An Evaluation of the Newark/Essex Construction Careers Consortium Pre-Apprenticeship Training Program

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Executive Summary

In June 2006, the New Jersey Institute for Social Justice (NJISJ) contracted with the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey to conduct an assessment of the Newark/Essex Construction Careers Consortium (N/ECCC) program.

The program's primary objective is to improve the employment prospects and earnings of Essex County's low-income residents. The program aims to achieve this goal by preparing its graduates for apprenticeships with one of the county's 17 construction and building trades unions. During the 10-week program, students receive intensive and highly targeted academic preparation in math, reading, and critical thinking; are introduced to the different building trades through hands-on work and site visits; and receive instruction in life skills. After completing the program, graduates apply for apprenticeships with the building trades.

NJISJ, in cooperation with a consortium of more than 20 organizations in Essex County, New Jersey, offers the program three times a year to 30-40 students per session with an annual budget of $600,000. The School Construction Corporation provides 75% of the program's funding (about $450,000 on average), and the Prudential Foundation and the Port Authority of New York and New Jersey contribute the remaining $150,000 annually. The average cost per participant is approximately $6,000.

Evaluation Methodology

The Heldrich Center used a variety of qualitative and quantitative methodologies to develop five key findings about the N/ECCC program. Center researchers interviewed 20 members of the Consortium, conducted a focus group with current students, and had current students complete a survey that solicited their feedback on the program. Researchers used New Jersey Unemployment Insurance wage records to determine the labor market outcomes of individuals who participated in the program in 2004 and 2005. In addition, researchers compared these outcomes to those of similar individuals who received other types of training in Essex County during the same period.

Key Findings

The results of this evaluation demonstrate that a pre-apprenticeship program, when well designed and well managed, can be an effective approach to improving the earnings of individuals with barriers to employment. The intensive, 10-week training program, with its focus on addressing multiple barriers to employment and strong involvement of labor unions, is particularly successful for participants age 20 and over.

Finding #1. Although it applies strict entrance requirements, the N/ECCC program provides an important opportunity for individuals who have limited employment histories, low levels of past earnings, and limited academic skills to prepare for a career in a growing field.

All participants served by the program must have a high school diploma or GED and must either possess or be able to obtain a valid driver's license. However, the program serves individuals who face significant barriers to employment. In each of the 12 quarters before they enrolled in the N/ECCC program, for example, no more than half of adult program participants were employed. While all participants had a high school diploma or GED before the program, the average TABE [Test of Adult Basic Education] reading score, which equates to grade level, among participants is 9.28, and the average math score is 8.26. In addition, approximately 12% of participants had formerly been incarcerated.

Finding #2. The program is effective at improving the earnings of *adult participants* (20 and older at enrollment).

Placement in Apprenticeships: Half of all adult participants in the N/ECCC program are placed into an apprenticeship. A total of 17 labor unions have accepted N/ECCC participants.

Effect of the Program on the Earnings of *All* Adult Participants: Adult graduates earned an average of $14,778 in the first year after completing the program and $18,940 in the second.[1] These earnings represent significant increases over the wages they earned before they entered the program and are significantly greater than the wages earned by a carefully selected comparison group of similar individuals who received other types of training in Essex County.

In the first year after completing the N/ECCC program, adults earned between $3,500 and $5,700 more than the adult comparison group members. The wages of both the N/ECCC graduates and the comparison group members were higher in the first year after training than they were in the first year before training. However, the **growth** in wages was between $3,000 and $4,600 greater for the N/ECCC adult participants than for the comparison group.

In the second year after training, the wages of the adult N/ECCC graduates were between $6,700 and $9,400 greater than were the wages of the adult comparison group members. N/ECCC adult participants experienced wage growth from the second year before training to the second year after training that exceeded the wage growth of the adults in the comparison group by $6,500 to $10,400.

Effect of the Program on the Earnings of Adult Participants Who Did *Not* Obtain an Apprenticeship: The 50% of **adult participants** (20 or older at enrollment) who do **not** obtain an apprenticeship still benefit from participation in the N/ECCC program, through increased earnings.

The 50% of the adult participants in the N/ECCC program who did **not** receive an apprenticeship perform at least as well in the labor market in the first year after completion as the comparison group members. There is no solid statistical evidence that the N/ECCC program non-apprentice adult graduates perform better in the first year after training than their counterparts in the comparison group. In the second year after completion, however, the adult N/ECCC non-apprentice graduates earn about $5,000 more than the comparison group. The wage growth from the second year before training to the second year after training is about $5,000 greater for the N/ECCC non-apprentice graduates than for the comparison group.

Finding #3. The N/ECCC program is no more successful than other forms of training at improving the employment prospects of the *youngest participants* (younger than 20 at enrollment).

Placement in Apprenticeships: Younger graduates were significantly less likely to obtain apprenticeships than older graduates, and the younger graduates who did manage to obtain apprenticeships were more likely to drop out of them than the older graduates who became apprentices. While approximately half of the graduates age 20 and older obtained apprenticeships after graduation, only about 25% of the younger graduates managed to do so.

Effect of the Program on the Earnings of the Youngest Participants: After completing the program, the average youth graduate earned $7,760 in the first year after graduation and $10,793 in the second, significantly less than older graduates.

N/ECCC program graduates who enrolled in the program at age 19 or younger were as likely to be employed in any of the eight quarters after completion as the similar youth who received other types of job training in Essex County. In addition, these individuals had similar earnings in each of the first two years after completing the program as those members of the comparison group.

Finding #4. A variety of factors contribute to the success of the N/ECCC program.

Based on interviews with members of the Consortium, a focus group with current students, and a survey of current students, the Heldrich Center identified six factors that may explain the success of the program:

1. **A close and solid working relationship between the program operators and labor unions.** NJISJ has worked to build a strong relationship with the 17 construction and building trades unions in Essex County. The unions are active members of the Consortium, providing input on both curriculum and program design. For example, the program has a strong focus on math, in part because the unions advised the program to highlight math. Most importantly, the unions routinely accept N/ECCC program graduates into their apprenticeship programs.

2. **Rigor of the curriculum.** During the 10-week program, participants receive over 100 hours of course work to help them improve their skills in math, reading, and locating information, academic skills that the unions require and that are also important for success in other occupations.

3. **Program components that address multiple barriers that program participants face to employment.** In addition to providing participants with the basic skills they need to pass the apprenticeship tests, the program provides training in life skills and financial management. In addition, the program provides assistance to those with suspended driver's licenses in getting their licenses restored and small loans to defray initial costs associated with becoming apprentices, such as transportation costs and costs for purchasing safety gear or other materials.

4. **A solid funding base.** SCC provides the money that supports the training that the N/ECCC program delivers. Supplemental funding from Prudential and the Port Authority enable the program to provide some of the additional services, such as the small loans, that help to address the multiple barriers that program participants face.

5. **A competent and highly dedicated staff.** All individuals interviewed for this study agreed that the NJISJ program director worked well with both the students and the unions to ensure that the graduates earned apprenticeships. Students and stakeholders interviewed indicated that teaching staff provided students with sound academic preparation for the union tests and skills needed for interviewing. The students felt connected to both the program director and the teachers, and they believed that the staff genuinely wanted them to succeed.

6. **A well-functioning consortium.** NJISJ has assembled a diverse group of stakeholders with otherwise different interests who collaborate to help the program succeed. Consortium members contribute in many ways to help make the program a success, including recruiting and screening applicants, offering instruction to students, and providing small loans to graduates to cover some costs associated with becoming an apprentice.

Finding #5. Suggestions for improvements include:

- Develop a plan for addressing the discrepancy in outcomes for youth versus adult participants. A plan could include targeting additional services specifically toward youth participants or accepting fewer youth and more adult applicants in order to concentrate program resources on those who benefit the most from the program.
- Strengthen outreach to the Hispanic community.

- Strengthen the relationships with the Newark One-Stop Center and with local Hispanic community organizations.
- Identify ways to increase the repayment rate of the post-graduate loans that students receive.

Introduction

Program Description

In 2000, the New Jersey Legislature appropriated $8.6 billion for the construction of schools in the state's poorest districts. New Jersey law mandates that one-half of 1% of these expenditures be directed to train women and minorities for construction careers. With the creation of the Schools Construction Corporation (SCC) in 2002, state funds were allocated to the New Jersey Department of Labor to oversee the development and implementation of construction training programs in several New Jersey cities, including Newark. Since 2001, the New Jersey Institute for Social Justice has administered the Newark/Essex Construction Careers Consortium program.

The N/ECCC program prepares women, minorities, and the economically disadvantaged for careers in the construction industry. The program's primary objective is to improve the employment prospects and earnings of Essex County's low-income residents. The program does this by placing its graduates into apprenticeships with one of the county's 17 construction and building trades unions. To prepare students for construction careers, the program provides intensive and highly targeted academic preparation in math, reading, and critical thinking; introduces students to the wide range of the building trades; and instructs them in life skills. The program has also developed solid working relationships with union officials and benefits from the strong community support it receives from the 27 Consortium members, representing a mix of unions, contractors, local government, schools, and community-based organizations.

NJISJ currently offers the program three times a year to 30-40 students per session. In all, over 400 students have completed the program and over 200 have been placed in union apprenticeships. The annual cost of the program is about $600,000, which amounts to a per-participant cost of around $6,000. SCC provides 75% of the program's funding, and the Prudential Foundation and the Port Authority of New York and New Jersey contribute the rest. The additional funding from Prudential and the Port Authority allows the N/ECCC program to employ a full-time director, hire placement/retention and labor liaison services, and offer supplemental loans to program completers to help defray expenses after graduation.

Purpose of the Evaluation

In June of 2006, NJISJ awarded the Heldrich Center a contract to conduct an evaluation of N/ECCC. The purpose of the evaluation was to measure the extent to which the program has or has not been successful in helping participants enter into union apprenticeships and earn higher wages (outcome evaluation). The study also sought to identify the elements of the program that have contributed to its success and the facets of the program that could be improved (process evaluation). This report summarizes the results of the Heldrich Center's evaluation.

Methodology

To complete the evaluation, the Heldrich Center employed a combination of qualitative and quantitative methodologies:

- Interviews with stakeholders: The Heldrich Center conducted one-on-one, in-person and telephone, interviews with 20 members of the Consortium to learn about the roles that the different members play in the Consortium and to assess the Consortium's effectiveness. The research team also interviewed every member of N/ECCC program staff, including administrators and teachers.
- Focus group with current students: Center personnel conducted a focus group with 10 students from the summer 2006 session to solicit their feedback on the program and help identify the program's strengths and weaknesses.
- Survey of current students: Students enrolled in the program's summer 2006 session completed a detailed written survey that asked them about their experiences in the program and their perceptions of the program's effectiveness.
- Analysis of math and reading test data: To assess the efficacy of the academic instruction that the students receive, the research team examined the WorkKeys test scores of students before the program began and compared them with the scores that they received at the end of the program.
- Analysis of apprenticeship placement information: Using placement data from NJISJ, the researchers studied the program's placement success rate.
- Analysis of Unemployment Insurance wage records for the State of New Jersey: The research team matched the students in the program with their wage records as reported to the New Jersey Unemployment Insurance system to compare their wages before enrollment in the program with their wages after completion. In addition, the researchers matched N/ECCC program graduates with similar individuals who received training from One-Stop Centers in Essex County and compared the wages of both groups.

Background

Description of NJISJ

Based in Newark, the New Jersey Institute for Social Justice is devoted to research, program implementation, and advocacy to improve the welfare of New Jersey's urban residents. Underpinning NJISJ's mission is a belief that urban areas can function as engines of economic growth and provide desirable communities. To fulfill its mission, NJISJ undertakes activities that target three specific areas: improving economic opportunities for minorities and the economically disadvantaged, helping to ensure that government is responsive to the needs of urban communities, and supporting the civil rights of New Jersey's minority and low-income citizens.

Impetus for the Program

To advance its mission of expanding economic opportunity for New Jersey's low-income population, NJISJ initiated in 2001 a pilot, pre-apprenticeship program to train Newark residents for careers in the construction and building trades.

Developments in New Jersey's courts and Legislature during the prior year had spurred NJISJ to initiate the program. In May 2000, the New Jersey State Supreme Court issued a ruling in the Abbott v. Burke case mandating that the state fully fund the construction of schools in Abbott districts, the state's poorest districts. In July 2000, the New Jersey Legislature adopted the Educational Facilities Construction and Financing Act (EFCFA) to appropriate $8.6 billion to fund Abbott school construction.

A second key impetus for the program was the unions' traditional exclusion of women and minorities. EFCFA legislation had mandated that urban residents be hired to work on school construction projects, and it authorized that up to one-half of 1% of the funds allocated for school construction be used to fund pre-apprenticeship programs to train women, minorities, and the economically disadvantaged for construction careers. Moreover, the unions recognized that they needed to build the trust of the local communities in which they were working. In order to build that trust, they would need to hire local residents. NJISJ started the construction careers program to ensure that by the time the school construction had begun, Newark residents would be prepared to do the work and ready to be accepted into the unions.

Continuing Relevance of the Program

Developments in later years solidified the need for the construction careers program in New Jersey, and especially in the state's urban areas. In 2002, the Governor issued the Executive Order that created the Schools Construction Corporation (SCC) and authorized it to spend the $8.6

billion that had been appropriated in the 2000 school construction legislation. SCC, in turn, signed a memorandum of understanding with the New Jersey Department of Labor that delegated to it the task of running the state's construction careers programs. In 2003, the building and trades unions signed a project labor agreement with the state in which they agreed "to ensure that minorities, women, or economically disadvantaged are afforded opportunities to participate in apprenticeship programs which result in the placement of apprentices on this project."[2]

In addition, New Jersey's construction industry and its unions cite the need for more workers. One factor that may drive an increase in the demand for building trades union workers is the growth in nonresidential construction. The New Jersey Department of Labor and Workforce Development forecasts that the dollar value of nonresidential construction contracts will rise by about 1% from just under $5 billion ($4.99 billion) in 2006 to a little over $5 billion ($5.04 billion) in 2007.[3]

Also driving the demand for new construction workers in New Jersey and Essex County is the aging of the current construction workforce. In the third quarter of 2005, 17% of construction workers in Essex County were 55 years of age or older and, of these workers, almost a third were over 65 or older.[4] As these workers age, greater numbers of them are likely to retire, creating a need for new workers.

Whereas in the past, replacement workers might have been culled from high schools that had prepared students for construction trades by teaching building trades curricula in their vocational programs, these sorts of programs have been curtailed in recent years as the vocational schools have shifted their emphasis to other fields, including information technology.

Finally, data from the 2005 American Community Survey demonstrate that many residents of Newark and Essex need well-paying jobs:

- Twenty-five percent of the population of Newark and 15% of Essex County live in poverty.
- Twenty two percent of Newark's high school graduates and 17% of high school (or GED) graduates in Essex County live in poverty.
- Nineteen percent of Blacks between the ages of 18 and 44 (the ages that the program primarily serves) in Essex County live in poverty.
- Fourteen percent of Hispanics between the ages of 18 and 44 (the ages that the program primarily serves) in Essex County live in poverty.

Unlike the low-skilled but relatively high-wage manufacturing jobs that have been steadily disappearing in recent years, nonresidential construction jobs, both union and non-union, are growing (according to NJLWD Local Employment Dynamics data). For those Newark and Essex County residents who possess the basic requirements—a high school diploma or GED and a

driver's license—a program that prepares them to compete for union apprenticeships represents, in the words of one current student, a "stepping stone to the future."

Population Served by the N/ECCC Program

The NJISJ construction careers program serves women and minorities in Essex County and Newark City. All program participants are required to have either graduated from high school or to have earned their GED. Before their enrollment in the N/ECCC program, many participants had not enjoyed success in the labor market and many had limited academic preparation.

Demographic Attributes of N/ECCC Program Participants

For the purposes of this evaluation, the Heldrich Center conducted a demographic analysis of the 231 students who completed the N/ECCC program in 2004 and 2005.

Table 1. Demographic Attributes of N/ECCC Program Participants (2004-2005)

Demographic Characteristic	Percentage
Male	89%
Female	11%
Black	87%
Hispanic	13%
Formerly Incarcerated	12%

Most program participants are Black males, though the program also serves female and Hispanic participants (Table 1). The program also services a noticeable number of formerly incarcerated individuals (about 12%), who have traditionally faced high barriers to re-integrating into the workforce.

The program serves people of many ages. In 2004 and 2005, program completers ranged from 16 to 46 years old at the time of enrollment. The average program completer was 25 years old. As this average age suggests, most program completers were at the lower reaches of the age distribution. A plurality of program completers was under 22 years old (Table 2).

