging the Digital Divide Pilot Project Overview

The digital divide is frequently discussed as an economic disparity between more privileged and less affluent communities in their access to, knowledge of, and/or use of information and communication technologies (IT). Planning documents for the ITCCP identified a critical lack of women, Latinos, and African Americans in IT education, training, and employment. Citing "cultural influences and expectations, inadequate opportunities for training, the perception of inaccessibility, unequal employment opportunities, or a lack of general interest in the field," project leaders determined there was a need for a program that would inspire interest in pursuing careers in IT among disproportionately underrepresented and disadvantaged groups.

Stakeholders who participated in the convening process in project Year 1 agreed with this assessment. The stakeholder workgroups proposed a pilot project to bridge the digital

[3] Preliminary formative findings were presented to the OCWIB in two previously published reports: *Year 1: Summary of Findings* (January 2013) and *Summary of Findings from Year 2 Formative Evaluation* (January 2015).

divide by developing career awareness and exploration activities for youth. The proposed pilot was intended to accomplish two goals:

- Communicate and celebrate the fact that Orange County is a national leader in IT/STEM-related industries with high-paying career opportunities.
- Generate awareness and greater interest in IT as a promising career path for the targeted participants.

To implement the pilot in Year 2, the OCWIB procured and contracted with Vital Link, a community-based nonprofit offering a wide array of workforce development, education, and training programs. The scope of the pilot was intended to focus on youth in grades 9–12 by planning and conducting youth events and public education programs and targeting the participation of schools that suffered from a lack of career technical education resources (a proxy for reaching economically disadvantaged groups likely to be affected by the digital divide).

Because parents, teachers, and other influential adults play a role in supporting students as they become aware of careers, the pilot also sought to bridge the gap between youth (the next generation of IT workers) and their parents, who are often unaware of the career opportunities IT holds. Another important pilot strategy was to leverage existing relationships among educators and businesses, and build new partnerships to offer interactive engagement events.

During the early months of 2014, the pilot provider developed a detailed implementation plan for the project around four specific strategies (see Exhibit 5).

Exhibit 5. Planned BDD Pilot Strategies

Strategy	Description
Identify the current status of high school IT programs and engage teachers to support the projects	• Work with regional career technical education directors from each of the high schools and Regional Occupation Programs (ROP) to survey the high schools and ROPs to determine which courses are being offered in order to update the current database. • Create a collaboration of high school and ROP instructors who are interested in engaging in an outreach effort and will promote IT activities and/or develop and deliver IT work-based projects in their schools.
Create and implement an outreach plan	• Create and implement an outreach plan to entities that influence the preparation of students for their future careers (students, parents, teachers, career counselors, afterschool programs, nonprofits, and professional associations). • Reach out to the media to assist in the awareness campaign to inform the general public of the need to grow the IT pipeline in the County. • Leverage high-profile events to attract attention and excitement to the IT sector.

Strategy	Description
Support and enhance existing programs and develop new programs and work-based projects	• Develop and support programs that create an opportunity for students and parents to explore the technology used by the IT sector, learn about the potential career options, and the education pathway to those careers. • Provide programs, competitions, events, and work-based projects that focus on the high school– and community college–age students. Work with schools to identify where support can be provided and program development can occur. Integrate events such as Hackathons and other project-based programs into the classroom.
Build strong relationships with the other pilot project teams	• Establish a strong referral network and relationships with County partners including but not limited to those supporting the Workforce Innovation Fund project.

On March 14, 2014, Vital Link presented the plan in a joint meeting of the business and education stakeholder groups that had participated in the Year 1 convening process. During the meeting, business and education stakeholders were able to ask questions and suggest modifications to the plan. Following the March 14[4] convening, Vital Link began implementing the pilot.

Formative Study Overview

WestEd conducted a formative evaluation to generate information that could be helpful to the OCWIB, Vital Link, and project stakeholders in understanding how the Bridging the Digital Divide pilot evolved. The formative evaluation sought to learn how the strategies and messaging used in career awareness and exploration events were developed, and discover which approaches were effective. Finally, the formative evaluation was intended to serve as a resource for future implementation of this type of training.

The research questions guiding the formative evaluation of the BDD pilot and its activities were:

1) How does the OCWIB develop targeted and effective career awareness events to inspire youth to pursue careers in IT?
    a. What are the specific messages that motivate youth to explore careers in IT?

Data Sources

Data to answer these questions were captured at different phases of the BDD pilot's evolution, and obtained from multiple sources.

Observation. WestEd observed and documented the March 2014 presentation of the pilot project plan to business and education stakeholders who participated in the Year 1

[4] Preliminary pilot activities commenced before this date.

convening process. WestEd also met regularly with OCWIB staff to learn and gather information about pilot plans and to identify appropriate data collection points.

Interviews. WestEd conducted in-person interviews with key OCWIB and Vital Link project staff at three points in time, to document their experience and progress with the pilot's launch and implementation.

- *Pre-Program Interviews*. WestEd interviewed project leaders about the formation of the BDD Pilot and their expectations for the program.
- *Process Interviews*. As the pilot was implemented, WestEd interviewed pilot staff and project leaders. The semi-structured, one-hour interviews gathered data at two points in time. The first interview was conducted in April 2014, to learn about early implementation activities. The second interview was conducted in September 2014 to learn about program refinements implemented during the summer of 2014 and planned activities.
- *Capstone Interviews*. WestEd interviewed pilot project leaders in September 2015 to learn their perspectives on pilot implementation at the conclusion of grant-funded activities.

Documents. Researchers also reviewed notes, documents, and materials that were used or developed to support BDD events and activities. Documents included items such as work plans, agendas, sign-in sheets, participant satisfaction/feedback surveys, PowerPoint presentations, handouts, and other materials the project team and partners created to support implementation of pilot activities.

WestEd researchers synthesized and analyzed information from these sources to answer the research questions. A full description of the methodology can be found in Appendix A: Methodology.

Limitations

The BDD pilot was intended to test innovative strategies to engage secondary school instructors, businesses, and other partners in demonstrating the use of technology in careers across industries represented in the IT cluster. The pilot sought to transform the workforce services system through building an infrastructure to promote career awareness and exploration activities, primarily for youth in grades 9–12, with an emphasis on populations traditionally underrepresented in IT education and employment. The design and methods selected for this study limit the ability to generalize findings to other contexts or populations, as they are specific to this project. However, the findings can serve as a source of information for stakeholders in the workforce development field who may be interested in adopting similar practices.

Summary of Findings

The main formative evaluation findings about the BDD pilot are summarized below:

- **The pilot leveraged existing relationships and planning processes to identify collaborators to participate in the design and implementation of pilot activities.**
- **The pilot planning process involved engaging champions — individuals with experience, as well as a need and interest — to develop specific programs based on strategies that had been well received in the past.**
- **Vital Link facilitated the design of career awareness and exploration programs based on a mixed-grade, experiential approach.**
- **BDD programs and activities provided experiential and project-based learning opportunities to teachers and students.**
- **The pilot provider brokered successful intersections between employers, schools and colleges by engaging businesses in a number of ways, including as exhibitors in events and judges in competitions featuring students' products.**
- **Events were publicized, planned, and scheduled to encourage participation by youth and their parents.**

Findings

This section presents the findings of the formative evaluation of the BDD pilot project. The first subsection describes the BDD pilot strategies and implementation activities. The second section examines stakeholders' perspectives on challenges and successes associated with the pilot and its activities. The final section discusses the findings and lessons learned.

Implementation

The original goal of the BDD pilot was to conduct activities to increase interest in IT-related careers among youth in demographic groups currently underrepresented in IT jobs, including females, Latinos, and other racial and ethnic minorities. The population of students in Orange County is 49 percent Latino and 45 percent female (Lucile Packard Foundation for Children's Health, 2015).

The pilot project leaders sought to achieve this goal by designing programs aligned with career pathway expansion strategies that targeted all students in Orange County. They reasoned that programs with broad appeal would reach more students and be more likely to reach students they hoped to target. They also planned to focus on schools with a high share of students eligible for free and reduced-price lunch programs, as a proxy for students in low-income communities most likely to be affected by the digital divide.

The pilot leveraged existing relationships and planning processes to identify collaborators to participate in the design and implementation of pilot activities.

Grant funds did not directly support programs created by the BDD pilot; the grant funds supported Vital Link to develop BDD programs and conduct outreach to schools about participation in those programs. Vital Link, a respected workforce intermediary in the region, has a rich network of relationships with educators and education organizations in Orange County, and a strong history of providing programs and activities to Orange County youth. Vital Link drew on its existing network to quickly plan the programs and activities that were part of the pilot.

Vital Link first sought feedback from educators through Career Technical Education Orange County (CTEoc), a collaboration hosted within Vital Link. The members of the CTEoc collaboration are the CTE Directors from each of the school districts in Orange County. The Directors meet monthly and twice a year at regional gatherings. CTEoc was Vital Link's primary collaborative network for purposes of sharing information about the pilot and engaging teachers in its development and implementation. Through this venue, Vital Link publicized the pilot project, conducted focus groups, and invited stakeholder input to determine what types of career awareness and exploration activities to develop.

At the time Vital Link was planning the pilot (January 2014), California launched the Career Pathways Trust Fund, a competitive grant program to allocate adult education, Perkins, and other funding to regional partnerships building programs for seamless pathways between schools, higher education, and careers. Vital Link also convened education stakeholders to begin planning responses to this Career Pathways Trust Fund grant opportunity. It was able to build on information gathered through this process — which included the IT sector as one of three industries targeted for pathways development — to identify schools and educators who might want to participate in the BDD pilot.

The pilot planning process involved engaging champions — individuals with experience, as well as a need and interest — to develop specific programs based on strategies that had been well received in the past.

Vital Link had previously developed career awareness and exploration activities for other industries; these involved partnerships between schools, institutions of higher education, and businesses. In its role as a trusted convener and the BDD pilot project leader, Vital Link's strategy was: (1) to publicize and conduct outreach to support the pilot; and (2) to bring key champions together to identify how stakeholders might collaborate through leveraging existing resources and expertise. Its goal was to engage stakeholders in developing and implementing a few activities as examples of programs that could be developed further in Project Year 3.

Vital Link acted as an intermediary to promote and support the individual career awareness and exploration programs developed through the BDD pilot project. It created

the venue for discussion, facilitating the conversation among educators to determine what was needed. Its role also included identifying and recruiting business partners; identifying strategies to leverage resources; and handling the logistics for overall pilot program delivery, including manpower and fundraising activities.

> *"Project-based learning is more expensive than learning theory from a book. Teachers do not have the bandwidth to handle the regional organization for these types of programs."*
>
> –Project Leader

Knowing each school's needs, capacity, and desire to participate in the BDD pilot was very important. By gathering data through its collaborative networks, Vital Link was in a position to target schools with teachers willing to participate. Because grant funds were limited, Vital Link recruited individual teachers willing to make the commitment to quickly develop and implement strategies in Year 2. The teachers would need to take on new responsibilities; for example, help develop curriculum, attend workshops and training sessions to learn the curriculum, learn how to use technology, and participate in organizing events. Without this commitment, pilot activities would not have happened.

Vital Link also knew that unless the interests of districts, schools, and teachers were aligned, the program was very unlikely to be sustained. While conducting the planning process, the provider selectively recruited stakeholders to ensure school districts, schools, and teachers were all willing and interested in taking on the new initiative.

Vital Link facilitated the design of career awareness and exploration programs based on a mixed-grade, experiential approach.

Field trips, exhibitions, in-school coursework, and competitions were all planned with a view toward creating opportunities for youth to learn through experience — whether interacting with or developing the technology themselves. Experiential learning opportunities often engaged youth of different ages, including secondary and postsecondary students, in the same activity.

For example, to create a 3D printing course, the CTEoc group formed a task force and wrote the curriculum. The process was facilitated by Vital Link, which distributed the curriculum to interested teachers during training workshops it conducted to provide the teachers a framework for delivery. Vital Link then created a separate event (the OC Maker Challenge) in which student teams competed against one another to showcase their products.

The classes for the 3D printing course, in which students formed teams, were not organized by grade level; instead, they were structured by the three levels of complexity of the project. The original model for bringing different education levels together came from a project sponsored by the University of California, Irvine. Vital Link took that design and

applied it to other programs. The program model was organized so that teachers formed teams of students to produce new product ideas and build a prototype using the 3D printer:

- Level 1: Static 3D printed product.
- Level 2: Product with movable parts.
- Level 3: Product with computer programming that allowed full functionality.

Teams could be composed of students from any grade, and could compete at any of the three levels. Students were able to choose an area to compete in, and students at any grade level could participate.

BDD programs and activities provided experiential and project-based learning opportunities to teachers and students.

In addition to offering experiential and project-based learning opportunities for students, BDD programs built teachers' technical and instructional skills as well. For example, the mixed-grade delivery model "helped the teachers to take the cap off of creativity" for their students and start to think about the different levels of delivery opportunities, and not be limited by grade level.

Many activities leveraged existing resources and programs to create new IT-focused career awareness and exploration program opportunities for middle and high school students, as well as postsecondary students. Exhibit 6 below describes examples of the type of career awareness and exploration programs and activities developed under this pilot project.

Exhibit 6. Example Programs and Activities Used to Bridge the Digital Divide

Activity/Grade	Description	Results
3D Printing	Teachers wanted to provide 3D printing and engineering instruction. 3D printer prices were going down, and partners found a number of sources through the education system to buy the equipment. The schools purchased the printers; Vital Link facilitated teacher training; and teachers developed curriculum for teaching design and programming skills.	New curriculum; number of 3D printers increased from few to 47.
OC Maker Challenge	The OC Maker Challenge was conducted over three days as a showcase of models or prototypes of inventions students made using the 3D printers. Vital Link recruited businesses to participate as judges. Teams were made up of 3–5 students per team.	The final event was held in spring 2015. Over 90 teams participated — spanning middle school, high school, and community college levels.

Activity/Grade	Description	Results
Hackathon	Vital Link connected with UC Irvine, which already hosts a hackathon. The partnership added a level of engagement to include high school students participating in the Hackathon with college students. Hackathons last a weekend and students compete on computer programming projects.	The Hackathon, originally created through the WIB, moved to the school district, and was redesigned as the C-STEM.
C-STEM	A CTEoc member researched this computer programming curriculum, developed by UC Davis, and brought it to Vital Link. The curriculum can be integrated into algebra classes and middle school math classes, as well as the digital media arts classes at the high school and community college level.	18 teachers participated in the CSTEM curriculum. Vital Link funded the kits that accompany the curriculum.
Rescue Robotics	The model for Rescue Robotics came from the OC Maker Challenge and focused on computer programming for robotics (ground or drone). The aim was to build robots that could help find people injured from natural disaster and in need of rescue. UC Irvine developed a curriculum. Two teacher meetings were held for Rescue Robotics, with the first involving 12 teachers and the second involving 54 teachers.	A Rescue Robotics performance was held. 110 students participated, broken out by competitive category (not grade level).
Career Exploration Exhibits	Exhibits focused on technical and career exploration were set up in gyms at participating schools. Each program ran a full school day and offered hands-on activities similar to a science museum. Students had opportunities to learn about local colleges that offer programs and careers that involve skillsets to develop the respective technology exhibited.	Delivered at 35 different locations. Over 20,000 students engaged in the exhibit program over the contract period; another 3,000 students were reached with exhibits integrated into two expanded showcase programs.
Field Trips	Vital Link partnered with colleges and businesses to create field trip experiences in large public spaces. Colleges exhibited interactive displays related to their IT departments. Businesses brought full-scale products featuring the latest in technology, much like they would do at a tradeshow. Additionally, student work was comingled with the business environment. Vital Link also produced sector-specific workshops.	Involved students, teachers, and parents, along with representatives from local colleges and businesses. Site tours reached over 800 attendees over the grant period.

The pilot activities engaged local businesses, as well as teachers and students at middle schools, secondary schools, colleges, and universities. The majority of the career exploration exhibits were funded by United Way. Business partners also funded

development of exhibits. For example, Mazda presented an auto design exhibit, funding the exhibit materials, artwork, and displays. Vital Link provided the table and covering, and staffed the exhibits during the program-day delivery.

The pilot provider brokered successful intersections between employers, schools, and colleges by engaging businesses in a number of ways, including as exhibitors in events and judges in competitions featuring students' products.

As the various career awareness programs were launched, businesses were engaged to participate in a number of ways, including through field trips, exhibits, fairs, and competitions. For example, in maker-focused classes, student teams produced videos delivering informational pitches about their product. Nicknamed "Dolphin Tank," students described in the video what the product does, demonstrated how it works, and delivered a sales pitch to potential customers and backers. Businesses viewed and rated the videos in a preliminary screening process; high scoring teams were then invited to participate in a live competition judged by businesses.

Vital Link has a strong group of business partners and reported the businesses were very willing to participate. By offering them ways to engage that built on their existing interests and capacity, the pilot provider was able to foster connections and broker new relationships with secondary and postsecondary education institutions participating in the pilot. Vital Link was also able to help businesses manage participation in more than one pilot by coordinating information and activities across events.

Events were publicized, planned, and scheduled to encourage participation by youth and their parents.

Vital Link's motto is "Explore, Discover, Connect." Although the motto is not specific to the BDD pilot, Vital Link applied the principles embodied in its approach to engaging students to its work on the BDD pilot. Accordingly, it drew on its considerable experience providing education programming for youth to develop a student engagement framework for BDD career awareness and exploration activities.

Vital Link labels activities that relate to the Explore phase as "Edutainment," a combination of education and entertainment. Edutainment activities include, for example, going to a museum of science and industry, and participating in interactive events and exhibits. The aim of exploration activities is to create an environment that "makes the connection for the youth" — allowing youth to find activities that are fun, linking activities to potential careers, and providing youth with the vehicle to learn more about what they just experienced.

