Workforce Innovation & Opportunity Act Program Evaluation for Wyoming

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Other program evaluations: https://doe.state.wy.us/lmi/outcomes.htm

Introduction:

Education beyond a high school diploma often leads to higher wages and lower potential for poverty (United States Census Bureau, 2017). A higher education is sometimes inaccessible for certain members of the labor force. The Workforce Innovation & Opportunity Act (WIOA), that amended the Workforce Investment Act of 1998, aims to provide "individuals with barriers to employment, access to and opportunities for the employment, education, training, and support services they need to succeed in the labor market" (H. R. 803, 2014). Training is offered through WIOA training providers to those adults, dislocated workers, and youth that meet certain eligibility requirements.

WIOA requires program evaluation on specific performance measures to promote accountability and transparency (Department of Labor, 2019). The current performance metrics are employment, earnings, credential attainment, skill gain, and effectiveness in serving employers after exit of the program (Wyoming Workforce Development Council, 2019). Through evaluation of metrics the workforce development programs can be better aligned with regional economic development strategies (Department of Labor, 2019). The Wyoming Department of Workforce Services, Research & Planning (R&P) will be conducting the program evaluation.

WIOA and its predecessor are an important resource in Wyoming for workforce development and economic diversification. Much of the needed training for workers comes from money tied to the oil and gas industry (Storrow, 2016). As mineral activity fluctuates, so does the state revenue to spend on workforce development and training. The WIOA program can help offset the decline in funding during times of slow mineral activity. Consistent funding from WIOA can help ensure consistency in workforce development programs, continued participation from training providers, and coordination of training services and employers' needs.

In compliance with WIOA's planning requirements the Wyoming Workforce Development Council (WWDC) partnered with Department of Workforce Services, Research & Planning (R&P) to prepare a state strategic plan. Part of the plan was to determine industry sectors and occupations with existing employment demand, industry sectors and occupations with emerging employment demand, and employers' employment needs (Wyoming Workforce Development Council, 2018). Using 2014-2024 long-term industry and occupational projections R&P created a list of 32 occupations that may "present employment and training opportunities for job seekers, employers, colleges, and training providers" (Wyoming Workforce Development Council, 2018). The 32 occupations had to also meet additional criteria from the WWDC. Occupations needed a mean hourly wage of at least $15.00, at least five projected annual openings, and typical education requirements that were beyond a high school diploma but less than a four-year degree (Wyoming Workforce Development Council, 2018).

The success of WIOA is important to workforce and economic development for Wyoming. To determine success of the program, performance measures have been mentioned above and R&P has been tasked with determining if completion of a WIOA training programs leads to an increase in wages. R&P will measure wages and employment of WIOA participants before and after completion of the program. Other states that have created annual plans and conducted evaluations of their WIOA programs have seen expected and positive results.

Washington State's workforce development council has been featured in interviews between the DOL and state agencies. The state's methods are highlighted in *Voices of Experience*, a series of interviews which "showcases workforce system leaders" (Workforce GPS, 2019). In conducting their analysis, Washington State measured wages two quarters after exit from a program and four quarters after exit from a program (WTECB, ESD and WDCs, 2019). Washington has seen an increase in wages in adult, dislocated, and youth participants in WIOA programs (Workforce Training & Education

Coordinating Board, 2018). Similar to the analysis conducted by R&P these performance metrics were broken down by gender, program, and age.

This study will be examining performance outcomes of WIOA per federal requirements. R&P will attempt to assess the outcomes of the program based on wages and employment. Further analysis could include cost effectiveness of the program, attainment of credentials, skill gain, and effectiveness in serving employers.

The participants will be compared to two control groups to determine if there were differences between the participant group and the control groups. This will help determine if changes in wages were due to a specific event, like WIOA training, or other unforeseen conditions. A control group is selected based on data available to R&P in wage records and driver's license information from the Wyoming Department of Transportation.

Selection of the control groups involves dividing the participants into stratification groups. Stratification groups are created by using gender, wages, and age. An example of a stratification group is Male age 35-44 with annual wages of over $25,000. After participants are grouped the distribution rate of participants across the total is determined. Once the rate is determined a subset of the control group must be determined for each stratification group.

The control subset size is determined by using the number of controls in the stratification group available to R&P and the distribution rate of the participant group. In a hypothetical study, If we know that 2727 individuals are in the same stratification group as the participant example above (Male, age 35-44, annual wages of $25000+) and the participant group is approximately 0.9% of the participant total we can determine that a sample size of 312,242 is needed so that the control group mirrors the participant group as much as possible. Once all the sample sizes are found for each stratification group the lowest value is found to determine the maximum size of the control pool. (Glover, 2002)

With the maximum value for the control group established, the stratification of the control groups are selected to reflect the same distribution as the participant group. The members of each control group are randomly selected using a computer program.