Table 2. Age Distribution of N/ECCC Program Completers

Age Group	Percentage
16 to 21	43%
22 to 29	30%
30+	27%

Geographic Distribution

The N/ECCC program serves residents of Essex County. The vast majority of program completers lived in the city of Newark (Table 3).

Table 3. Geographic Distribution of N/ECCC Program Graduates

Municipality	Number of Graduates
Newark	160
East Orange	28
Irvington	19
Orange	7
Elizabeth	3
Montclair	2
Belleville	1
Bloomfield	1
Carteret	1
Kearny	1
Maplewood	1
Vauxhall	1

Pre-Program Labor Market Status

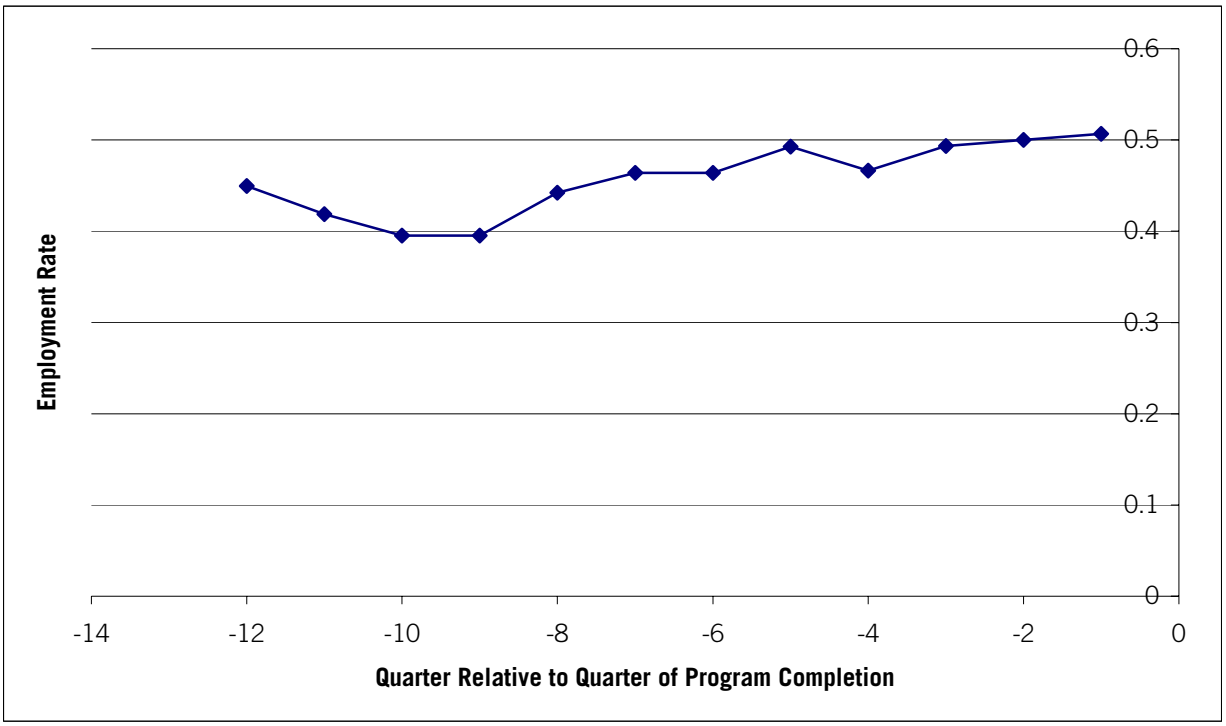
Before their enrollment in the program, the adult N/ECCC participants (those 20 years of age and older) had not had high levels of success in the labor market. The percentage of graduates employed before enrollment is relatively low as is the average wage of those employed.

To get a sense of the pre-enrollment employment histories of the adult N/ECCC program completers, the Heldrich Center used Unemployment Insurance wage record data from the New Jersey Department of Labor and Workforce Development to calculate an employment rate and an average wage for each quarter before enrollment. Nearly all employers in the state report the wages of their employees on a quarterly basis to the State of New Jersey when they pay their Unemployment Insurance (UI) payroll taxes. UI wage records include the following information for individuals who are employed: the social security number, quarterly earnings paid, and industry of employment.

It is important to note that students enroll in and complete the N/ECCC program during the same calendar quarter. So their participation in the program influences their labor market outcomes during only a single quarter.[5]

Employment rates among the adults who completed the N/ECCC program were fairly low before they entered the program.[6] The employment rate actually peaked in the quarter before enrollment, when almost 51% of N/ECCC program completers were employed. Employment rates were especially low during the third year before students enrolled in the program, hovering between 40% and 45%. In any given quarter during the three years before enrolling in the program, more than half of program enrollees earned no wages.

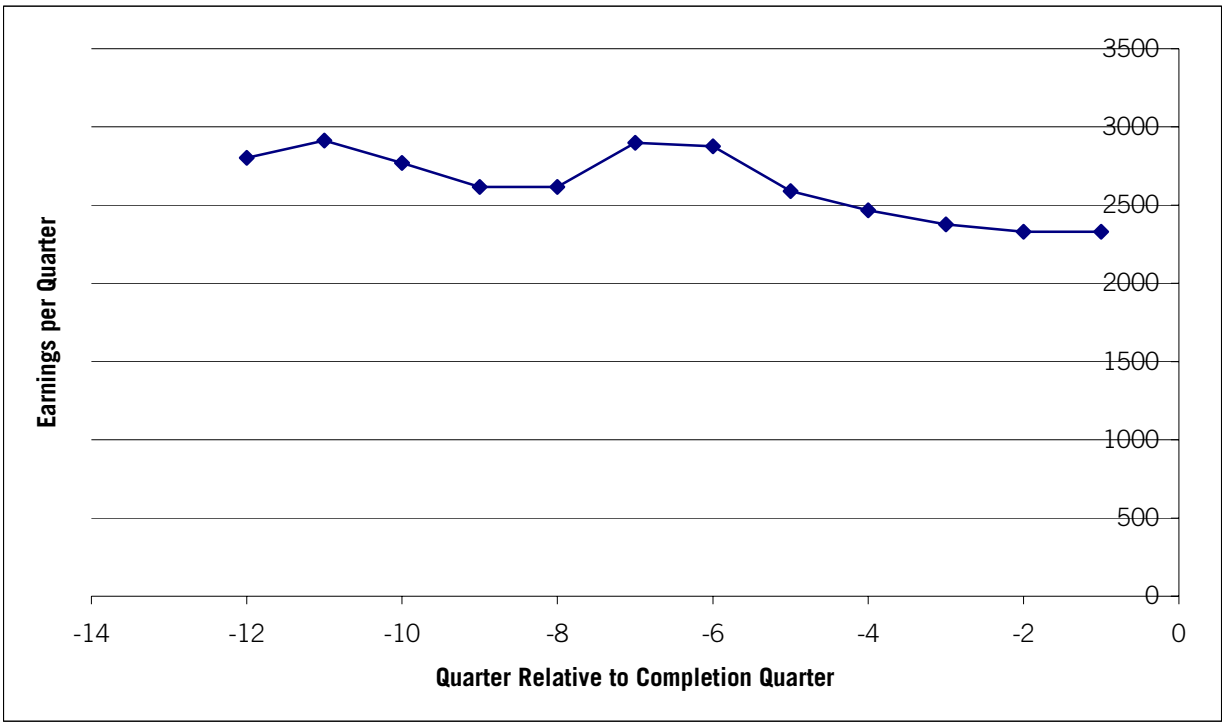
Figure 1. Quarterly Pre-Enrollment Employment Rates of N/ECCC Program Completers (for students 20 and older at enrollment)



In addition to examining the pre-enrollment employment status of N/ECCC program completers, Heldrich Center researchers also calculated the average pre-enrollment wages for those N/ECCC program completers who were employed in the quarters before starting the program.

Figure 2 shows the trend in wages from the 12th quarter before enrollment to the 1st quarter before enrollment. Participant wages are in a steady and significant decline beginning in the ninth quarter before enrollment. From an average wage of about $7,000 per quarter in the third year (quarters -9 through -12), wages decline by a little more than a third to around $4,600 per quarter for the first year before enrollment.[7]

Figure 2. Average (Mean) Pre-Enrollment Quarterly Earnings of Employed N/ECCC Program Completers Age 20 and Older



Academic Preparation

Although all program participants are required to possess either a high school diploma or a GED, many have low levels of academic preparation. Test score results indicate that many would have difficulty scoring high enough on the union apprenticeship tests, either the Wonderlic test or the WorkKeys test, to be accepted into union apprenticeships. When they apply to the N/ECCC program, applicants take the Test of Adult Basic Education (TABE). The average TABE reading score among participants is 9.28, and the average math score is 8.26. TABE scores equate to grade levels, so the average participant enters the program at a little better than a ninth-grade reading level and a little higher than an eighth-grade math level.

N/ECCC Program Components

NJISJ offers the construction careers program three times a year, in the winter, spring, and summer. Each winter and spring session, held at Essex County Vocational Technical School's (ECVTS) Newark campus, lasts 10 weeks with most classes between 4:00 p.m. and 8:00 p.m. and some on Saturdays. During the summer, when the students attend full time (six hours a day) on the ECVTS Bloomfield campus, the program is six weeks long.

The staff of the N/ECCC program consists of personnel from NJISJ and ECVTS. The N/ECCC program director works with program participants, the teaching staff, and the Consortium members to ensure that the program runs smoothly. ECVTS personnel include a site supervisor who schedules the classes and provides some counseling to students. ECVTS provides the teachers for the Math, Reading for Information, Locating Information, and Physical Conditioning classes. Staff from the community-based organizations, WISE Women's Center, and La Casa de Don Pedro teach the life skills course.

Many low-income residents of Essex County, including participants in the N/ECCC program, face a number of barriers to establishing careers in the construction industry. The N/ECCC program consists of a number of different components, which are designed to assist program participants in overcoming the barriers they face to becoming union apprentices.

Outreach and Recruitment

In order to provide the construction industry with qualified workers, each session of the program begins with an extensive outreach and recruitment effort aimed at identifying strong applicants. Community outreach involves communicating three important messages: (1) that the program exists and is a good opportunity, (2) the program's admission requirements, and (3) the type of person who not only meets the application criteria but who would also be likely to excel in the program and become a competent apprentice. The program will only get referrals if the community is aware of the program and the opportunity it provides. Likewise, the program will only get qualified referrals if NJISJ explains to community groups the program's requirements and the type of applicant they're seeking.

Program personnel recruit applicants by distributing fliers that describe the program and by making presentations to various groups, including high school students, church groups, and community-based organizations. In addition, NJISJ enlists partner organizations to help identify and refer applicants. In at least one case, a probation officer referred an applicant. Positive word of mouth is also an important source for new recruits, with siblings, cousins, and friends of former students often vying for spots after watching their relatives and friends succeed.

Application and Screening

There are many more applicants than there are available slots in the program. For each session, about 350 people apply for admission, while the program accepts only 30-40 students. The application and screening process consists of three steps. Applicants first complete an application that asks them basic information about themselves. If applicants lack a high school diploma or GED, their application is not considered. In addition, potential students are repeatedly told that they must pass a drug test (the prospect of which keeps some away).

Second, everyone who completes an application and has a GED or high school diploma is given a date on which they can take the TABE. On average, about 250 applicants per session take the TABE. The purpose of the TABE is to gauge each student's level of academic proficiency.

Third, applicants interview before a panel of Consortium members. Everyone who takes the TABE is given the opportunity for an interview, regardless of their test score. The interview panel consists of NJISJ personnel and a mix of Consortium representatives including teachers from the program, partners from community-based organizations, school district personnel, union personnel, vocational school personnel, and representatives from city government. The panel, usually between four to eight members, interviews about 200 applicants, for about 15 minutes each. At the interview, the panel learns of the applicant's driver's license status. Each interviewer fills out a comment sheet on every applicant and scores the candidates during the interviews.

The admissions process concludes with a discussion among the members of the interview committee about the relative strengths of the different applicants. The committee admits 30-40 students to the program based on a combination of TABE scores and the interview. Nearly all students offered admission accept.

Admission to the program is contingent on the applicants possessing a valid driver's license or the ability to demonstrate that they could get a driver's license or have one reinstated. The program works with students whom the program accepts without valid driver's licenses to get their licenses reinstated. If necessary, the program assists students in paying off their traffic fines. (The program pays half, up to $1,000, for non-moving violations.)

Admission

All accepted students are invited to a family night dinner before the program begins. The dinner, which is mandatory for all admitted students, provides an orientation to the program, explains the rules and expectations, and sets the tone for the weeks ahead, serving to impress on the students that the program is very serious and that it represents a great opportunity. The dinner also informs family members about the significance of the program, and gives them a sense of the hard work that they will have to perform over the coming weeks to successfully complete the program. In some cases, the dinner represents the first chance for parents of the younger

students to learn about the program. Graduates of the program who are in apprenticeships attend the dinner and share their experiences.

Drug Testing

The program conducts a drug test of every admitted student during the first week of the program. Students who fail the drug test are expelled from the program. The program also administers random drug testing, similar to what the students would face as union apprentices. A goal of the program is to prepare the students not only for the apprenticeship application process but also to improve their odds of keeping the apprenticeships by ensuring their experiences in the program closely resemble what they will encounter as apprentices. Few students fail the drug test. In the summer 2006 session, no students failed the drug test, and in earlier sessions only one or two students failed. Program personnel attribute the low failure rate to the fact that through word-of-mouth, students know both that the program is serious about drug testing and that the program represents a great opportunity that the students do not want to jeopardize.

Driver's License Restoration

In order to become a union apprentice, one must have a valid New Jersey driver's license so that they can get to the work site. Many low-income residents either do not have driver's licenses or have suspended licenses. In their final report to the Motor Vehicles Affordability and Fairness Task Force, Rutgers University's Voorhees Transportation Center and the New Jersey Motor Vehicle Commission found that 24% of all drivers (and 35% of male drivers) living in the state's lowest income zip codes have suspended licenses.[8]

Curriculum

The program provides the students with academic preparation to enable them to pass the union apprenticeship tests, hands-on learning to give them an understanding of the requirements and rigors of construction trades employment, life skills training, and in the summer physical conditioning. (The summer program takes place at ECVTS' Bloomfield Tech campus, where there is a gymnasium; the fall and spring classes are held on the Newark campus, which does not have a gym.) All classes are taught by certified high school teachers who are full-time teachers in the ECVTS district.

Table 4 lists the components of the curriculum that the program offers.

Table 4. N/ECCC Program Curriculum

Construction Careers Program Curriculum
Math
Reading for Information
Locating Information
Construction Basics
Life Skills Training
Site Visits to Work Sites
Union Presentations
Physical Conditioning (summer sessions)

Based largely on their math scores on the TABE, the students in each session are divided into four separate classes. By creating classes with between 6-10 students, the program is able to give the students more individualized attention and tailor the curriculum to the students' academic needs.

Academic preparation consists of three courses: applied math, reading for information, and locating information. The instructors gear the classes to both the ability levels of the students in the class and the material on which students will be tested on the union exams. In scheduling the course, the instructors take their cues from the tests that are upcoming and emphasize different elements of the curriculum depending on the test (Wonderlic or WorkKeys) for which students are preparing.

Union members of the Consortium have made clear that math skills are critical, and the math course teaches applied math to help students score as high as possible on the union exams. The primary objective in the reading course is to improve the students' reading levels so that they can score high on the reading portions of the union exams. The locating information course teaches critical thinking and how to analyze information. The work involves reading maps, charts, and diagrams. The course also provides students instruction in technical/mechanical drawing and spatial relations. Students take the WorkKeys tests in all three subjects at both the beginning and the end of the program so that program staff can assess the students' improvement.

The construction basics course, which also teaches academic material such as how to work with fractions (necessary for accurate measuring), requires the students to perform hands-on tasks that they might have to perform as apprentices, primarily to give them some exposure to the trades. (Union members of the Consortium note that it is not the N/ECCC's job to teach the students the skills and crafts; the unions will teach those skills if and when the students become apprentices.) Students may learn some basics of working with tile, pipes, drywall, ladders, and other tools and materials. Students also take field trips to visit worksites so that they can see the types of work that the different trades perform. Similarly, union representatives visit the classroom, sometimes with apprentices who are graduates of the N/ECCC program, to inform them about what they can expect on the job.

Life skills training involves financial management and interviewing skills. The financial management class introduces students to financial concepts, such as credit and debt, and to financial instruments, such as checking and savings accounts. The program seeks to ensure that students are prepared to deal responsibly with the relatively high paychecks they stand to receive if and when they become apprentices, as well as to plan for stretches when work is scarce.

In the interviewing skills class, students are given tips on interviewing and conduct mock interviews. The goal is to prepare the students for the interviews that will determine whether they are accepted into union apprenticeship programs.