The Discover phase helps youth discover their talents and abilities, as well as skills that are aligned with what was exciting to them about the Explore phase. In the Discover phase, youth identify skills and align them with their interests and passions. Project-based learning and linked-learning type models are examples of Discover phase activities.

The final phase is Connect. Vital Link understands that school counselors and parents are gatekeepers. If parents don't understand what their children are talking about, there is less likely to be follow-up to help the youth explore their interests in a career. If a parent shares the experience, it is often a very different conversation.

> ***"The kids could bring their parents to the exhibit. That was an 'a-ha' moment: Seeing how engaged students were in showing off technology to their parents."***
>
> *–BDD Project Leader*

Thus, to Connect, Vital Link planned and scheduled exhibits and competitions at times when parents could attend. Many of the exhibits presented high-tech devices that parents do not normally have access to see. Seeing the exhibits and learning how technology works is interesting to parents, provides an opportunity for parents and their children to share an experience, and opens doors for further conversations about the child's career interests.

Exhibits (e.g., the Career Exploration Exhibits), competitions (e.g., the OC Maker Fair), and award ceremonies (incorporated into multiple activities) provided opportunities to educate parents on programs that schools, colleges, and universities offer and helped expose them to opportunities they may not have been aware of for their children in the technology field.

Messages that motivated youth to explore IT careers conveyed that these occupations were interactive, dynamic, innovative, and oriented to the real-world. Messages described IT careers as "interactive and dynamic" through hands-on and creative activities, such as exhibits and competitions which were intended to spark students' curiosity and expand their interests. Messaging also highlighted ways that occupations responded to real-world needs and values that could be explored both within and beyond the classroom, such as how technology can improve and save lives in healthcare, or how it can be used to help sustain the environment. In documents evaluators reviewed, educators reported that "…Vital Link offers connections with real-world professionals who can give practice advice to curious students," and that it was a "Great program to introduce kids to the skills and technologies of the future."

Project Leader and Provider Perspectives

Researchers interviewed the Vital Link program manager and program staff involved in the BDD pilot, to learn their perspectives on planning, implementation, and outcomes.

Challenges

The timing of the contract awards made it difficult to immediately implement the pilot project.

Because the pilot project contract awards were made in November 2013, the middle of the school year, it was difficult to immediately plan and offer services in Project Year 2. Vital Link worked with stakeholders to begin developing curriculum and to offer some services immediately after being awarded the contract to implement the BDD pilot, and then revise services during summer 2014 for full implementation in the fall of 2014. Additionally, the original awards coincided with the holiday months, making it difficult to immediately get pilot projects up and running because many staff and/or collaborators were on holiday vacations.

Managing increasing demand for pilot activities that depended, in part, on training educators, proved to be a challenge and required redefining roles.

In Project Year 2, Vital Link targeted a small group of educators and schools to participate in the development phase of the BDD pilot. Teachers weren't paid stipends to attend a workshop or participate; they came because they wanted the equipment for their classroom and the ability to be a part of innovation. Vital Link purposely worked with a small group of highly motivated individuals who could help make the first year successful, so that others could see the resulting activities and build on them.

The following year (Project Year 3), there was a huge increase in demand. Vital Link conducts many programs with a view toward regional collaboration and hoped to incorporate all school districts in pilot activities; a project leader from Vital Link said, "Ideally, we want all districts to participate in the program to make sure this is integrated into the culture of all schools in Orange County. We want to make sure we do not force narrowness." Managing that growth was difficult. Vital Link worked with CTEoc partners to transition responsibilities for managing the programs to the collaborative. Vital Link's role shifted from providing intensive support to simply bringing any equipment the CTEoc partners might need, such as tables and chairs or sound equipment.

While programs are integrated in the schools, ongoing financial support is uncertain.

Vital Link's strategy helped to integrate various BDD pilot programs in schools and workforce-planning bodies. However, after the programs were institutionalized and embedded into classrooms, they still needed financial support. Vital Link is exploring whether products developed through the BDD courses and competitions can be part of a royalty agreement. For example, student teams sometimes develop products that are feasible to bring to market, and Vital Link would like for those teams and/or schools to be able to earn money from products developed through these programs to help finance ongoing operations.

Successes

The ability to tap into existing relationships and leverage resources was instrumental to the pilot's success.

Vital Link's extensive network, experience with similar programs, and understanding of how to leverage resources within Orange County were cited as the biggest factors that facilitated planning and implementation of the BDD pilot project programs and activities.

A trusted workforce intermediary, Vital Link is heavily involved in the education and business community in Orange County. It hosts and participates in a number of consortia and collaborations, has a strong history of collaborating with key stakeholders, and is very knowledgeable about the program and funding landscape. In many ways, with Vital Link at the helm, the foundation for a successful pilot was set; without Vital Link's extensive experience and local network, it would have been very challenging to "start from scratch."

Adapting existing, successful program models made it easier to integrate and sustain the BDD programs in schools.

Vital Link's ability to adapt successful practices (e.g., based on prior experience working with UC Irvine on the OC Maker Challenge), to the needs of STEM instructors who wanted to build capacity to offer IT pathways courses helped in developing sustainable programs that could be easily integrated into the schools. Vital Link's ability to adapt successful practices it had developed in collaboration with other organizations to the BDD pilot also helped to build the infrastructure of relationships and collaborative activities required to manage the BDD programs over the long-term.

For example, Vital Link knew from previous Career Pathways Trust grant-planning discussions that teachers were interested in building capacity to teach and use 3D printing technology, but were not familiar with how to operate 3D printers or with how to incorporate instruction in principles associated with 3D printing into their curriculum. Presenting the BDD pilot as an opportunity to create a program modeled on the design of a popular and successful existing effort, Vital Link facilitated a collaborative task force to access resources and develop curriculum that a small group of educator leaders could test. One member of the collaborative planning team was able to secure a few 3D printer kits that teachers learned how to use to build more 3D printers. In combination with supporting teachers to build and use the printers, Vital Link supported teachers to develop curriculum to teach students how to use the printers.

Vital Link also created a scaffolded career awareness and exploration activity structure consisting of fairs, exhibits, and competitions, which promoted interest in IT careers, in part, by featuring student-made products. This scaffolded activity structure also offered opportunities for community colleges and four-year schools to coordinate academic programs with K–12 schools, and formed the basis for engaging employers to participate in exhibits and competitions.

Pilot activities enhanced the capacity of schools and teachers to provide career-focused skills instruction through project-based learning.

Project leaders viewed funding for this pilot as a way for the BDD pilot project partners to extend their work to build IT career pathways programs and reach a greater number of students. According to the pilot provider, schools "aren't afraid of this type of learning model now." That is, when Vital Link first started to promote project-based and experiential learning, particularly among mixed grade levels, it was a challenge to help teachers and schools shift from a focus on core academics to an understanding that instruction in both theory and applied skills is necessary for students to succeed.

Local schools that worked with Vital Link on these BDD pilot activities and programs are beginning to understand how to structure learning for youth who are "builders and makers," and need to understand how things work in order to connect this learning to theory. The BDD pilot offered ways for teachers and schools to understand that not all youth want to attend college, and to encourage youth who might not have had an interest in attending college to envision opportunities to use their skills in creative ways and seek the education and training to help them advance in a career.

Summary

The pilot provider, Vital Link, and the pilot project partners drew on their connections within the Orange County community to quickly plan and implement pilot programs and activities. Existing relationships and connections within Orange County greatly facilitated implementation. Other factors contributing to the success of BDD pilot activities included tapping into a committed group of educators willing to assume extra responsibilities to develop curricula and obtain resources; implementing programs and activities that aligned the interests of districts, schools, and teachers; creating opportunities to engage both youth and parents; and leveraging resources.

The pilot provider and project team reported a few barriers to planning and implementation. The timing of the contracting process and rapid timeline for implementing the pilot projects affected progress in the early phases of implementation. In addition, following initial implementation, the pilot provider found it challenging to have the capacity to meet, manage, and fund the overwhelming demand for the BDD pilot projects and activities.

Discussion and Lessons Learned

BDD pilot activities surpassed expectations about what could be accomplished on many levels. The activities and programs created change by building capacity in the workforce development system; among businesses; within colleges, districts, and schools; among

individual teachers; and, perhaps most importantly, among the students and their parents affected by the digital divide.

The pilot provider's experience as a trusted intermediary, its capacity to tap existing relationships, and its ability to leverage resources was instrumental to the pilot's success.

The trust that partners had in the intermediary organization (Vital Link) leading the pilot was an important factor in promoting the extensive collaboration necessary to the pilot's success. For example, as an intermediary, Vital Link created a forum for stakeholders to communicate and collaborate together. Successful collaboration during the BDD pilot activities included taking students into the field, expanding programs and supporting growth in schools, collaborating with teachers as equal partners, leveraging funding for resources, and engaging with schools and businesses as partners.

Vital Link noted that the role of an intermediary organization is an important one for supporting structures and systems, doing things faster, and sustaining work over a longer period of time. While stakeholders may have interest and commitment to projects, they may not have access to broader networks and capacity. Teachers, for example, don't have time to go knocking on doors to establish relationships among students, parents, and businesses. With their sole interest being an intermediary, Vital Link was able to cover all topics and industry sectors, focusing on creating those sort of structures and supports. Because of Vital Link's experience and pre-existing networks, the infrastructure for BDD was largely already in place, which made rapid progress possible.

Engaging teachers by meeting their interests and building their capacity helped to support the success of the pilot.

Vital Link noted that teachers' interests were an important focus for the pilot. Vital Link targeted schools with teachers who were willing to participate in the pilot and who were committed to quickly developing and implementing project strategies. These teachers took on new responsibilities, such as helping to develop curriculum, attending workshops and trainings to learn curriculum, learning about new technologies, and helping to organize events. Vital Link also noted that without the teachers' commitment, pilot activities would not have happened.

This interest and commitment from the teachers also attracted other schools and organizations as the pilot progressed, which made it possible to scale the pilot rapidly — a case, pilot leaders noted, of "If you build it, they will come." Methods for capitalizing on teachers' interests included showing videos of successes, putting the projects in public arenas (like campus quads), and showing off what students were doing. By demonstrating possible programs and activities to engage students in IT-related learning, teachers could select which activities fit well with their interests and curriculum.

The pilot helped to transform teachers' approach to career awareness, exposure, and education.

Pilot providers discovered that BDD and its activities changed many teachers' thinking about instructional approaches from a focus on grade-level instruction to a focus on the "level of delivery." This included teachers considering differentiated levels within teams in a class and developing strategies to support all levels of learners. It also included thinking about the pilot program activities as content areas rather than being restricted to grade-level benchmarks. Pilot activities also helped foster the understanding that students might do well outside of academics, such as in project-based "maker" programs, which resulted in teacher excitement as well as changed thinking.

The pilot provider brokered successful intersections between employers, schools, and colleges by engaging businesses in a number of ways, including as exhibitors in events and judges in competitions featuring students' products.

As the various career awareness programs were launched, businesses were engaged to participate in a number of ways, including through field trips, exhibits, fairs, and competitions. For example, in maker-focused classes, student teams produced videos delivering informational pitches about their products. Nicknamed "Dolphin Tank," students described in the videos what the product does, demonstrated how it works, and delivered a sales pitch to potential customers and backers. Businesses viewed and rated the videos in a preliminary screening process; high-scoring teams were then invited to participate in a live competition judged by businesses.

Vital Link has a strong group of business partners and reported the businesses were very willing to participate. By offering them ways to engage that built on their existing interests and capacity, the pilot provider was able to foster connections and broker new relationships with secondary and postsecondary education institutions participating in the pilot. Vital Link was also able to help businesses manage participation in more than one pilot by coordinating information and activities across events.

By engaging parents and students, the pilot promoted career awareness and exploration and established a foundation for action.

The pilot providers noted that parents can contribute to the digital divide if they do not understand technology, or have limited access to information about technology- or IT-related careers. They also understood that while students may be aware of technology as users, they may not be aware of IT careers and need access to resources that help them to bridge the divide from multiple sources.

If parents don't understand what students are talking about concerning IT, they may not be able to follow up with their children in ways that help support children's interests and choices. However, if a parent shares the student's experience, a very different conversation can occur. Having a shared experience can create an opportunity for communication that

students and parents don't have if learning experiences are just held during school hours. Scheduling BDD IT-related events such as field trips, competitions, and awards ceremonies on the weekends created venues of shared exposure and experience that fostered understanding among students and parents, and provided information resources they could use for future action.

V. Outcome Study: New and Improved Training Pilot Project

In addition to conducting a formative evaluation of the stakeholder convening process and the Bridging the Digital Divide pilot project, WestEd conducted an outcome evaluation of pilot projects implemented by the ITCCP to provide education and training opportunities for adults. These pilots were informed by the roadmap produced by the stakeholder convening groups. The OCWIB procured pilot providers to develop the specific pilot program design, content, and delivery strategies to meet the goals outlined in the roadmap.

This chapter of the report presents the results of an outcome study of the New and Improved Training Pilot project, which developed new information technology (IT) curricula and retrofitted existing curricula to fill existing gaps in training in Orange County.[5] This chapter describes this pilot project and presents findings and lessons learned from an analysis of completion, employment, and retention outcomes.

Pilot Overview

During the stakeholder convening process, business stakeholders identified six skill areas with notable growth opportunities: IT security, mobile application development, business process analytics, business intelligence and predictive analysis, cloud computing, and healthcare IT. The stakeholders identified these target areas through reviews of national job growth trends (e.g., median pay, number of jobs, job outlook, and employment change) and the current local business demand. Business stakeholders further noted that skills in these areas were needed not only to build the future workforce but also to ensure that incumbent workers remained competitive in their positions.

New Courses

Based on consensus from the business and education stakeholders, it was determined that the New and Improved Training Pilot would involve developing four new IT-related training programs:

- **Mobile Application and Development:** This program is designed for people embedded within an organization and/or working in an entrepreneurial

[5] This pilot project was originally presented as two pilot projects in the roadmap: one to develop new curricula to address unmet need, and a second to update existing curricula to better meet the needs of local businesses. The pilots were awarded to the same provider, Brandman University, and implemented as one project; they are, therefore, treated as one pilot for the purpose of this evaluation.

capacity. Technical skills are combined with business skills, including entrepreneur/intrepeneur best practices, in order to develop individuals ready to work productively in a cross-functional business setting. Technical skills focus on the fundamental concepts of software application development relative to development of mobile applications. The foundations of mobile application development for iPads, iPhones, Androids, and JQuery Mobile Essentials will be introduced using languages and tools including HTML, CSS3, Adobe Dreamweaver, and JavaScript. Students participate in a mobile app development lab with an opportunity to create their own application with the assistance of a certified instructor.

- **Business Process Analytics**
    - **Level 1 – Foundations:** This program integrates technical foundations with an understanding of organizational structure and project methodology. The successful completion of the program provides students with the ability to communicate and work with IT teams and other business functional teams and move forward technology-focused projects intended to solve business problems. Students successfully completing this program will understand how to gather data and analyze the same. Tools focused on include Excel, Access, and Crystal Reports. Project management and other leadership competencies provide the framework for managing business intelligence projects and working with cross-functional teams to utilize appropriately gathered analytics to make business decisions. Students must have intermediate knowledge of Microsoft Excel to be eligible for this program. Students successfully completing this program will attain the Business Process Analytics Level 1 Certificate in addition to a Microsoft MOS Access Certification, upon passing the MOS exam.
    - **Level 2:** This well-rounded program integrates technical expertise with an understanding of organizational structure and project methodology. Students entering this program must have a working knowledge of the toolset developed in Business Database Analytics and Process Analysis Level 1 and a general understanding of individual leadership competencies. Students will build on their ability to use the basic Microsoft applications' analytic tools by moving forward to master the Transact SQL language to write basic queries for Microsoft SQL Server. Team and organizational leadership competencies as well as advanced project management skills will provide the ability for students to direct the use of analytical tools with business analysis insights to solve strategic business questions. Successful completion of the program includes Microsoft Certified Solutions Associate (MCSA) in SQL Server 2012 certification (upon the passing of three Microsoft exams). Students with the MCSA certification may be awarded academic credit toward the Brandman Bachelor of Science in Computer Technology undergraduate degree.
- **Understanding Cloud Computing:** This program is designed for network administrators or those similarly situated. Students will gain an understanding of cloud computing along with the ability to install, configure, and manage the world's most used Cloud IT solutions. Because these individuals must work

cross-functionally in order to evaluate and lead a project that affects multiple business functional areas, leadership, business, and management skills are incorporated into the curriculum with outcomes focused on providing the ability to work with management-level decision makers. Successful completion of this certificate program provides the student with the necessary training for the industry-recognized certifications CompTIA Cloud Essentials VMware Certified Professional (VCP) and Red Hat System Administrator (RHCA).

- **IT Security:** This program recognizes that IT Security specialists are often hired as senior-level members of the IT team. The students best positioned for success will have three to five years of experience in IT, either as a network or system administrator. This robust selection of industry-recognized information security courses provide the technical skills required to conceptualize, design, and engineer secure solutions across complex enterprise environments. Recognizing that technical skills are only a part of the skillset required to effectively perform the work this student will be trained for, this program includes a focus on leadership, business, and management skills required of individuals with management-level decision-making authority. Successful completion of this certificate program provides students with the knowledge required to apply to sit for three of the following certifications exams — depending upon experience, student will choose from: CompTIA Security+, CompTIA Advanced Security Practitioner (CASP), Computer Hacking Forensics Investigator (CHFI), Certified Ethical Hacker (CEH), Certified Information Systems Auditor (CISA), Certified Information Security Manager (CISM), and Certified Information System Security Professional (CISSP). Brandman also provides academic credit toward the Bachelor of Science in Computer Updated Courses.

According to the roadmap, business stakeholders also voted the revision of existing IT training programs as the greatest priority. The revision of programs was a bigger priority than the creation of new courses and programs because it takes less time to adjust current courses and training programs, compared to implementing new areas of study. Thus, the second piece of the New and Improved Training Pilot was conceptualized as a "retooling" of two IT-related training programs.