This quasi-experimental design is the best design to use for R&P's purpose other than experimental. The experimental design cannot be used in this situation as it involves randomly selecting both participants and control group. The participants cannot be randomly selected due to ethical issues. The study must use the quasi-experimental design of using participants that have completed the training program and creation of the control group.

Methodology:

The data sources used for this research came from the wage records database, Wyoming Department of Transportation (WYDOT), Wyoming Department of Education (WYDOE), University of Wyoming (UW), Wyoming Community College Commission (WCCC) and the Workforce Innovation and Opportunity Act (WIOA) Participant Individual Record Layout (PIRL) files. R&P aggregated the WIOA youth, adult and dislocated worker programs due to sample size. One participant was removed for being the only participant in fiscal year 2013 (FY2013). The number of WIOA program participants by fiscal year is shown in Table 1. There were 466 participants in the WIOA Youth, Adult or Dislocated Worker programs. Quarters with WIOA training program information were available from 2013Q3 to 2017Q4. The largest number of WIOA participants came from FY2017 with 180 individuals, while FY2014 and FY2019 had the fewest WIOA participants with 6 individuals.

Variables for this research included gender, which was assigned male or female. Unknown sex was excluded from the study so R&P could statistically match to the two control groups. Tables 2 and 2a show 265 women and 201 men with the average age for women and men at 31 and 33 years. Table 3 has age groups contained in six brackets ranging from 0-19, 20-24, 25-34, 35-44, 45-54, and 55 and over.

The distribution of each age range was 62, 108, 130, 77, 57, and 32 respectively. Gender and age group brackets were utilized for the purpose of grouping similar individuals by age and gender to the control groups to make sure the distributions were similar. Indirectly, by aggregating the WIOA programs more observations were available that would not need to be suppressed for confidentiality.

Table 4 displays wage ranges comprised of six brackets: $3,999 or less, $4,000-$8,999, $9,000-$14,999, $15,000-$24,999, $25,000-$49,999 and $50,000-$99,999. The reason wages above $99,999 were not used was due to these wages being an outlier. The distribution of each wage range was 118, 83, 88, 90, 68 and 19 which summed is 466; the percentage representation of each wage range bracket was 25.3, 17.8, 18.9, 19.3, 14.6 and 4.1 totaling 100.0. Table 3a breaks down the WIOA and control groups by age group and gender. The biggest difference in Table 3a is the participation of females in the 20-24 and 25-34 age brackets. There are 40 and 28 more females than males in the WIOA participant group. Wage ranges were rounded to the closest thousandth dollar. The wage ranges and rounding were done to group the WIOA participants to similar members of the two randomly selected control groups.

Quarters worked determined whether an individual was categorized as having worked all of the previous four quarters or if they had worked less than four quarters prior to program participation. This was done to differentiate between full-time and part-time work between program participants and the control group. Average number of quarters worked was four if the quarters worked variable was four, if quarters worked were less than four then average quarters worked was between one and three. Average number of employers was defined as the number of employers an individual had in the previous four quarters, also it was used to differentiate workforce turnover between program participants and the control group. Table 4a displays wage groups and quarters worked categories while

Table 4b includes gender. The majority of individuals that worked less than four quarters were in the wage group earning less than $3,999.

Table 5 shows WIOA and both control groups primary industry prior to WIOA program entry. While WIOA participants' primary industry was not statistically matched to the control groups, they are similarly grouped. Leisure and hospitality was the primary industry of 23.2% WIOA participants and 25.0% and 24.7% for the control groups one and two. Retail trade was the primary industry at 15.2 and 16.9% for WIOA participants and the control groups respectively. WIOA participants whose primary industry was in mining represented 7.1% of all WIOA participants, while the control groups whose primary industry was mining was 2.6% and 2.7%. WIOA participants whose primary industry was in health services represented 16.3% of all WIOA participants, while the control groups whose primary industry was health services was 11.8%. Health services had the largest percent difference at 4.5%.

Matchperiod was created to match WIOA participants to the most recent timeframe where they had received wages. If participants received wages during the WIOA training period then matchperiod was the same as the WIOA program training period. If participants didn't receive wages while they were in the WIOA program then matchperiod was the first quarter before entry in the WIOA training period where they received a wage. There were 171 observations that earned zero wages while receiving training in one of the WIOA programs and had to be matched to a prior period where a participant received wages. Average wages were calculated by taking the total wage from the last four quarters from the match period.