Life skills training—and the program overall—reinforces the notion that students must develop and then guard their reputations for dependability and punctuality if they hope to be successful on the job and in life. Also like the program overall, it strives to imbue the students with a sense of confidence and self-esteem.

In the summer, the program offers a physical conditioning course that the students attend every day, except when they are visiting a work site or attending a union presentation. The physical conditioning class provides the students with an hour-long workout in an unair-conditioned gymnasium. The purpose of the class is to improve the students' physical conditioning so that they will be fitter and better able to perform manual labor, and to give them a sense of the physical exertion that they will be required to perform every day as a part of their job as a union apprentice. (The program is hoping to include physical conditioning in the other sessions as well, contingent on a gym being built at the Newark campus.)

Case Management and Counseling

Program personnel, including NJISJ staff and ECVTS personnel, provide counseling to the students. School personnel take attendance at every class. Students must have valid reasons for any absence. In some cases, staff has arranged for students in need to receive outside counseling. Case management and counseling services continue after students have graduated from the program. NJISJ personnel maintain contact with graduates and are available to provide job coaching and to discuss with them any challenges that they are facing in their jobs. The supportive and nurturing environment improves the students' chances of success.

Stipend

The students receive a stipend of $50 a week during the winter and spring terms and $100 a week in the summer to help to defer the expenses they incur while enrolled in the program. In addition to the stipend, during the summer, the program provides students with daily free lunches in the school cafeteria. The relatively small size of the stipend means that some students have full- or part-time jobs outside of the program. Some are welfare recipients. One older student, a Hurricane Katrina evacuee, relied on assistance from the Salvation Army and the understanding

nature of a patient landlord to make ends meet while he was in the program. The stipend has remained at $100 a week since the inception of the program in 2001. N/ECCC could consider raising the stipend.

Apprenticeship Placement

In order to enter a union, a person must pass a union exam, which is offered just once a year, and then perform well in an in-person interview. Many low-income people are not aware of this process and do not know about the dates when the unions offer the apprenticeship tests. The program helps to inform Newark and Essex residents about the exam and to prepare them to obtain apprenticeships.

Competition for apprenticeships is fierce. All of the unions receive many more applicants than they have available apprenticeship slots. Because demand for apprenticeships is high, the unions have strict requirements for admission. To enter a union as an apprentice, a person must earn a minimum score, which varies from one union to the next, on either the WorkKeys test or the Wonderlic test that each union offers. Union apprenticeship tests are given once a year, with the date scheduled by the various locals, which operate autonomously. Students who earn at least an established minimum score on the test are invited for an interview with union personnel. The union then accepts as apprentices a percentage of those applicants who perform well in the interview. As with the program, acceptance into a union is conditional on passing a drug test, and apprentices must pass drug tests to retain their positions.

Program personnel work with the participants to identify the unions that match each student's skills and interests. NJISJ personnel have established strong relationships with the construction and building trades unions and work to place program graduates in apprenticeships. To help place students, program personnel identify union apprenticeship exam dates, speak directly to the unions about program graduates, and in some cases, drive students without cars to their exams. NJISJ maintains contact with students who were not placed during the program to help them secure apprenticeships. In some cases, students have been accepted into apprenticeships as early as the first or second week of the program, because the particular trade offered its test at that time of the year and the program used its flexibility to provide the targeted assistance that the student needed. The program measures success based on students achieving a union apprenticeship, even if that means they drop out before completing the entire program. Midway through the summer 2006 session, 4 of 32 students had started apprenticeships (3 roofers, 1 bricklayer). Of those placed through the program, 90% are with union apprenticeship programs. A few graduates accept non-union construction jobs.

Tutoring

The program offers tutoring to students who need extra help in the various courses, or who need help in preparing for an upcoming union test. The program also allows students who have

completed the program but have not yet entered an apprenticeship to return to receive tutoring to prepare them for union apprenticeship tests. Students may also return to receive coaching to prepare them for the union interviews.

Graduation

At the conclusion of the program, all students who have completed the program or who have been placed in an apprenticeship while they were enrolled in the program participate in a formal graduation ceremony. At the ceremony, union leaders, education and city government officials, and previous graduates speak to the students to congratulate them on completing the program and to stress the significance of the opportunity they have to establish careers in the construction trades. At the August 2006 graduation, the city of Newark's new mayor, Cory Booker, spoke to the graduates.

Post-Graduation Assistance

By definition, low-income citizens have little money, and as a result they lack the means to pay for job training programs that might prepare them for the construction trades. They also lack funds to be able to purchase some of the work materials, safety equipment, and transportation that they may need when they become union apprentices. These start-up costs make it difficult for low-income persons to enter the construction trades.

The program also assists graduates after they have completed the program. The program provides students with low-interest loans to pay expenses, including a car to get them to work and work materials (clothes, work boots, tools) they incur in order to join some of the trades unions. The loans for assistance with purchasing a car average about $1,000 to $1,200. The most an individual may borrow for other (non-auto) expenses is $500. The program also offers job coaching and counseling to the graduates while they are on the job.

Evaluation of Program Components

The research team evaluated the effectiveness of six program components:

1. Recruitment
2. Screening
3. Curriculum
4. Case management/counseling
5. Driver's license restoration
6. Revolving loan fund/credit union

Recruitment

According to the stakeholders the research team interviewed, N/ECCC generally does a very good job recruiting applicants. The key indicator of the program's success in recruiting applicants is that many more people apply to the program than the program can accept. The program receives about eight applications per available slot.

The one exception to the program's generally strong recruitment performance is the recruitment of Hispanic participants. The weakness in recruitment, some stakeholders said, lies in its outreach to the Hispanic community. NJISJ currently recruits Hispanics through presentations at high schools with large numbers of Hispanic students and through La Casa de don Pedro's career fairs. Yet few Hispanics have come to the program from the schools where the program has recruited. As a percentage of the participants in the program, Hispanics are under-represented relative to the percentage of Hispanics who live in Newark City and Essex County. During 2004 and 2005, 33 of 235 (or 14%) students were Hispanic.[9] In Essex County, Hispanics comprise 28% of the minority population.[10] In Newark City, Hispanics account for 38% of the minority population. The low number of Hispanic participants is a direct result of a low number of Hispanic applicants.

Some Consortium members have speculated that a lack of confidence in their English language skills may lead a number of Hispanics to eschew training programs that offer instruction in English. Notwithstanding these points, a similar pre-apprenticeship construction program conducted in the New York City public schools has high levels of participation among Hispanics. A detailed analysis of the reasons for low levels of Hispanic participation merits further study.

Screening

The unions think that the N/ECCC program is sending them qualified applicants. One union official described the applicants who apply from the N/ECCC program as "head and shoulders above others that walk in off street." This union official described the apprentices that the

program had been placed in his union as being in the top of their apprentice classes in attendance and work ethic. An official with a different union thought that the program did a good job of screening people and that by the time they had completed the program, they had developed a good understanding of what it takes to succeed in the building trades. A contractor who had employed workers from the N/ECCC program said that she had "high regard for all graduates" and had "nothing but good experiences from working" with the program.

The unions receive strong applicants despite the fact that the program works with individuals who have incomplete employment histories and who face barriers to employment such as having previously been incarcerated and having suspended driver's licenses. The program endeavors to be as selective as it can be because it is very difficult for anyone to get selected for an apprenticeship. Otherwise, it would be unable to place many students into apprenticeships.

Curriculum

In the surveys and the focus groups, the students were nearly unanimous in their opinion that the curriculum was effective. An analysis of test score data shows that, on average, students are improving in all subjects in which they are tested. The students who participated in the focus group thought that all of the classes that the program offered were helpful. The students identified two elements that contributed to the general effectiveness of the curriculum.

First, the participants thought that the instructors who taught the material were competent and dedicated to helping the students learn. In the survey, 21 of 22 respondents "strongly agreed" with the statement that "I found the course instructors and other presenters well prepared." Regarding the teachers' dedication, one student in the focus group explained that the teachers "have a passion for what they do."

The instructors, who also taught in high schools in Essex County, indicated that they found teaching in this program to be more rewarding than teaching in high school, because the results are immediate. Whereas teachers may never see high school students again after they graduate, in this program the teachers will learn soon after graduation which students were placed into which unions and they may see them at future graduation and reunion dinners. The thrill of actually seeing their students' tangible success seemed to keep the teachers motivated and engaged in helping the participants succeed.

Second, according to the 22 students surveyed, the small class size contributed significantly to their positive experiences. The students also thought that the tutoring and individual attention they received from the instructors motivated them and contributed to their academic success.

Overall, the student ratings of the classes and the instructors who taught them were positive (Table 5). For example, nearly all participants rated the quality of the individual classes as excellent or very good.

Table 5. Student Ratings of Course Quality

Student Ratings of the Quality of the Class					
Class	**Excellent**	**Very Good**	**Fair**	**Poor**	**Extremely Poor**
Math	15	6	0	0	0
Reading	10	10	1	0	0
Locating Information	13	6	3	0	0
Construction Basics	14	8	0	0	0
Physical Conditioning	9	9	3	0	0

With the exception of physical conditioning, virtually all participants rated the quality of the instructors as excellent or very good (Table 6).

Table 6. Student Ratings of Instructor Quality

Student Ratings of the Quality of the Instructor					
Class	**Excellent**	**Very Good**	**Fair**	**Poor**	**Extremely Poor**
Math	16	5	1	0	0
Reading	14	6	1	0	0
Locating Information	14	7	1	0	0
Construction Basics	12	6	3	0	0
Physical Conditioning	6	5	9	0	1

Math. Students thought the math class was the most helpful class in preparing them to take the union apprenticeship tests. The survey of students who were enrolled during summer 2006 asked students which class they thought was the most helpful in this regard. Sixteen of the 23 responses identified the math class as being the most helpful in preparing them for union tests. The conversation with students in the focus group supported this finding, with the students reaching some rough agreement that math was the most helpful. In the survey question specifically about the math class, 21 of 22 respondents rated the helpfulness of the math class in preparing them for the union exams as "very helpful," the highest level. One student rated the class as "helpful."

Reading. The students offered extremely positive comments about the instructor and her willingness to help the students improve their reading skills. One student wrote, "The teacher helped us read better and she always listens to every student." Another student thought that the instructor had really helped him prepare for the union test: "I felt she prepared me the most with the test. Reading was a weak field before this program. Now I feel confident with taking these [*sic*] apprenticeship test."

Locating Information. The students also offered positive feedback for the Locating Information course. The students said that they learned a variety of different things from the course. Said one, "We learned about different foundations of construction itself, such as the blueprints and different layouts." Another wrote, "It taught me how to seek out information the shortest way

possible." The students also had a positive impression of the instructor, with one student writing that "He is an excellent teacher" and another that "He is one of the best instructors."

Construction Basics. In Construction Basics, nearly every student appreciated getting some hands-on experience with construction work. One student summarized the thoughts of the vast majority of survey respondents, "It gave me hands-on experience of different trades and what they do, like plumbing, tile setting, etc."

Life Skills. In the focus group, some students thought that interviewing classes were rushed because they were left to the very end of the program. One student who had recently interviewed with one of the unions noted, however, that the mock interview prepared him well for the actual interview because it was more challenging than the actual union interview.

Students in the focus group generally thought that the class that taught people how to manage their finances was very educational. This seemed to be especially true for some of the younger students who knew little about credit.

Physical Conditioning. Although the physical conditioning class and instructor earned lower marks, the primary complaints were that the class required the students to perform difficult exercises and that the gymnasium in which they exercised was unair-conditioned. Creating a physical environment that challenges the students may be useful to preparing them for work as apprentices, even if they do not especially enjoy the work.

Site Visits and Union Presentations. The feedback from the focus group was very positive about the site visits. The students enjoyed seeing the different trades in action so that they could get a sense of the types of activities that they would be required to perform if they were to become apprentices. The union presentations also gave them some insight into the types of work that each of the trades performs so that they could reflect on whether that sort of work would interest them.

Analysis of WorkKeys Test Score Data. The research team also measured the extent to which students improved their test scores on the WorkKeys test from the beginning of the program to the end of the program. On the first day of the program, students take WorkKeys tests in Locating Information, Math, and Reading. They take those same tests again during the last week of the program.[11]

On average, students improved their WorkKeys scores between the time they first took the test at the start of the program and when they retested at the end of the program. Students showed improvement in all three subjects (Table 7).

Table 7. Average WorkKeys Scores

Course	Pre-Program Score	Post-Program Score	Change
Locating Information	3.43	3.85	+ 0.42
Math	3.96	4.29	+ 0.33
Reading	4.43	4.85	+ 0.42

On average, scores on the WorkKeys tests improved by four-tenths of a point. That the tests indicate an improvement in students' academic skills is consistent with the impressions gleaned from the qualitative information about student perceptions of teacher effectiveness and the research team's estimation of the teachers' dedication and competence. Because there was no way the research team could create a comparison group by which to compare the test results of N/ECCC program students, it is difficult to draw any conclusions about the significance of these improvements.

Case Management/Counseling

Program personnel, teachers, students, unions leaders, and other stakeholders were unanimous in their praise for the program director and the work he does to ensure that the students successfully complete the N/ECCC program and subsequently get accepted into apprenticeships. He knows each student by first and last name, before the first class starts, consistent with his personal philosophy that the students must abide by strict rules, but that these rules must be grounded in strong and supportive relationships with him and the staff. Though some students said they thought of him as a "big brother," they know his recommendations carry significant weight with the unions, and they do not take the chance to impress him lightly. It creates something of a win-win atmosphere.

Driver's License Restoration

Although it is difficult to compare to other similar endeavors, the program's efforts to restore the suspended licenses of program participants appear to be effective. According to records supplied by NJISJ, in 2005, the program spent $357 to help 2 individuals restore their licenses. In 2006, the program spent $1,883 to help 11 people, and in 2007 $489 to help 1 person get his/her license reinstated.

Revolving Loan Fund/Credit Union

La Casa de Don Pedro personnel thought that the line-of-credit program, though it had provided a valuable service to program graduates, had not functioned well, because very few of the students had repaid their loans. The experience with participants "has not been good." La Casa is not hurting the borrowers' credit ratings but is instead working with NJISJ to encourage the students to repay the loans. Operational difficulties with the program may have also contributed

to the low repayment rate. La Casa personnel think that the line-of-credit program should be modified so that it is more effective at encouraging program graduates to take more responsible approaches to borrowing.

Composition of the Newark/Essex Construction Careers Consortium

The research from the evaluation pointed to the fact that the full participation of the many diverse members of the Consortium is necessary for the program's success. This section identifies the Consortium members and describes their roles. The Consortium consists of NJISJ, Essex County Vocational and Technical Schools (ECVTS), the local public high schools, the construction and building trades unions, the New Jersey Department of Labor and Workforce Development, Newark and Essex One-Stop Centers, and community-based organizations.

New Jersey Institute for Social Justice

NJISJ manages the N/ECCC program. NJISJ personnel perform a variety of tasks, including:

- building relationships with stakeholders,
- coordinating instruction with the ECVTS teachers,
- arranging for the use of ECVTS facilities,
- recruiting program applicants,
- screening applicants,
- case management,
- providing students with their stipends,
- apprenticeship placement, and
- loans to cover start-up costs when students enter an apprenticeship.

NJISJ's role is really more than the sum of these (many and important) parts. The N/ECCC program director from NJISJ provides the glue that binds the many disparate activities that are necessary to the program's success. The program director recruits students, enlists the unions as a partner in the program, assists the students through the training process, links the graduates to the unions, and helps the unions select the most qualified apprentices by providing honest recommendations about program graduates.

Essex County Vocational and Technical Schools

ECVTS plays two significant roles in the construction careers program. First, they provide the facilities in which the program takes place. In the summer, the program is held at Bloomfield Tech High School, and in the winter and spring, the program uses Newark Tech High School. ECVTS also staffs the program with the instructors who teach the classes and a site supervisor who coordinates all field trips, oversees program scheduling, and handles other administrative matters.

The Local Public High Schools

The N/ECCC program recruits applicants from high schools in four districts: East Orange, Irvington, Newark, and Orange. The local public high schools are critical to the program's recruitment efforts. Part of NJISJ's job is to continuously educate school personnel about the opportunities that apprenticeships offer, particularly for non-college-bound youth. To accomplish this task, personnel from NJISJ explain the program to teachers, counselors, and school administrators and make presentations and distribute flyers on the program to students. In these presentations, NJISJ stresses the benefits of apprenticeships and the high-quality career opportunities that they offer. The program works especially closely with the Abbott district representatives at each school. Teachers are a key group because they are the ones who identify students who might benefit from the program and encourage students to apply. Finally, success with the schools also requires buy-in from the school principals, because they are the ones who decide whether to allow program representatives into the building to address the students.