According to the roadmap, the following revised training programs would be offered as part of the New and Improved Training Pilot:

- **Business Skills for IT:** Employers repeatedly report that many prospective hires and current employees have excellent technical skills but do not have the soft skills, business acumen, and leadership understanding to work effectively in today's cross-functional environment. This program is designed to provide individuals new to the workforce with individual leadership skills, project management principles, process understanding and improvement, along with the basic business acumen to work effectively and efficiently.
- **Soft Skills Training:** Many members of the workforce have excellent technical knowledge and skills; however, employers report that a lack of understanding of the business and insufficient team and organizational leadership competencies result in a failure to work as effectively or productively as

required in today's cross-functional environment. This program addresses this gap with courses focused on leadership development, project management, process analysis tools, and other competencies every professional and paraprofessional must master in order to manage and lead projects, teams, and strategic business initiatives.

The "improved" portion of the New and Improved Training Pilot was an opportunity for business and education stakeholders to continue to work together to refine existing courses to include relevant skills and knowledge.

Development Process

When developing the new and improved courses for the New and Improved Training Pilot, Brandman University involved business stakeholders and advisory board members in the process of designing and revising the curricula. Project leaders at Brandman University followed their typical course development policy and process: the course objectives were defined and, to develop the course, they consulted their development team, which includes an instructional design team, technology specialists, subject matter experts, Brandman University faculty, business stakeholders, and Brandman University's advisory board. Brandman University partnered with New Horizons to assist with course development because New Horizons has significant experience as subject matter experts in IT curriculum development and methods of instruction. They anticipated adapting the curricula after it was developed, so that courses could also be offered online, in person, or in a blended environment (online and face-to-face). By the end of the pilot project, all courses were offered exclusively online.

The process of developing the courses took four months to complete. During that time period, Brandman University received feedback from business stakeholders and incorporated that feedback into their revisions. Business stakeholders and advisory board members received and provided feedback through email, phone calls, and in-person meetings.

During the stakeholder convening process and development of the roadmap, it was decided that unemployed, incumbent, and dislocated workers and college students would be recruited to participate in the new and improved training programs from multiple sources: the One-Stop system, schools, nonprofit partners, and other OCWIB-established referral networks. The participant enrollment target for the New and Improved Training Pilot was 150 students.

Evaluation Overview

The main research questions guiding the outcome evaluation of the New and Improved Training Pilots were:

1) Were individuals who completed new or revised programs placed in IT-related jobs?
2) Did incumbent workers who completed the new or revised training programs retain their current position or show wage gains?

Additionally, a secondary research question was:

3) Did individuals who participated in new or revised training programs pass and complete courses?

Data Sources and Methods

Data to answer these questions were obtained from multiple sources:

Administrative data: The pilot provider maintained Excel spreadsheets tracking students throughout their enrollment as participants in the training programs. Staff entered participant information and tracking information directly into the Excel sheets on an ongoing basis. The database tracked participant demographics and information to determine eligibility for public workforce development programs funded by the Workforce Investment Act. At the end of the study (September 30, 2015), the database was transferred to OCWIB, who then transferred the files to WestEd.

Interviews: WestEd conducted interviews with the project leaders during the first year of the project and at the end of the project. The purpose of the interviews was to obtain information about barriers and facilitators to implementation and plans for sustainability.

The quantitative analysis of outcomes data for the New and Improved Training Pilot included conducting three regression models to examine the impact of training courses on two outcomes. The first logistic regression model examined the number of completed courses as a predictor of employment. The second logistic regression included an adjustment for clustered standard errors and examined the number of courses passed versus the number of courses not passed as a predictor of employment. The third model, an ordinary least squares model, examined the impact of the number of courses completed on wage gains. Qualitative data were analyzed to identify themes across respondents and across time.

Limitations

Two aspects of data collection limit the ability to generalize results. First, the wages at follow-up were not consistently reported. In some cases, the wages reported were from the employer. In other cases, they were reported by the participant. Thus, results for the incumbent worker analysis should be interpreted with caution. Additionally, the methodology does not adjust for selection bias (i.e., does not allow for disaggregating the influence of the program and the participant's own efforts). Lessons learned from the implementation may be transferrable to similar program contexts. A full description of the methodology can be found in Appendix A.

Participant Demographics

The New and Improved Training Pilot included a total of 159 participants. Fifty-four participants were incumbent workers, meaning that they were currrently employed at the time of enrollment. The remaining 105 participants were unemployed at the time of enrollment.

Exhibit 7. Demographic Characteristics

Demographic Characteristic (n = 159)	Percentage
Male	74
Female	26
Highest Grade Completed	
Some High School (highest grade = 10)	1
Some College (highest grade = 13–15)	15
Bachelor's (highest grade = 16)	35
Some graduate school (highest grade = 17)	16
Not reported	34
Self-Reported Optional Race/Ethnicity	
Asian	16
African American/Black	4
Hawaiian/Other Pacific Islander	1
White	55
Declined	23
Age	
25–44	47
Other (less than 25, greater than 44)	53

Summary of Findings

The main findings from the evaluation included:

- **The majority of participants (67%, n = 70) who were unemployed at enrollment were employed at follow-up.**

- **For incumbent workers, the average increase in wages from pre-training to post-training was $0.75 an hour. All incumbent workers remained employed at follow-up.**
- **The number of courses participants completed and the number of courses participants passed were not significantly associated with employment or with increased wages.**

Findings

This section presents findings on participant outcomes and project leader perceptions about the implementation of the New and Improved Trainings Pilot.

Participant Outcomes

Course Enrollment and Completion

Participants enrolled in an average of three courses (mean [M] = 3.11, standard deviation [SD] = 2.52). The total number of courses that participants enrolled in ranged from 1 to 16. The 159 participants enrolled in a total of 410 courses. Of those 410 courses, 96 (23%) were considered Pass/No Pass. Of the 96 Pass/No Pass courses, 68 percent of courses were passed.

Letter grades were given in 314 courses. Of those 314 courses, students recevied an "A" in 140 (45%) courses, a "B" in 75 (24%) courses, a "C" in 47 (15%) courses, a "D" in 12 (4%) courses, and an "F" in 40 (13%) courses. According to the pilot project provider, Brandman University, a "C" or better is considering passing. Thus, students passed in 327 out of the 410 courses (80%). Unemployed workers passed 234 courses (74%); incumbent workers passed all of their courses. Exhibit 8 includes the grades and the percentage of courses passed and not passed.

Exhibit 8. Course Grades and Percent Passed

Letter Grade Courses (n = 314)		Pass/No Pass Courses (n = 96)		Passing Rate for All Courses
Grade	Percentage*	Pass/No Pass	Percentage	
A	45	Pass	68	80%
B	24			
C	15			
D	4	No Pass	32	20%
F	13			
Total	100%	Total	100%	100%

*Total does not sum to 100% due to rounding.

Exhibit 9 includes the number of courses in each of the six program areas. The majority of courses were taken in the Leadership and Business Administration program area (116 courses), followed by IT Security (85 courses). The fewest number of courses were taken in the Business Data Analytics and Process Analysis Level 1 — Foundation program area.

Unemployed workers took more courses in all program areas, with the exception of Understanding Cloud Computing. Very few incumbent workers took courses in Mobile Application Development, Business Data Analytics and Process Analysis (Level 1 or Level 2), and Business Administration for the IT Professional.

Exhibit 9. Courses by Program Area

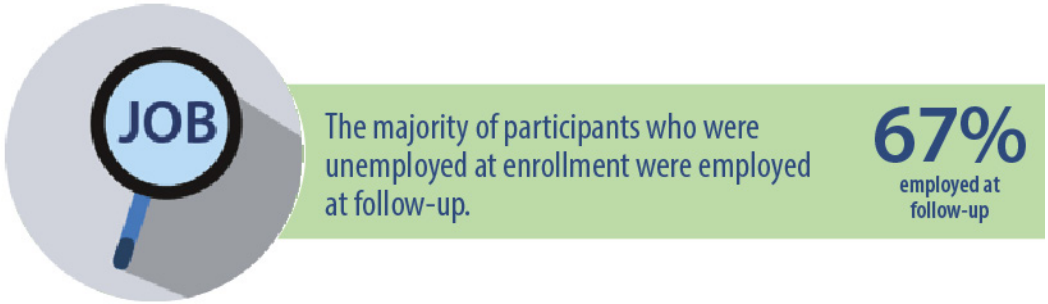
Program Area	Number of Courses		
	Incumbent Workers	Unemployed Workers	Total
Mobile Application Development	4	55	59
Business Data Analytics and Process Analysis Level 1 — Foundation	0	19	19
Business Data Analytics and Process Analysis Level 2	2	23	25
Understanding Cloud Computing	24	19	43
IT Security	27	58	85
Business Administration for the IT Professional	2	54	56
Leadership and Business Administration	33	83	116
Total Courses	**92**	**311**	**403**

Unemployed workers completed an average of 3.03 (SD = 2.09) courses, whereas incumbent workers completed an average of 1.70 (SD = 0.61) courses. Comparing unemployed workers to incumbent workers, unemployed workers completed a significantly greater number of courses (t = 5.90, p <.001).

Comparing unemployed workers to incumbent workers, unemployed workers completed a significantly greater number of courses (t = 5.90, p <.001).

Employment and Wages at Follow-Up

- The majority of participants (67%, n = 70) who were unemployed at enrollment were employed at follow-up.



For workers who were unemployed at baseline, 67 percent (n = 71) were employed at follow-up. The number of courses completed did not significantly predict employment at follow-up (b = 0.03, p = .76). The number of courses passed also did not significantly predict employment at follow-up (B = 0.60, p = .13). Participants who were employed at follow-up completed, on average, a slightly higher number of courses (M = 3.07, SD = 2.02) compared to participants who were not employed at follow-up (M = 2.94, SD = 2.26), although this difference was not statisitically significant. Participants who were employed at follow-up passed, on average, a slightly higher percentage of courses (M = 72.76%, SD = 34.77) compared to participants who were not employed at follow-up (M = 69.17%, SD = 41.24); the difference was not statistically significant.

All incumbent participants remained employed at follow-up. For incumbent workers (n = 54), the average change in wages from enrollment to post-enrollment was an increase of $0.75 (SD = 6.11) from pre-training to post-training. The range in wage changes was -$22.64 to $36.04. The number of courses did not significantly predict increases in

wages (b = 0.44, p = .65). The number of courses was only correlated with difference in wages by .14, a very small correlation that was not significant. All incumbent workers passed their courses, so we were unable to test for differences based on passing or not passing courses.

Summary of Quantitative Findings

The main quantitative findings for participants attending the New and Improved Training Pilot courses are as follows:

- The greatest number of courses taken were in the Leadership and Business Administration program area.
- The fewest number of courses taken were in the Business Data Analytics and Process Analysis Level 1 —Foundation program area.
- Unemployed workers enrolled in a significantly greater number of courses compared to incumbent workers.
- Participation in courses did not predict employment for unemployed workers.
- Participation in courses did not predict wage increase among incumbent workers.

Pilot Project Provider Perspectives

During the implementation of the pilot program, WestEd staff met with the New and Improved Training Pilot project provider to discuss barriers and facilitators to implementation.

- **The biggest facilitator to implementation was the existing relationships with businesses in Orange County.** The existing relationships facilitated the rapid development and revision of the training courses. The pilot provider relied on the established relationships with businesses to provide feedback on the courses.
- **While few barriers were noted, the timing of the procurement and contracting process caused some difficulty.** The pilot project was funded in November of the calendar year. Because the school year typically operates September to May, this made it difficult to immediately enroll students.
- New and improved courses were successfully integrated into ongoing course offerings. Moreover, courses were adapted to be offered exclusively online.

Discussion and Lessons Learned

The purpose of the New and Improved Training Pilot project was to revise existing courses and develop new courses to fit the needs of IT employers in Orange County. The target for the pilot was 150 participants; this goal was met.

Participants successfully completed training courses. However, the number of training courses was not significantly related to employment or increases in wages.

- The greatest number of courses taken were in the Leadership and Business Administration program area.
- The fewest number of courses taken were in the Business Data Analytics and Process Analysis Level 1 – Foundation program area.
- Unemployed workers enrolled in a significantly greater number of courses, compared to incumbent workers.

The incumbent workers who took courses were still employed at follow-up. Further, 67 percent of unemployed participants were employed at follow-up.

The outcomes observed in this study were tracked for a relatively short time after participants completed the new and improved education and training programs. Many of these courses were offered as part of longer certification or degree programs, and they will continue to be offered after the term of the grant. Additional research could help to document the longer-term effects of participation in the new and improved courses developed under this pilot on participants' employment and wage outcomes.

VI. Outcome Study: Internship Pipeline Pilot Project

WestEd conducted a second outcome evaluation of a pilot project launched by the ITCCP to build internship pipelines connecting postsecondary students with education and training opportunities leading to workplace experience. This pilot was also informed by the roadmap produced by the stakeholder convening process. This chapter describes the Internship Pipeline Pilot Project and presents findings from an analysis of completion and employment outcomes. It also describes lessons learned from implementation.

Pilot Overview

In order to build a pipeline of workers entering IT jobs in Orange County, business stakeholders agreed that creating alumni networking and internship opportunities for students was a high priority. Additionally, Orange County has a substantial veteran population, with existing skill sets applicable to open IT jobs. The business stakeholders agreed that creating a pipeline for veterans and students to obtain internship positions would help satisfy the long-term demand for IT expertise in Orange County.

To address this priority and demand, the OCWIB released a procurement to establish Internship Pipeline Pilot Project(s) creating internship pipelines for students and veterans. Two providers — Vital Link and Saddleback College — were selected to develop an expanded internship capacity and infrastructure program, and to formalize a consistent internship and alumni network. The pipeline pilot project had two foci:

- Developing an internship pipeline and network for students (Internship Matching System, implemented by Vital Link).
- Developing an internship pipeline for veterans leading to direct placement, or in some cases, training and then placement (Veterans' Pipeline, implemented by Saddleback College).

Internship Matching System

The purpose of the Internship Matching System was to provide a centralized source for businesses to find interns, and for students to find internships. Vital Link, the Intern Matching System provider, nicknamed the system the "match.com of internships." The main component of the system was a website that linked businesses with potential interns that met qualifications for internship positions. The pilot sought to place 50 students in internships.

In developing the Internship Matching System website, Vital Link sought feedback from all business and education stakeholders who participated in the stakeholder convening process. Vital Link obtained feedback during a presentation to the convening group on March 14, 2014, and periodically throughout the development of the system. Vital Link also developed specific criteria for website functionality based on recommendations in the roadmap. The internship matching website was envisioned to (1) be a mechanism to assess applicant quality and qualifications; (2) serve as a funnel for employers to narrow the field of qualified candidates; (3) be economically self-sustaining; and (4) serve local students, schools, and employers.

Vital Link conducted research on similar websites to select the best system to use as a baseline or building platform. As part of its research, Vital Link investigated existing tools currently used by universities and looked at other websites that used matching algorithms. Vital Link also met with colleges to discuss functionality. Vital Link then customized the website from the baseline version.

As pilot project leaders were customizing and testing the site, they sought feedback from a wider group of stakeholders. Vital Link tapped existing relationships in the community to conduct beta testing. The beta testers included the North Orange County Community College District, and various teachers, counselors, and students with whom Vital Link had existing relationships. Vital Link also sought business stakeholder feedback through its existing relationships and from its CTEoc regional advisory board, which is an Orange County regional collaborative that Vital Link has hosted for the last 10 years that consists of leadership from all school districts serving students in grades K–12, Regional Occupational Programs, and community colleges.

Veterans' Pipeline

The Veterans' Pipeline sought to establish a system that facilitated veterans' participation in IT by providing veterans with opportunities to capitalize on their existing expertise and develop additional expertise. Headed by Saddleback College, the Veterans' Pipeline included activities to promote internship and job placement for veterans in IT positions. The Veterans' Pipeline intended to place 30 veterans in internships or jobs.

While developing the Veterans' Pipeline, Saddleback College utilized existing connections and partnerships, including gathering feedback from the Region 8 consortium (the California community colleges are organized in 10 regions; Orange County and part of Los Angeles County are part of Region 8). The Region 8 consortium was established in spring 2009 and was one of the first regional consortia to address educational programming and services to meet veterans' needs. Fourteen community colleges participate in the Region 8 consortium, as well as three California State Universities, University of California, Irvine, and several private institutions of higher education (IHE)

that meet requirements of being "veteran friendly." Representatives from these IHEs try to meet every two months to share best practices.

Approximately 10,000 veterans attend the member IHEs participating in the Region 8 consortium. Saddleback College utilized this consortium to elicit feedback on and promote the Veterans' Pipeline. Saddleback College also has an existing relationship with Camp Pendleton, a local Marine Corps base, and was able to utilize that relationship to gather feedback to inform development of the pilot.

Evaluation Overview

The design of these pilots was informed by the convening process. The pilots were designed to provide IT-related internship pathways to postsecondary students, with a special focus on serving veterans, in Orange County. This evaluation of the two ITCCP internship pipeline pilots expanded the evidence base for IT internship programs by reporting outcomes for postsecondary students and veterans.

The main research questions guiding the outcome evaluation of these internship pipeline pilots were the following:

- Are students and veterans placed in IT internships?
- Do students and veterans complete internships?

Additionally, information was collected to determine the number of veteran interns who were placed into jobs following their internship placement.

Data Sources and Methods

Data to answer these questions were obtained from multiple sources:

Administrative data: Pilot providers maintained Excel spreadsheets tracking students and veterans throughout their enrollment as participants in the Pipeline Pilot. Staff entered participant information and tracking information directly into the Excel sheet on an ongoing basis. The database tracked participant demographics and information to determine eligibility for public workforce development programs funded by the Workforce Investment Act. At the end of the study (September 30, 2015), the database was transferred to OCWIB, who then transferred the file to WestEd.