Some of the fiscal years used have incomplete annual wage data for one, two, or three years. Fiscal years that had incomplete data were not used for the year there was missing data after WIOA program entry. For example, FY2017 data was only used for one year after WIOA program entry and omitted for two and three years after WIOA program entry due to incomplete data. Participation rates

for both control groups as well as the WIOA participant group by Fiscal Year dropped over the course of three years after program entry. Table 6 shows the number of individuals with wages by WIOA program year and the percent left compared to prior entry into the WIOA program. Control groups 1 and 2 both started with 52,192 individuals prior to participant entry into a WIOA program. There were 5,264 individuals in FY2014 and FY2015 that had wages one year prior to program entry in Wyoming, of those, 3,227 and 3,270 representing 61.3 and 62.1% from control groups 1 and 2 had wages three years after program entry in Wyoming. There were 466 individuals in the participant group prior to WIOA program entry, 47 individuals in FY2014 and FY2015 had data one year prior program entry, of those, 31 representing 65.9% of the original 47 individuals had wages three years after program entry in Wyoming.

The control groups were statistically matched to the training entry year and quarter based on the aforementioned demographic and wage variables listed. Members of the participant and control groups had to have wages after the first year of training. The next step was to make sure that the participant and control groups were not statistically different prior to WIOA training. Figure 1 shows that the distribution between experimental and control groups did not differ within gender and age group. Since wages were not normally distributed non-parametric statistical testing was done to see if the participant and control group wages were statistically different prior to entering a WIOA program. A Wilcoxon rank sum scores non-parametric test was done for both control groups against the participant group with mean annual wages being measured. The Wilcoxon test ranked the annual wages of control group 1 and the participant group as well as control group 2 and the participant group. The rank of each annual wage is then added up as a sum of scores, which is compared to an expected number under the null hypothesis used for determining statistical significance. The sum of scores number used in this study will always be the participant score because it had fewer individuals than either control groups.

Table 7 displays the results of the Wilcoxon non-parametric test showed wages prior to entering a WIOA program were not statistically different to wages in the control group.

Another statistical test employed was an independent samples t-test. An independent samples t-test compares the means of two independent groups, for this paper the mean annual wages for the control groups are compared to the participant group. Results of the independent samples t-test showed that mean annual wages between participants and both control groups were not statistically different from one another prior to WIOA program entry, shown in Table 8. Both statistical tests indicate the control groups are statistically matched to the WIOA participants.

Results:

Tables 9-11 show results of the Wilcoxon non-parametric statistical testing one to three years after WIOA program entry. The tables list the following information number of individuals in the control and participant groups, the sum of the rank score, the expected score under the null hypothesis of no difference between the control and participant groups, the p-value and whether the result was statistically significant.

Table 9 shows results for one year after WIOA program entry. There were 31,894 and 31,877 individuals from FY2014, FY2015, FY2016 and FY2017 represented in control groups 1 and 2 that had wages, while 259 individuals from FY2014, FY2015, FY2016 and FY2017 with wages were in the participant group. The Wilcoxon scores for participants against control groups 1 and 2 for year one was 3,297,434 and 3,275,841, while the Wilcoxon score expected for the null hypothesis was 4,163,943 and 4,161,741.5. Year 1 Wilcoxon scores were statistically significant with a p-value of <.0001, this means that the annual wages for control groups 1 and 2 were significantly higher than the participant group.

Table 10 displays results for WIOA participants two years after program entry. Control groups 1 and 2 had 15,326 and 15,507 individuals from FY2014, FY2015, and FY2016 while the participant group had 135 individuals with wages from FY2014, FY2015, and FY2016. The Wilcoxon scores for participants against control groups 1 and 2 for year one was 953,856 and 958,785, while the Wilcoxon score expected for the null hypothesis was 1,043,685 and 1,055,902.5. Year 2 Wilcoxon scores were statistically significant with a p-value of .041 and .0315, this means that the annual wages for control groups 1 and 2 were significantly higher than the participant group.

Three years after WIOA program entry results are shown on Table 11. Control groups 1 and 2 had 3,227 and 3,270 individuals with wages from FY2014 and FY2015 while the participant group had 31 individuals with wages from FY2014 and FY2015. Wilcoxon scores for annual wages three years after program entry were 51,098 and 49,512. The Wilcoxon score expected for the null hypothesis was 50,514.5 and 51,181. With a p-value of .4555 and .376, year 3 annual wages show no significant difference between the control and participant groups.

Tables 12-14 show the results of the means testing between participants and the control groups. The information is as follows: number of individuals in participant and control groups, mean annual wages one to three years after WIOA program entry, the standard deviation, t-values and whether the result was statistically significant. Tables 15-17 display the mean of the difference in annual wages between WIOA participants one, two and three years after program entry against one year prior to program entry (i.e. Year 1 – Prior Year 1, Year 2 – Prior Year 1, and Year 3 – Prior Year 1) compared to the control groups.