Unions

NJISJ has developed strong links with the unions and these links have benefited the students in the program. The unions play a number of significant roles in N/ECCC. Their central role has been to accept program graduates into the unions. Participants who completed in 2004 and 2005 were accepted into apprenticeships at 18 different building and trades unions in New Jersey (see Table 8 for the number of program graduates by union).

The unions have provided input on both curriculum and program design, and program administrators have been responsive to this input. For example, the program has a strong focus on math, in part because the unions advised the program to highlight math. In addition, the construction basics course focuses heavily on teaching students to work well with the ruler, because the unions emphasized that working with a ruler was a skill that all members of construction and building trades unions need to possess. Early on, some Consortium members felt the requirement for a driver's license should not be included. The unions stressed the importance of taking a hard line on the driver's license issue, because if the students do not have their licenses, they cannot get to the job sites. (A pre-apprenticeship construction program in New York City does not include the driver's license requirement because public transportation is so widely available there.)

The unions have been forthcoming in sharing information about apprenticeships and the policies and requirements related to acceptance into apprenticeships. In addition, their emphasis on union apprenticeships as leading to a "career" and not just a "job" has contributed heavily to the spirit of the program. From focus group comments, it was clear that the students drew a distinction between other jobs they may have had in the past, some even construction-related, that were generally without health insurance or other benefits, and what they saw as a chance to join a union "family." Several also expressed an understanding that they do not have to stop by

becoming a journeyman but might continue to rise through the ranks, perhaps owning their own contracting businesses at some point.

New Jersey Department of Labor and Workforce Development (NJLWD)

NJLWD administers the state's Construction Trades Training Program for Women and Minorities program. NJLWD authorizes funding for the construction trades training programs and reviews and evaluates these programs.

One-Stop Centers

The One-Stop Centers' primary association with N/ECCC is through the recruitment, screening, and referral of applicants to the program. Two One-Stop Centers refer clients to the program: the One-Stop in Newark, also known as the Mayor's Office of Employment and Training (MOET), and the Essex County One-Stop. The Newark One-Stop has limited interaction with the program. MOET personnel knew little about the program. They indicated that although the One-Stop had previously referred clients to the program, they had not done so recently. MOET personnel indicated an eagerness to reestablish a relationship with the program.

NJISJ has a more formal agreement with the Essex County One-Stop Center. The Essex County government provides funding to NJISJ. The Essex County One-Stop pre-screens applicants, which is helpful for the program because it enables the program to recruit Essex County residents who live outside of Newark.

N/ECCC personnel thought that when the program started, the One-Stops did not have a full understanding of the type of person who would make a successful applicant. As a result, the individuals whom the One-Stops initially referred to the program were not qualified to participate in it. The program needed to educate the One-Stops about the skills and backgrounds that the referrals needed to have in order to enter apprenticeships. It appears that the One-Stops may have initially underestimated the requirements for passing the union apprenticeship tests and admissions process.

Community-Based Organizations

NJISJ has enlisted community-based organizations both to provide instruction to participants and to help in recruiting applicants to the program. La Casa de Don Pedro is a subcontractor to NJISJ and provides the financial management portion of the instruction. The WISE Women's Center is a subcontractor to NJISJ and provides the workplace readiness and interviewing training. La Casa de Don Pedro also sets up and manages accounts with funds deposited by NJISJ from which program graduates can take no-interest loans to help with the purchase of an automobile or help pay any other start-up costs associated with entering a union, such as required tools or safety equipment.

The program receives applicant referrals from La Casa de Don Pedro, WISE Women's Center, churches through the North Jersey Black Clergy, two Youthbuild programs in Newark.

Evaluation of the Effectiveness of the Consortium

The Consortium generally functions well according to most of the stakeholders the research team interviewed. The role of the Consortium has evolved over time. One Consortium member explained that in the beginning, members were more involved in program and curriculum design issues; by now, the program is fairly well established. However, some stakeholders think that the program could be more effective at reaching out to community-based organizations that could help in recruitment, especially in the recruitment of Hispanic applicants.

Strengths of the Consortium

A significant part of the effectiveness of the Consortium is a result of the strong relationship between the program and the construction and building and trades unions. As the quotations in the previous section of the report indicated, unions consistently give the program high marks for sending them qualified applicants and competent workers.

One key to the strong relationships with the unions relates to how NJISJ approached the unions when it began the program. NJISJ made it clear to the unions that it was not asking them to lower their standards to accept program graduates, to commit to accepting a certain number of graduates, or to alter the dates on which the unions offered their exams. NJISJ also made it clear to the unions that it wanted to learn from them and to deliver them graduates who could be successful apprentices and wanted the unions' input on the program so that they could make it as effective as possible.

The relationship between the program and the unions has grown closer over time as the unions have come to see that the apprentices whom they receive from NJISJ are well-qualified. The better the graduates perform in their apprenticeships, the more willing the unions become to accept future program graduates.

Another key to the relationship with the unions is the program's director. In interviews with stakeholders, respondents reported that he is honest with unions about the applicants that he sends them and makes sure that when he recommends someone, that person is truly worthy of his recommendation. Over time, this has allowed the unions to trust the program director's recommendations. One union official who thought that the program director's abilities were a key component of the program's success, described him as "really knowing what he's doing" and being "tremendously dedicated." The program has been successful in dealing with the unions not only because it has developed relationships with the unions but also because it has sustained those relationships over time through close communication. The relationships between the program director and the unions have become so strong because they have been cultivated and nurtured over time.

Stakeholders generally praised NJISJ for pursuing the initiative in the first place, for managing to keep the Consortium focused on its mission and not allowing it to devolve into contentious political issues that exist between some members, and for genuinely welcoming the input of members. As one interviewee explained, NJISJ did not "just come in and make decisions about the community; they actively solicited input. They use the community as a sounding board."

The program was also credited by one Consortium member as not creating unrealistic expectations: they "don't make promises the real world won't keep" but keep the emphasis on responsibility, credibility and reliability. In addition, this stakeholder thought that NJISJ had demonstrated considerable "commitment, fortitude, and tenacity" in initiating the program and implementing it successfully against some difficult odds.

In addition, stakeholders thought that the program has been smart about identifying personnel with whom to work, in order to maximize their knowledge of the union system. The program has a labor liaison who had worked for the unions and had participated in many interviews of apprentices. As such, he is able to advise the program about the sorts of questions that the unions ask of their apprenticeship applicants. Another program official had been the U.S. Department of Labor apprenticeship coordinator and was well aware of the different tests that the different unions require their applicants to take. Since the program administrators know the different types of tests that the different unions offer, they are able to adapt their curriculum in a manner that maximizes the students' chances of doing well on the tests. In addition, if unions are offering tests while the pre-apprenticeship program is ongoing, the teachers tailor their instruction to the type of test that students are about to take.

The research team found that the relationship between ECVTS and the program administrators appears to function very effectively. Program personnel work with ECVTS teachers to target curriculum to the real-world demands of the apprenticeship exams. The teachers reported that the program administrators were responsive to advice or suggestions that they had about the curriculum. The program personnel and the ECVTS personnel appear to work as though they were one organization.

Finally, the team found the link to the Essex County One-Stop Center is substantially stronger than is the relationship between the program and the Newark One-Stop in the Mayor's Office of Employment and Training. The N/ECCC program should consider strengthening the relationship with MOET as a way to help improve recruitment.

Weaknesses of the Consortium

The research team found that NJISJ generally works well with its partner organizations. However, the strength of the relationships between NJISJ and La Casa de Don Pedro and MOET has waned in recent years, with referrals from both sources declining. As a result, La Casa and

MOET had limited contact with NJISJ personnel, or other stakeholders, and as a result, they had limited knowledge of the program.

Discussions with the partner agencies suggested that personnel turnover at the partner agencies may have played a role in declining contacts between NJISJ and these partners. NJISJ may need to do a better job of maintaining relationships with others at partner agencies so that personnel turnover does not affect the extent to which the program collaborates with the partner agencies. When turnover at the other agency occurs, NJISJ could probably do more to educate the new staffer about the program and cultivate a relationship with him or her. Ultimately, the linkages between NJISJ and the partner organizations need to be institutionalized so that they can endure personnel turnover.

One of the key contributors to the program's success may, paradoxically, also be one of its weaknesses. The program director's relationships with the unions are extremely strong, and this is a source of the program's strength. Certainly the credibility that the program director has won in working with the unions also reflects on the program. However, because personal relationships are a key to the program's success, the loss of the program director could weaken the program. To ensure that there is no fall-off, NJISJ will have to take great care in finding an effective replacement. In the words of one union official, the program director's successor will "really have to dedicate themselves to the program to get up to Rodney's standards."[12]

Placement and Wage Analysis

Raw Placement and Employment Rate and Average Earnings

An extensive analysis by Heldrich Center staff and interviews with union officials found that the N/ECCC program helps graduates earn apprenticeships, become employed, and increase their wages. The research team used records on program graduates supplied by NJISJ to calculate an apprenticeship placement rate for N/ECCC graduates. Of the 230 students who completed the program in 2004 and 2005, 92 (40%) placed into an apprenticeship with a construction and building trades union (Table 8).

Table 8. Number of N/ECCC Program Graduates by Union (as of May 2006)

Union	Number of N/ECCC Program Graduates Working as Apprentices
Bricklayers Local 4	6
Carpenters Local 1342	12
Carpenters Local 821	1
Electricians Local 164	9
HVAC Pipefitters Local 9	1
Insulators Local 32	5
Ironworkers Local 11	10
Laborers Local 1153	4
Laborers Local 1030	7
Operating Engineers Local 825	5
Painters/Glazers Local 1009	21
Plumbers Local 24	6
Roofers Local 4	25
Sheet Metal Workers Local 25	11
Sprinklerfitters Local 696	1
Stationary Engineers Local 68	4
Steamfitters Local 475	2
Terrazo/Tile Setters Local 7	13

By May 2006, the N/ECCC program had placed 143 graduates into union apprenticeships. Of these 143 graduates who obtained apprenticeships, 92 participated in the program in either 2004 or 2005.

Although fewer than half of program graduates obtain apprenticeships, the program improves their employment prospects. The researchers matched program graduates with their wage data from the State of New Jersey's Unemployment Insurance wage record database in order to calculate employment rates and average wages.

In each of the 10 quarters after completion at least 60% of program graduates were employed, and typically the rate was above 65% employment.[13]

After completing the program, N/ECCC program participants earned an average of $12,276 in the first year after graduation and $15,990 in the second year.[14] The research team disaggregated these wages and compared the average wages of men to the average wages of women and the average wages of Black participants to those of Hispanic participants. These comparisons showed that there were no significant post-program wage differences between either men and women or Blacks and Hispanics.[15]

Need for a Comparison Group

This employment and earnings information is important for helping to get a general sense of the N/ECCC participants' post-completion outcomes. On their own, however, employment rates and average earnings values are not particularly informative. They could represent positive or negative outcomes. Moreover, even if the raw employment rates and average wage outcomes are positive, there is no way of knowing whether and to what extent the N/ECCC program contributed to those positive outcomes.

Ideally, one would be able to precisely measure whether and to what extent any training program affected a person's earnings by comparing the wages he earned in the world in which he enrolled in and completed the N/ECCC program with the wages he earned in the world in which he did not participate in the program. This is, of course, impossible because we observe either the state of the world in which he participated in the program or the state of the world in which he did not, but not both. Since such a research strategy is not possible, the researcher must compare individuals who participated in the program with individuals who did not participate in the program but are otherwise as similar as possible to the participants.

In a perfect world, the only pre-program difference between the N/ECCC program participants and the comparison group of non-participants would be that one participated in the program but the other did not. Purely from a research standpoint, the ideal way to develop such a control group would be to have been to have randomly assigned applicants at the outset of the N/ECCC program to treatment and control groups, followed both groups as they entered the labor market, and then compared their earnings. Assignment at random would have ensured that the two groups were the same except that some were assigned to participate in the program while others were assigned not to participate. For many obvious reasons, such a randomized control trial was not feasible.

The next best alternative is to use observational data to generate a valid comparison group. In order for the comparison group to be valid, its members had to be as similar as possible on a range of dimensions to N/ECCC program participants. In order for a comparison group to be effective, it is necessary that the members of the comparison group be observed at the same time and in the same geographic location as the members of the treatment group. This is necessary because it ensures that members of both groups faced roughly similar labor market conditions

when they sought employment and training. The treatment and comparison group members should also be as similar as possible on measurable characteristics, including their sex, race, age, education level, and wages they earned before training. The individuals in the two groups also need to be similar on characteristics that are extremely difficult to measure, such as their motivation to succeed.

The research team therefore worked with NJLWD to identify a comparison group of highly similar individuals. Under a data-sharing agreement, NJLWD supplied the Heldrich Center with data from its AOSOS system on individuals who received training at any One-Stop Center in Essex County during 2004 or 2005. The AOSOS data included 3,749 unique individuals who received either occupational skills training, skills upgrading or retraining, or on-the-job training from either the Newark City One-Stop or the Essex County One-Stop during 2004 or 2005 (the same period when the N/ECCC participants participated in training).

The AOSOS data was effective for building a valid comparison group, because it included individuals who received training services at the same time and in the same location as N/ECCC program participants. In addition, the AOSOS data contain information on the individuals' sex, race, age, and education level so that it was possible to select for inclusion in the comparison group only those individuals who were as similar as possible to N/ECCC program participants on these characteristics. Heldrich Center researchers also used data from the Unemployment Insurance Wage Reporting Database to match N/ECCC completers and individuals from AOSOS on the wages they earned three years before training, the wages earned in the second year before training, and the wages earned in the first year before they started training. This ensured that the comparison group included individuals whose employment histories were very similar to the N/ECCC program participants. Finally, because the AOSOS data include only those individuals who, like the N/ECCC program participants, sought workforce services, the comparison group members have roughly similar levels of motivation to N/ECCC program participants. Although there is no perfect way to rule out different levels of motivation across the two groups, three years worth of prior wage data also helps to control for different levels of motivation.

To construct the comparison group, for each of the 230 participants in the Newark/Essex program, the research team selected one person from AOSOS who was most similar to each participant, based on sex, race, age, education, and employment history.[16] By matching, the research team was able to ensure that the only individuals included in the comparison group were very similar to participants in the N/ECCC program. By selecting for the comparison group only those individuals who were extremely similar to program participants, the research team was able to make a fair comparison between the two groups and accurately estimate the effects of the N/ECCC program on participants.

Wage Analysis

Results for All N/ECCC Graduates. N/ECCC program graduates earn higher wages than a comparison group of individuals who received job training in Essex County.

The research team first examined the average wages in the first and second years after completion for all graduates of the N/ECCC program and for a comparison group that had received training from the Essex County One-Stop Centers. The comparisons show that the average N/ECCC program completer earned between $2,200 and $3,700 more than the average comparison group member during the first year after training.[17] During the second year after training, the N/ECCC graduates were earning between $3,900 and $4,600 more, on average, than the comparison group individuals. To put this finding into context, by the second year after program completion, the average N/ECCC program completer's cumulative post-graduation earnings exceeded the post-training earnings of the average comparison group member by more than the $6,000 per-participant cost of the N/ECCC program.

Results for N/ECCC Graduates Who Were 20 or Older at Enrollment. The N/ECCC program is exceptionally effective at helping adult N/ECCC graduates, who were 20 or older when they enrolled in the program, increase their earnings.

One weakness of the wage analysis results that included all N/ECCC program completers regardless of age is that it precluded the research team from measuring changes in wages from before program enrollment to after enrollment. The results therefore appear outside the context of how each person was faring in the labor market before enrollment in the program. It is possible that the results could be worse (or better) once prior wage levels are taken into account.

In order to put these wages into context, the research team investigated the question of whether N/ECCC program graduates had higher earnings in the years after completing the program than they had in the years before enrolling in it. For N/ECCC program graduates who were enrolled in high school before they entered the program, the question of whether the program helped them increase their wages is irrelevant, or at least has little meaning. These students, who may or may not have held jobs while in school, were not in the labor market like the older students. For this reason, the research team decided to calculate the change in wage effect only for program completers who were at least 20 years old when they enrolled in the program. The purpose of this restriction was to ensure that no wage information for high school students was included in the data.