Interviews: WestEd conducted interviews with the pilot project leaders during the first year of the project and at the end of the project. The purpose of the interviews was to obtain information about barriers and facilitators to implementation and plans for sustainability.

The proposed analysis for the Internship Pipeline Pilot was to report the number of internships awarded (paid and unpaid) and the number of internships completed. To complete the descriptive analysis, the total numbers for each category were counted.

Because of the small number of proposed internships, testing for statistical significance was not included in the original plan. The outcome results are not generalizable because of small sample sizes. Lessons learned in the implementation process are, however, transferable to similar program contexts. A full description of the methodology can be found in Appendix A.

Participant Demographics

The Internship Matching System was originally intended to serve 50 students by placing them in internships during the period of the grant. A total of 121 students enrolled as participants in the Internship Matching System. Exhibit 10 outlines the demographic information for the participants who enrolled in the Internship Matching System.

Exhibit 10. Demographic Characteristics of Internship Matching System Participants

Demographic Characteristic (n = 121)	Percentage
Male	58
Female	42
Highest Grade Completed	
High School	7
Associate	11
Some College	32
Bachelor's	32
Master's	16
Doctorate	1
Unknown/Not Reported	2
Self-Reported Optional Race/Ethnicity	
American Indian/Alaskan Native	1
Asian	24
Black	7
Hispanic/Latino	11
White/Caucasian	38
Declined	19
Age	
25–44	21
Other (less than 25, greater than 44)	78
Unknown	2

The Veterans' Pipeline intended to place 30 participants in internships. Forty-eight individuals enrolled and 21 of those participants received internships. Exhibit 11 outlines the demographic characteristics of the Veterans' Pipeline participants.

Exhibit 11. Demographic Characteristics of the Veterans' Pipeline Participants

Demographic Characteristic (n = 48)	Percentage
Male	83
Female	17
Highest Grade Completed	
High School	56
Associate	2
Some College	13
Bachelor's	13
Master's	2
Not reported	15
Self-Reported Optional Race/Ethnicity	
African American	4
Asian	2
Asian/Hawaiian-Pacific Islander	8
Hispanic	8
White	15
Declined	63
Age	
25–44	46
Other (less than 25, greater than 44)	8
Not reported*	46
Veteran Status	
Air Force	4
Army	19
Coast Guard	2

Demographic Characteristic (n = 48)	Percentage
Honorable Discharge	23
Marine Corp	21
Navy	13
Not Reported	19

*Dates of enrollment into the program were used to calculate the participant's age at enrollment. Dates of enrollment were only reported for 26 of the participants.

Summary of Findings

The main findings from the evaluation included:

- **The Internship Matching System met its target goal of enrolling 50 students in internships.** Forty-nine of the 50 students completed their internship.
- **The Veterans' Pipeline placed 21 veterans into internships; thus, it did not meet its target of placing 30 veterans into internships.** All of the veteran interns completed their internship.
- **All internships provided as part of the Internship Pipeline Pilot Project were paid.**

Findings

This section presents findings on participant outcomes and project leader perceptions about the implementation of the Internship Pipeline Pilot.

Participant Outcomes

Student Internships

Of the 121 participants in the Internship Matching System, 50 (41%) were awarded internships; all but one participant completed the internships (98% completion rate).

The Internship Matching System met its target of serving 50 students; 50 students were placed in internships. All of the internships were paid internships that fell into two categories:

- *Unsubsidized employment*. **39 of the interns** secured unsubsidized employment, meaning the participant was hired by an employer either in a full- or part-time position. The employer paid the participant's salary and the OCWIB did not contribute to payroll expenses.
- *Short-term employment*. **11 of the interns** obtained a short-term position with a specific end date and not a permanent hire.

Exhibit 12. Descriptive Outcomes for the Internship Matching System

Descriptive Outcome	Number of Interns
Total Participants	121
Internships Awarded	50
Short-Term Employment	11
Unsubsidized Employment	39
Internships Completed	49

Veteran Internships

The Veterans' Pipeline served 48 participants. It had a target of placing 30 veterans in internships; 21 internships were awarded (44% of participants received internships). Of those 21 interns, all 21 participants completed their internship and 10 (48%) were able to transition their internship into a job placement. The interns were placed in a total of 13 unique businesses/settings. Exhibit 13 outlines the internship outcomes for the participants in the Veterans' Pipeline.

Exhibit 13. Descriptive Outcomes for the Veterans' Pipeline

Descriptive Outcome	Number of Veterans
Total Veteran Participants	48
Internships Awarded	21
Internships Completed	21

Project Provider Perspectives

During the implementation of the pilot, WestEd staff met with pilot project leaders to discuss facilitators and barriers to implementation. The Internship Pipeline Pilot Project leaders at Saddleback College and Vital Link shared similar perspectives on factors that facilitated or acted as barriers to placing students and veterans in internships.

Facilitating Factors

- **The major facilitators to placement were being able to identify openings among Orange County businesses appropriate for internships.** The Internship Pipeline Pilot providers utilized their strong existing partnerships within the region to identify potential placement opportunities. These relationships allowed them to help businesses plan for and support interns.
- **Both Internship Pipeline Pilot providers utilized their existing networks with Orange County businesses to help them identify students and**

veterans eligible for placement. This ensured a pool of qualified candidates were enrolled in the program.

- The I**nternship Matching System was viewed as a user-friendly, innovative use of technology, and as increasing efficiency in the intern selection process by both businesses and applicants.** The internship matching system included pages where businesses posted interview questions. Internship applicants could record and upload video responses to interview questions, allowing them time to practice and refine their responses before submitting an application. Businesses were able to screen and contact only candidates they believed matched their hiring criteria, which streamlined the entire process.
- **Both Internship Pipeline Pilot providers offered additional supports to ensure participants were successful in the program.**
    - **The Veterans' Pipeline** assigned a staff member who was responsible for frequent meetings with veterans, to ensure that registration paperwork was completed. Further, this staff member provided mentoring and feedback to veteran interns in areas such as interviewing and time management. This staff member was seen as an invaluable asset for this pilot project due to a combination of in-depth understanding of veterans and the individual program participants, as well as established relationships with local businesses. This combination of knowledge facilitated promoting the program and brokering effective matches.
    - **The Internship Matching System** pilot was staffed by a Vital Link counselor who met individually with the prospective interns, providing feedback on their applications and interview videos; answering questions about the internship process; and offering mentoring, support, and general coaching to interns.

Barriers to Success

The Internship Pipeline Pilot providers also reported experiencing similar barriers to successful outcomes.

- **The timing of the procurement process leading to contract awards was described as a barrier.** The contracts to Vital Link (for the Internship Matching System) and Saddleback College (for the Veterans' Pipeline) were issued in November 2013. Because the school year typically operates September to May, this made it difficult to launch and immediately enroll students and veterans in internships, which are typically offered during the academic year.
- **The primary barriers were related to being unfamiliar with requirements of federally funded workforce development grants and programs.**
    - **Obtaining and tracking information on workforce development program eligibility and participation.** The pilot providers' inexperience with data entry and reporting requirements associated with public workforce development funding resulted in the omission of data in the final participation estimates for some participants who were initially part of the Internship Pipeline. The OCWIB worked with both

pilot providers to correctly obtain and store required participant information after this barrier was discovered. Following the training, both providers noted that the OCWIB was responsive to their requests and that the training was "excellent."

  - Administrative responsibilities associated with participation in a federal grant resulted in unanticipated staffing requirements. One pilot provider was new to the reporting and administrative tasks involved in managing a contract under a federal grant. In hindsight, the provider realized it had not budgeted sufficient staff time and resources for program and participant reporting tasks, which placed a heavy workload on the pilot project team.

- **Testing pilot strategies took time before successful practices were fully implemented.** For example, at the beginning of the Veterans' Pipeline, Saddleback College did not have a dedicated person assigned to coach veterans in the internship process. After recognizing that it was necessary for someone who had existing connections with Orange County businesses and who could work one-on-one with veterans to assist in the application process, Saddleback College hired a person to fill this role. The addition of this staff person was one of the greatest facilitators of the pilot project's success.

Future Plans

At the time data collection concluded, plans were underway for the Internship Matching System website to continue as a fee-for-membership site. The Veterans' Pipeline will not continue as implemented after WIF funding ends. As noted above, during the implementation of the Veterans' Pipeline, pilot project leaders found it was necessary to employ a full-time staff person dedicated to helping veterans with their interviewing skills, identifying and scheduling interviews, and preparing for interviews. This full-time position cannot be maintained after funding ends, so the program, as conceptualized for the pilot project, will not continue.

Saddleback College will continue to strengthen relationships with Orange County businesses and attempt to direct veterans to open positions at those businesses. Further, Saddleback College now has an established relationship with the OneStop system, which it will continue to strengthen and will use to connect veterans to jobs. Finally, Saddleback College will apply the lessons learned through this experience in future work.

Discussion and Lessons Learned

The purpose of the Internship Pipeline Pilot Project was to create a pathway for students and veterans to obtain IT-related work-based experience by being placed in internships in Orange County. The targets for the Internship Pilot Program were to serve 50 student interns and 30 veteran interns through internship placements.

Overall the Internship Pipeline Pilot Project was successful in placing students and veterans in internships and ensuring a high completion rate for the internships.

- The Internship Matching System met its target to serve 50 student interns. The Veterans' Pipeline did not meet its target of serving 30 veteran interns.
- Although the Veterans' Pipeline did not meet the target, the program was able to place 21 veterans into internships (representing 70% of the target).
- All internships were paid positions.

The pilot providers' existing relationships with businesses in Orange County greatly facilitated the accomplishment of pilot project goals.

- Providers successfully engaged employers in noticing available internship opportunities through existing networks.

Providing staff to help mentor, coach, and support interns while enrolled in the program and in internships also facilitated successful outcomes. Both students and veterans benefitted from opportunities to meet with staff who helped them navigate program requirements and match them with promising opportunities.

The site developed for the Internship Matching System will continue as a fee-for-membership site. The Veterans' Pipeline will not continue as implemented after WIF funding ends.

VII. Cost Analysis

The purpose of the ITCCP cost analysis was to examine how grant funds were distributed across activities, focusing on pilot development and service delivery. Because some of the costs were associated with system building, we first discuss the total system-level costs. We then describe the per-participant cost, which is calculated based on actual costs of implementing the pilot programs both overall and individually for the New and Improved Trainings and the Internship Pipeline Pilot projects. The information from the cost study provides a point of comparison for developing and implementing similar projects and initiatives, although location is likely to affect the transferability of cost estimates to similar efforts elsewhere.

The research questions guiding the cost study were the following:

1) What are the costs of the overall ITCCP?
2) What is the per-participant cost of each of the two pilot projects providing direct services to individuals?

Data Sources and Methodology

WestEd obtained data for the cost study from the ITCCP project team, including the OCWIB and the pilot providers. Data included the following:

Expenditure (Cost) Data: WestEd obtained expenditure data organized by type of expense (e.g., costs associated with grant management, system-level activities, and pilots). The costs were further broken down according to the pilot projects.

Pilot Administrative Data: WestEd also obtained data on the number of individuals who participated in the participant-serving pilot projects supported by the grant. The cost analysis determines the per-participant costs for the New and Improved Trainings and the Internship Pipeline Pilot projects. The convening process and the Bridging the Digital Divide pilot were not included in the pilot cost analysis because they were intended to affect system change and did not serve WIA-eligible participants.

Analysis

In order to address the research questions, WestEd separated costs into two categories: (1) system-building (e.g., grant management and evaluation, strategic development, stakeholder convening, project support); and (2) pilot development and service delivery. System-building costs were not included in the per-participant cost analysis because they involve long-term investments in the system infrastructure that fall outside this study's scope. Future cost studies that examine participation over a longer period could include them.

WestEd calculated the combined cost per participant across the New and Improved Trainings and the Internship Pipeline Pilot projects by dividing the total pilot costs for the group by the total number of participants (see Equation 1).

> [Equation 1] Per participant cost = (total pilot costs for pilot) / (number of participants)

After calculating the overall cost per participant, WestEd further specified the cost by calculating the cost per participant for each pilot. For example, equation 2 below demonstrates how the costs per participant were calculated for the Veterans' Pipeline.

> [Equation 2] Per participant cost = (Veterans' Pipeline development and service delivery costs) / (number of Veterans' Pipeline participants)

Limitations

The cost information provided has limitations to how it can be used toward informing the development and delivery of similar initiatives. First, resources were allocated based on local needs and overlaid with existing staffing/system structures, which would likely differ in other local contexts. Second, the cost analysis does not account for valuable non-financial resources, such as contributions made by stakeholders through their attendance during the convening process and at meetings, or matching funds and other potential program resources leveraged, but not reported by the pilot project providers.

Funding

Exhibit 14 outlines the WIF grant-funding allocations for the two costs categories described in the previous section: (1) system-building and (2) pilot development and service delivery.

- **The WIF funding associated with system-building totaled $930,000, representing 31 percent of the total WIF funding awarded to the OCITCCP.**
- **The pilot development and service delivery funding totaled $2,070,000, representing 69 percent of the WIF funding.**

Exhibit 14. WIF Grant Funding Allocations for ITCCP

WIF Grant Activity	Total Funding	Percentage of Total Funding
System Building:	$930,000	31%
Grant Management and Evaluation: County staff; administrative and grant program management; personnel, supplies, and travel; program evaluation	$630,000	21%

WIF Grant Activity	Total Funding	Percentage of Total Funding
Strategic Development, Stakeholder Convening, and Project Support: Stakeholder convening and communication, environmental scans, roadmap development	$300,000	10%
Pilot Development and Service Delivery:	$2,070,000	69%
New and Improved Trainings Pilot Project Development, Participant Training, and Support Services: IT curriculum and certificate program development; participant recruitment, enrollment, and tuition; case management and support services; job development and placement; follow-up services	$1,207,251	40%
Internship Matching System: Website development and management; participant recruitment, coaching, placement, tracking and reporting; follow-up services	$494,477	17%
Veterans' Pipeline: Program development and management; participant recruitment, coaching, placement, tracking, and reporting; follow-up services	$170,600	6%
Bridging Digital Divide: Program development and services delivery to schools, teachers, parents, and students	$175,656	6%
Pilot 5: Toolkit development[6]	$22,016	1%
Total WIF Funds	$3,000,000	100%

Cost per Participant

The average cost per participant for the participant-serving pilots (New and Improved Trainings and Internship Pipeline) was $5,691. Cost per participant for each respective individual pilot ranged from $3,554 (Veterans' Pipeline) to $7,593 (New and Improved Trainings). These costs are not comparable across the pilots because services received differed in length, target audience, and activities. Exhibit 15 outlines the costs per participant across the three pilots.

[6] This pilot project was designed to create a toolkit of information resources about the IT cluster in Orange County for local businesses to use when promoting IT careers and attracting talent. The toolkit was under development after data collection for this evaluation concluded and was, therefore, not included in the formative study.

Exhibit 15. Cost per Participant for Participant-Serving Pilots

Program	Number of Participants	Cost per Participant
Average Cost of Participant-Serving Pilots	**329**	**$5,691**
New and Improved Trainings	159	$7,593
Internship Matching System	121	$4,087
Veterans' Pipeline	48	$3,554

Conclusion and Lessons Learned

WIF grant funding was spent in ways intended to meet local needs in Orange County. Pilot development and delivery of services responded to local needs in the context of local infrastructure and resources.

- The participant-serving pilots helped individuals learn new skills, earn certificates, gain work experience, and secure high-paying IT jobs. Participants were provided specialized, intensive, and innovative services in a competitive economy for approximately the same costs as Workforce Innovation and Opportunity Act basic formula grants.

- The costs are not fully representative, as certain nonfinancial resources are missing from the analyses. Pilot project providers were not required to track matching, leveraged, or in-kind contributions which, as qualitative evaluation data collected by this evaluation suggest, were substantial and figured prominently in the success of each pilot that was studied.

- Future studies could benefit from developing a simple, quick, and standardized method for pilot project providers to quantify the matching, leveraged, or in-kind resources contributed to help make innovative grant-funded programs successful.

The costs to support the ITCCP are not necessarily transferable to the design and implementation of other efforts. The costs of the participant services may be more transferable to similar types of direct program services, but should be considered in tandem with the structure and duration of the individual pilots (described in Chapters 5 and 6), as well as non-quantified costs (matching, leveraged, and in-kind).

All the costs represent an investment in the local workforce system and further development of participants' human capital. Estimating a monetary return on these investments requires data on the monetary benefits of the investments, which this evaluation is not designed to capture. Future evaluations could build on this cost data and estimate the economic returns to efforts that build on the investments made through this grant.

VIII. Conclusion: Summary of Findings and Lessons Learned

The ITCCP initiated strategies and tested programs designed to achieve comprehensive and long-term change in the local workforce development system. The previous chapters in this report presented detailed findings from (1) formative evaluations of an innovative stakeholder convening process and a pilot project to bridge the digital divide by building capacity and infrastructure for career awareness and exploration activities; (2) outcome evaluations of pilot projects that provided education, training, and internships to adult students, job seekers, and incumbent workers; and (3) a cost study. This concluding chapter summarizes the findings across these studies, and reviews lessons learned. The chapter concludes with a discussion of how these findings contribute to the evidence base on cluster and sector strategies, and career pathways programs.

Summary of Findings

The Workforce Innovation Fund supported projects designed to achieve change in the workforce development system and test innovative programs and services to improve outcomes for individuals. The formative and outcome evaluations of the ITCCP examined an innovative, business-led stakeholder convening process and career awareness and exploration programs aimed at achieving system-level change, and new career technical education and internship programs to improve outcomes for adults. The findings are summarized below.

Changes in the Workforce System

Strategies to achieve change in the workforce development system focused on (1) establishing a new, business-led model to engage businesses in identifying and planning for skills needed across an industry cluster, and (2) building capacity for career awareness and exploration activities to help build a pipeline of local, skilled IT talent. These approaches brought new businesses to the process of planning and participating in workforce development services; fostered collaboration among businesses and between businesses and education stakeholders; and transformed approaches to the delivery of IT education and training for youth and adults.