Table 12 displays the independent samples t-test for annual mean wage differences between the two control groups and the WIOA participant group one year after program entry. The mean annual wages for the year 1 control group 1 and 2 were $23,059.80 and $23,196.30, while the mean wages for

the participant group was $16,227.70. The difference in the mean annual wages was $6,832.20 and $6,968.70, which was statistically different between control groups 1 and 2 compared to the participant group, meaning that control groups 1 and 2 had statistically significant higher mean annual wages than WIOA participants one year after program entry.

Results for the independent samples t-test two years after WIOA program entry is shown in Table 13. The mean annual wages for the year 2 control group 1 and 2 was $27,529.50 and $27,794.40. The mean annual wages for the participant group was $24,434.30. The difference in the mean annual wages was $3,095.30 and $3,360.10, which was not statistically different between control groups 1 and 2 compared to the participant group. Control groups 1 and 2 did not have statistically significant higher mean annual wage than WIOA participants two years after program entry.

Table 14 displays the independent samples t-test for annual mean wage differences between the two control groups and the WIOA participant group three years after program entry. Annual mean wages for control groups 1 and 2 were $23,523.70 and $25,104.20, while annual mean wages for the participant group was $25,770.30. The difference in the mean annual wages was -$2,246.50 and -$666.00, which was not statistically different between the control and the participant groups, meaning that WIOA participants three years after program entry did not have a statistically significant higher mean annual wage than control groups 1 and 2.

A comparison of the mean difference between WIOA participants and control groups of year one and prior year WIOA program entry annual wages is displayed in Table 15. The mean of the difference between year 1 annual wages and one year prior to WIOA program entry was -$211.90 compared to $4,595.90 and $4,645.50 for control groups 1 and 2, a difference of over $4,000 on average. This was statistically significant meaning that both control groups net gain in annual wages between year 1 and the prior year to WIOA program entry was greater than WIOA participants.

Table 16 displays a comparison of the annual mean wage difference of annual wages two years after program entry and annual wages one year prior to program entry between WIOA participants and control groups. The mean of the difference between year two and one year prior to WIOA program entry annual wages was $4,539.00 compared to $5,715.10 and $5,881.00 for control groups 1 and 2. This was not statistically significant meaning that both control groups net gain in annual wages between year 2 and the prior year to WIOA program entry was not significantly different than WIOA participants.

Table 17 displays a comparison of the annual mean wage difference of annual wages three years after program entry and annual wages one year prior to program entry between WIOA participants and control groups. The mean of the difference between year three and one year prior to WIOA program entry annual wages was $9,817.30 compared to $6,406.60 and $7,572.40 for control groups 1 and 2. This was not statistically significant meaning WIOA participant's net gain in annual wages between year three and the prior year to WIOA program entry was not significantly different than both control groups.

Limitations:

The size of the sample can make it difficult to compare the WIOA participant group to a control group and to report on individual programs. The size of some WIOA program participant data are too small to meet reporting requirements. Many WIOA training providers also do not maintain complete records for non-WIOA participants, further limiting R&P's efforts of comparing to a control group.

Conclusion:

During the first two years after WIOA program entry those unaffiliated with the program earned significantly higher annual wages than WIOA program participants, while annual wages for participants three years after program entry were not significantly different than their statistically matched control groups using non-parametric statistical testing. The independent samples t-tests show similar results

with annual mean wages higher for control groups 1 and 2 than participants for the first year after WIOA program entry, while the second and third year after WIOA program entry participants do not have significantly different higher annual mean wages than both control groups 1 and 2.

Independent samples t-tests were conducted on the difference in annual wages between one, two and three years after program entry to one year prior to WIOA program entry. The results showed that the difference between one year after training and one year prior to entry in a WIOA program was statistically significant, meaning that both control groups had an increase in wages compared to the WIOA participants. The difference of annual wages between two years after program entry and one year prior to program entry, as well as three years after program entry and one year prior to program entry were not statistically significant between the control groups and WIOA participants.

Workforce participation rates fell during the three years after WIOA program entry. In FY14 16.7 percent of the program participants did not have wages in Wyoming after three years, while the control groups in FY14 had 34.7 and 36.5 percent of individuals without wages in Wyoming. In FY15 36.6 percent of WIOA program participants that did not have wages in Wyoming after three years of program entry compared to 39.3 and 38.1 percent for control groups 1 and 2. We could speculate that those individuals with turnover qualified for unemployment insurance benefits, left the state for other opportunities, or retired.

In future research, the primary industry of employment of participants after WIOA completion could be statistically matched to the control groups. This could help establish if the participants are being employed in the fields for which they have received training and if not, does the completion of WIOA lead to wage difference independent of the credential attained? In past studies, R&P has discovered that adult WIOA participants may have an increase in turnover as time after program

completion has increased (Jones, 2004). The turnover could be examined closer to discover if it is caused by ex-participants seeking higher wages or having unstable employment due to other factors.

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