Heldrich Center researchers had three years worth of prior wage data for program participants. Consistent with the reasons for excluding from change-in-wage calculations all program participants who were younger than 20 years old at the time they enrolled in the program, the research team only used all three prior years of wage data for participants who were at least 22 years old when they started the program. For participants who were 20 years old to start,

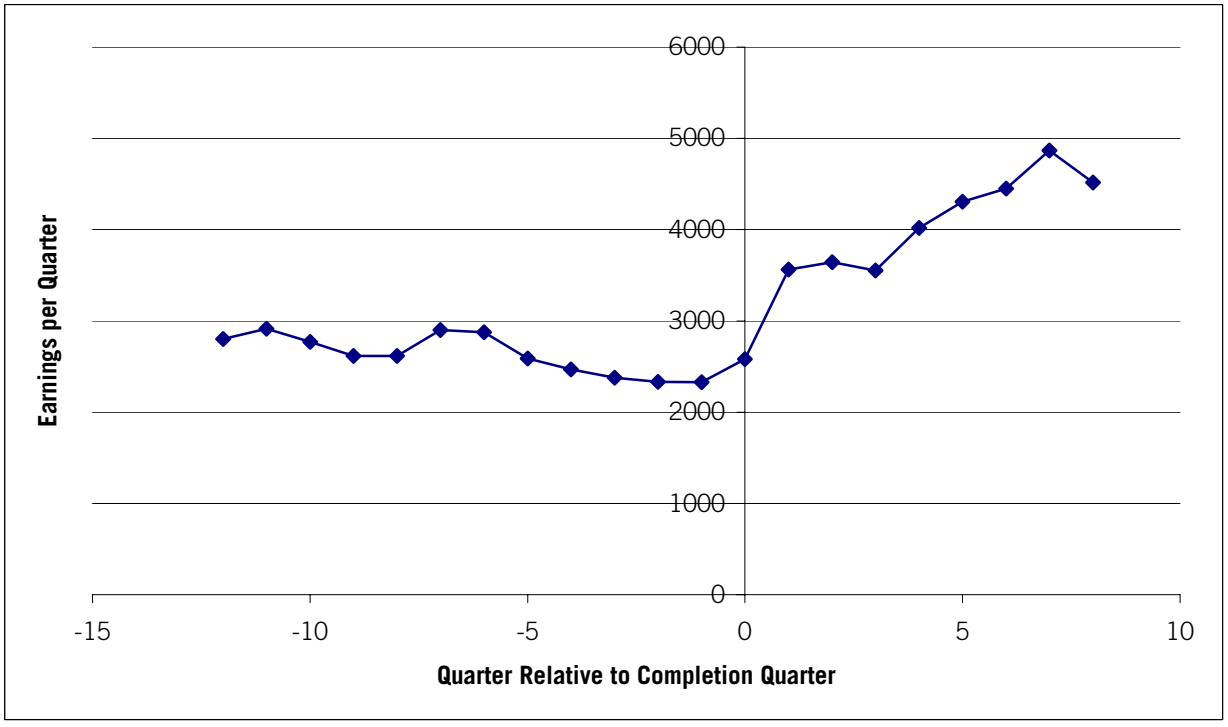
researchers used only wage data from the prior year for change in wage comparisons, and for those who were 21, the prior two years. Table 9 illustrates which program participants were included in the change-in-wage calculations and how many years of wage data were used for each cohort.

Table 9. Age Cohorts and the Use of Wage Data for Calculating Before/After Changes in Earnings

Age at Enrollment	Number of Participants	Included in Change-in-Wage Calculations?	Years of Pre-Enrollment Wage Data
19 and younger	82	No	NA
20	10	Yes	1
21	9	Yes	2
22 and older	129	Yes	3

To get an initial sense of the change in the average quarterly earnings of program completers, the Heldrich Center calculated average earnings per quarter for all program completers who were 20 or older at the time of enrollment. Figure 3 shows the trend in the average earnings per quarter for N/ECCC graduates who entered the program when they were at least 20 years old.

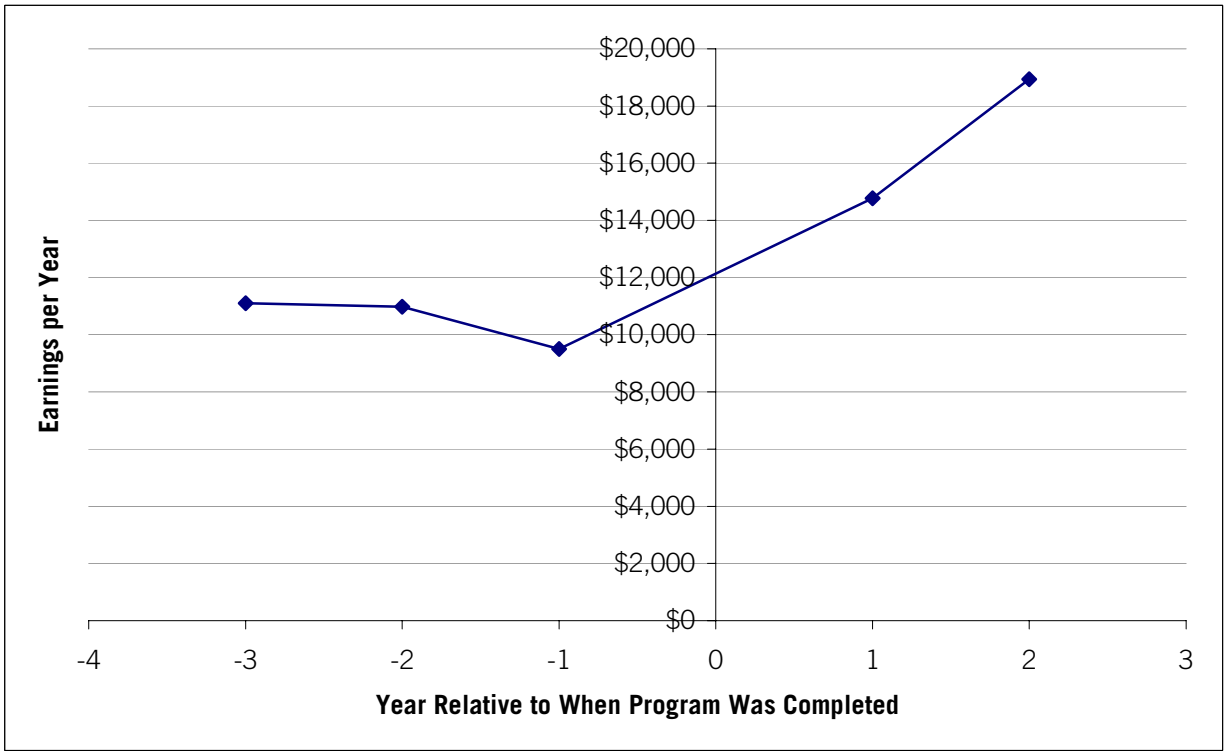
Figure 3. Average Quarterly Earnings of N/ECCC Program Completers Who Were 20 or Older at Enrollment (Includes Person-Quarters Where Wages=0)



The data clearly show that before they enrolled in the program, the average quarterly earnings of N/ECCC program completers was very low, below $3,000 in every one of the 12 quarters prior to enrollment. After enrollment, the quarterly earnings increased significantly, to about $3,500 during the first three quarters after completion to over $4,000 a quarter during the subsequent quarters.

To ensure that the results of the analysis would not be too dependent on any one particular quarter or on any individual cohort of completers, Center researchers decided it would be preferable to examine the program's average annual wages. The research team therefore calculated the average annual wages that N/ECCC program completers earned in the three years before enrolling in the program and the two years after they completed it. Figure 4 shows the average annual earnings over time of N/ECCC program completers who were 20 or older at enrollment.

Figure 4. Average Annual Earnings of N/ECCC Program Completers Who Were 20 or Older at Enrollment



The average earnings data indicate significant wage growth after program completion. To develop a better understanding of how N/ECCC program completers' earnings differ after the program compared to before, the research team calculated the change in earnings between the years before they entered the program and the years after they completed it. Table 10 shows the change in wages for two intervals.

Table 10. Changes in Wages from before Enrollment to after Completion for Completers Who Were 20 or Older at Enrollment

Average Difference in Earnings Between:	Dollar Value of the Difference	N-size (Number of Graduates on Which the Calculation was Based)
Year 1 After Completion and Year 1 Before Enrollment	$5,273	148
Year 2 After Completion and Year 2 Before Enrollment	$9,466	69

Table 10 shows that the wages of N/ECCC program completers are much higher on average after they completed the program than they were before they enrolled in it. The increases in earnings from one year before to one year after and from two years before to two years after are substantial. On average, people who enrolled in the program when they were 20 or older, and completed, earned almost $9,500 more during the second year after the program than they earned during the second year before they enrolled in the program. The data indicate that the wages of N/ECCC program completers are significantly higher after program completion than they were before enrollment.

A critical question is whether it is reasonable to attribute this earnings growth over time to the N/ECCC program. The before-after comparisons detailed above are, of course, important in establishing the N/ECCC program's effectiveness because the program can only have affected a person's earnings if those earnings actually changed after the person completed the program.

Nonetheless, although the wages of N/ECCC program participants increased between the time before they entered the program and two years after they completed it, one cannot necessarily conclude that the program caused the wage growth, because one cannot rule out the possibility that the program participant may have experienced the same positive outcome even if he had not participated in the program. Some factor unrelated to the program (and beyond the control of the researcher) may have been responsible for this wage growth.

As the researchers did in analyzing the data on all N/ECCC graduates, they compared the average wages in the first and second years after completion of the adult N/ECCC graduates and the adult comparison group members. Because the adults had prior wage information, the researchers were able to control for the wages that the N/ECCC graduates and comparison group members earned before they started training. In the first year after completing the N/ECCC program, adults earned between $3,500 and $5,700 more than the adult comparison group members. In the second year after training, the wages of the adult N/ECCC graduates were between $6,700 and $9,400 greater than were the wages of the adult comparison group members.

The research team then employed a difference-in-difference model that compared each person's earnings in the year before they received workforce training to the wages they earned in the year

after they completed the training. The purpose of this strategy was to learn whether the N/ECCC program participants experienced more or less wage growth during this period than did the similar persons who received One-Stop services.

Taking into account the education, sex, race, and age of the N/ECCC participants and the comparison group members, as well as the quarter when each person received training, the data indicate that N/ECCC program participants experienced between $3,000 and $4,600 more wage growth (than the individuals who received One-Stop services) between the first year before training and the first year after training. In other words, although the earnings of both the N/ECCC participants and comparison group members increased during this time period, the earnings of the N/ECCC program participants increased at a significantly faster rate.

The researchers also used a difference-in-difference model to compare the earnings two years before to two years after training. The estimate of the difference in wage growth from the second year before training to the second year after training between the N/ECCC program participants and the AOSOS comparison group is also significant. On average, those who participated in the N/ECCC program experienced between $6,500 and $10,400 more earnings growth during this timeframe than the comparison group members who received One-Stop services.

One of the critical ways in which the N/ECCC program improves wage outcomes is by moving graduates into construction union apprenticeships, which allow program graduates to earn high wages. As one would certainly expect, the graduates who obtained apprenticeships fared significantly better after graduation than the graduates who were not placed into apprenticeships. In the first year after completion, the average N/ECCC program completer who obtained an apprenticeship earned $16,905. By comparison, those graduates who were unable to obtain apprenticeships earned $9,190. The gap between the two groups expanded in the second year after completion, when the apprentices earned $23,226 and the non-apprentices, $12,325.

Apprentices also experienced a higher rate of wage growth after training than did those N/ECCC program participants who did not obtain apprenticeships (Table 11).

Table 11. Comparison of Change in Earnings of Non-Apprentices and Apprentices for Completers Who Were 20 or Older at Enrollment

Average Difference in Earnings Between:	Dollar Value of the Difference for *Non*-Apprentices	Dollar Value of the Difference for *Apprentices*
Year 1 After Completion and Year 1 Before Enrollment	$3,700 (76)	$6,934 (72)
Year 2 After Completion and Year 2 Before Enrollment	$7,271 (40)	$12,493 (29)

This information prompted Heldrich Center researchers to wonder whether the adults who were placed as apprentices were the ones who were deriving all of the wage gains from the N/ECCC program. In order to investigate this concern, the research team removed the N/ECCC graduates who obtained apprenticeships from the data and compared the earnings of the non-apprentices in the first and second years after completion as well as their wage growth from year one before training to year one after training and from year two before to year two after to the comparison group.

Even with the apprentices omitted from the analysis, the average N/ECCC program participant experienced greater wage growth from the second year before training to the second year after than did the AOSOS individuals. In the second year after completion, the adult N/ECCC non-apprentice graduates earn about $5,000 more than their counterparts in the comparison group. In addition, the wage growth from the second year before training to the second year after training is about $5,000 greater for the N/ECCC non-apprentice graduates than for the comparison group. The data indicate that in the first year after training, there is no statistically significant difference in the outcomes for the N/ECCC graduates and the comparison group. The adult graduates of the N/ECCC program who do not obtain apprenticeships are doing as well after completing training as the adults who received training through the One-Stop.

These results indicate that the program has beneficial wage effects even for those N/ECCC graduates who fail to obtain apprenticeships. Moreover, it suggests that the N/ECCC program boosts its graduates' wages in two ways: by helping them obtain apprenticeships and by providing them with some basic skills that make them more competitive in the labor market. The findings echo the words of some Consortium members who agreed that even for the graduates who do not achieve the goal of a union apprenticeship, the N/ECCC program equips them with vital skills. As one stakeholder explained:

> *Through ISJ, the students are getting more than access to apprenticeships in the building trades. They are getting the support and background they need to get any job, including reading, math, and interviewing, and workplace skills like how to be on time. You can't just judge the program by the numbers who get into the building trades. It's a successful program for having the outreach it does and for making people employable elsewhere, too.*

Results for N/ECCC Graduates Who Were Younger than 20 at Enrollment. The data indicate that the N/ECCC is no more effective than other training programs at helping the younger N/ECCC graduates increase their earnings.

In light of the positive results for the adult N/ECCC program completers, the research team considered the effects of the program on those graduates who entered the program when they were under the age of 20. As Table 12 indicates, the average post-program earnings for the

younger cohort were significantly lower than for the older cohort in each of the first two years after completion.

Table 12. Comparison of Average Annual Earnings of Youth (under 20 years of age) and Adult (20 or older) N/ECCC Completers

Average Earnings in:	Average Earnings of Youth Graduates	Average Earnings of Adult Graduates
First Year After Completion	$7,760	$14,778
Second Year After Completion	$10,793	$18,940

The wages of the youth completers are lower than those for adult completers because the younger group of students obtained apprenticeships at much lower rates than the older students. Twenty-four percent of the students who were under the age of 20 when they started the program became apprentices, compared with 49% of the students who were 20 or older when they began. This is a substantial disparity.

The research team then decided to exclude from the data anyone who was over the age of 19 at enrollment and compared the wages of the N/ECCC program graduates in the first and second years after graduation to those of the comparison group members during the same time period. Using a variety of statistical models, the researchers found that the N/ECCC program graduates performed neither better nor worse than the comparison group individuals who received training through One-Stop Centers in Essex County.[18]

This disparity in the effectiveness of the program for older versus younger participants is a significant finding. The N/ECCC program is exceptionally effective for adults (those older than 19 at enrollment), even those who did not secure apprenticeships. However, the program is no more (and no less) effective than training from the One-Stops for those who are younger than 20 when they enroll.

Retention

As the previous section discussed, many students who graduate from the program earn apprenticeships with construction and building trades unions. Not all N/ECCC program graduates who become apprentices, however, retain their apprenticeships. Of the 92 N/ECCC program graduates from 2004 and 2005 who obtained apprenticeships, 21 have since dropped out of their apprenticeships.

There are some significant differences between the graduates who have dropped out of their apprenticeships and those who have retained their apprenticeships. The most significant difference is that the apprenticeship dropouts were noticeably younger than the apprenticeship retainers when they participated in the N/ECCC program: 22.6 years old for the dropouts and 27.1 years old for the retainers. Similarly, whereas only 39% of the apprenticeship retainers were younger than 25 when they enrolled in the program, 71% of the dropouts were younger than 25 at the time of enrollment. There were no significant differences in dropout rates by sex or race.

There were important differences between the dropouts and the retainers in terms of their levels of academic preparation. The dropouts scored significantly lower on the TABE reading test than the retainers. The dropouts' average TABE reading score was 8.07, while the retainers averaged 9.85. The initial WorkKeys reading scores of the dropouts were also lower than those of the retainers (4.69 versus 4.2). However, by the end of the program, there were no differences in the WorkKeys reading scores of dropouts and retainers, suggesting that the dropouts worked hard in the program to improve their skills. This supposition is borne out by data on the average change in WorkKeys reading scores from the first time the test was taken at the beginning of the program to end of the program when the test was administered again. The data indicate that the dropouts improved their reading scores at least as much, and possibly more, than the retainers. The data indicate that the dropouts entered the program with weaker academic skills than the retainers, but that they worked about as hard as and possibly harder than the apprenticeship retainers to upgrade their academic skills.