The business-led stakeholder convening process was regarded as a success by business stakeholders, while education stakeholders had a mixed response.

- The strategy of having a business intermediary organization convene business and education stakeholders separately and then together facilitated open communication and the sharing of ideas — two central goals of the ITCCP.
- Business stakeholders consistently and overwhelmingly expressed positive feedback on all aspects of the convening process and a wish to continue to be engaged in similar convening processes in the future.
- Education stakeholders held divergent views on the process. They consistently provided feedback that direct communication with business stakeholders earlier in the process would have been helpful.
- The education and business stakeholder groups were managed differently, and some education members did not respond well to the facilitation strategy until their questions and concerns about the process had been addressed.

The Bridging the Digital Divide Pilot helped to transform teachers' approach to career awareness, exposure, and education. By engaging parents and students, the pilot both promoted career awareness and exploration and established a foundation for action on career goals.

- The experience of the provider (Vital Link) as a trusted intermediary, as well as its capacity to tap existing relationships and leverage resources was instrumental to the pilot's success in greatly exceeding proposed service goals.
- Engaging teachers by meeting their interests and building their capacity helped to support the pilot. Vital Link noted that teachers' interests were an important focus for the pilot. Vital Link was in a position to target schools with teachers who were willing to participate in the pilot.
- These teachers committed to quickly developing and implementing project strategies. They took on new responsibilities such as helping to develop curriculum, attending workshops and training to learn the curriculum, learning technology, and taking part in organizing events. Vital Link also noted that without the teachers' commitment, pilot activities would not have happened.
- The pilot provider brokered successful intersections between employers, schools, and colleges by engaging businesses in a number of ways, including as exhibitors in events and judges in competitions featuring students' products.
- Scheduling events such as field trips, competitions, and awards ceremonies in the evenings and on the weekends created venues of shared exposure and experience that fostered understanding among students and parents, and provided career information resources they could use for future action on education and career goals.

Changes in Direct Services

The new pilot projects providing services to unemployed individuals, incumbent workers, and students were focused on designing and implementing new and improved education opportunities as well as work experience opportunities through paid internships that would meet employers' needs for a highly skilled workforce. The following is a summary of key findings on individual-level outcomes these pilots produced.

Participants successfully completed training courses. However, the number of training courses was not significantly related to employment or increases in wages.

- Participants passed courses at approximately the same rate, regardless of whether they were taken for letter grade or pass/fail.
- The greatest number of courses taken were in the Leadership and Business Administration program area; the fewest number of courses taken were in the Business Data Analytics and Process Analysis Level 1 – Foundation program area.
- The incumbent workers who took courses were still employed at follow-up.
- Further, 67 percent of unemployed participants were employed at follow-up.
- The training courses will continue to be offered after the term of the grant ends.

Overall, the Internship Pipeline Pilot Projects were successful in placing students and veterans in internships and ensuring a high completion rate for the internships.

- The Internship Matching System met its target to serve 50 student interns.
- 78 percent of the interns were hired by their employers in either full- or part-time positions; 22 percent of the interns were hired in a short-term position with a specific end date.
- Although the Veterans' Pipeline (VP) did not meet its target to place 30 veterans, the program was able to place 21 veterans into paid internships (representing 70% of its target).
- 100 percent of interns placed through the VP program completed the internship. Participants in the VP were provided additional support services to ensure they successfully completed the program.

Lessons Learned

Based on the findings, this section discusses lessons learned from the ITCCP that could help inform similar endeavors.

Lessons Learned on Systems Change

When convening diverse stakeholders in an industry cluster planning process, it can be helpful to explore common interests as well as differences, and offer options to participate in a variety of formats.

While the business stakeholders provided overwhelmingly positive feedback on the convening process, their suggestions to improve the stakeholder working group and joint convening process included:

- Offering small-group breakout sessions, possibly organized by theme or interest, could facilitate participation and expression of different perspectives and could help newcomers establish connections and a level of comfort with the process.
- Varying the meeting times (e.g., alternating morning or afternoon meetings) to allow stakeholders who might have had standing time conflicts to attend, and/or arranging for virtual meeting participation to include stakeholders who could not physically attend could also have helped increase participation by different business representatives within the cluster.

While the education stakeholder group was managed differently from the business stakeholder group, it was important to address unarticulated questions and the diverse interests of workgroup members so progress on workgroup goals could move forward.

- The education stakeholders represented a wide range of organizations with extremely diverse interests and roles in preparing youth and adults for careers in the IT cluster. Their feedback suggests it would have been beneficial to allow education stakeholders to voice their goals and perspectives at the beginning of the process, to build greater cohesion and trust among workgroup members.
- Stakeholder feedback signaled a lack of trust among education workgroup members. Addressing some education stakeholders' interest in and questions about the pilot project procurement early on would have been helpful so that possible competition among work group members would not hinder collaboration.
- Education stakeholders consistently expressed the wish to meet with business stakeholders earlier in the process. An early joint convening to orient both working groups to the format and process could have mitigated concern with the separate workgroup meeting format.

Positioning a trusted intermediary to lead change is an important factor in promoting the extensive collaboration necessary to success.

- In both the stakeholder convening process and the career awareness and exploration pilot, the intermediary that lead the process (i.e., OCBC and Vital Link, respectively) created a forum for stakeholders to communicate and collaborate together. Several project and pilot leaders noted that partnering with intermediary organizations is important to supporting structures and systems, and for doing things faster and over a longer period of time.

Leveraging existing relationships, systems, and structures to build new programs helps make it possible to attract participation and interest, and to scale pilot projects rapidly.

- Much of the infrastructure for the Bridging the Digital Divide Pilot had been created through the provider's prior work, and the provider was able to identify a select group of educators to lay the foundation for the new pilot activities. Leveraging this interest and commitment helped to attract others, which made

it possible to scale the pilot rapidly. Methods for capitalizing on teachers' interests included showing videos of successes, putting the project in a public arena (like the quad on campus), and showing off what students are doing.

- The interests of teachers, schools, and districts must be aligned and supported to transform learning through project-based career awareness and exploration activities. The Bridging the Digital Divide Pilot provided the facilitation and logistical support to help change teachers' thinking about instructional approaches from a focus on grade-level groups to the level of delivery. Absent support and commitment, pilot activities would not have been possible.

Engaging parents and students in career awareness and exploration activities can help bridge the digital divide.

- Parents may not support their children's interest in IT careers if they do not understand technology, or have limited access to information about technology or IT related careers. Scheduling events such as field trips, competitions, and awards ceremonies on the weekends created venues of shared exposure and experience that fostered understanding among students and parents, and provided information resources they could use for future action.

Lessons Learned from Pilot Projects

Existing relationships the pilot providers had established with key stakeholders and businesses in Orange County greatly facilitated progress on pilot projects.

- Providers successfully integrated the new and improved trainings into their course development process and curriculum offerings by tapping existing processes and leveraging new partnerships established through the convening process to expedite the work.
- Providers successfully tapped existing networks and relationships and they engaged employers through posting available internship opportunities.

Contribution to the Evidence Base

Information derived from the development, implementation, and evaluation of the ITCCP adds to the body of knowledge available on cluster and sector strategies and career pathways efforts. The findings also demonstrate the challenges and successes of implementing workforce development systems and training initiatives tailored to the needs of multiple businesses in the IT sector. This section highlights how the evaluation findings contribute to the evidence base and identifies areas for further research.

ITCCP and Cluster Strategies

Findings from this evaluation are consistent with previous research that indicates fostering collaboration across businesses within an industry cluster, as well as between businesses in the cluster and universities, government organizations, and support groups or "champions" is an effective way to advance workforce and economic development. By

focusing on creating education pipelines that prepare secondary and postsecondary students to enter IT careers and developing new and improved training for incumbent workers and unemployed individuals (including veterans with transferrable skills), the ITCCP successfully engaged representatives from multiple industry and stakeholder groups to join in workforce development planning that promoted innovation and relationships among stakeholders and possible competitors.

This evaluation extends the literature by pointing to the critical importance of engaging intermediary organizations with the capacity to leverage existing networks to lead change processes. While many stakeholders had interacted with one another in the past, the ITCPP included new industry representatives and tapped respected, experienced intermediaries — one in business and others in education — to spearhead innovative pilot projects. These pilots not only produced concrete, useful deliverables, but created infrastructure and set in motion processes capable of creating long-term and lasting change in the workforce development system.

ITCCP and Career Pathways Literature

The findings from both the formative and the outcome studies also provide new evidence about strategies to build career pathways for youth and adults. The formative study described a successful effort to build a career pathways infrastructure where few resources and opportunities had previously existed. While the formative study did not address student outcomes, it demonstrated efforts to build sustainable changes in instructional practices as well as an enhanced IT pathways capacity that can support ongoing student learning — as well as outcomes studies — into the future.

The outcomes studies demonstrated the capacity of education institutions to develop classroom, self-directed training and work experience learning opportunities that respond directly to business needs for skilled talent in well-defined occupational areas. Little evidence is currently documented about these programs. This evaluation revealed modest short-term gains as a result of participation in new and improved training programs and internships. Additional research is warranted. This evaluation also demonstrated challenges with respect to enrolling and supporting veterans to complete work experience programs, which include scheduling and program eligibility conflicts, and the need for ongoing support to ensure successful completion of internship programs.

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Appendix A. Methodology

This appendix details the methodology for (1) the formative evaluations of the convening process and the Bridge the Digital Divide Pilot, and (2) the outcome evaluations of the New and Improved Training Pilot and the Internship Pipelines.

Formative Evaluation: Stakeholder Convening Process and Bridge the Digital Divide Pilot

WestEd conducted a formative evaluation of two system-level interventions implemented by the OC ITCCP: the Stakeholder Convening process (Chapter III) and the Bridge the Digital Divide pilot (Chapter IV). The formative evaluation gathered and reported information; provided feedback on key project milestones in the planning and implementation processes; and documented how specific strategies unfolded. The overall objective of the formative study was to build the evidence base on previously untested strategies to change and improve the public workforce system.

The formative evaluation for the convening process had two objectives: (1) to provide the project team and participating stakeholders feedback over the course of the project's planning and early implementation phases; and (2) to document key benchmarks, successes, challenges and lessons, particularly focusing on fostering collaborative stakeholder engagement and participation in a cluster-focused workforce development planning process. It also followed two dimensions of convening process activities:

- The project team's efforts to plan and implement the convening process; and
- Stakeholder perceptions of the process and its results.

Concerning the Bridge the Digital Divide pilot (BDD), the formative evaluation generated information that could be helpful to the OCWIB, Vital Link, and project stakeholders in understanding how the pilot evolved. The evaluation sought to learn how the strategies and messaging used in career awareness and exploration events were developed, and which approaches were effective. Information learned from the formative evaluation of the BDD pilot serves as a resource for further implementation of this type of training.

WestEd gathered data from multiple sources throughout the convening process and BDD pilot to document and assess objectives and dimensions, and provided findings to project leaders and stakeholders.

The research questions that guided the formative evaluation of the convening process were:

1) What are the most effective practices in convening local business leaders? Educators?
2) Did the process that was used to convene the stakeholders produce intended results?
3) Did the convening process affect communication among stakeholders with respect to IT skills development and training?
4) How do stakeholders perceive the value of the convening(s)?
5) How has collaboration between business and education stakeholders to address IT skill and training needs changed over the course of the project?
6) What progress has ITCCP made on project goals and milestones?

The research questions guiding the formative evaluation of the BDD pilot and its activities were:

1) How does OCWIB develop targeted and effective career awareness events to inspire youth to pursue careers in ICT?
    a) What are the specific messages that motivate youth to explore careers in ICT?

Participants

The formative evaluation of the convening process and Bridge the Digital Divide pilot gathered data from four groups of participants. One group was composed of **project leaders** heading the convening process and project activities. This group included members of the OCWIB and OCBC. Members of this group were interviewed to follow developments related to the convening and planning process and to the development and implementation of BDD.

A second group included **business stakeholders** involved in the convening group process. Business stakeholders were asked to participate in a survey that asked about their experiences participating in the convenings, the barriers and facilitators to convening and asked for their feedback on the process.

A third group included **education stakeholders** involved in the convening group process, who were also asked to participate in the survey, which was similar to the business stakeholder survey.

The fourth group consisted of **pilot leaders** who headed the development and implementation of the Bridge the Digital Divide pilot. This group included project staff from Vital Link.

Data Sources, Collection and Analysis

WestEd gathered qualitative and quantitative data for the formative evaluation from multiple sources throughout the convening process and implementation of the BDD pilot. These included interviews and surveys, observations of meetings and presentations, and a review of documents. The data included information on successes and challenges with respect to the convening process and its development, as well as those involved with creating and implementing the BDD pilot for K–12 students.

WestEd also used quantitative and qualitative approaches to analyze the data sources for the formative evaluation. Each data source was analyzed separately and then synthesized to provide a comprehensive answer to the research questions. Analyses generated by the formative evaluation were used to provide feedback to project leaders to help inform the convening process and the BDD pilot development and implementation.

Observations

WestEd observed and documented two joint convening group meetings and the March 2014 pilot presentation plan (including that of BDD) to business and education stakeholders who participated in the convening process. WestEd also met regularly with OCWIB staff to learn and gather information about pilot plans and to identify appropriate data collection points.

Interviews

During Years 1, 2, and 3 of the convening process, WestEd conducted interviews with project leaders and a small group of stakeholders who participated in the process and who had also been selected through competitive procurement to run pilot projects implementing recommendations contained in the road map. These were held by two WestEd staff members who conducted one-on-one interviews with 3 project leaders from OCBC and OCWIB during October and November 2013. The interviews occurred either in person or by phone; were semi-structured to allow for follow-up on topics; lasted approximately 60 minutes; and were based on protocols that focused on key project intervention phases, challenges and factors that facilitated progress.

For the Bridge the Digital Divide pilot, WestEd conducted in-person interviews with key OCWIB and Vital Link project staff at three points in time in order to document their experience and progress with the pilot's launch and implementation.

- Pre-Program Interviews — WestEd interviewed project leaders about the formation for the BDD Pilot and their expectation for the program. These interviews occurred in October and November 2013.
- Process Interviews — As the pilot was implemented, WestEd interviewed pilot staff and project leaders. The semi-structured, one-hour interviews gathered data at two points in time. The first interview was conducted in April 2014, to learn about early implementation activities. The second interview was

conducted in September 2014 to learn about program refinements implemented during the summer of 2014 and planned activities.

- Capstone Interviews — WestEd interviewed pilot project leaders in September 2015 to learn their perspectives on pilot implementation at the conclusion of grant-funded activities.

WestEd provided the interview notes to the respective project leaders for comments, edits, and clarification. Interviews and the finalized notes were used for thematic coding and analysis of the data.

Group Member Surveys

WestEd administered and collected workgroup member surveys from business and education stakeholders at two points of time, in May 2013 at the end of the convening process, and once in September 2013. Because the first round of surveys received a low response rate, a second opportunity was provided in order to capture more stakeholder perspectives.

The 15–20 minute web-based survey included open- and close–ended questions regarding participants' experiences in both the separate and co-convened meetings, perceptions of the process's format effectiveness, and areas for improvement. Of the 25 business stakeholders who attended workgroup meetings, 12 responded to the stakeholder survey for a 48 percent response rate. Of the 32 education stakeholders who attended work group meetings, 14 responded to the stakeholder survey for a 44 percent response rate.

In addition, both the business and education stakeholders who attended workgroup meetings attended an average of 4.7 meetings. Eight of the 12 business responders and 10 of the 14 education responders attended at least half of the meetings. Thus, both the business and education stakeholders who responded to the survey mostly represented individuals who actively participated in the convening process. It also represents slightly less than half of the stakeholders who attended at least one stakeholder meeting.

Finally, because the respondents were more involved in the convening process compared to non-respondents (i.e., they attended more meetings), the results of the stakeholder survey might not be generalizable to the larger stakeholder group.

Document Review

WestEd researchers reviewed notes, documents, and materials that were used or developed to support the convening process and BDD events and activities. Documents included items such as work plans, agendas, sign-in sheets, minutes, participant satisfaction/feedback surveys, PowerPoint presentations, handouts, statements of work, work plans, planning meetings, copies of final contracts with training providers from OCWIB, and other materials the project team and partners created to support implementation of convening and BDD activities. They also included the environmental

scan and Roadmap produced during the convening process, as well as training handouts, career guides, and announcements or background materials from training providers.

The document review provided additional context and background information about the development and implementation of the convening process, the Bridge the Digital Divide pilot and their activities. Examining these records allowed researchers to identify how processes and innovation unfolded; how content, decisions and actions took place; and provided information that could be helpful for future project implementation such as with the Roadmap.

Outcome Study: Pilot Projects

WestEd conducted outcome studies of three project pilot interventions — the New and Improved Training pilots, the Internship Matching System, and the Veterans' Pipeline. The outcome analysis was supplemented with project and pilot leader/program staff interviews.

The research questions that guided the outcome evaluation of the New and Improved Training pilots were:

1) Were individuals who completed new or revised programs placed in IT-related jobs?
2) Did incumbent workers who completed the new or revised training programs retain their current position or show wage gain?

Additionally, the secondary research questions were:

1) Did individuals who participated in new or revised training programs pass and complete courses?
2) Has stakeholder satisfaction with the skills of potential employees and new hires increased since the implementation of new and revised training programs?[7]

The primary research question for the Internship Pipeline projects was:

3) Are students and veterans placed in IT internships?

The secondary research question was:

4) Do students and veterans complete internships?

Additionally, information was collected to determine the number of veteran interns who were placed into jobs following their internship placement.

[7] WestEd was not in charge of data collection for this research question, and data that was collected was insufficient to answer the question's goals.

Participants

Data were collected from three groups to answer the research questions. Data about **pilot participants** included administrative data about student and veteran enrollment, demographics, internship and job placement, and wage gain for those who participated in the ITCCP.