The other significant difference between the dropouts and the retainers was that formerly incarcerated individuals were less likely to drop out of apprenticeships than were graduates who had never before been incarcerated.

The research team also sought to address the question of why students drop out of their apprenticeships. In their interviews with union officials, the researchers asked about the apprenticeship dropouts. One Consortium member representing a union observed that the students who get into the apprenticeships seem to excel in attendance and work ethic. Those who have dropped out have done so not for discipline problems but either because of other opportunities that may have come up or because they decided the work was not for them after all. One union official said he thought that some dropped out, or stopped attending the

mandatory apprenticeship training sessions, when work was light, an endemic problem for a cyclical industry such as construction.

The data analysis above suggests one reason for the higher dropout rates: age. Younger program graduates may not have as great an appreciation of the value of the opportunity of a union apprenticeship. The union into which the graduate was placed may also be a factor. The work that some unions perform is simply harder than others. According to the program director, dropout rates for program graduates were higher for students who were placed as roofers and bricklayers. Part of the reason for this could be the generally more strenuous work these union members must perform. According to the program director, ISJ has not lost any electricians or iron workers. The program director and union officials whom the researchers interviewed thought that the dropout rates for N/ECCC graduates who became apprentices was roughly similar to the general dropout rates for each of the different unions.

Conclusion

Based on the evaluation data, the Heldrich Center concludes that the N/ECCC program is effective at preparing its students for apprenticeships and for success in the labor market more generally. The results of this evaluation demonstrate that a well-designed and well-managed pre-apprenticeship program can improve the earnings of individuals with barriers to employment. The intensive training program, with its focus on addressing multiple barriers to employment and incorporating significant labor union involvement, is particularly successful for participants age 20 and over.

The program has served and continues to serve the needs of the key stakeholders. There are many unemployed and underemployed residents in Essex County. The wage analysis demonstrates that the program has benefited this population by helping the unemployed to move into stable employment and the underemployed to obtain jobs that pay them higher wages.

The N/ECCC program can, and indeed does, play an important role in meeting this increased demand for building trades workers. In addition, the construction industry and the labor unions that serve it continuously need skilled workers for their building projects. Contractors and union officials concur that the program has helped them to obtain the qualified workers they require.

The program is effective at increasing the wages of adult low-income residents of Newark City and Essex County. Careful statistical analysis shows that the earnings of adult N/ECCC program graduates grow significantly after training, compared with what the graduates had been earning before they started the program. Wage growth is also greater for the N/ECCC program completers than for a carefully matched comparison group of individuals who received training in Essex County. Moreover, this wage growth is not limited to those individuals who obtain apprenticeships. Adults who fail to obtain apprenticeships also earn higher wages and experience more wage growth than the comparison group.

The N/ECCC program is less effective at helping its youth participants, those aged 19 or younger at enrollment, earn high wages. The difference in the post-program success of the adults and youth is significant. Whereas the adults earned $14,778 in the first year after completion and $18,940 in the second year after, the youth earned $7,760 in the first and $10,793 in the second year after completing training. Whereas the adult graduates earned significantly more than a comparison group of adults who participated in other types of training in Essex County, the youth graduates earned no more (nor no less) than the comparison group.

Based on interviews with members of the Consortium, a focus group with current students, and a survey of current students, the Heldrich Center identified five factors that may explain the success of the program:

- **Strong working relationship between the program operators and the construction and building unions.** The data indicate that the N/ECCC program graduates who fare the best are those who obtain union apprenticeships. These jobs pay very high wages and offer clear paths for advancement to high-wage journeyman positions. Critical to being able to place N/ECCC students into union apprenticeships, and hence critical to the program's effectiveness, have been the program's strong relationships with construction and building trades. The centrality of the unions to the program's success requires that these relationships continue to be nurtured and developed over time.

- **Rigor of the curriculum.** The program provides over 100 hours of course work to help students improve their skills in math, reading, and locating information, academic skills that the unions require and that are also important for success in other occupations. The intensive services that the students receive helps improve their chances of success in the labor market, both for those graduates who obtain apprenticeships as well as for those who do not.

- **The program addresses multiple barriers that program participants face to obtaining union apprenticeships.** Students in the program may face many difficult obstacles to becoming apprentices, including a suspended driver's license, weak academic skills, and limited knowledge of the apprenticeship application process. Because students have limited income, they may not have the resources to afford some of the materials that their apprenticeships require, including safety gear or an automobile. The N/ECCC programs attempts to address each of the multiple barriers that the population that it serves faces.

- **Dedicated and capable staff.** Students strongly felt that the NJISJ program director and the teachers in the program were incredibly dedicated and effective. The staff's dedication and ability to teach the subject matter motivates many of the students to excel.

- **A well-functioning consortium.** The Consortium generally functions effectively, especially the relationship between the program and the unions. Stakeholders agreed that the Consortium functioned well, incorporating input from the diverse groups.

While the results of this evaluation are quite positive, NJISJ and the Consortium should consider addressing two issues raised by this evaluation.

First, adult N/ECCC program graduates, in general, appear to benefit more from participating in the program than do the younger graduates. There are likely many reasons why the adult graduates fare better than the youth graduates. Older students are more likely to obtain apprenticeships and more likely to retain their apprenticeships over time than the younger students. Older students may be more mature than younger students and so may be more dedicated to learning the information they are taught during the training. The maturity of older

students may also translate in the interviews so that they are perceived by the unions as likely to be more effective apprentices. The discrepancy in outcomes for the younger and older students is an issue that deserves attention from the program staff. N/ECCC program staff should consider whether there are actions that the program can take to help the younger students become better consumers of the information the program provides them and more competitive for apprenticeships. Alternatively or in addition, the N/ECCC program may want to be more selective in accepting younger students into the program.

Second, the qualitative evaluation indicated that the recruitment of Hispanic participants could be strengthened. Community-based organization partners of N/ECCC suggested a number of steps that the N/ECCC program might take to improve the recruitment of Hispanic students. NJISJ should work more closely with La Casa de Don Pedro and other agencies, such as Aspira, that serve Hispanic clients. Such organizations could help identify qualified applicants for the program and could assist in the pre-screening of candidates.

NJISJ should also increase active efforts to publicize the program to the Hispanic community. Such efforts could include attendance at career fairs, postings on the NJLatinoIssues website (*http://groups.yahoo.com/group/NJLatinoIssues/*), and advertising on public access cable television stations. NJISJ should also enlist Hispanic graduates of the program in recruitment efforts, by including them in recruiting sessions and including photos of them in promotional materials for the program.

Finally, the small loans that the program makes to graduates to finance the initial cost of starting a career in the construction industry can be valuable. In order to ensure that these loans are able to be offered in the future, the program should work with students while they are enrolled in the program and after they graduate to help increase the probability that graduates indeed repay the loans provided them.

Appendix

The Principal Methodological Challenge

The most difficult task for the researchers was generating accurate estimates of the effect of the N/ECCC program on the earnings of program graduates. Ideally, one would have been able to precisely measure whether and to what extent the N/ECCC program affected a person's earnings by comparing the wages he earned in the world in which he enrolled in and completed the program with the wages he earned in the world in which he did not participate in the program. This is, of course, impossible because one observes either the state of the world in which he participated in the program or the state of the world in which he did not, but not both. Since such a research strategy is not possible, the researcher must compare individuals who participated in the program with individuals who did not participate in the program. In order for this comparison to be valid, the non-participants must be as similar as possible to the participants in terms of both their observable and unobservable characteristics.

In a perfect world, there would be no pre-program differences between the N/ECCC program participants and the comparison group of non-participants. Purely from a research standpoint, the ideal way to develop such a control group would be to have been to have randomly assigned applicants at the outset of the N/ECCC program to treatment and control groups, followed both groups as they entered the labor market, and then compared their earnings. Assignment at random would have ensured that the two groups were the same except that some were assigned to participate in the program while others were assigned not to participate. For many obvious reasons, such a randomized control trial was not feasible.

The next best alternative is to use observational data to generate a valid comparison group. In order for the comparison group to be valid, its members had to be as similar as possible on a range of dimensions to N/ECCC program participants. In order for a comparison group to be effective, it is necessary that the members of the comparison group be observed at the same time and in the same geographic location as the members of the treatment group. This is necessary because it ensures that members of both groups faced roughly similar labor market conditions when they sought employment and training. The treatment and comparison group members should also be as similar as possible on observable characteristics, including their sex, race, age, education level, and wages they earned before training. The individuals in the two groups also need to be similar on unobservable characteristics, such as their motivation to succeed.

Therefore the greatest challenge that the researchers faced in conducting the study was in identifying an appropriate comparison group against whom the outcomes of the N/ECCC program graduates could be compared.

Methodological Strategy

Treatment Group

The treatment group included the 231 graduates of the N/ECCC program who completed the program in either 2004 or 2005 and had social security numbers.[19] The data file from NJISJ included the ages of program graduates. All program participants were either Black or Hispanic. The program staff had not identified either the race/ethnicity or the sex of program graduates. The researchers identified individuals as Hispanic based on their surnames and as female based on their first names. The percentages of Hispanic and female students in the group of 231 graduates was consistent with the program staff's impression of the distribution of program participants by race and sex. Program graduates had at least a GED or a high school diploma. Some had completed college courses.

Comparison Group

Researchers can create either an internal comparison group or an external comparison group. An internal comparison group includes those individuals who also applied to participate in the program but did not ultimately participate, because they were either denied admission or accepted into the program but chose not to participate. An external comparison group includes individuals who were eligible to participate in the program but who were not in the program's applicant pool.

The greatest weakness of the internal comparison group is that when applicants are selected non-randomly to participate in a program, the program administrators may be selecting into the program individuals who are systematically different from the rejected applicants. Typically, the factors that persuade a training program to accept or reject an applicant are also indicators of how well the applicant would fare in the labor market. The rejected applicants, because they are judged by the admissions committee to be weaker, may therefore constitute an inappropriate comparison group. If the comparison group instead includes individuals who were offered admission into the program but decided not to participate, those individuals may be less motivated than the treatment group members and thus may not comprise an effective comparison group. Alternatively, the non-participants who were admitted may be very strong labor market participants because they may have not matriculated because other, more promising job opportunities. Using no-shows as a comparison group may therefore impart bias, in unknown directions, into the analysis.

The greatest weakness of using an external comparison group is that it may sometimes be difficult to match comparison group members with treatment group members across time and space. In addition, it is also possible that outcomes for comparison and treatment group members may have been measured differently, making it difficult to compare the outcomes of the two groups.

For this study, the research team created an external comparison group. The research team worked with the New Jersey Department of Labor and Workforce Development (NJLWD) to identify a comparison group of highly similar individuals. Under a data-sharing agreement, NJLWD supplied the Heldrich Center with data from its AOSOS system on individuals who received training at any One-Stop Center in Essex County during 2004 or 2005. The AOSOS data included 3,749 unique individuals who received either occupational skills training, skills upgrading or retraining, or on-the-job training from either the Newark City One-Stop or the Essex County One-Stop during 2004 or 2005 (the same period when the N/ECCC participants participated in training).

The AOSOS data was effective for building a valid comparison group, because it included individuals who received training services at the same time and in the same location as N/ECCC program participants. In addition, the AOSOS data contains information on the individuals' sex, race, age, and education level so that it was possible to select for inclusion in the comparison group only those individuals who were as similar as possible to N/ECCC program participants on these characteristics. Heldrich Center researchers also used data from the Unemployment Insurance wage reporting database to match N/ECCC completers and individuals from AOSOS on the wages they earned three years before training, the wages earned in the second year before training, and the wages earned in the first year before they started training. This ensured that the comparison group included individuals whose employment histories were very similar to the N/ECCC program participants. Finally, because the AOSOS data includes only those individuals who, like the N/ECCC program participants, sought workforce services, the comparison group members have roughly similar levels of motivation to N/ECCC program participants. Although there is no perfect way to rule out different levels of motivation across the two groups, three years worth of prior wage data also helps to control for different levels of motivation.

In addition, because both data sets contained information on participants' social security numbers, the research team was able to match treatment and comparison group members with their wages in the New Jersey Unemployment Insurance wage record database. In other words, the same data source was used to measure the outcomes for both treatment and comparison group members.

The Creation of the Comparison Group

Matching Variables

The research team selected for inclusion in the comparison group those individuals who were most similar to the treatment group members along a variety of dimensions. Treatment and comparison group members were matched on sex, race, age, education, and, for those individuals aged 20 or older at enrollment, their annual earnings in the three years prior to entering training. Individuals were matched on education by excluding from the comparison group those

individuals who had less than a high school education or who lacked a GED and those individuals who had a bachelor's degree or higher.

For the purpose of matching, annual wage values in the years before an individual entered training were computed relative to the quarter during which the individual began training. The N/ECCC program completers followed in this study enrolled in training in six different calendar quarters during 2004 and 2005. Because different individuals in both the treatment and comparison groups began their training in different quarters, the four quarters before training were different for different individuals. All pre-training wage values for each individual were calculated relative to the quarter in which that individual began training. All wage values were adjusted for inflation, by converting them to fourth-quarter 2006 dollars.

Pre-enrollment earnings were calculated only for any person in either the treatment or comparison group who was 19 years old or older during that quarter. (In terms of age at enrollment, this means that only those students who were at least 20 years old when they enrolled in training were included in pre-enrollment earnings calculations.) Therefore, only students who were 22 or older had earnings calculated for all 12 pre-enrollment quarters. The reason for this is straightforward: high school students are not necessarily in the labor market. They are not actively seeking employment. To include the wages that students earn while in high school in the calculation of average wages for those employed would distort the estimate of the true average wage, because high school students' wages are necessarily limited because they have to spend many of their waking hours at school.

How the Matching Was Done

The researchers took the data with the matching variables (sex, race, age, and the prior yearly wage variables) and tested various algorithms for matching treatment group members with comparison group members. The goal was to find the set of treatment and control group observations that produced the best balance in the distribution of the covariates.[20]

Observations had to be matched on many covariates and because the covariates themselves can take on many different values, it would be impossible to match treatment group members with comparison group members exactly on the values of their covariates. Instead, the researchers had to compute a propensity score for each individual in the sample. The propensity score is the probability of being in the treatment group given all of the covariates the matching variables). Matching then involves selecting into the sample for analysis only those treatment and control group observations that have very similar propensity scores.

The research team used the statistical routine MatchIt to compute propensity scores and to perform the matching.[21] MatchIt was implemented using Zelig[22] in R.[23] MatchIt allows the user to try a variety of different matching techniques and then run tests to see which matching algorithm yields the best balance on the distribution of the covariates. The researchers used nearest

neighbor matching, genetic matching, full matching, and optimal matching. Which of these algorithms was best depended on the specific dataset.

The researchers created eight separate datasets and used the MatchIt program to identify the best sample for each.

1. All observations that had year one wages
2. All observations that had year two wages
3. Adults with year one wages
4. Adults with year two wages
5. Non-apprentice adults with year one wages
6. Non-apprentice adults with year two wages
7. Youth with year one wages
8. Youth with year two wages

The matching algorithms performed very well in generating balance on the distribution of the covariates.[24]

Data Analysis

After identifying most appropriate observations to include in the analysis dataset, the researchers analyzed the data.

Calculation of Wages for Program Completers

Because different completers had different quarters of completion, the calendar quarter that comprised the first quarter before completion was different for different completers. So the first quarter before completion for anyone who finished the program in the first quarter of 2004 was the fourth quarter of 2003, while the first quarter before completion for a second-quarter 2005 completer was the first quarter of 2005. For each completer, a variable was constructed that indicated whether a person was employed for each quarter relative to the quarter during which they completed the program. A person was counted as being employed for a particular quarter if they earned wages greater than zero during that quarter.

The AOSOS data on the comparison group members did not contain information on the dates when participants completed training. The research team conducted two separate sets of analyses, based on different assumptions of when the AOSOS individuals completed training. One set of analyses were based on the assumption that the One-Stop training recipients completed their training in the same quarter in which they began it ("End 1"). The other analyses were based on the assumption that they completed training in the quarter after they entered training ("End 2").

Statistical Models Used

The research team ran models with four different dependent variables: the wages earned in the first year after completing training, the wages earned in the second year, the change in wages from the first year before training to the first year after training, and the change in wages from the second year before to the second year after.

These variables are continuous and roughly normally distributed. (Wages for the general population are typically log normally distributed, with there being a small but sizable minority of individuals who earn exceptionally high wages, but for the low-income population, there are none of these exceptionally high wage earners. As a result, no log transformation was applied to wages.) The research team therefore estimated the wage effects of graduating from the N/ECCC program using ordinary least squares (multiple regression).

In addition to controlling for the variables that were used in matching the treatment and control observations (i.e., sex, race, age, and for those individuals 20 or older at enrollment, the wages that they earned in the three years before training), the researchers also included dummy variables for the quarters in which individuals started training.[25] All wages were adjusted for inflation to the fourth quarter of 2006. The inflation adjustment was calculated based on the average of New York and Philadelphia's price levels.

Results

The research team calculated results for three broad sets of individuals: the full sample including people of all ages; adults (i.e., those who were 20 or older when they started their training); and youth (those who were younger than 20 at the start of training). For each group, separate models were run for the first year after training and the second year after training, and for two different operationalizations of the end date of training for comparison group members, as explained above. For the "all" and "youth" models the only dependent variables used were (1) the wage in the first year after training and (2) the wage in the second year after training. For the "adult" models, two other dependent variables were used: (3) the difference in wages between the first year before training and the first year after training, and (4) the difference in wages between the second year before training and the second year after training.

The dependent variables included:

- wage1: wages in first year after training
- wage2: wages in second year after training
- diff11: difference between wages in the first year after training and the first year before training
- diff22: difference between wages in the second year after training and the second year before training

The independent variables included:

- neccc: a dummy for whether the person graduated from the N/ECCC program, equal to one of the person graduated from the N/ECCC program and a zero if they did not.
- female: a dummy variable indicating whether the individual was female, equal to one if female, zero if male.
- black: a dummy variable indicating whether the individual was black, equal to one if black, zero if Hispanic.
- age
- wagem4: wages earned in the **third** year before enrolling in training
- wagem2: wages earned in the second year before enrolling in training
- wagem1: wages earned in the first year before enrolling in training
- cohort dummies indicate the quarter in which the individual enrolled in a training program

Each of the three main sections below discusses the results for each of the three groups ("all," "adult," and "youth") and for each of the four dependent variables.

All

N/ECCC program graduates have higher wages in the first year after training and the second year after training than individuals who complete training at the One-Stop. These results are robust to different measurements of the date that control group members exited their training programs.

Year 1, End 1

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-16064  -6773  -3584   4265  81800

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   9887.9     1514.3    6.53  9.1e-11 ***
neccc         3698.7      864.6    4.28  2.0e-05 ***
female       -3211.9      597.2   -5.38  8.7e-08 ***
black        -2613.2     1103.8   -2.37    0.018 *
age             77.4       38.0    2.04    0.042 *
cohort42     -1464.4      866.1   -1.69    0.091 .
cohort43       107.4      815.0    0.13    0.895
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10800 on 1468 degrees of freedom
Multiple R-Squared: 0.0548,   Adjusted R-squared: 0.0509
F-statistic: 14.2 on 6 and 1468 DF,  p-value: 9.15e-16
```

Year 1, End 2

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-16478  -8283  -3430   5631  67887

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  10688.4     1807.6    5.91  4.4e-09 ***
neccc         1697.2      973.8    1.74   0.0816 .
female       -3832.3      724.3   -5.29  1.4e-07 ***
black        -2442.9     1297.7   -1.88   0.0600 .
age            127.9       45.3    2.82   0.0049 **
cohort42     -1740.1      972.3   -1.79   0.0738 .
cohort43      -598.8      916.4   -0.65   0.5136
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 11900 on 1228 degrees of freedom
Multiple R-Squared: 0.0466,   Adjusted R-squared: 0.042
F-statistic:   10 on 6 and 1228 DF,  p-value: 8.17e-11
```

Year 2, End 1

```
Call:
zelig(formula = wage2 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-25070 -13296  -3940  11933  67435

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    10180       5396    1.89    0.060 .
neccc           3922       2324    1.69    0.093 .
female         -3526       3143   -1.12    0.263
black          -4454       3117   -1.43    0.154
age              343        155    2.21    0.028 *
cohort42        -419       2912   -0.14    0.886
cohort43       -2349       2794   -0.84    0.401
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 17100 on 232 degrees of freedom
Multiple R-Squared: 0.0482,   Adjusted R-squared: 0.0236
F-statistic: 1.96 on 6 and 232 DF,  p-value: 0.0723

Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-19582  -9520  -2663   6543  60039
```

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   6261.1     2583.1    2.42  0.01570 *
neccc         2246.3     1154.0    1.95  0.05214 .
female       -3788.0     1467.7   -2.58  0.01013 *
black        -2883.3     1503.1   -1.92  0.05565 .
age            317.2       84.5    3.75  0.00019 ***
cohort42     -1452.4     1716.3   -0.85  0.39782
cohort43     -2987.4     1523.5   -1.96  0.05043 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12500 on 511 degrees of freedom
Multiple R-Squared: 0.0585,   Adjusted R-squared: 0.0475
F-statistic: 5.29 on 6 and 511 DF,  p-value: 2.61e-05
```

Year 2, End 2

```
Call:
zelig(formula = wage2 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-26002 -12098  -3785   8370  67196

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     6693       5314    1.26   0.2090
neccc           4597       2505    1.84   0.0676 .
female         -6717       2276   -2.95   0.0035 **
black          -2291       3562   -0.64   0.5206
age              386        130    2.97   0.0032 **
cohort42        -736       2157   -0.34   0.7331
cohort43       -2990       3406   -0.88   0.3809
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 15800 on 259 degrees of freedom
Multiple R-Squared: 0.0992,   Adjusted R-squared: 0.0784
F-statistic: 4.75 on 6 and 259 DF,  p-value: 0.000129
```

All—Apprentices Excluded

When all of the apprentices are deleted from the sample, there is no difference between the wages that the non-apprentice N/ECCC program graduates are earning and the wages of the individuals who received training at the One-Stop.

Year 1, End 1

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
```

```
   Min     1Q Median     3Q    Max
-12404  -6668  -3444   4213  62730

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  11616.8     1731.9    6.71  3.3e-11 ***
neccc          273.7     1054.2    0.26     0.80
female       -3752.6      677.2   -5.54  3.8e-08 ***
black        -2480.2     1265.0   -1.96     0.05 .
age             16.1       42.7    0.38     0.71
cohort42     -1590.6     1001.0   -1.59     0.11
cohort43      1076.2      936.3    1.15     0.25
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10400 on 1030 degrees of freedom
Multiple R-Squared: 0.0416,   Adjusted R-squared: 0.036
F-statistic: 7.44 on 6 and 1030 DF,  p-value: 8.05e-08
```

Year 1, End 2

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-15964  -7967  -3229   6051  68233

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  14473.3     2137.3    6.77  2.4e-11 ***
neccc        -1534.3     1214.2   -1.26    0.207
female       -4611.8      841.8   -5.48  5.7e-08 ***
black        -3634.0     1524.6   -2.38    0.017 *
age             41.4       52.5    0.79    0.430
cohort42     -2085.6     1149.1   -1.81    0.070 .
cohort43       421.4     1076.6    0.39    0.696
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 11700 on 851 degrees of freedom
Multiple R-Squared: 0.049,    Adjusted R-squared: 0.0423
F-statistic: 7.31 on 6 and 851 DF,  p-value: 1.24e-07
```

Year 2 End 1

```
Call:
zelig(formula = wage2 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-18706 -12166  -5736   7358  69538

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    11878       7028    1.69    0.093 .
neccc           1247       2914    0.43    0.669
female         -5853       3674   -1.59    0.113
black          -2451       3958   -0.62    0.537
age              174        206    0.85    0.399
```

```
cohort42        -411       3704   -0.11    0.912
cohort43         414       3478    0.12    0.905
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 16700 on 140 degrees of freedom
Multiple R-Squared: 0.0285,   Adjusted R-squared: -0.0131
F-statistic: 0.685 on 6 and 140 DF,  p-value: 0.662
```

Year 2, End 2

```
Call:
zelig(formula = wage2 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-23014 -10016  -3497   5936  67674

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    14268       5941    2.40   0.0173 *
neccc          -1760       2870   -0.61   0.5404
female         -6174       2363   -2.61   0.0097 **
black          -7937       4266   -1.86   0.0643 .
age              284        146    1.95   0.0526 .
cohort42        -122       2278   -0.05   0.9574
cohort43        4535       3941    1.15   0.2513
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 14500 on 193 degrees of freedom
Multiple R-Squared: 0.0981,   Adjusted R-squared: 0.0701
F-statistic:  3.5 on 6 and 193 DF,  p-value: 0.00262
```

Adults

Adult graduates, those who were 20 or older when they enrolled in the program, are earning significantly higher wages than adults who received their training from the One-Stop. These results are robust to the different operationalizations for end date for the control group.

In addition, N/ECCC program graduates experienced significantly greater wage growth from the first year before training to the first year after training than the comparison group individuals who received their training through the One-Stop. The difference in wage growth from the second year before training to the second year after training between the treatment group and control group was even greater for the control group.

Year 1, End 1

```
Call:
zelig(formula = wage1 ~ neccc + wagem4 + wagem2 + wagem1 + female +
    black + age + cohort42 + cohort43 + cohort51 + cohort52 +
    cohort53, model = "ls", data = m1h.data)

Residuals:
```

```
   Min     1Q Median     3Q    Max
-38844  -5375  -1541   5429  33584

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.09e+03   3.63e+03    0.85     0.40
neccc        5.70e+03   1.23e+03    4.62  6.1e-06 ***
wagem4       1.71e-04   6.76e-02  0.0025     1.00
wagem2       5.08e-02   8.23e-02    0.62     0.54
wagem1       6.21e-01   8.35e-02    7.44  1.4e-12 ***
female      -2.33e+03   1.74e+03   -1.34     0.18
black        1.68e+03   1.99e+03    0.84     0.40
age         -9.50e+01   9.72e+01   -0.98     0.33
cohort42     9.19e+02   2.28e+03    0.40     0.69
cohort43     2.55e+03   2.14e+03    1.19     0.23
cohort51     3.08e+03   2.04e+03    1.51     0.13
cohort52     8.59e+02   2.03e+03    0.42     0.67
cohort53     3.11e+03   2.01e+03    1.55     0.12
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9970 on 260 degrees of freedom
Multiple R-Squared: 0.513,    Adjusted R-squared: 0.491
F-statistic: 22.8 on 12 and 260 DF,  p-value: <2e-16


Call:
zelig(formula = diff11 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1h.data)

Residuals:
   Min     1Q Median     3Q    Max
-54994  -4591    215   4779  31355

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     2025       3962    0.51  0.60971
neccc           4665       1342    3.48  0.00059 ***
female         -2487       1894   -1.31  0.19026
black           3202       2136    1.50  0.13499
age             -203        105   -1.95  0.05278 .
cohort42        1906       2489    0.77  0.44444
cohort43        3744       2317    1.62  0.10735
cohort51        5022       2211    2.27  0.02391 *
cohort52         778       2206    0.35  0.72471
cohort53        3895       2178    1.79  0.07494 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10900 on 263 degrees of freedom
Multiple R-Squared: 0.112,    Adjusted R-squared: 0.0819
F-statistic: 3.69 on 9 and 263 DF,  p-value: 0.000222
```

Year 1, End 2

```
Call:
zelig(formula = wage1 ~ neccc + wagem4 + wagem2 + wagem1 + female +
    black + age + cohort42 + cohort43 + cohort51 + cohort52 +
    cohort53, model = "ls", data = m1i.data)

Residuals:
   Min     1Q Median     3Q    Max
```

```
-40362  -5976  -1033   4636  38454

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  4.98e+03   4.06e+03    1.23    0.222
neccc        3.45e+03   1.43e+03    2.40    0.017 *
wagem4       8.76e-03   7.03e-02    0.12    0.901
wagem2       3.29e-02   8.82e-02    0.37    0.709
wagem1       6.88e-01   9.68e-02    7.11  1.3e-11 ***
female      -4.23e+03   1.94e+03   -2.17    0.031 *
black       -7.95e+02   2.19e+03   -0.36    0.717
age         -1.17e+01   1.11e+02   -0.11    0.916
cohort42     4.02e+02   2.37e+03    0.17    0.866
cohort43     2.46e+03   2.23e+03    1.10    0.272
cohort51     1.20e+03   2.10e+03    0.57    0.569
cohort52     7.27e+02   2.10e+03    0.35    0.729
cohort53     3.93e+03   2.85e+03    1.38    0.168
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10800 on 245 degrees of freedom
Multiple R-Squared: 0.504,    Adjusted R-squared: 0.48
F-statistic: 20.8 on 12 and 245 DF,  p-value: <2e-16


Call:
zelig(formula = diff11 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1j.data)

Residuals:
   Min     1Q Median     3Q    Max
-51632  -4756   -875   5141  35206

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     4145       4254    0.97    0.331
neccc           3012       1505    2.00    0.046 *
female         -4349       2042   -2.13    0.034 *
black            515       2235    0.23    0.818
age             -101        114   -0.88    0.378
cohort42         763       2496    0.31    0.760
cohort43        2818       2339    1.20    0.229
cohort51        2187       2192    1.00    0.319
cohort52         746       2204    0.34    0.735
cohort53        3206       2971    1.08    0.282
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 11400 on 248 degrees of freedom
Multiple R-Squared: 0.0636,   Adjusted R-squared: 0.0296
F-statistic: 1.87 on 9 and 248 DF,  p-value: 0.0566
```

Year 2, End 1

```
Call:
zelig(formula = wage2 ~ neccc + wagem4 + wagem2 + wagem1 + female +
    black + age + cohort42 + cohort43, model = "ls", data = m1h.data)

Residuals:
   Min     1Q Median     3Q    Max
-28298  -7374  -2114   9457  28467
```

```
Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  3625.168   6951.988    0.52   0.6032
neccc        6744.432   2561.602    2.63   0.0098 **
wagem4          0.172      0.156    1.11   0.2716
wagem2          0.401      0.203    1.98   0.0508 .
wagem1          0.491      0.177    2.78   0.0065 **
female      -5704.323   3650.302   -1.56   0.1213
black         801.212   3962.598    0.20   0.8402
age           -17.226    191.831   -0.09   0.9286
cohort42      822.481   3278.684    0.25   0.8024
cohort43    -2238.728   3157.714   -0.71   0.4800
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12900 on 100 degrees of freedom
Multiple R-Squared: 0.598,    Adjusted R-squared: 0.562
F-statistic: 16.5 on 9 and 100 DF,  p-value: 2.52e-16


Call:
zelig(formula = diff22 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1h.data)

Residuals:
   Min     1Q Median     3Q    Max
-35080  -7439   -834   8350  30011

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2106.9     7094.3    0.30    0.767
neccc         6557.8     2645.7    2.48    0.015 *
female       -4143.6     3650.0   -1.14    0.259
black         2962.2     4002.9    0.74    0.461
age            -11.4      194.9   -0.06    0.954
cohort42      -366.3     3364.0   -0.11    0.914
cohort43     -2819.2     3251.0   -0.87    0.388
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 13300 on 103 degrees of freedom
Multiple R-Squared: 0.0879,   Adjusted R-squared: 0.0348
F-statistic: 1.66 on 6 and 103 DF,  p-value: 0.140
```

Year 2, End 2

```
Call:
zelig(formula = wage2 ~ neccc + wagem4 + wagem2 + wagem1 + female +
    black + age + cohort42 + cohort43, model = "ls", data = m1r.data)

Residuals:
   Min     1Q Median     3Q    Max
-28571  -7993  -2402   8738  36400

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -1326.384   7189.620   -0.18   0.8540
neccc        9441.024   2883.325    3.27   0.0015 **
wagem4          0.281      0.160    1.75   0.0830 .
wagem2          0.265      0.194    1.37   0.1747
wagem1          0.519      0.186    2.79   0.0064 **
```

```
female       -647.188   3640.355   -0.18   0.8593
black        5381.066   3906.972    1.38   0.1715
age          -163.333    195.722   -0.83   0.4060
cohort42     4332.461   2920.788    1.48   0.1412
cohort43      855.040   3712.681    0.23   0.8183
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12900 on 99 degrees of freedom
Multiple R-Squared: 0.574,    Adjusted R-squared: 0.535
F-statistic: 14.8 on 9 and 99 DF,  p-value: 5.82e-15


Call:
zelig(formula = diff22 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1s.data)