The two other groups consisted of **project leaders** and **pilot leaders/program staff** who were interviewed during the first year of the project and at the end of the project. The purpose of the interviews was to obtain information about barriers and facilitators to implementation and plans for sustainability.

Data Sources, Collection and Analysis

Qualitative and quantitative data for the outcome evaluation of pilot projects came from multiple sources:

Administrative Data

WestEd worked with the OCWIB, One-Stops and contracted course providers to collect administrative data for the New and Improved Training pilot. Data included enrollment and assessment data, and characteristics of individuals enrolled in the curricula or training (e.g., standard demographics, indicators of socioeconomic status, academic preparation, employment wages, and course completion). For the internship and veterans' pipeline pilots, WestEd worked in collaboration with the OCWIB and pilot vendors to collect background information on participants at the time of placements. The vendors also provided information at the end of internships as to whether or not participants completed internships.

Pilot providers maintained Excel spreadsheets tracking students and veterans throughout their enrollment as participants in the ITCCP. Staff entered participant and tracking information directly into the sheet on an ongoing basis. The database tracked participant demographics and WIA information. At the end of the study (September 30, 2015), the database was transferred to OCWIB. The OCWIB transferred the data file to WestEd.

WestEd then analyzed the data using outcome models.

Outcome Models and Analytic Methods

WestEd's analysis also included estimating regression models. The quantitative analysis of outcomes data for the New and Improved Training pilot included conducting three regressions models to examine the impact of training courses on two outcomes; one logistic regression model to examine the dichotomous outcome employed versus not employed, one logistic regression model to examine the impact of passing courses on the dichotomous outcome employed versus not employed, and a second ordinary least squares regression model to examine potential changes in wages.

The first model was:

$$Pr(Employed_i = 1) = logit^{-1}(\beta_0 + \beta_1 * NumberCourses + \beta_2 * female + \beta_3 * age + \varepsilon_i)$$

Where Employed is a dichotomous variable indicting that an individual is employed, NumberCourses is a continuous variable representing the number of courses the participant completed, female is a dichotomous variable indicating participant gender, and age is a continuous variable indicating participant age at enrollment.

The second model was:

$$Pr(Employed_i = 1) = logit^{-1}(\beta_0 + \beta_1 * Pass + \beta_2 * female + \beta_3 * age + \varepsilon_i)$$

The second model was the same as the first model, except that it included a dichotomous variable, Pass, which indicated whether or not the individual passed a course. Additionally, due to nesting of courses within participants (i.e., participants could take multiple courses), we also include clustered standard errors in our model.

The third model was a ordinary least squares regression model:

$$Wage_i = \beta_0 + \beta_i * \text{NumberCourses} + \beta_2 * \text{BaselineWage} + \beta_3 * \text{female} + \beta_3 * \text{Age} + \beta_4 * \text{AfricanAmerican} + \beta_5 * \text{Asian} + \beta_6 * \text{Hawaiian} + \varepsilon_i$$

Where NumberCourses is a continuous variable representing the number of courses the participant complete, BaselineWage is a continuous variable representing the participant's wage at baseline, female is a dichotomous variable indicating participant gender, age is a continuous variable indicating participant age at enrollment, and African American, Asian, and Hawaiian are dichotomous variables representing participant ethnicity (Caucasian was held as the constant).

The proposed analysis for the internship and veterans' pipeline pilot was to report the number of internships awarded, the number of internships completed, and the number of paid and unpaid internships. To complete the descriptive analysis, the total numbers for each category were counted.

Interviews

WestEd conducted interviews with project leaders during the second year of the ITCCP and at the end of the project. The purpose of the interviews was to obtain information about barriers and facilitators to implementation and plans for sustainability. WestEd also conducted interviews with pilot leaders/program staff at two points of time to address tropics including implementation successes and challenges, and perceived program benefits.

Two WestEd staff members conducted the one-on-one in person or by telephone interviews. The interviews followed the developments, challenges, and lessons learned

with pilot implementation. They were also semi-structured to allow for follow-up on topics and lasted approximately 60 minutes each.

Interviews notes were provided to pilot leaders/staff members for feedback and additional comments. WestEd researchers then analyzed the interviews thematically, across respondents, and across time to report data on implementation process, successes and challenges, and lessons learned.

A secondary research question examining employer perceptions of skill increases was originally included in the evaluation plan for employer interviews. The secondary research question was:

1) Has stakeholder satisfaction with the skills of potential employees and new hires increased since the implementation of new and revised training programs?

As originally planned, OCWIB counselors would query employers as to the satisfaction with their employees skills after completing training. Unfortunately, the interviews were not conducted systematically, and resulted in only one employer interview. Thus, results are not reported.

Threats to Validity and Limitations

Two aspects of data collection for the outcome studies limit the ability to generalize results. First, the wage at follow-up during for the New and Improved Training pilot was not consistently reported. In some cases, the wage reported was from the employer. In other cases it was reported by the participant. Thus, results for the incumbent worker analysis should be interpreted with caution. Additionally, the methodology does not adjust for selection bias (i.e., allow for disaggregating the influence of the program and participant's own efforts).

Also, because of the small number of proposed internships for the internship and veterans' pipeline, testing for statistical significance wasn't included in the original evaluation plan. The reported outcome data is presented without estimating the statistical association with attendance. Therefore, the outcome results are not generalizable because of small sample sizes.

Finally, the primary threats to validity in the ITCCP's evaluation design concern history and maturation effects. Because researchers were unable to randomly assign participant treatment or control conditions, there was not a defined comparison group. Thus, participant's pre-intervention characteristics had to serve as the comparison. A limit to this design is that it is not possible to distinguish the effects of the intervention from other events that might have occurred during the course of the study (e.g., fluctuations of employment, additional training received by participants, a participant receiving a job applied to before completing training). Events other than the pilot projects could account

for stakeholders' perceptions of the utility of the pilot projects' opportunities; of changes in employment, wages, and retention; or of students' awareness of IT educational, training, and careers.

Regardless of these limitations and/or threats to validity, lessons learned from the outcome evaluation concerning implementation processes, may be transferable to similar program contexts.

Appendix B. ITCCP Logic Models

During the planning stages of the OC-ITCCP, WestEd developed a series of logic models in collaboration with the OCWIB and OCBC. The models outline inputs, activities, outputs, and short-,intermediate-, and long-term outcomes for:

- Workforce outcomes related to the pilot projects developed through the stakeholder engagement process (Logic Model 1).
- Stakeholder outcomes associated with the stakeholder engagement and convening process (Logic Model 2).
- Pilot project outcomes for each of the pilots (Logic Models 3-7).

While the scope of the OC-ITCCP evaluation does not include long-term outcomes because they fall outside the grant's term, they were included in the logic models as part of conceptual planning. This appendix includes all the logic models prepared for the OC-ITCCP.

Exhibit B1. Logic Model — IT Cluster Competitiveness Project

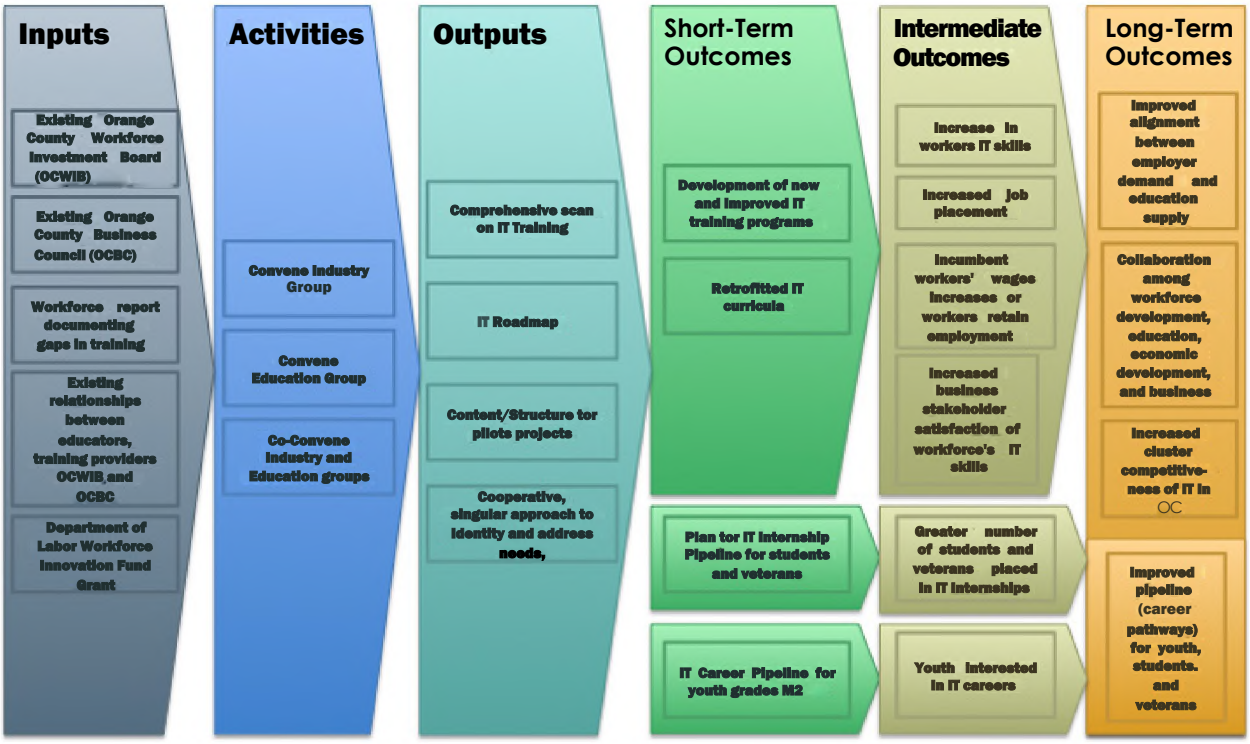


Exhibit B2. Logic Model — IT Cluster Competitiveness Project: Stakeholder Convening Outcomes

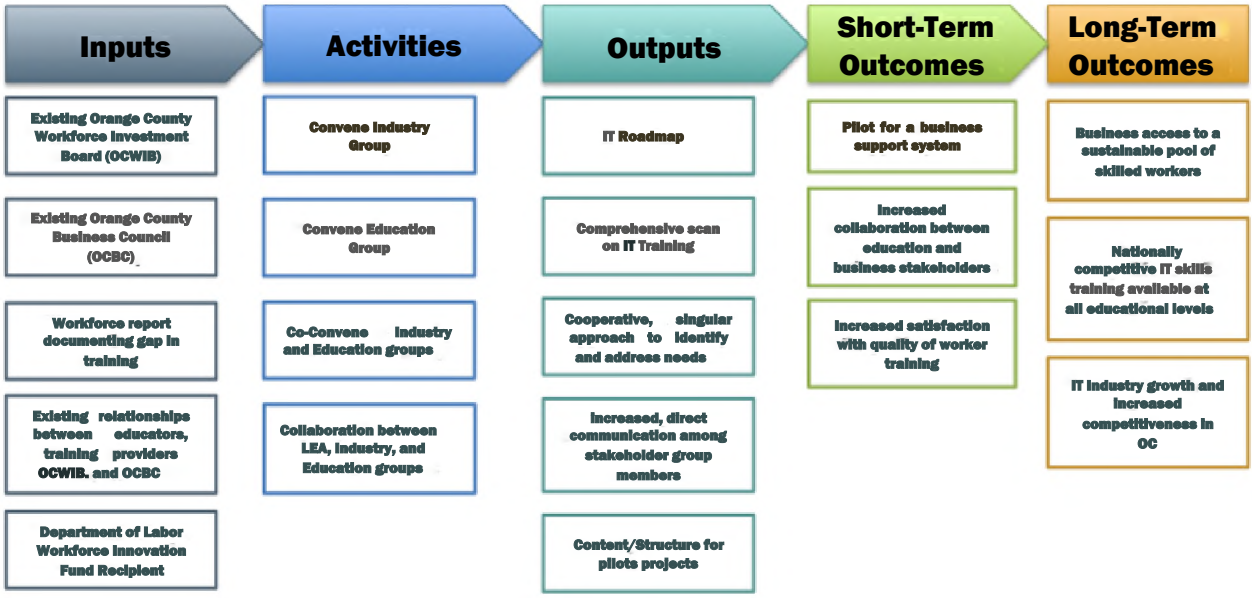


Exhibit B3. Logic Model — IT Cluster Competitiveness Project: New and Improved Training Programs Pilot Project

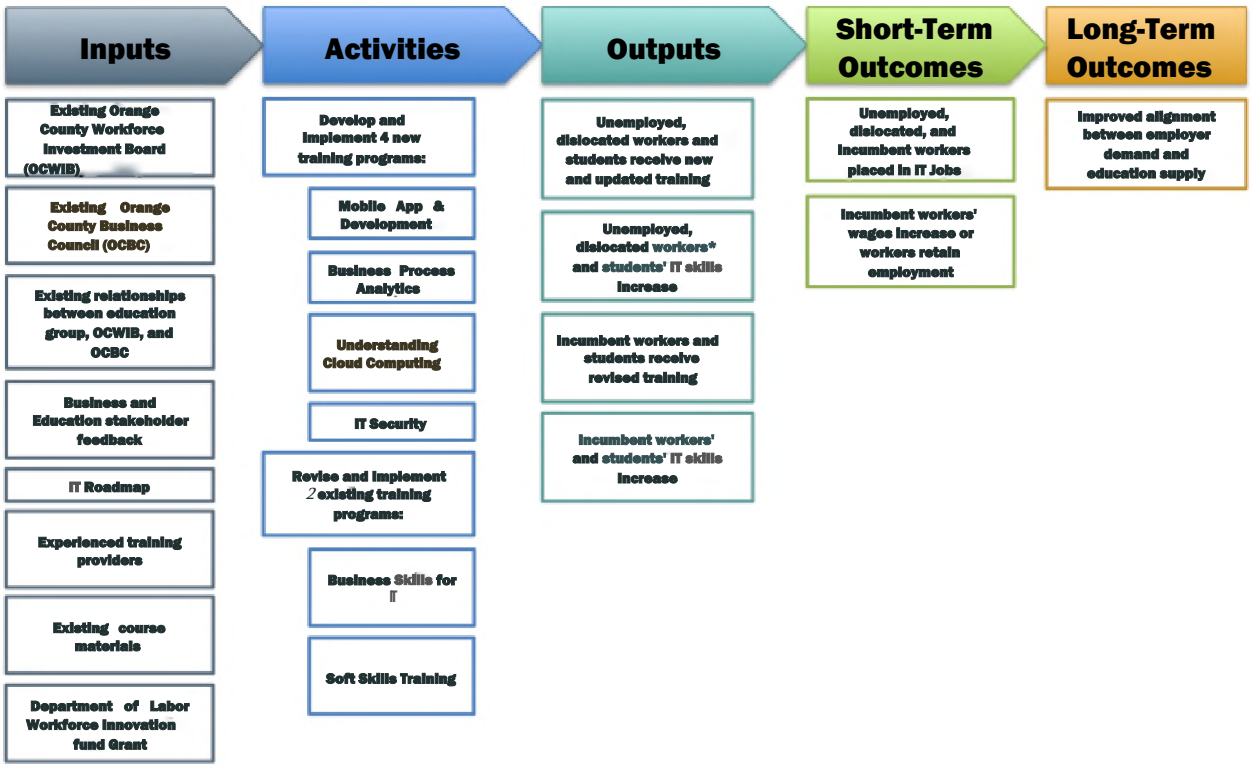


Exhibit B4. Logic Model — IT Cluster Competitiveness Project: Internship Matching System Pilot Project

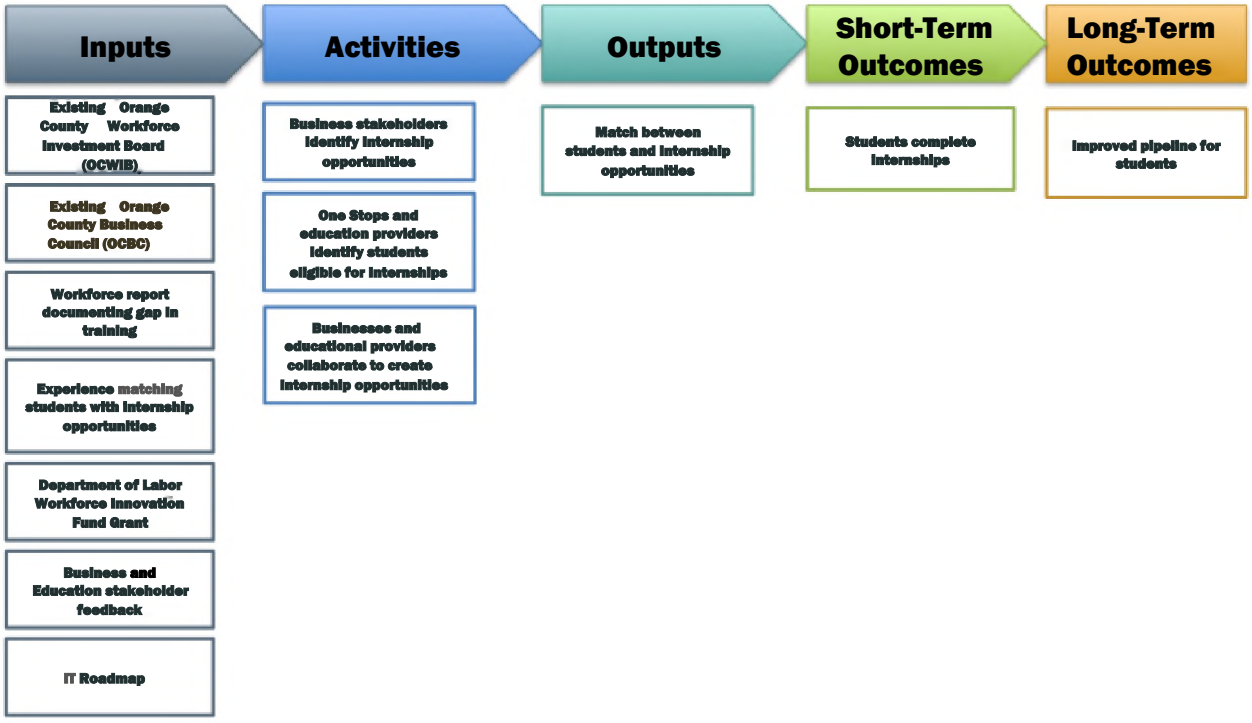


Exhibit B5. Logic Model — IT Cluster Competitiveness Project: Veterans' Pipeline Pilot Project