Residuals:
   Min     1Q Median     3Q    Max
-34729  -8342  -1407   8130  34783

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    -3907       7417   -0.53  0.59955
neccc          10440       3036    3.44  0.00085 ***
female          2112       3752    0.56  0.57464
black           6662       3992    1.67  0.09820 .
age             -152        202   -0.75  0.45353
cohort42        4864       3073    1.58  0.11659
cohort43        -112       3900   -0.03  0.97717
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 13600 on 102 degrees of freedom
Multiple R-Squared: 0.138,    Adjusted R-squared: 0.0873
F-statistic: 2.72 on 6 and 102 DF,  p-value: 0.0171
```

Adults—Apprentices Excluded

To see if the N/ECCC program had positive effects even for those adult graduates who were not able to obtain apprenticeships, the research team excluded from the sample anyone who obtained an apprenticeship and compared the post training wages and wage growth of the N/ECCC non-apprentices to the post-training wage growth of the One-Stop trainees.

The data indicate that in the first year after training, there is no statistically significant difference in the outcomes for the N/ECCC graduates and the comparison group. In other words, the adult graduates of the N/ECCC program who do not obtain apprenticeships are doing as well after completing training as the adults who received training through the One-Stop.

In the second year, however, the data indicate that the N/ECCC graduates are faring better than the One-Stop comparison group. In the second year, their wages are about $5,000 higher than the comparison group and they also see wage growth from the second year before training to the second year after training of about $5,000. These results are not as robust as the results for all

adults, however. When the second method of measuring the end date of training for comparison group members is used, the effect of the program remains strongly positive, though the level of statistical significant falls below conventional levels.

Year 1, End 1

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1h.data)

Residuals:
   Min     1Q Median     3Q    Max
-17924  -6971  -4066   3362  64153

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     8419       5922    1.42    0.157
neccc           3826       2241    1.71    0.090 .
female         -6106       3016   -2.02    0.045 *
black          -6796       3154   -2.15    0.033 *
age              171        162    1.05    0.295
cohort42         222       4021    0.06    0.956
cohort43        1605       3863    0.42    0.678
cohort51         184       3391    0.05    0.957
cohort52        -762       3697   -0.21    0.837
cohort53        1641       3298    0.50    0.619
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 13500 on 150 degrees of freedom
Multiple R-Squared: 0.0775,   Adjusted R-squared: 0.0221
F-statistic:  1.4 on 9 and 150 DF,  p-value: 0.193

Call:
zelig(formula = diff11 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1h.data)

Residuals:
     Min       1Q   Median       3Q      Max
-52161.4  -4571.3     21.1   3795.3  40189.1

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     1933       4522    0.43  0.66961
neccc           1285       1711    0.75  0.45389
female         -5418       2303   -2.35  0.01995 *
black           3804       2408    1.58  0.11629
age             -213        124   -1.72  0.08757 .
cohort42        5124       3070    1.67  0.09715 .
cohort43        5447       2950    1.85  0.06677 .
cohort51        9136       2589    3.53  0.00055 ***
cohort52        3007       2823    1.07  0.28840
cohort53        5699       2518    2.26  0.02505 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10300 on 150 degrees of freedom
Multiple R-Squared: 0.163,    Adjusted R-squared: 0.113
F-statistic: 3.25 on 9 and 150 DF,  p-value: 0.00122
```

Year 1, End 2

```
Call:
zelig(formula = diff11 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1h.data)

Residuals:
   Min     1Q Median     3Q    Max
-32062  -4677   -519   4092  41878

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     2710       4463    0.61   0.5447
neccc            580       1665    0.35   0.7279
female         -5410       2216   -2.44   0.0159 *
black           5991       2208    2.71   0.0075 **
age             -175        120   -1.45   0.1481
cohort42        2339       2548    0.92   0.3603
cohort43        1237       2490    0.50   0.6202
cohort51        3386       2358    1.44   0.1532
cohort52        -349       2592   -0.13   0.8932
cohort53        2738       3420    0.80   0.4247
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9360 on 136 degrees of freedom
Multiple R-Squared: 0.154,    Adjusted R-squared: 0.0977
F-statistic: 2.74 on 9 and 136 DF,  p-value: 0.00562


Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1h.data)

Residuals:
   Min     1Q Median     3Q    Max
-18826  -8247  -4282   3596  70638

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     9811       6835    1.44    0.153
neccc            922       2550    0.36    0.718
female         -5432       3393   -1.60    0.112
black          -7451       3382   -2.20    0.029 *
age              220        184    1.20    0.233
cohort42         777       3903    0.20    0.843
cohort43        1901       3814    0.50    0.619
cohort51       -1129       3611   -0.31    0.755
cohort52       -2558       3969   -0.64    0.520
cohort53        5861       5238    1.12    0.265
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 14300 on 136 degrees of freedom
Multiple R-Squared: 0.0732,   Adjusted R-squared: 0.0118
F-statistic: 1.19 on 9 and 136 DF,  p-value: 0.304
```

Year 2, End 1

```
Call:
zelig(formula = wage2 ~ neccc + wagem4 + wagem2 + wagem1 + female +
    black + age + cohort42 + cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-28895  -6178  -1564   5188  33487

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.37e+03   7.47e+03    0.32  0.75121
neccc        5.15e+03   2.69e+03    1.92  0.05838 .
wagem4      -6.75e-02   1.69e-01   -0.40  0.68940
wagem2       6.80e-01   1.83e-01    3.73  0.00033 ***
wagem1       2.88e-01   1.63e-01    1.76  0.08153 .
female      -4.83e+03   3.61e+03   -1.34  0.18432
black        1.49e+03   3.76e+03    0.40  0.69360
age          2.44e+00   1.87e+02    0.01  0.98963
cohort42     1.91e+03   3.29e+03    0.58  0.56277
cohort43    -6.89e+02   3.21e+03   -0.21  0.83035
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12700 on 95 degrees of freedom
Multiple R-Squared: 0.489,    Adjusted R-squared: 0.441
F-statistic: 10.1 on 9 and 95 DF,  p-value: 9.27e-11


Call:
zelig(formula = diff22 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-35027  -5884  -1711   4102  37430

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   -58.36    7406.48   -0.01    0.994
neccc        4864.47    2721.79    1.79    0.077 .
female      -5255.03    3643.05   -1.44    0.152
black        3929.79    3621.47    1.09    0.281
age            -6.39     188.76   -0.03    0.973
cohort42      628.28    3281.36    0.19    0.849
cohort43    -1205.42    3234.78   -0.37    0.710
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12900 on 98 degrees of freedom
Multiple R-Squared: 0.0639,   Adjusted R-squared: 0.00661
F-statistic: 1.12 on 6 and 98 DF,  p-value: 0.359
```

Year 2, End 2

```
Call:
zelig(formula = wage2 ~ neccc + wagem4 + wagem2 + wagem1 + female +
    black + age + cohort42 + cohort43, model = "ls", data = m1g.data)

Residuals:
```

```
   Min     1Q Median     3Q    Max
-32621  -7712  -2154   8209  29323

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  9.45e+03   8.80e+03    1.07    0.287
neccc        4.58e+03   3.79e+03    1.21    0.231
wagem4      -3.69e-02   1.68e-01   -0.22    0.827
wagem2       4.20e-01   2.32e-01    1.81    0.075 .
wagem1       5.47e-01   2.09e-01    2.61    0.011 *
female      -6.52e+03   4.73e+03   -1.38    0.173
black        4.63e+03   4.51e+03    1.03    0.309
age         -2.58e+02   2.40e+02   -1.07    0.287
cohort42     2.26e+02   3.77e+03    0.06    0.952
cohort43     8.54e+02   5.09e+03    0.17    0.867
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 13400 on 62 degrees of freedom
Multiple R-Squared: 0.482,    Adjusted R-squared: 0.407
F-statistic:  6.4 on 9 and 62 DF,  p-value: 2.25e-06


Call:
zelig(formula = diff22 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-36884  -5852  -1156   7800  30596

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)     7483       9302    0.80     0.42
neccc           5490       4009    1.37     0.18
female         -7967       4999   -1.59     0.12
black           5529       4540    1.22     0.23
age             -296        247   -1.20     0.24
cohort42         974       3938    0.25     0.81
cohort43         286       5285    0.05     0.96

Residual standard error: 14200 on 65 degrees of freedom
Multiple R-Squared: 0.12,     Adjusted R-squared: 0.0391
F-statistic: 1.48 on 6 and 65 DF,  p-value: 0.199
```

Youth

Regardless of the dependent variable analyzed or how the end date of training is operationalized for the comparison group, youth graduates of the N/ECCC program fare no better, nor no worse than youth members of the One-Stop comparison group.

Year 1, End 1

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1g.data)

Residuals:
```

```
   Min     1Q Median     3Q    Max
-10921  -4574  -1706   2906  56156

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    13381      23453    0.57     0.57
neccc            145       1981    0.07     0.94
female         -2340       1928   -1.21     0.23
black          -3063       2340   -1.31     0.19
age             -191       1275   -0.15     0.88
cohort42        -995       2144   -0.46     0.64
cohort43        3135       2317    1.35     0.18
cohort51        1177       2471    0.48     0.63
cohort52        -296       2224   -0.13     0.89
cohort53        2156       2006    1.07     0.28

Residual standard error: 8550 on 156 degrees of freedom
Multiple R-Squared: 0.0721,   Adjusted R-squared: 0.0185
F-statistic: 1.35 on 9 and 156 DF,  p-value: 0.217
```

Year 1, End 2

```
Call:
zelig(formula = wage1 ~ neccc + female + black + age + cohort42 +
    cohort43 + cohort51 + cohort52 + cohort53, model = "ls",
    data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-13101  -4718  -1633   2648  30114

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    44542      24262    1.84    0.069 .
neccc           -288       1923   -0.15    0.881
female         -2593       1854   -1.40    0.164
black          -4288       2275   -1.89    0.062 .
age            -1731       1294   -1.34    0.183
cohort42       -1962       1916   -1.02    0.308
cohort43        3023       2071    1.46    0.147
cohort51        -182       2295   -0.08    0.937
cohort52       -1222       2032   -0.60    0.549
cohort53         979       2941    0.33    0.740
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 7530 on 130 degrees of freedom
Multiple R-Squared: 0.121,    Adjusted R-squared: 0.0598
F-statistic: 1.98 on 9 and 130 DF,  p-value: 0.0463
```

Year 2, End 1

```
Call:
zelig(formula = wage2 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-21575  -6399  -1962   4335  41889
```

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   113919      57469    1.98    0.052 .
neccc          -2673       4547   -0.59    0.559
female         -8360       4326   -1.93    0.058 .
black         -14707       8589   -1.71    0.092 .
age            -4437       2915   -1.52    0.133
cohort42       -4592       3525   -1.30    0.198
cohort43         772       3711    0.21    0.836
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 11300 on 59 degrees of freedom
Multiple R-Squared: 0.193,      Adjusted R-squared: 0.111
F-statistic: 2.35 on 6 and 59 DF,  p-value: 0.0419
```

Year 2, End 2

```
Call:
zelig(formula = wage2 ~ neccc + female + black + age + cohort42 +
    cohort43, model = "ls", data = m1g.data)

Residuals:
   Min     1Q Median     3Q    Max
-21762  -7160  -1606   4578  39788

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   136068      63052    2.16    0.036 *
neccc          -3775       5145   -0.73    0.467
female        -10802       4663   -2.32    0.025 *
black         -13911       9257   -1.50    0.139
age            -5554       3208   -1.73    0.090 .
cohort42       -4218       3750   -1.12    0.266
cohort43       -1574       5384   -0.29    0.771
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12000 on 48 degrees of freedom
Multiple R-Squared: 0.224,      Adjusted R-squared: 0.127
F-statistic: 2.31 on 6 and 48 DF,  p-value: 0.0489
```

Endnotes

[1] All wages have been adjusted for inflation and are in fourth-quarter 2006 dollars.

[2] New Jersey Schools Construction Corporation Projects, *Project Labor Agreement*, May 2003. Accessed from http://www.njscc.com/business/PLA/PDF/PLA_7-29-03.pdf on June 18, 2007.

[3] New Jersey Council of Economic Advisers, *New Jersey Economic Review and Outlook for 2007*. Accessed from http://www.state.nj.us/treasury/taxation/pdf/njeconreview.pdf on June 18, 2007.

[4] New Jersey Department of Labor and Workforce Development, *Local Employment Dynamics*. Accessed through http://www.wnjpin.net/OneStopCareerCenter/LaborMarketInformation/lmi27/index.html on various dates between October and December 2006.

[5] The N/ECCC program completers followed in this study completed in six different calendar quarters during 2004 and 2005. Because different completers had different quarters of completion, the calendar quarter that comprised the first quarter before completion was different for different completers. So, the first quarter before completion for anyone who finished the program in the first quarter of 2004 was the fourth quarter of 2003, while the first quarter before completion for a second quarter 2005 completer was the first quarter of 2005. For each completer, a variable was constructed that indicated whether a person was employed for each quarter relative to the quarter during which they completed the program. A person was counted as being employed for a particular quarter if they earned wages greater than zero during that quarter.

[6] The pre-enrollment employment rates were calculated for each quarter only for any N/ECCC program completers who were 19 years old or older during that quarter. (In terms of age at enrollment, this means that only those students who were at least 20 years old when they enrolled in the program were included in pre-enrollment employment rate calculations.) Therefore, only students who were 22 or older had employment rates calculated for all 12 pre-enrollment quarters. The reason for this is straightforward: high school students are not necessarily in the labor market. They are not actively seeking employment. To count them as unemployed would distort the true employment rate. Similarly, to include the wages that students earn while in high school in the calculation of average wages for those employed would distort the estimate of the true average wage, because high school students' wages are necessarily limited because they have to spend many of their waking hours at school.

[7] All wages have been adjusted for inflation and are in fourth-quarter 2006 dollars.

[8] Alan M. Voorhees Transportation Center and New Jersey Motor Vehicle Commission, *Motor Vehicles Affordability and Fairness Task Force: Final Report*, February 2006.

[9] Percent Hispanic in the data (judging from surnames).

[10] U.S. Census, *American Community Survey*. Accessed through U.S. Census American Factfinder at http://factfinder.census.gov/home/saff/main.html?_lang=en, on various dates between October and December 2006.

[11] Some students who take the initial WorkKeys test do not take the follow-up test, because they may have already been placed in an apprenticeship or because they may have been absent that day.

[12] In March 2007, the program director accepted another position with the Newark WIB. NJISJ has since hired a replacement.

[13] Employed was defined as having wages>0 in the New Jersey Unemployment Insurance wage record database.

[14] The average wage calculations include individuals whose wages equaled zero.

[15] This report discusses the post-program wage disparity between the younger and older N/ECCC graduates later.

[16] The research team used the statistical routine MatchIt (Ho, D., Imai, K., King, G., and Stuart, E., 2007, *Matchit: Matching as Nonparametric Preprocessing for Parametric Causal Inference*, accessed at http://gking.harvard.edu/matchit/docs/matchit.pdf on June 18, 2007, and Ho, D., Imai, K., King, G., and Stuart, E, in press, "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference," *Political Analysis*. MatchIt was implemented using Zelig (Imai, K., King, G., and Lau, O., *Toward a Common Framework for Statistical Analysis and Development*, 2007, accessed from http://gking.harvard.edu/files/z.pdf on June 18, 2007; Imai, K., King, G., and Lau, O., *Zelig: Everyone's Statistical Software*, accessed from http://gking.harvard.edu/zelig/docs/zelig.pdf on June 18, 2007) in R (R Core Development Team, *R: A Language and Environment for Statistical Computing*, Vienna, Austria: R Foundation for Statistical Computing, 2006). See also Diamond, A. and Sekhon, J., *Genetic Matching for Estimating Causal Effects: A New Method of Achieving Balance in Observational Studies*, Institute of Governmental Studies, University of California Berkeley, 2006, accessed from http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1132&context=igs on June 18, 2007; and Hansen, B.B. (2004), "Full Matching in an Observational Study of Coaching for

the SAT," *Journal of the American Statistical Association*, 99, 609–618. The appendix contains a discussion of the matching procedure.

[17] All wages have been adjusted for inflation and are in fourth-quarter 2006 dollars.

[18] The research team also compared the probability of being employed after training of the youth N/ECCC graduates and the comparison group members. The researchers found that the N/ECCC graduates were no more (and no less) likely to be employed in any of the eight quarters after training than the comparison group individuals who received other types of job training.

[19] One individual was removed because he had wages over a six-quarter period prior to enrolling in the program of greater than $250,000.

[20] Ho, Imai, King, and Stuart, "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference."

[21] Ho, Imai, King, and Stuart, *Matchit: Matching as Nonparametric Preprocessing for Parametric Causal Inference*; Ho, Imai, King, and Stuart, "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference."

[22] Imai, King, and Lau, *Toward a Common Framework for Statistical Analysis and Development*; Imai, King, and Lau, *Zelig: Everyone's Statistical Software*.

[23] R Core Development Team, *R: A Language and Environment for Statistical Computing*.

[24] The code used to run the matching algorithms and the results of the matching procedures are available upon request.

[25] The research team found that when it excluded the start quarter dummies in the matching models, it achieve worse balance on the covariates. Consequently, the researchers decided to exclude the start quarter dummies from the matching models.