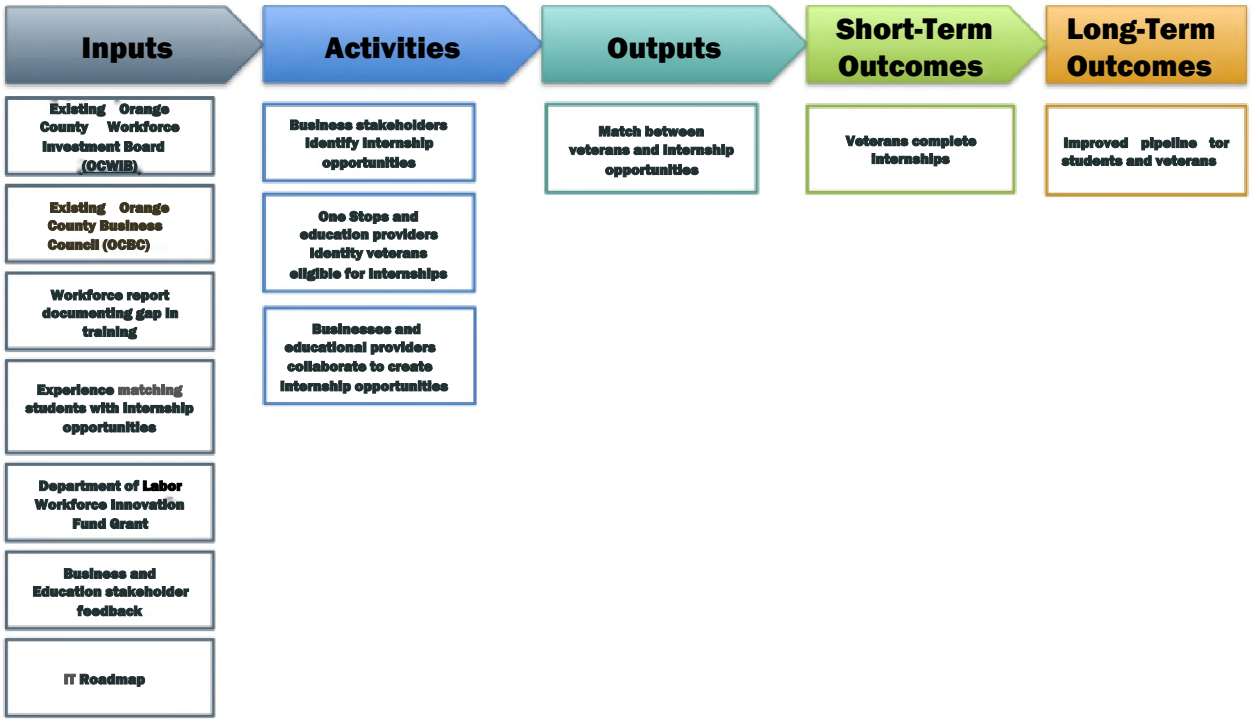
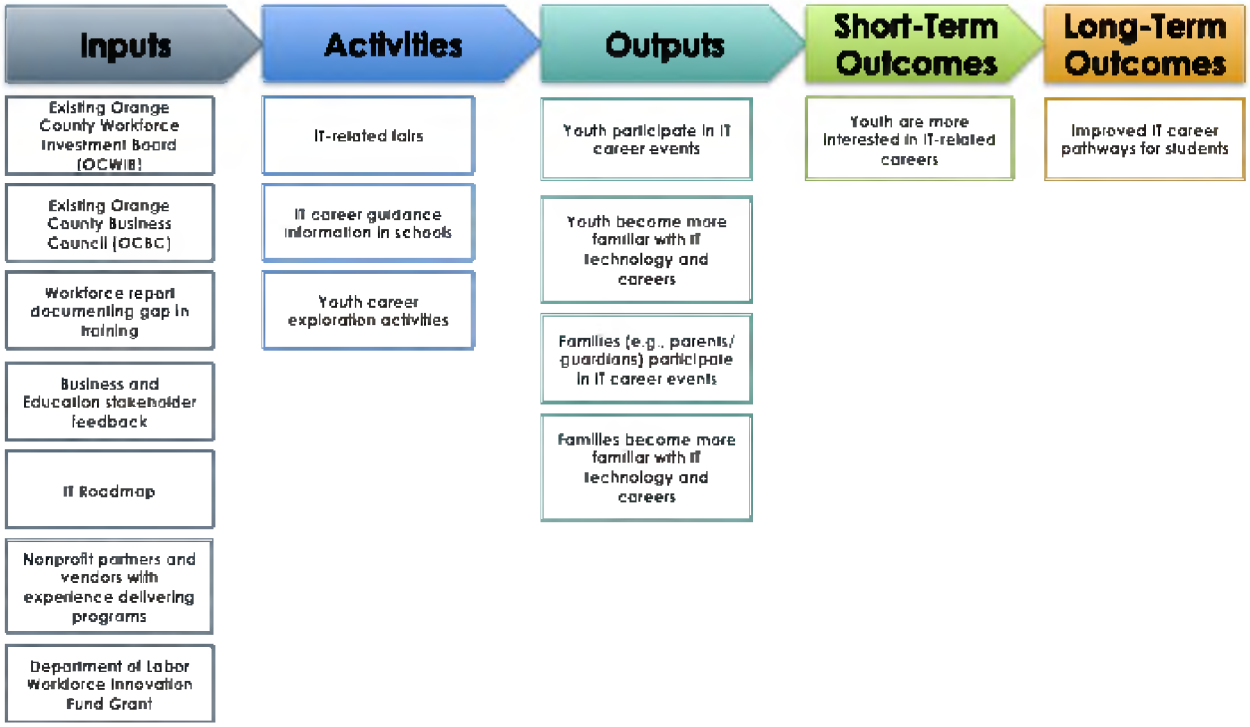


Exhibit B6. Logic Model — IT Cluster Competitiveness Project: Bridging Digital Divide Pilot Project



Appendix C. Convening Group Stakeholder Surveys

Education Stakeholder Survey

This survey is part of the evaluation of Orange County's Information Technology Cluster Competitiveness Project. The survey seeks to learn about the process for convening the *education and training organization stakeholder work group* as well as the co-convening of the *business stakeholder work group* and *education and training organization stakeholder work group*. It is part of a larger study on the outcomes of pilot projects developed through the convening group process.

The survey will take approximately 15-20 minutes to complete and includes questions about your experience as a member of the *education and training organization stakeholder work group*. Your responses will be confidential; your name and other identifying information will not be collected. Additionally, results will be presented in aggregate (i.e., all responses will be presented together) with no personal identifying information.

The survey is an opportunity for you to provide feedback on your experience participating in the convening groups. Your participation will help the evaluation team develop an understanding of the convening group process and might help inform the process for convening future stakeholder work groups. Your participation in the survey is completely voluntary. You are free to withdraw from the survey at any time. If you choose not to participate, there will be no penalty or loss to you. You will not receive compensation for participating in the survey and there are no foreseeable risks for participating in the survey.

If you would like to participate in the short survey, please select "Yes" below to be redirected to the survey. If you want to participate in the survey, but would prefer a paper copy, please contact Staci Wendt at WestEd (email: swendt@WestEd.org, phone: 562-799-5432).

If you do not wish to participate in the survey, please select "No" below and then close your browser.

If you have questions regarding the study or regarding the confidentiality of your responses, please contact the Principal Investigator: Ursula Bischoff, email: ubischo@WestEd.org, phone: 415-615-3384.

Yes, I agree to participate in the study

No, I do not wish to participate in the study

I would like to participate in the study, but would prefer a paper version of the survey

A. Questions about your education or Training Organization

The first several questions are about the education or training organization that you work in or represent, and your role in the organization. Please remember that all of your responses will be kept confidential and results will be presented in aggregate.

How many years have you been with your current education or training organization?

[Response options]: <1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 >20

What type of education or training organization do you currently work in or represent?

[Response options]:

K–12 school

Career school/college

Career exploration

Community college

Education non-profit/volunteer organization

Education foundation

School district

Training organization

University

Other

[If other]: Please specify: _[OPEN FOR RESPONSE]_____

What type of position do you currently hold in your education or training organization?

[Response options]:

Administrator/Executive management

Program/Project management

Professor/Faculty member/Educator

Institutional Development

Human Resources

Other

[If other]: Please specify: _[OPEN FOR RESPONSE]_____

B. Questions about your Participation in the Workgroups

The following questions ask about your participation in the workgroup.

Please select the reasons you decided to participate in the workgroup. Please select all that apply.

[Response options. Check all that apply]:

There is an urgent need for more workers with the IT skills in demand by Orange County businesses.

My input can help shape or influence the capacity of the work force in Orange County to meet the IT demands of businesses.

I (or my organization) believe in "giving back" to the community.

The goals of the work group are important or interesting to me.

Other

[If other] Please specify: _____[OPEN FOR RESPONSE]_____

The *education and training organization stakeholder work group* convened on eight occasions (six as the *education and training organization stakeholder work group* only, and twice with the business stakeholder workgroup). How many of these meetings did you attend?

[Response options]:

1

2

3

4

5

6

7

8

5a. [If attended fewer than 8 meetings, in response to question 5]: What were the reasons you did not attend all of the meetings? Please check all that apply.

[Response options. Check all that apply]:

I had a time conflict with the meeting time

I was not interested in the topic

I thought the convening meetings were unproductive

The location of the meetings made it difficult for me to attend

Someone else from my organization attended

I did not believe the results will benefit my organization

My organization did not support my attendance

Other

[If other]: Please specify:_____[OPEN FOR RESPONSE]_____

C. Workgroup Membership

The following questions ask about the individuals and organizations that comprise the *education and training organization stakeholder work group*. For each item, please indicate the degree that you agree or disagree with the statement.

I think the *education and training organization stakeholder work group* was cohesive (e.g., members share similar goals, similar commitment to the goals).

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don’t know

In my opinion, the members of the *education and training organization stakeholder work group* were aware of the IT work force needs in Orange County.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don’t know

In my opinion, members of the *education and training organization stakeholder work group* were knowledgeable about the education training needs of the IT work force in Orange County.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don’t know

In my opinion, the *education and training organization stakeholder work group* represented education or training organizations in Orange County who could inform pilot programs to increase the IT skills of the workforce in Orange County.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don’t know

Are there representatives from the Orange County education or training community who were not involved with the workgroup but whose participation would have help address the skills required by the IT workforce in Orange County?

[Response options]:

Yes

No

11a. [If "yes" in response to 10]. Please indicate the types of positions these individuals hold and in what type of institution or organization they work.

[Open-ended response]: _____

D. Workgroup Functioning and Format

The following questions are about both the six education and training organization stakeholder work group meetings and the two co-convened meetings with the business stakeholder and education and training organization stakeholder work groups. The questions ask about the way the workgroups functioned, the format of the workgroup meetings, and communication among workgroup members. For each of the following items, please indicate how much you agree or disagree with each statement.

I think the time spent in the workgroup meetings was well used.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

I think the format of the workgroup meetings (scheduling, agenda, materials, meeting space) encouraged group members to interact and communicate with each other.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

I think the way the meetings were conducted (facilitation, activities, time allocations) encouraged members to interact and communicate with each other.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

I could voice my true views and concerns during the workgroup meetings.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

Please describe the greatest catalyst of communication during the workgroup meetings.

[Open-ended response]: _____.

Please describe the greatest barrier to communication during the workgroup meetings.

[Open-ended response]: _____.

E. Outcomes of Workgroup Meetings

The following questions ask about your perceptions of the outcomes produced by the workgroup process (i.e., both the *education and training organization stakeholder work group* meetings and the two co-convened meetings with the *business stakeholder* and *education and training organization stakeholder work groups*). For each item, please indicate the degree to which you agree or disagree with each statement.

My concerns regarding the skills and training of the IT workforce in Orange County were addressed by the workgroup.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the results of the workgroup process will benefit my work and/or my organization in the long run.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the format (scheduling, agenda, materials, and meeting space) of the meetings facilitated the development of the pilot programs.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the way the meetings were conducted (presenters, facilitation, activities, time allocations) helped the group develop pilot programs.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the materials provided to the workgroup had enough information to help the workgroup achieve its goals.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

Were there any alternative formats, methods of conducting the meetings, or additional materials that would have worked better for or assisted in producing the plan/roadmap?

[Open-ended]: _____.

F. Perceived value of the Convening Workgroups

The following questions ask you about your perceptions of the utility of the workgroups (i.e., both the *education and training organization stakeholder work group* meetings and the two co-convened meetings with the *business stakeholder* and *education and training organization stakeholder work groups*) and whether the group met its intended goals. For each item, please indicate the extent to which you agree or disagree with each statement.

I think the workgroup meetings were a worthwhile investment of my energy and time.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the results of this workgroup process will improve training programs and education for the IT workforce.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the results of this workgroup process will lead to an increase in IT skills among workers in Orange County.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the workgroup included the goals, views, and priorities of both business and education stakeholders in Orange County.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

In my opinion, the pilot programs identified by the education and business workgroups will be feasible to implement.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

Do you have anything else you would like to share about how the workgroup process or the pilot programs identified by the education and business workgroups?

[Open-ended]: _____.

G. Skills of the current work force

The following question asks you about your perceptions of the IT skills of the current work force in Orange County. Please indicate the extent to which you agree or disagree.

In my opinion, the IT skills of students who have recently completed training or education match those needed by local industries with IT hiring needs.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don't know

H. Collaboration with other organizations

The final section of the survey asks about your organization's history of collaboration with other businesses, and education or training organizations. For each item, please indicate the degree to which you agree or disagree with each statement.

Before the workgroup was convened, my education or training organization collaborated with businesses in Orange County on issues surrounding workforce IT training and skills.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don’t know

Before the workgroup formed, my education or training organization collaborated with other Orange County education or training organizations on issues surrounding workforce IT training and skills.

[Response options]:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Don’t know

Is there anything else that you would like to tell us?

[Open response]: _____.

Thank you for your time and your participation.

Business Stakeholder Survey

This survey is part of the evaluation of Orange County's Information Technology Cluster Competitiveness Project. The survey seeks to learn about the process for convening the business stakeholders work group as well as the co-convening of the business and education stakeholder work groups. It is part of a larger study on the outcomes of pilot projects developed through the convening group process.

The survey will take 15-20 minutes to complete and includes questions about your experience as a member of the business stakeholder work group. Your responses will be confidential; your name and other identifying information will not be collected. Additionally, results will be presented in aggregate (i.e., all responses will be presented together) with no personal identifying information.

The survey is an opportunity for you to provide feedback on your experience participating in the convening groups. Your participation will help the evaluation team develop an understanding of the convening group process and might help inform the process for convening future stakeholder work groups. Your participation in the survey is completely voluntary. You are free to withdraw from the survey at any time. If you choose not to participate, there will be no penalty or loss to you. You will not receive compensation for participating in the survey and there are no foreseeable risks for participating in the survey.

If you would like to participate in the short survey, please select "Yes" below to be redirected to the survey. If you want to participate in the survey, but would prefer a paper copy, please contact Staci Wendt at WestEd (email: swendt@WestEd.org, phone: 562-799-5432).

If you do not wish to participate in the survey, please select "No" below and then close your browser.

If you have questions regarding the study or regarding the confidentiality of your responses, please contact the Principal Investigator: Ursula Bischoff, email: ubischo@WestEd.org, phone: 415-615-3384.

- ☐ Yes, I agree to participate in the study
- ☐ No, I do not wish to participate in the study
- ☐ I would like to participate in the study, but would prefer a paper version of the survey

I. Questions about your Business/Organization

The first several questions are about the business or organization that you work in or represent, and your role in the business/organization. Please remember that all of your responses will be kept confidential and results will be presented in aggregate.

1. How many years have you been with your current business or organization?

   [Response options]: <1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 >20

2. What type of business or organization do you currently work in or represent?

[Response options]:

a) Healthcare

b) Engineering/construction

c) Entertainment

d) Financial

e) Real estate

f) Information Technology

g) Trade association

h) Transportation

i) Utility

j) Other

a. [If other]: Please specify: _[OPEN FOR RESPONSE]_____

3. What type of position do you currently hold in your business or organization?

[Response options]:

a) Human resources/recruitment

b) Research and development

c) Executive management

d) Program/project management

e) Other

a. [If other]: Please specify: _[OPEN FOR RESPONSE]_____

J. Questions about your Participation in the Workgroup

The following questions ask about your participation in the workgroups.

4. Please select the reasons you decided to participate in the workgroup. Select all that apply.

[Response options. Check all that apply]:

a) There is an urgent need for more workers with the IT skills in demand by Orange County businesses.

b) My input can help shape or influence the capacity of the work force in Orange County to meet the IT demands of businesses.

c) I (or my organization) believe in "giving back" to the community.

d) The goals of the work group are important or interesting to me.

e) Other

a. [If other] Please specify: _____[OPEN FOR RESPONSE]_____

5. The business stakeholder workgroup convened on eight occasions (six as the business stakeholder workgroup only, and twice with the education stakeholder workgroup). How many of these meetings did you attend?

[Response options]:

a) 1

b) 2

c) 3

d) 4

e) 5

f) 6

g) 7

h) 8

5a. [If attended fewer than 8 meetings, in response to question 5]: What were the reasons you did not attend all of the meetings? Please check all that apply.

[Response options. Check all that apply]:

a) I had a time conflict with the meeting time(s)

b) I was not interested in the topic(s)

c) I thought that the convening meetings were unproductive

d) The location of the meetings made it difficult for me to attend

e) Someone else from my organization attended

f) I did not believe the results will benefit my organization

g) My organization did not support my attendance

h) Other

a. [If other]: Please specify:_____[OPEN FOR RESPONSE]_____

K. Workgroup Membership

The following questions ask about the individuals, businesses, and organizations that comprise the business stakeholder workgroup. For each item, please indicate the degree that you agree or disagree with the statement.

6. I thought the business stakeholder workgroup was cohesive (e.g., members share similar goals, similar commitment to the goals).

   [Response options]:

   a) Strongly disagree

   b) Disagree

   c) Neither agree nor disagree

   d) Agree

   e) Strongly agree

   f) Don't know

7. In my opinion, the members of the business stakeholder workgroup were aware of the IT workforce needs in Orange County.

   [Response options]:

   a) Strongly disagree

   b) Disagree

   c) Neither agree nor disagree

   d) Agree

   e) Strongly agree

   f) Don't know

8. In my opinion, members of the business stakeholder workgroup were knowledgeable about the education and training needs of the IT work force in Orange County.

   [Response options]:

   a) Strongly disagree

   b) Disagree

c) Neither agree nor disagree

d) Agree

e) Strongly agree

f) Don't know

9. In my opinion, the business stakeholder workgroup represented businesses and organizations in Orange County that have IT needs.

   [Response options]:

   a) Strongly disagree

   b) Disagree

   c) Neither agree nor disagree

   d) Agree

   e) Strongly agree

   f) Don't know

10. In my opinion, the business stakeholder workgroup represented businesses and organizations in Orange County who could inform pilot programs to increase the IT skills of the workforce in Orange County.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

11. Are there representatives from the Orange County business community who were not involved with the workgroup but whose participation would have helped inform the pilot programs to increase the IT skills of the workforce in Orange County.

    [Response options]:

    a) Yes

    b) No

11a. [If "yes" in response to 11]. Please indicate the types of positions these individuals hold and in what type of business or organization they work.

[Open-ended response]: _____

L. Workgroup Functioning and Format

The following questions are about both the six business stakeholder work group meetings and the two co-convened business and education stakeholder work group meetings. The questions ask about the way the workgroups functioned, the format of the workgroup meetings, and communication among workgroup members. For each of the following items, please indicate how much you agree or disagree with each statement.

12. I think the time spent in the workgroup meetings was well used.

    [Response options]:

    g) Strongly disagree

    h) Disagree

    i) Neither agree nor disagree

    j) Agree

    k) Strongly agree

    l) Don't know

13. I think the format of the workgroup meetings (scheduling, agenda, materials, and meeting space) encouraged group members to interact and communicate with each other.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

14. I think the way the meetings were conducted (facilitation, activities, time allocations) encouraged members to interact and communicate with each other.

    [Response options]:

    a) Strongly disagree

b) Disagree

c) Neither agree nor disagree

d) Agree

e) Strongly agree

f) Don't know

15. I could voice my true views and concerns during the workgroup meetings.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

16. Please describe the greatest catalyst of communication during the workgroup meetings.

    [Open-ended response]: _____.

17. Please describe the greatest barrier to communication during the workgroup meetings.

    [Open-ended response]: _____.

M. Outcomes of Workgroup Meetings

The following questions ask about your perceptions of the outcomes produced by the workgroup process (i.e., both the business stakeholder work group meetings and the co-convened business and education stakeholder work group meetings). For each item, please indicate the degree to which you agree or disagree with each statement.

18. My concerns regarding the skills and training of the IT workforce in Orange County were addressed by the workgroup.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

e) Strongly agree

f) Don't know

19. In my opinion, the results of the workgroup process will benefit my work and/or my organization in the long run.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

20. In my opinion, the format (scheduling, agenda, materials, and meeting space) of the meetings facilitated the development the pilot programs.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

21. In my opinion, the way the meetings were conducted (presenters, facilitation, activities, time allocations) helped the group develop pilot programs.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

f) Don't know

22. I think the information presented at the meetings helped inform development of the pilot programs to increase the IT skills of the workforce in Orange County.

    [Response options]:

    m) Strongly disagree

    n) Disagree

    o) Neither agree nor disagree

    p) Agree

    q) Strongly agree

    r) Don't know

23. In my opinion, the materials provided to the workgroup had enough information to help the workgroup achieve its goals.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

24. Were there any alternative formats, methods of conducting the meetings, or additional materials that would have worked better for or assisted in developing the pilot programs? [Open-ended]: _____.

N. Perceived value of the Convening Workgroups

The following questions ask you about your perceptions of the utility of the workgroups (i.e., both the business six stakeholder work group meetings and the two co-convened business and education stakeholder work group meetings) and whether the group met its intended goals. For each item, please indicate the extent to which you agree or disagree with each statement.

25. I think the workgroup meetings were a worthwhile investment of my energy and time.

    [Response options]:

    a) Strongly disagree

b) Disagree

c) Neither agree nor disagree

d) Agree

e) Strongly agree

f) Don't know

26. In my opinion, the results of this workgroup process will improve training programs and education for the IT workforce in Orange County.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

27. In my opinion, the results of this workgroup process will lead to an increase in IT skills among workers in Orange County.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

28. In my opinion, the workgroup included the goals, views, and priorities of both business and education stakeholders in Orange County.

    [Response options]:

    a) Strongly disagree

    b) Disagree

c) Neither agree nor disagree

d) Agree

e) Strongly agree

f) Don't know

29. In my opinion, the pilot programs identified by the education and business workgroups will be feasible to implement.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

30. Do you have anything else you would like to share about how the workgroup process or the pilot programs identified by the education and business workgroups? [Open-ended]: _____.

O. Skills of the current work force

The following questions ask you about your perceptions of the IT skills of the current work force in Orange County. For each item, please indicate the extent to which you agree or disagree with each statement.

31. In my opinion, the IT skills of employees who have recently been hired in my organization match the needs of the positions.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

32. In my opinion, the IT skills of potential employees (applicant pool) in the region match the skills needed by local industries with IT hiring needs.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

P. Collaboration with other organizations

The final section of the survey asks about your organization's history of collaboration with other businesses or organizations and education institutions. For each item, please indicate the degree to which you agree or disagree with each statement.

33. Before the workgroup was convened, my organization collaborated with education and training providers in Orange County on issues surrounding workforce IT training and skills.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

    d) Agree

    e) Strongly agree

    f) Don't know

34. Before the workgroup formed, my organization collaborated with other Orange County business or organizations on issues surrounding workforce IT training and skills.

    [Response options]:

    a) Strongly disagree

    b) Disagree

    c) Neither agree nor disagree

d) Agree

e) Strongly agree

f) Don't know

35. Is there anything else that you would like to tell us?

[Open response]: _____.

Thank you for your time and your participation.

Appendix D. Interview Protocol for Interviews of OCBC and OCWIB Project Leader Interviews

Introduction (5 minutes)

a. Thank you for participating in today's interview. As you know, we are interviewing the Orange County IT Cluster Competitiveness Project leaders to gain more information about the convening group process and the pilot projects. We will use results from these interviews, in conjunction with the survey data we gathered from stakeholders, to provide a comprehensive picture of the convening group process. We will not use your name in the report and we will not directly quote individuals. We plan on reporting broader themes that emerge from these interviews in combination with other data.

b. The interview today will last approximately 1 hour and will cover three areas: development of the convening group process, implementation of the stakeholder meetings, and lessons learned.

c. Are there any questions you would like to ask me before we begin?

Formation of the Convening Groups and Pilot Projects (20 minutes)[8]

d. For the initial set of questions, think back to when you were developing the OC ITCCP grant application and the idea for the convening group processes.

1. **The convening process is a cornerstone or innovative aspect of the grant that was used to develop the roadmap. What was behind the decision to convene groups of business and education stakeholders?**

2. **After deciding to conduct a convening group process, how did you determine which stakeholders would be recruited and who recruited them?**

3. **Were there stakeholders who did not participate, but that you think should have been included?**

4. **Did additional stakeholder outreach occur after the initial stakeholder group meetings occurred?**

[8]The purpose of questions in this section are to: (a) identify the origin of the convening group process, which will provide context for other interview responses; (b) obtain information about stakeholder recruitment, which will be used to answer Research Question 1; and (c) obtain information about development of the pilot projects, which will be used to address Research Question 7.

5. **The pilot projects that you ended up with in the roadmap are somewhat different from those in the grant proposal. But how were the ideas for the pilot projects developed in the first place**?

6. **What do you think were the advantages and disadvantages to holding separate business and education stakeholder meetings?**

Implementation of the Stakeholder Meetings (10 minutes)[9]

e. The next series of questions focus on implementing the stakeholder group meetings. Please think back to January to April of this year, when the stakeholder groups met.

7. **Who was involved in deciding the format for the convening group meetings, such as how often the groups would meet, the meeting topics, and the meeting format and structure?**

8. **Did OCBC/OCWIB receive feedback from stakeholders on any aspects of the group meetings?**

9. **Were any changes made to the stakeholder group meeting format or structure after the initial stakeholder group meetings occurred?**

f. The next series of questions ask about your perceptions of the stakeholder group meetings, now that they are complete.

10. **What are your impressions of the stakeholder group meetings including how they facilitated development of the roadmap, and the strengths and weaknesses of the meetings?**

11. **In what ways did the stakeholder group meetings increase communication and collaboration between business and education stakeholders in Orange County?**

    a. Did you think it increased collaboration and communication outside of the meetings as well as during the meetings? If so, how?

12. **Moving forward, what are your goals for the members of the stakeholder groups?**

    a. Would you like to see the meetings continue and, if so, what do you want to get out of the meetings?

13. **In general, the educators had a more negative view of the convening groups than the business stakeholder. For example….. How do you think this will affect**

[9]The purpose of questions in this section are to: (a) identify how decision were made about the format and of convening process, which will provide context for other interview responses and (b) gather feedback on the convening process, which will be used to answer Research Questions 2.

participation of these or other educators going forward if you reconvene or in future projects?

Wrap-Up (5 minutes)

14. **Are there any final thoughts on the development of the convening group process, implementation of the stakeholder meetings, or any other topics we covered that you would like to share?**

Appendix E. Pilot Project Leader Interviews

Round 1 Interview Protocol for Interview with Pilots 1 and 2 Project Leaders

1. The purpose of Pilots 1 and 2 is to provide new curriculum focused on information technology disciplines. Please briefly describe the process used to identify the disciplines targeted with this pilot (i.e., Mobile Applications and Development, Business Process Analytics, Cloud Computing, IT Security, Business Administration for the IT Professional, Leadership Development and Business Administration for the IT Professional).
    a. Who was involved in helping determine which technology disciplines would be the focus of Pilots 1 and 2?
    b. How did you identify who would help determine the focus of Pilots 1 and 2?
2. Please describe the process you used to develop the curriculum.
    a. Who was involved on the education side?
    b. Who was involved on the business side?
    c. How frequently did you meet/communicate?
        i. How did you communicate (e.g., email, in-person meetings)?
    d. How do you courses align with the demand from businesses for additional well-trained workers?
        i. How do the courses align with building the IT cluster in Orange County?
3. Please briefly describe how Pilots 1 and 2 have been implemented to date.
    a. [Walk through each step of the process e.g.:
        i. Advertising/marketing the courses
        ii. Student enrollment
        iii. Student progress and tracking

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iv. Certificates/Completion

v. Relationship to work-based or work-place experience

vi. Relationship to job search placement or advancement

4. Have you received feedback on the courses that have been implemented so far?
5. What has gone well with implementing courses so far?
6. Have there been difficulties or challenges in implementing the courses so far?
7. *Thinking of the future, what would need to be put in place to ensure that curricula continue to meet employer demand?*
8. What would need to be in place to facilitate ongoing communication with employers?
9. What have you learned from this experience so far that you would recommend for future efforts?
10. Are there any final thoughts on the development and implementation of Pilots 1 and 2 or any other topics we covered that you would like to share?

Round 1 Interview Protocol for Interview with Pilot 3 Project Leaders

1. The purpose of Pilot 3b is to develop system that connects OC businesses with military veterans. Please describe the program design and development. Please briefly describe the progress so far.
    a. Who has been involved in the development of the system?
        i. How did you determine what services needed to be offered?
    b. How has the system been implemented to date?
        i. Advertising of system to veterans
            a. Enrollment
        ii. Advertising of system to businesses
            a. Enrollment
        iii. Progress and tracking

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2. Have you received feedback on the activities and programs that have been implemented so far?
3. What has gone well with implementing activities and programs so far?
4. Have there been difficulties or challenges in implementing the activities and programs so far?
5. Are there any final thoughts on the development and implementation of Pilot 3b or any other topics we covered that you would like to share?

Round 1 Interview Protocol for Interview with Pilot 4 Project Leader

For the initial set of questions, think back to when you were developing the plan for Pilot 4.

1. The purpose of Pilot 4 is to bridge the digital divide. Please briefly describe the digital divide, in your opinion.
2. How will Pilot 4 bridge the digital divide?

The next series of questions focus on implementing the programs and activities selected for Pilot 4.

3. Please briefly describe the activities and programs that have been implemented to date.
4. Have you received feedback on the activities and programs that have been implemented so far?
    a. [Follow-up]: Who provided the feedback, how did they provide feedback, and what was the feedback?
5. Have there been difficulties or challenges in implementing the activities and programs so far?
    a. [Follow-up]: How have you addressed challenges?
6. Are there any final thoughts on the development and implementation of Pilot 4 or any other topics we covered that you would like to share?

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Round 2 Interview Protocol for Interview with Pilots 1 and 2 Project Leaders

1. At the time of the last interview (July 2014), the pilots were in earlier development phases. Can you please give us an update on the implementation of Pilots 1 and 2 as they stand today?

2. The purpose of Pilots 1 and 2 was to provide new curriculum focused on information technology disciplines. Also, at the time of the last interview, all courses were being offered online, although in-person and blended options were available. How, if at all, has the original focus of Pilots 1 and 2 changed since the beginning of this project?

3. What feedback, if any, have you received on the courses that have been implemented so far?

4. What has gone well with implementing courses so far?

5. Have there been difficulties or challenges in implementing the courses so far? If yes, could you please describe them?

6. *Thinking of the future, what pieces of Pilots 1 and 2 will continue to be implemented after WIF funding ends?*

7. *Thinking of the future, what would need to be put in place to ensure that curricula continue to meet employer demand?*

8. What would need to be in place to facilitate ongoing communication with employers?

9. What have you learned from this experience so far that you would recommend for future efforts?

10. Are there any final thoughts on the development and implementation of Pilots 1 and 2 or any other topics we covered that you would like to share?

Round 2 Interview Protocol for Interview with Pilot 3 Project Leaders (Internship Pilot)

1. At the time of the last interview (July 2014), the pilot was in earlier development phases. Can you please give us an update on the implementation of Pilot 3 as it stands today?

2. The purpose of Pilot 3a was to develop an Orange County IT Internship Pipeline. The pilot includes two goals: Create a centralized internship matching system and develop an OC Internship Consortium. At the last interview, the internship matching website was in

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Phase 2 (moving to Phase 3 shortly after), and the consortium was in the beginning stages. Please briefly describe the progress toward these goals so far.

3. How has the matching system been implemented to date?
4. What feedback, if any, have you received on implementation processes and activities so far?
5. What has gone well with implementing the pilot activities so far?
6. Have there been difficulties or challenges in implementing the pilot so far? If yes, could you please describe them?
7. Thinking of the future, what pieces of Pilot 3 will continue to be implemented after WIF funding ends?
8. Thinking of the future, what would need to be put in place to ensure that the internship matching system continues to meet the needs of employers? …of students?
9. What have you learned from this experience so far that you would recommend for future efforts?
10. Are there any final thoughts on the development, implementation, or sustainability of Pilot 3 or any other topics we covered that you would like to share?

Round 2 Interview Protocol for Interview with Pilot 3 Project Leaders (Veterans Pipeline)

1. At the time of the last interview (summer 2014), the pilot was in earlier development phases. Can you please give us an update on the implementation of Pilot 3 as it stands today?
2. The purpose of Pilot 3b is to develop system that connects OC businesses with military veterans. Please describe the program design and development so far. Please briefly describe the progress so far.
3. What feedback, if any, have you received on the activities and programs that have been implemented so far?
4. What has gone well with implementing activities and programs so far?
5. Have there been difficulties or challenges in implementing the activities and programs so far? If yes, could you please describe them?

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6. Thinking of the future, what pieces of Pilot 3 will continue to be implemented after WIF funding ends?
7. What have you learned from this experience so far that you would recommend for future efforts?
8. Are there any final thoughts on the development and implementation of Pilot 3b or any other topics we covered that you would like to share?

Round 2 Interview Protocol for Interview with Pilot 4 Project Leader

1. At the time of the last interview (June 2014), the pilot was in earlier development phases. Can you please give us an update on the implementation of Pilot 4 as it stands today?
2. The purpose of Pilot 4 is to bridge the digital divide. In June 2014, the digital divide was further explained as being dependent on multiple factors and making youth more aware of technology and technology related jobs in question for Pilot 4.Please briefly describe the progress toward the goal(s) so far.
3. Please briefly describe the activities and programs that have been implemented to date.
4. How did Pilot 4 bridge the digital divide?
5. What feedback, if any, have you received on the activities and programs that were implemented?
6. What went well with implementing the program and activities?
7. Have there been difficulties or challenges in implementing the activities and programs so far? If yes, could you please describe them?
8. Thinking of the future, what pieces of Pilot 4 will continue to be implemented after the WIF funding ends?
9. What have you learned from this experience so far that you would recommend for future efforts?
10. Are there any final thoughts on the development and implementation of Pilot 4 or any other topics we covered that you would like to share?

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